User Instructions

Laser Engraver

Technical Data / Device Specification

Model			
Basic info	USB570-60W	USB570-80W	USB570-100W
Color	Red and black	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	Autofocus	Autofocus	Autofocus
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*110cm	141*98*110cm	161*98*108cm
Gross weight	170kg	178kg	184kg

CONTENTS

Introduction

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

Frist, it should be emphasized that the installation of each system must meet the requirements, and make it consistent with the installation requirements of LASER. If not, the machine will not working properly and this will lead to poor performance, shortened service life, 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, thus you can correctly install and use. If you meet any installation problems, you can contact our technical staff and customer service staff.

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 to 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: Note or information on individual components of the device that 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

This is used for engraving and cutting of 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 only 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 only 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. Caution 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.

1.4 Device Specification

Mechanics

Working area	27.6“x 19.7“/ 700 x 500 mm
Table Size	29.5“x 21.6“/ 750 x 550 mm
Z Axis Height	7.9 inch / 200mm
Max. Height of work piece (Standard laser head)	7.9 inch / 200mm

Features 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.

Optional:

Rotary Attachment, open cover protection, 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	RDWORKS V8
Operating Modes	Optimized raster, vector, and combined mode
Buffer Memory	128MB Standard

Laser Equipment

Laser Type	Sealed CO2 Glass Laser Tube
Laser Power	60W,80W,100W

Cooling System

Water Cooling System	Water Cooled

Electricity, Power, Fuse

Electricity Requirement	110 or 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

1.5 Manufacturer's Label

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.
The user is recommended to 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 only 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 only 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 persons work with the machine (e.g. by activating equipment without authorization).
3. It is the duty of the operator, to check the machine before start of work for externally visible damage and defects, and to immediately report changes that appear(including behavior during operation) that 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 corresponding instructions and controls.

6. Principally, no safety components may be removed or disabled (already here we emphasize the imminent dangers, for example severe burns, loss of eye-sight). Ifthe 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 only performed with equipment switched off, by trained personnel.
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

1. To assess the potential dangers that 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.

Please note that improper operation of the device can override the status of safety class 4 and can cause the emission of harmful radiation.

2. This laser engraving system contains a carbon dioxide (CO2) laser of class 4 that emits intensive 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 only be operated by trained and authorized personnel.
in your operation, when there is no water, less water or dirty water, the laser machine will be off, so please attention the water situation, for example, there is more enough water, and the water is cleanly.
We suggest you choose purified water or distilled water.
Press the "PAUSE" button, if you want to interrupt an 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 in the inside of 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 will lead to high reflection 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.)

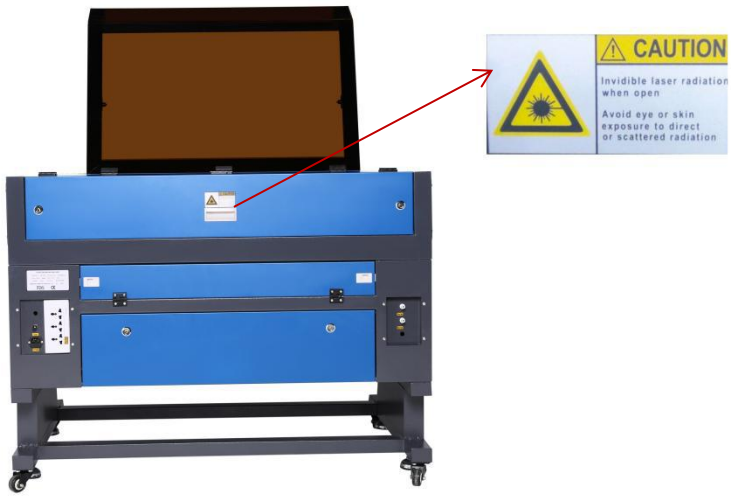
Please refer to the manual of the exhaust system on how and in what intervals you need to replace filters.

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

Should you have further questions before starting work, please feel free to write us an email at: 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 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, carefully remove the foam material, which protects the viewing window of the cover and around the machine.

3. Take out the key， 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 machine (below chapters are installation details)

5. Please keep the 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, which contains the following parts:

	ITEM	QTY
1.	tools	1
2	Ground Wire	1
3	Long USB Cable	1
4	Ethernet cable	1
5	Water box	1
6	Power Cable	1
7	silicone	1
8	7mm acrylic focus tool	1
9	Water Pump	1
10	Sticker for Adjust light path	1

11	Exhaust Pipe	1
12	Hose Clamp	3
13	Water Pipe	2
14	Key	3
15	Manual	1
16	4G-U DISK (software)	1

3.3 Location

Before you install the laser system, you should select an appropriate

location. Follow the guidelines shown below:

1. Avoid locations where the system is exposed to high temperatures, 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.

3. Fuse protection:

   Do not connect other devices via the laser fuse, as the laser system requires the full amperage.

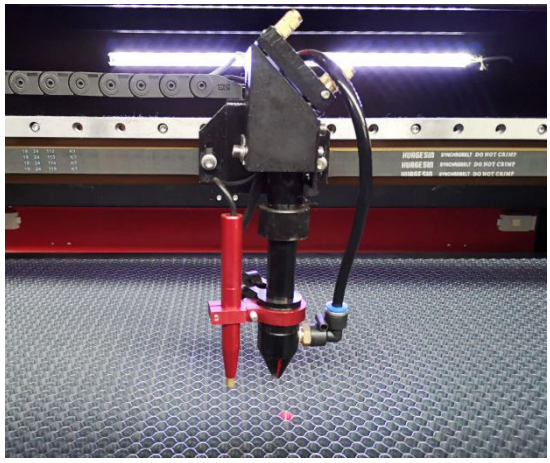
Tips:

1. Avoid locations with poor air circulation.
2. Select a location, whose room temperature is between 5 °C and 25 °C Avoid higher ambient temperatures 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 next to it and avoid using the machine as a table

3.4 Before Installation

1. **Take out the sponge around the laser tube.**

2. **Take out the nylon cable ties around the honey comb plate and X axis.**



3. **Open the rotate emergency switch (must do it for the first time to use the machine).** Like below

3.4 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 an carbon filter (neutralization of smells) 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.

3.5 Built-in air pump

3.6 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 transfer to the laser are reduced. To use the newest software version, you might have to abide 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

3.7 Connections

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

3.7.1 Connecting the Mains

Connect one end of the mains 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.

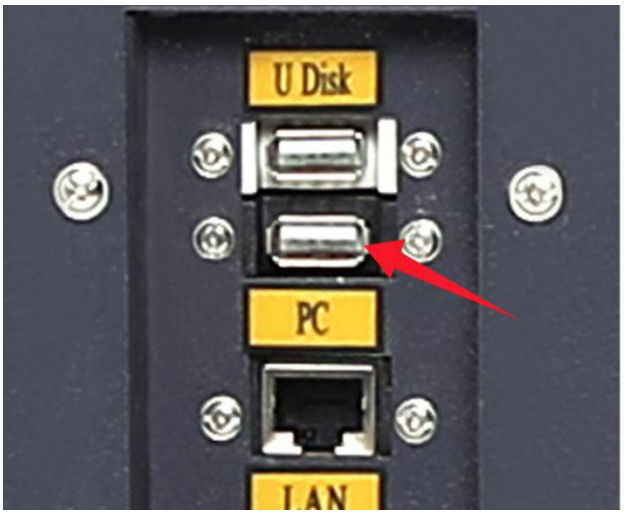
Mains voltage and operating voltage must correspond (AC 220 V/50 Hz or AC 110 V/60 Hz) – see information label beside the connection socket.

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

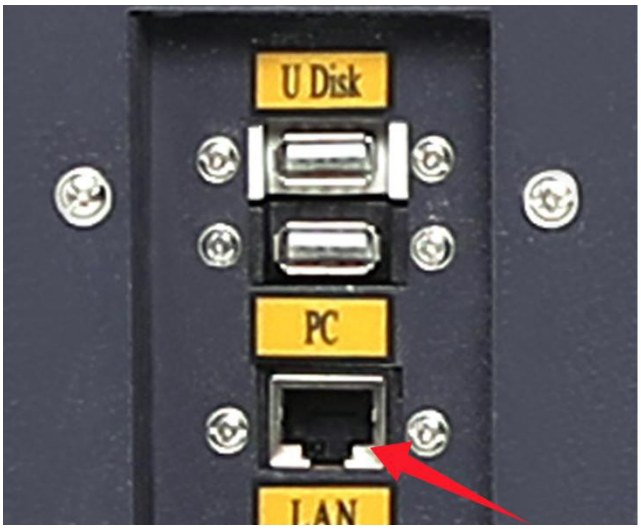
Tips: The main fuses are located inside the connection socket and are accessible from the exterior.

3.7.2 Connecting the Computer

Connecting the computer and the machine by using the USB cable, like below:

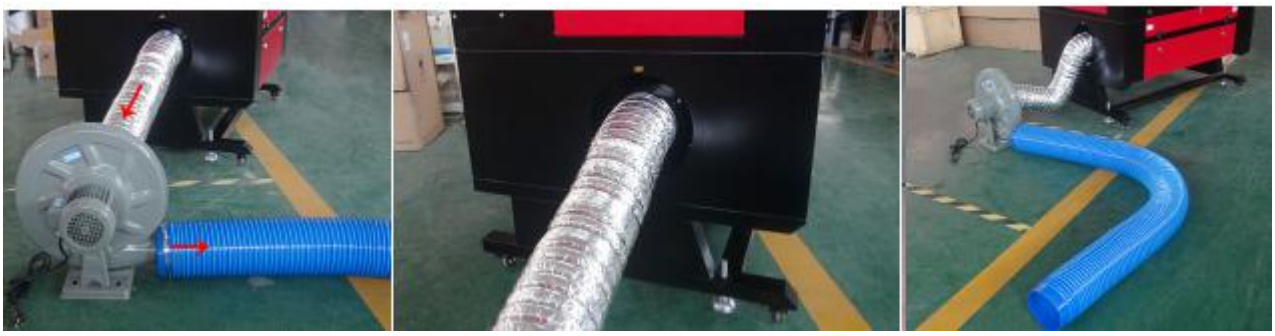


Connecting the computer and the machine by using the Ethernet cable, like below:



3.7.3 Connecting the Exhaust System

Exhaust fan, smoke pipe, is shown in Fig.



Also follow the operation and maintenance instructions in the Operation Manual of the exhaust system.

The input voltage must correspond (AC 220 V/50 Hz or AC 110 V/60 Hz) – see information label beside the connection socket.

Tips: Do not connect the air compressor or the water chiller to the above interface. If you connect them to the above interfaces that cause in failure of the machine, the warranty does not covered.

3.7.4 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 and connect to the water chiller where marked as "OUTLET", the other side of the pipe connect to the machine where marked as "Water IN".

② The other pipe, please connect 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.

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**

① Take out one of the water pipes and connect to the water pump, the other side connect to the machine where marked as “Water IN”.

② The other pipe, please connect to the machine where marked as “Water OUT”., the other side directly into the water.

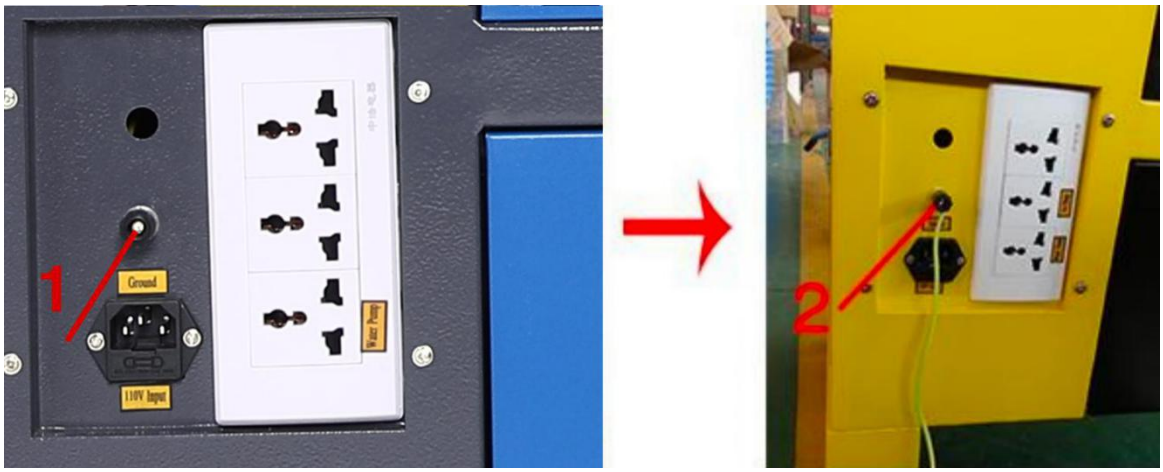
Like below:

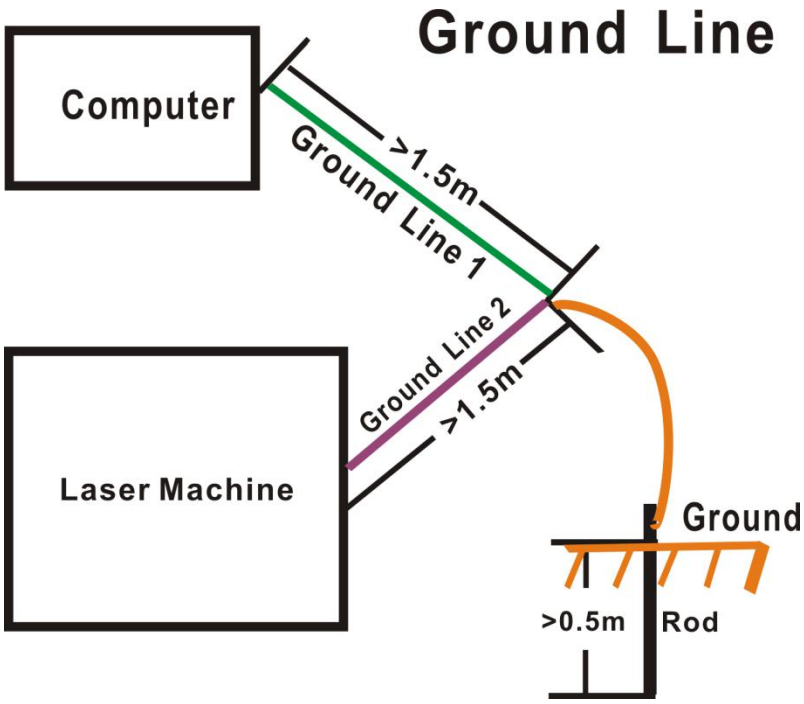
Get through the water chiller or the water pump, and turn on the main power. Check the water chiller or pump to work（If normally work, the green light will light or water will flow from the pipe）.

3.7.5 Safety Grounding

Co2 laser tube is the fourth type of laser. The type of drive is high-voltage-driven, so during 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:



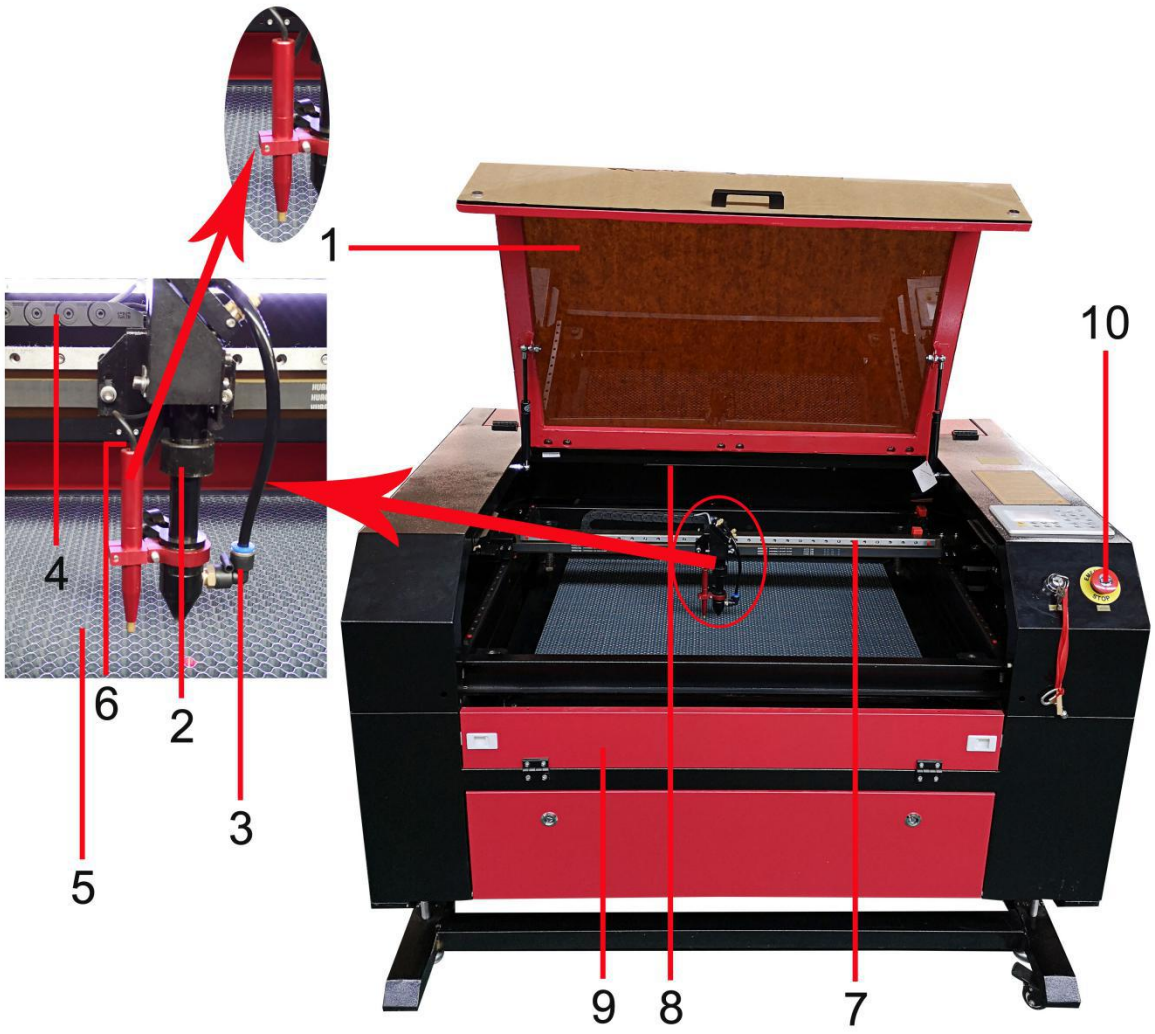


Attention please, bad grounding can cause high failure rate of equipment and at the same time may cause other safety incidents!!!
The company won't assume any responsibility and obligation to the fault and the accident caused by gad grounding!!!

Chapter 4 Operation

4.1 Machine View

Auto-Focus device




Attention
15
11
13
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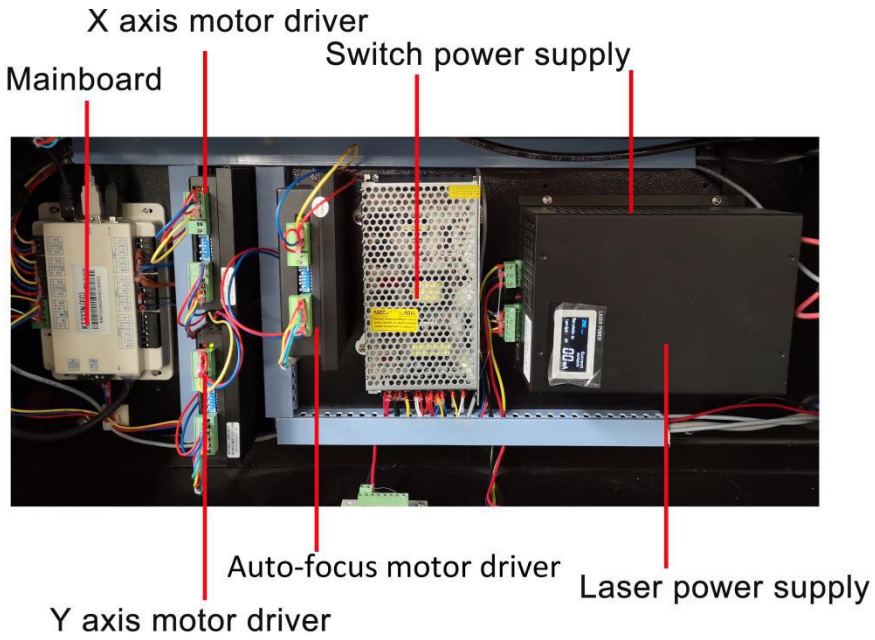
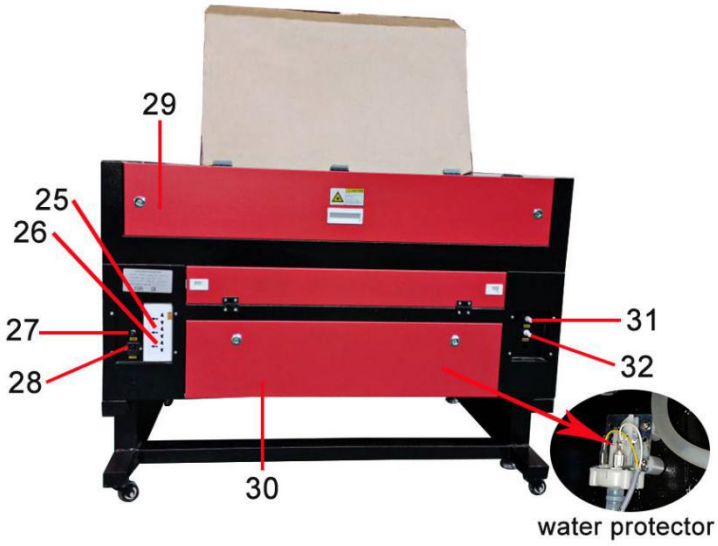
14


X axis motor driver
Mainboard
Switch power supply
Auto-focus motor driver
Laser power supply
Y axis motor driver



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

The air pipe is here to blow air for laser head, and there is red point cable in it.

5. Honeycomb working table

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. X - axis

The motion system is that performs the mechanical movements in X direction. The X- axis is visible in the working area.

8. LED light

You can easily see the situation of working.

9. Front and rear feeding port.

Easy to process the long materials

10. E-stop (The rotate emergency switches)

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

And run the machine, make sure it is on.

11. Left up side door

Open this door for cleaning the second reflective mirror

12. Exhaust hose

This is for installing the exhaust device.

13. Manual regulating valve of up and down

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

14. Front door

Open this door for cleaning the waste after working.

15. Attention

Please read it carefully before the machine works.

16. X limit switch

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

17. U-disk connection port (USB)

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

18. USB cable port (PC connection port)

This USB is for connecting computer.

19. Ethernet port

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

20. Control switch

Turn it on when the machine is running; otherwise there is no instruction for the machine.

21. Laser switch

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

22. Fan

Bring down fever of the main board and driver.

23. Right down side door

There is laser power supply, main board, switch power supply, X and Y motor driver. please open this door for checking these parts, but must pay attention to the electric current.

24. Right up side door

Open it, easy to connect socket of rotary attachment. (rotary attachment is optional)

25. Air pump power socket

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

26. Water pump power socket

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

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 is fuses in it.

29. Laser tube cover

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

30. Back door

Open the door, you can see the water protector.

31. Water outlet

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

32. Water inlet

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

33. 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)

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 turn on the power of machine, and note that turn on the E-stop switch first and then the laser supply power.

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

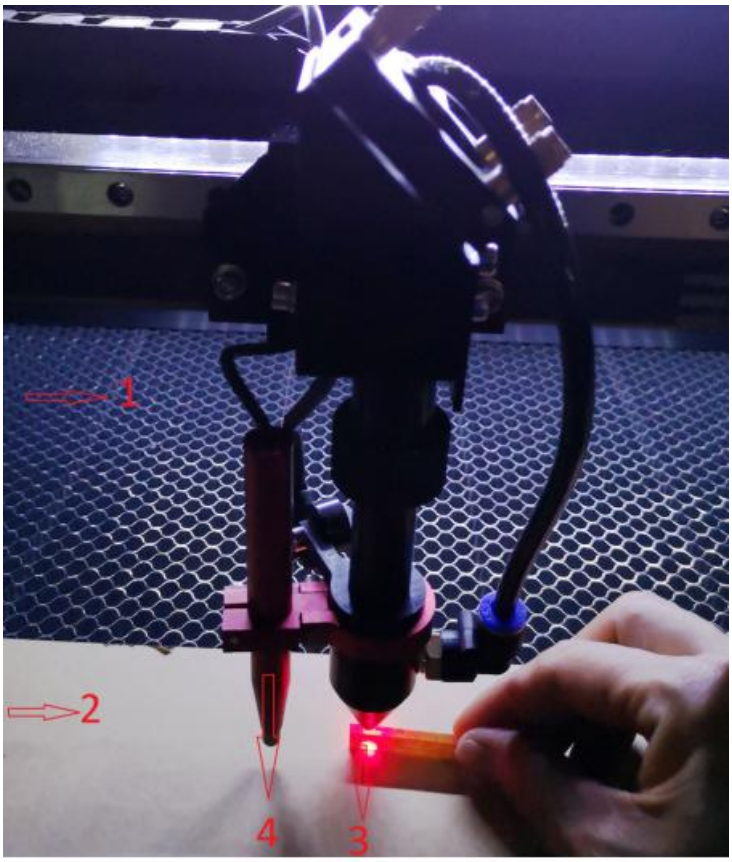
Before switching on the device, the user must make sure that no objects of any kind are located inside the operating space, which could limit or obstruct the mechanics of the device.

Tips: When switching off the mains 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. Materials 3. 7mm acrylic focus tool

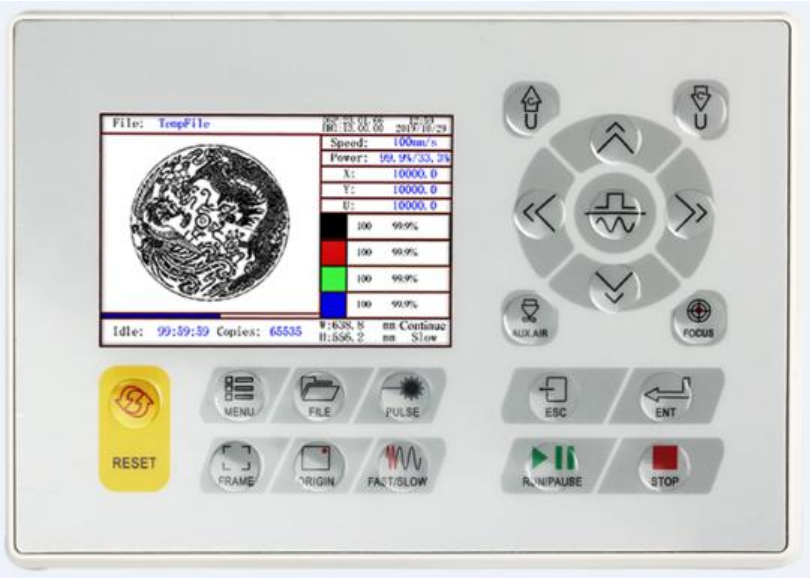
4. Auto-focus device : the bottom of the device should touch the flat and hard materials to be effective, otherwise it will cause failure

4.4 How to use the control panel

KT332N-HMI panel (hereinafter referred to as "panel") is a HMI interface based on a 3.5 TFT LCD screen. The panel can display cutting path in real time, allowing users to understand the current processing patterns, supporting file management, file preview, parameter modification, and support for switching between multiple language interfaces.

Panel characteristics：

- 3.5-inch TFT
- 320×480 Resolution
- 64K color
- RS232 Standard Communication
- Buzzer



4.4.1 Key Function Description

- 

“RESET”：Reset system
- 

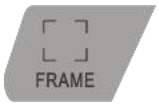
“RUN/PAUSE”：Start job or pause / restart job
- 

“PULSE”：Laser tube pulse
- 

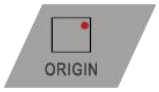
“STOP”：Stop processing/Motor axis movement
- 

“FOCUS”：Auto Focus

- 

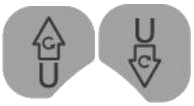
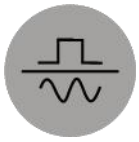
"MANU"： User parameters, manufacturer parameters, language settings, etc.
- 

"FRAME"：Perform border operation on the current processing file
- 

"FILE"：Memory file and U disk file management
- 

"ORINGIN"：Set Positioning
- 

"ESC"：Used to return to the previous menu, cancel parameter settings, etc.
- 

"ENT"：Enter
- 
Arrow keys：Used to move the X and Y axes or move options when setting parameters in the menu.
- 
U axis：U axis movement
- 
"Jog / Continuous"： Jog and continuous motion switching
- 

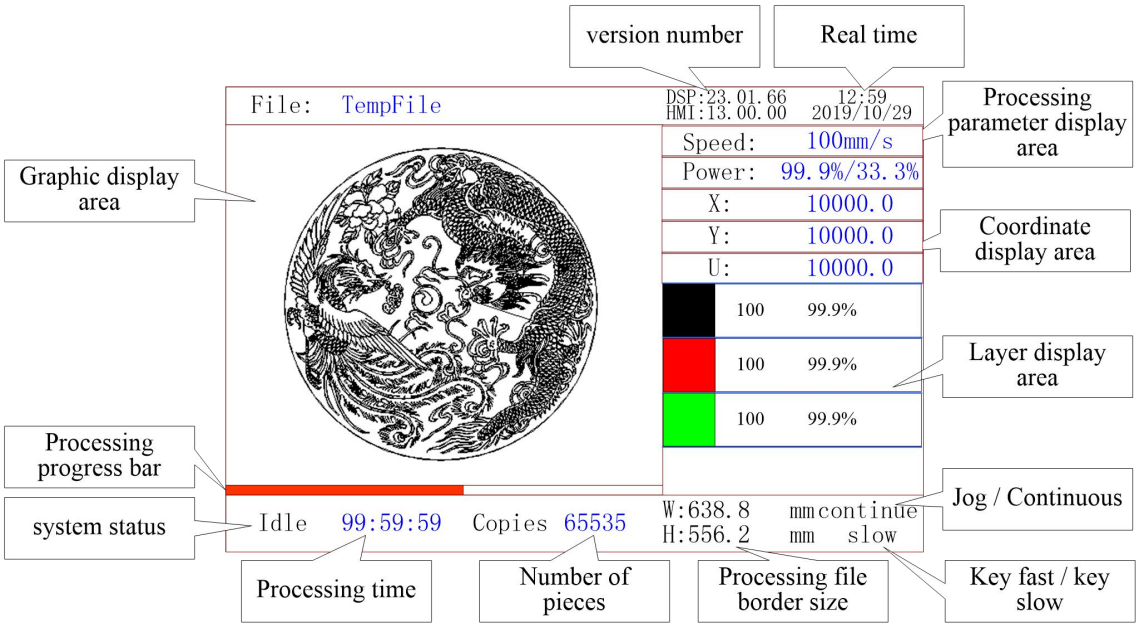
"AUX.AIR"： For controlling air blowing
- 

"FAST/SLOW"： Used to set the fast and slow speed of the keys.

When user presses the arrow key (manual move) directly, it will be slow; when you press and hold the "FAST/SLOW" key, now press arrow key, high speed will be loaded.
Note: Press and hold "FAST/SLOW" key and then press the Esc key will execute a return origin point action.

4.4.2 Main interface funtion

When the system is reset after power on, the main interface will be displayed. As shown below:



- Graphic display area：This area is used to trace the processed file image during file preview display and processing.
- Processing parameter display area：Display the file number, speed and maximum power of the current processing file.
- Coordinate display area：Display the coordinate value of the current position of the laser head
- Layer parameter area：Display the layer parameters of the current processing file or the layer parameters of the preview file. The parameters from left to right are: layer color, layer speed, and layer maximum power.
- Working status area：Used to display the current working status of the system, which are idle, paused, completed, running. The processing time is displayed on the right.
- Processing progress bar：Display the current processing progress
- Number of pieces：Display the processed quantity of the current processing file.
- Frame size of processing file：The range of the processing file is displayed.
- Version number：Program version number for panel and motherboard.
- System time：Display the current system time

In the completed / idle state, the keys can respond, and users can perform file processing, parameter setting, file preview and other operations.

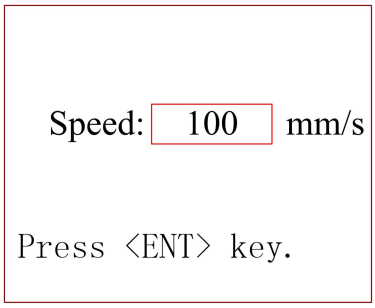
In the running / pause state, some keys do not respond, such as positioning key, border key, file key, etc.

4.4.3 Speed Key

Press [ENT] in the main interface, and the speed parameter in the upper right corner is selected by the red selection box, as shown in the figure below:

Speed	100mm/s
Power:	99.9%/33.3%
X:	10000.0
Y:	10000.0
U:	10000.0

Press ENT again, the following interface pops up:



Refer to Section 4.8 for parameter setting operation. After setting, press [ENT] to save the modified parameters, and press [Esc] to exit from interface.

4.4.4 Power Setting

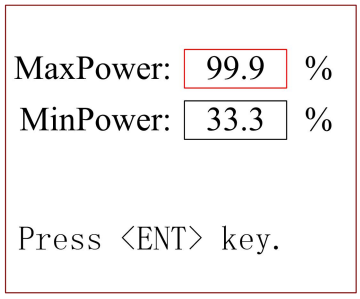
Press [ENT] in the main interface, and the speed parameter in the upper right corner is selected by the red selection box, as shown in the figure below:

Speed	100mm/s
Power:	99.9%/33.3%
X:	10000.0
Y:	10000.0
U:	10000.0

Press the up and down keys to move the red selection box to select the power parameter, as shown in the figure below:

Speed:	100mm/s
Power	99.9%/33.3%
X:	10000.0
Y:	10000.0
U:	10000.0

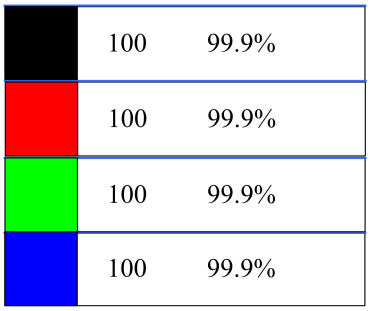
Press ENT again, the following interface pops up:



Refer to Section 4.8 for parameter setting operation. After setting, press [ENT] to save the modified parameters, and press the [Esc] key to exit the interface.

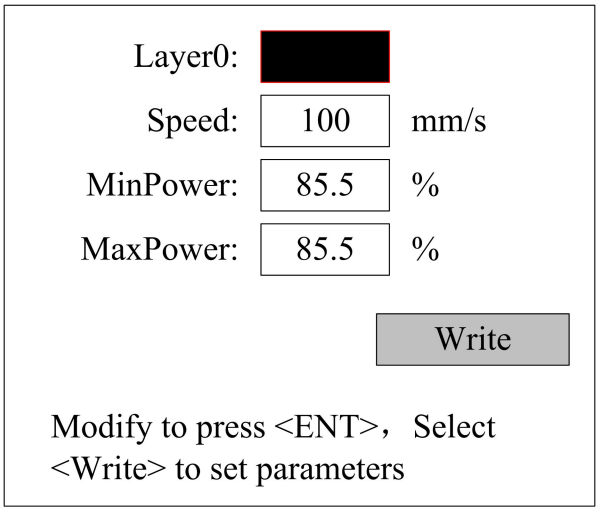
4.4.5 layer funtion

When the systems is completed / idle in the main interface, if there is layer information in the layer parameter area, as shown below:



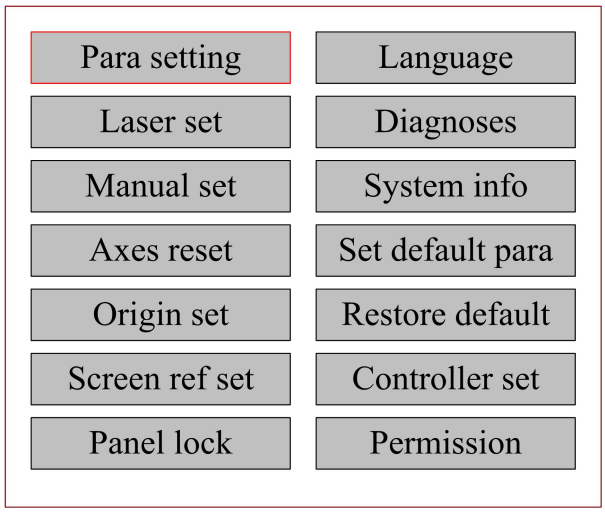
Press [ENT] to enter the parameter area. Use the up and down arrow keys to select the layer parameter area. At this time, the "red selection box" appears in the first line of the layer list, as shown in the figure below:

User can press the up and down keys to select the layer number, and the "select block" will also move. Select the layer number to be modified and press [ENT] ,the layer setting interface will pop up, as shown in the figure below:



4.4.6 Menu funtion

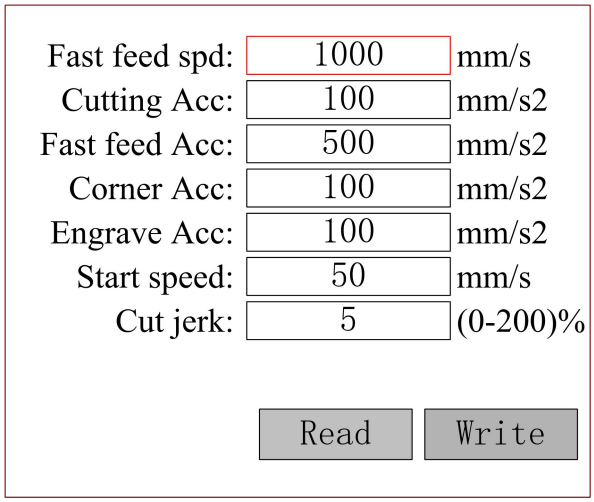
Press [Menu] in the main interface, the pop-up menu interface is as follows:



Press [ENT] to enter the lower menu, and press [Esc] to return to the previous menu.

4.4.7 Z Motion parameter

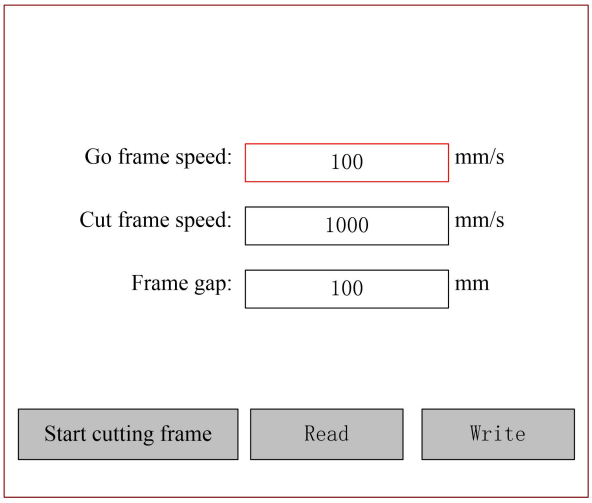
In the parameter setting interface, press [Movement parameter] , and the movement parameter setting interface will pop up as follows:



Refer to Section 4.8 for parameter setting operation. Press the [Esc] key. The interface exit and returns to the previous interface.

4.4.8 Frame setting

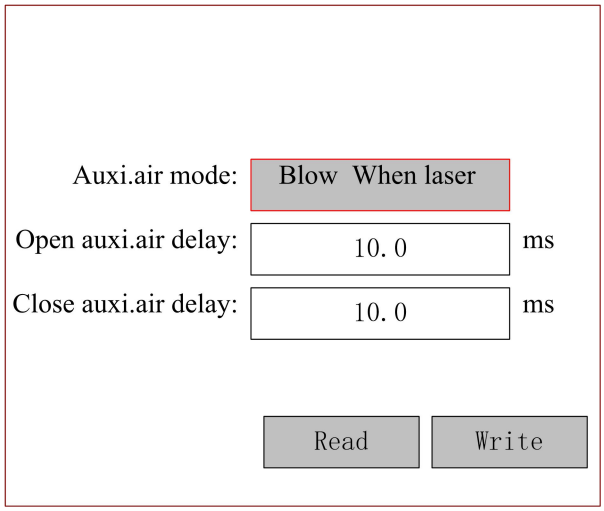
In the parameter setting interface, press [Frame setting] , the frame setting interface pops up as follows:



Refer to Section 4.8 for parameter setting operation. Press the [Esc] key. The interface exit and returns to the previous interface.

4.4.8 Blow setting

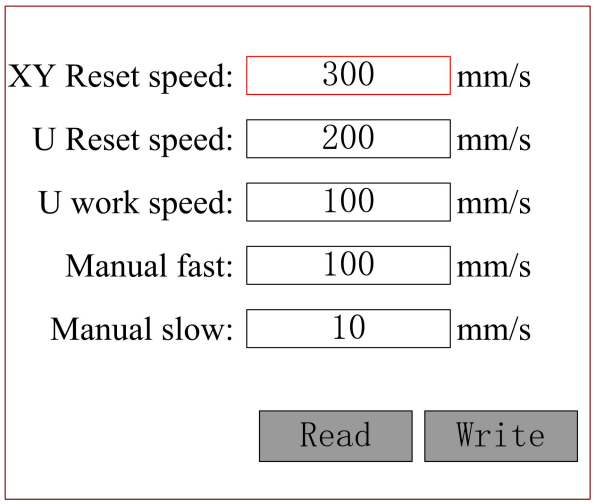
In the parameter setting interface, press [Blow Setting], and the blowing setting interface pops up as follows:



Refer to Section 4.8 for parameter setting operation. Press the [Esc] key. The interface exit and returns to the previous interface.

4.4.9 Speed setting

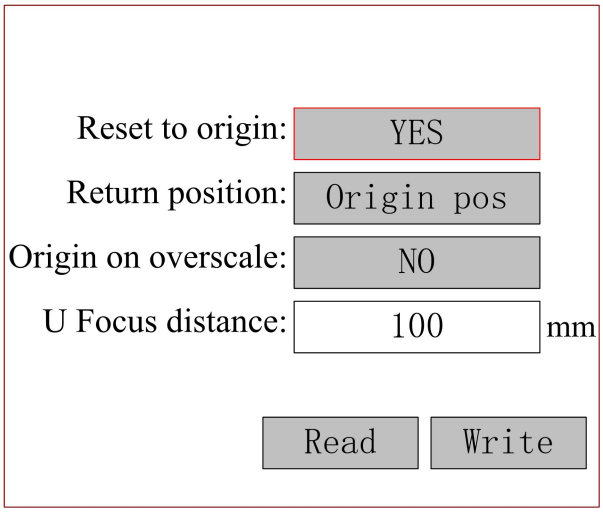
Press [Speed Setting] in the parameter setting interface, and the speed parameter setting interface pops up as follows



Refer to Section 4.8 for parameter setting operation. Press the [Esc] key. The interface exit and returns to the previous interface.

4.4.10 Machine configuration

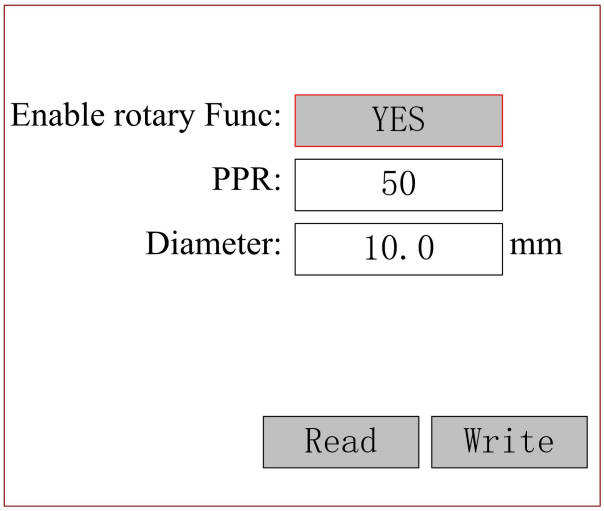
Press [Machine Config] in the parameter setting interface, and the machine configuration interface pops up as follows:



Refer to Section 4.8 for parameter setting operation. Press the [Esc] key. The interface exit and returns to the previous interface.

4.4.11 Rotate function settings

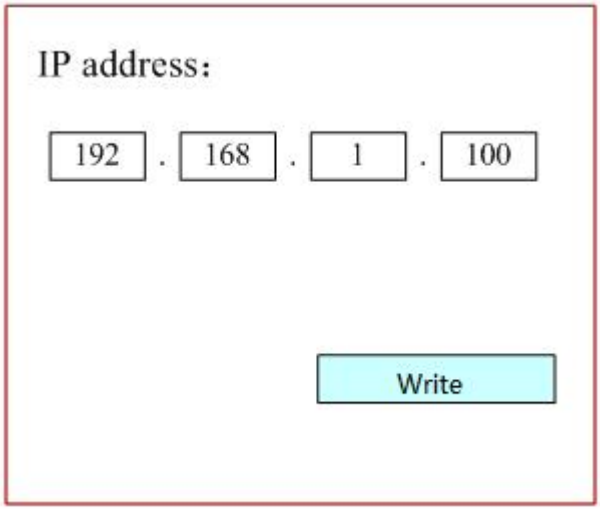
Press [Rotate Function Setting] in the parameter setting interface, and the rotation function setting interface pops up as follows:



Refer to Section 4.8 for parameter setting operation. Press the [Esc] key. The interface exit and returns to the previous interface.

4.4.12 IP set

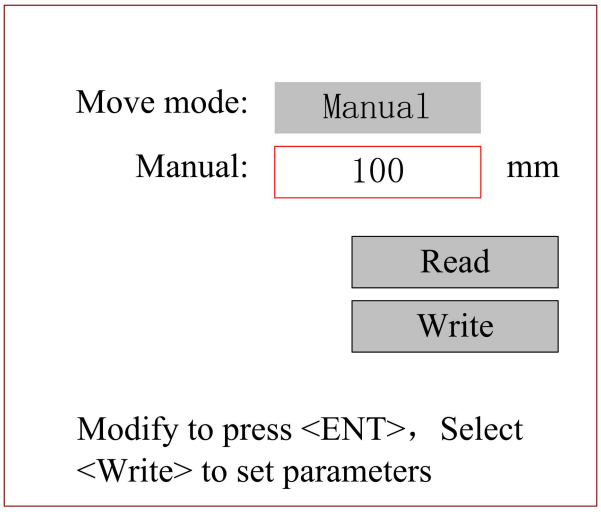
KT332N can support Ethernet and USB.



When the IP is changed, user should <Write > make the parameter valid.

4.4.13 Jog settings

When the red selection box is stopped on the item and press [OK] key, the following interface pops up:

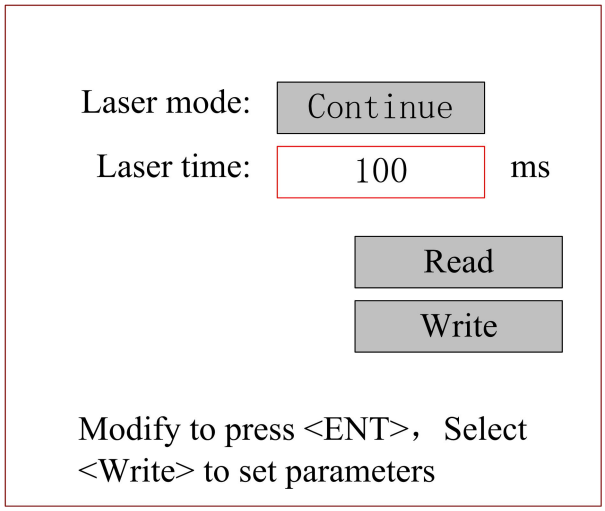


Refer to Section 4.8 for parameter setting operation. Press the [Esc] key. The interface exit and returns to the previous interface.
When the jog mode is in "continuous", the jog parameters have no effect. When returning to the main interface, when the direction key is pressed, the axis moves, and when the direction key is popped up, the axis stops moving. When the jog mode is "Jog", each time the direction key is pressed, the corresponding motion axis runs one time and runs .The distance is equal to the jog distance value set by the user (without exceeding the machine format).

4.4.14 Laser pulse setting

When the red selection box is stopped on the item and presses the [OK] key, the following interface

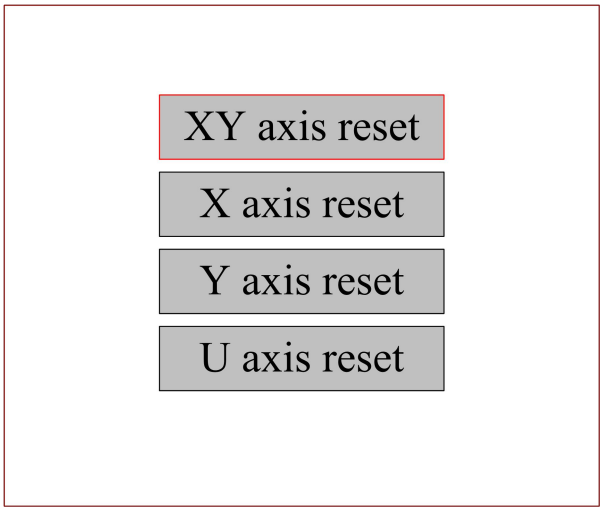
pops up:



If the continuous shooting mode is selected, the laser will always on when press the continuous button. When loose this button, the laser stops. If the laser pulse mode is selected, when the key is pressed, the laser is switched on for some time and then switched off automatically. The laser pulse time is determined by the parameter <laser time>

4.4.15 Axis reset

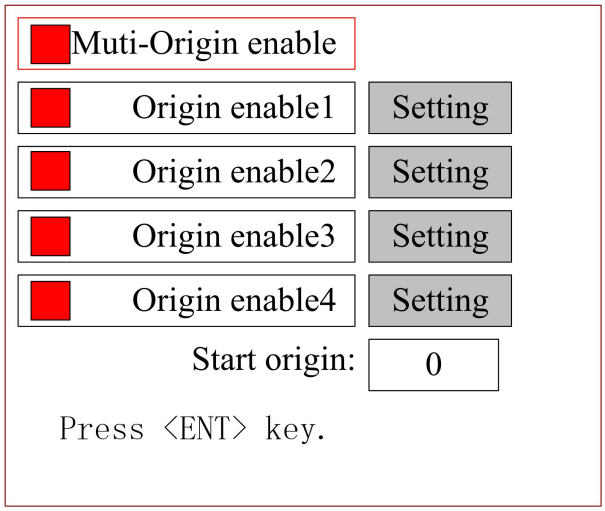
When the red selection box is stopped on the item and presses the [OK] key, the following interface pops up:



Press the arrow keys to select an item and press the [OK] key. The system resets the axis and prompts "Resetting ...".
Press the [Esc] key to return to the previous menu.

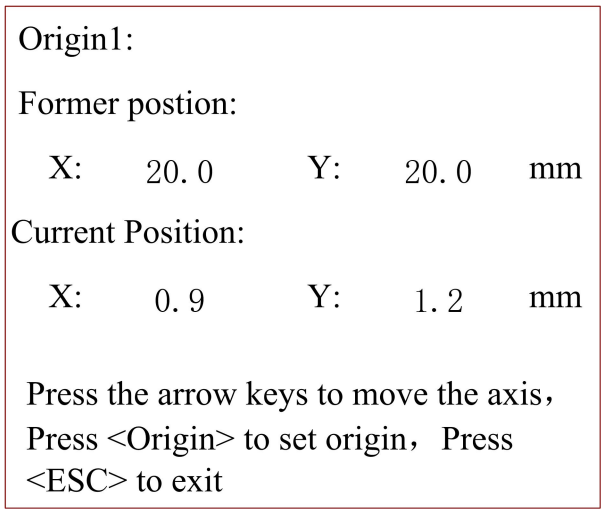
4.4.16 Multiple origin points setting

In the menu, select the item “Origin point setting” and press the [OK] key to pop up the following interface:



Move the red selection box to the "Multi-origin enable" item . Press [OK] to enable or disable the multi-origin functions (the small square on the right side is displayed in red when it is enabled), same as others setting. There is a [Setting] button for each item. Press the button and go to the page shown as below. On this page the coordinates are displayed. And user can move the axes manually to the origin position and press <Origin> to set each origin point

.



Press the up, down, left and right keys to move the X or Y axis to the target position, press the [Origin] key to set the origin point, and press Esc to cancel.

There are 4 origin points that can be set. The steps are that same as above when set other 3 origin points.

User can select one of the 4 origin points as the start origin point. When the "selection box" stops at the "start origin", press the [OK] key to confirm the modification, press the "Up / Down" key to change the number of the origin point, and press the [OK] to confirm the modification. After that, the parameter will automatically take effect. Press [Esc] can return to the previous menu.

Here is the description in detail of the items of the multi-origin setting:

The sub-items are described as follows:

- <Multi-origin setting>: "Yes" enables the multi-origin function. "No" disable the multi-origin function. When disable the multi-origin function, one origin mode is enabled in default. The

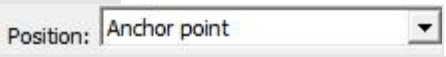
key<Origin> on the panel can set the origin position. When "Yes" is selected and enable the multi-origin function, the origin position that has ever been set with the <origin> will be invalid because now is the multi-origin mode. All the origin point s is set in the multi-origin page.

- <Origin enable>: enable or set the coordinate of the origin point from 1~4.
- <Start origin> select the start origin point from the 4 origin points.

Prompt

Once the multiple origin logic is enabled, if the start origin is the first origin point and all four are enabled, the cutting job will be done according to different origin points. The cutting order will be from origin 1 to origin 4.

Only the software select the <Anchor point> option, the multi-origin function is valid.

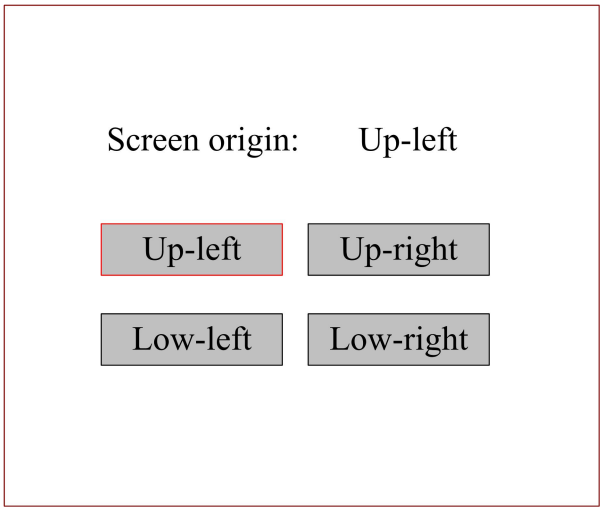


If user has selected the graphic position to be <Current position>, <machine zero> or <absolute coordinate>, the multi-origin function does not work.

And if user has enabled the multi-origin function, the <origin > function will does not work.

4.4.17 Screen refernce coordinate setting

When the "red selection box" is stopped on the item and presses the [OK] key, the following interface pops up:



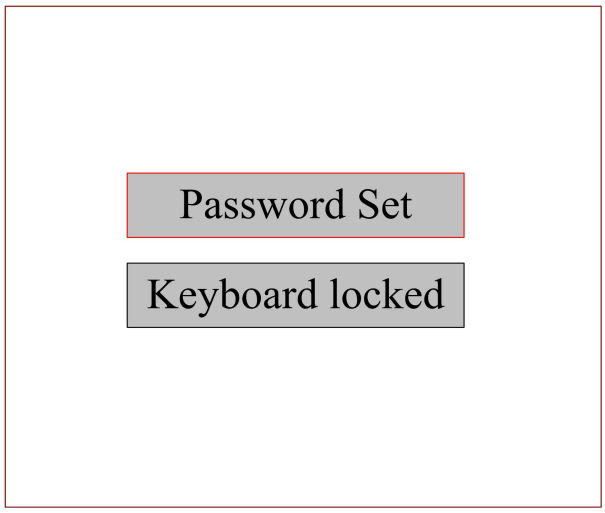
Set the reference position of the screen here. Select different reference positions of the screen to correctly display the patterns.

Select a reference position and press the [OK] key. The setting takes effect and the system returns to the main interface automatically.

When the entity displayed on the screen reverse, mirror to the pattern in the computer, user can modify the reference point to set them the same.

4.4.18 Panel lock settings

In order to ensure the safety of the machine working, the panel can be locked while machine is working.
When the "red selection box" stops on this item and press [OK]. the following interface will pop up:



- Password setting

  This item is used to set the password for keyboard lock. When set successfully, use the password to lock the keys.

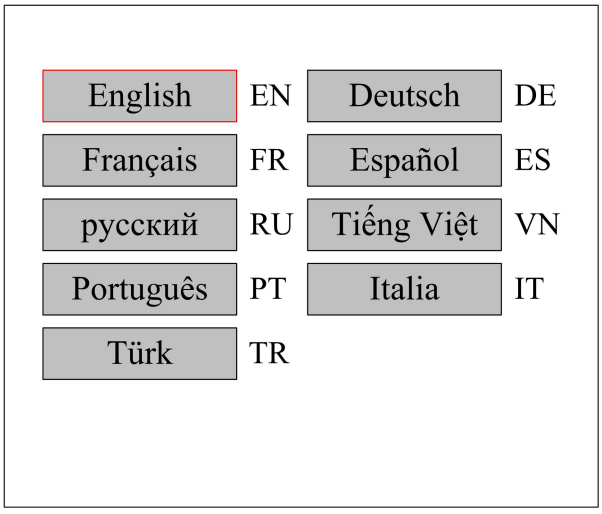
- Keyboard lock

  This item can lock the keys. After entering the correct password, the keys are automatically locked and returned to the main interface. When any key is pressed, the interface prompts for the password to unlock the keys.

Please refer to section 4.6 for password input and setting method.
Press the [Esc] key to return to the previous menu.

4.4.19 Languate settings

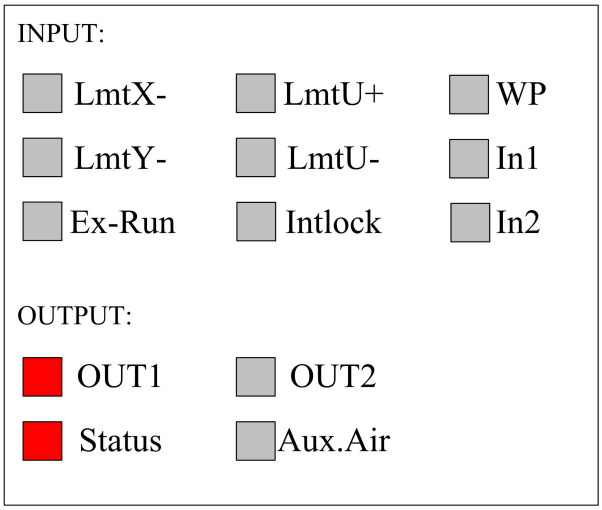
When the "red selection box" is stopped on the item and press [OK], it will pop up as follows:



Press the arrow keys to select a language and press the [OK] key. The setting takes effect and the system returns to the main interface automatically.

4.4.20 Diagnosis tools

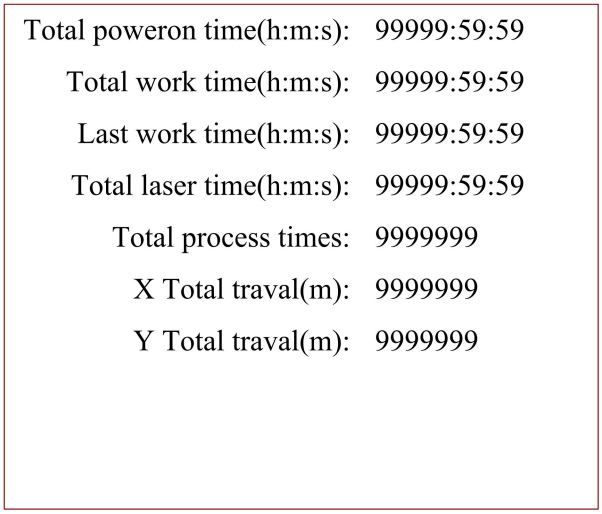
When the "red selection box" is stopped on the item and press the [OK] key, the following interface pops up:



This interface displays the system's hardware IO port information: trigger normal
INPUT:
Read the system hardware information. When the hardware signal is triggered, the small box to the left of the corresponding entry will be displayed in red, otherwise it will be displayed in gray.
OUTPUT:
Select an output port with the cursor and press [OK] to switch the output state.
Press the [Exit] key to return to the previous menu.

4.4.21 System Information

When the "red selection box" is stopped on the item and press the [OK] key, the following interface pops up:



Press the [OK] key to read the controller information, and press the [Esc] key to return to the previous menu.

4.4.22 Backup factory parameters

Select the "Backup factory parameters" item in the menu interface, and press the [OK] key to pop up the password interface. For password input operations, refer to section 4.6. If the password is entered correctly, the system will back up all current factory parameters and user parameters to factory parameters, the interface prompts “set parameters successfully".

Prompt

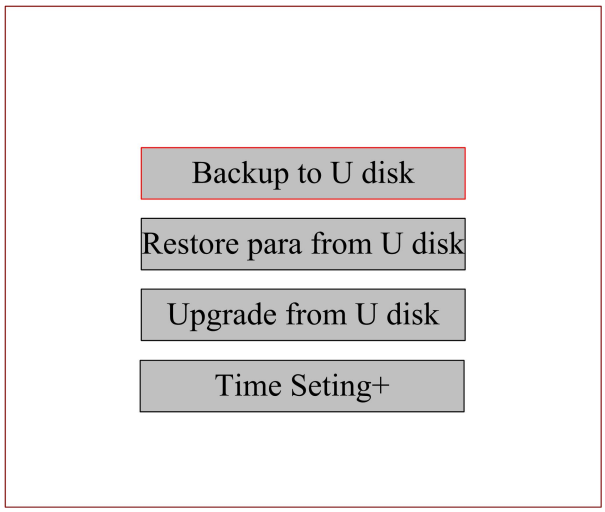
When the machine delivery from the factory, use the "Backup Factory Parameters" function to back up all debugged factory parameters and user parameters, and then at any time, you can use "Restore Factory Parameters" to restore all factory and user parameters .

4.4.23 Restore factory parameters

In the menu interface, select the "Restore Factory Parameters" , and press the [OK] key to pop up the password input interface. For the password input operation, refer to section 4.6. If the password is entered correctly, the system will restore all current user parameters and vendor parameters with the factory parameters that were set before. The interface prompts "Successfully restored parameters."

4.4.24 Controller management

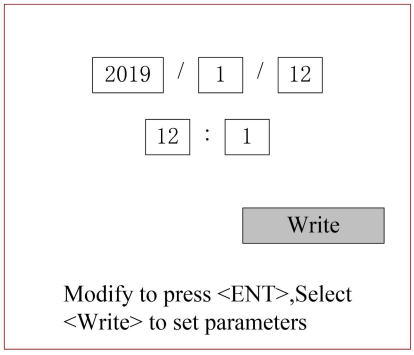
When the "red selection box" is stopped on the item and press [OK] , the following interface pops up:



Press the [OK] key on the corresponding entry to execute the corresponding function, and press the [Esc] key to return to the previous menu.
<backup to U disk> “press this button, controller will backup the user and vendor parameters to the Udisk.
<restore para from U disk>: restore the vendor and user parameters from the Udisk.
<upgrade from U disk>: upgrade the controller firmware from the U disk.

4.4.25 Time settings

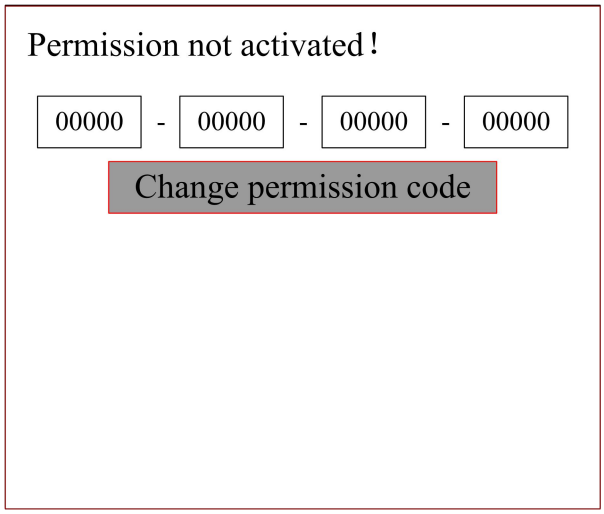
When the "red selection box" is stopped on the item and press [OK] , the following interface pops up:



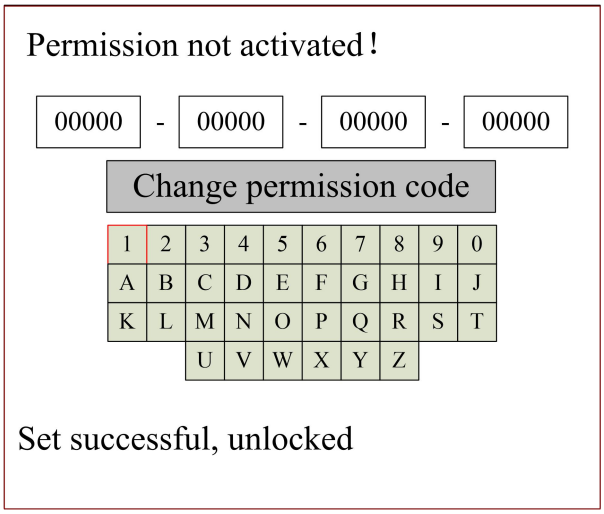
This interface is only displayed when the system is not encrypted. For parameter setting operations, please refer to Section 4.8.

4.4.26 Authorization Management

When user buy the first product from our company, the product should be authorized.
If the current product is not authorized, when the "red selection box" on this item, press [OK] and the following interface pops up:



Press [OK] , the red selection box selects the first parameter box, and press the [OK] key again to display the soft keyboard, as shown in the figure:

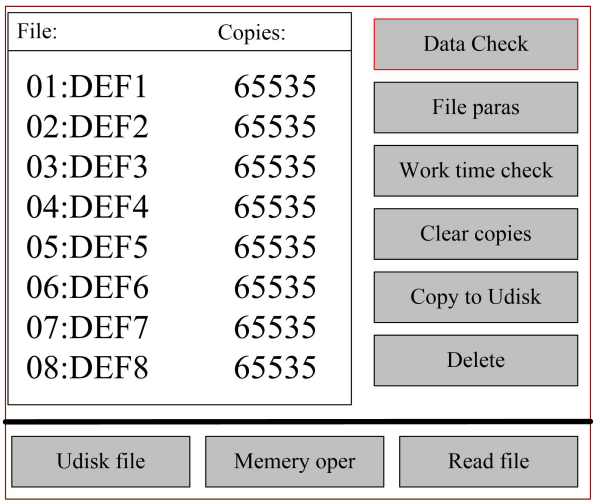


Use the “Up, Down, Left, Right” to select the corresponding character. If the operation is incorrect and the input is wrong, just press [Esc] and select [OK] to enter the setting again. The red selection box selects the currently modified parameter box, and presses the arrow keys to select other parameter boxes. The parameter setting operation is the same as above. After all the parameters are set, move the red selection box to change the authorization code and press the [OK] key to set successfully. Press Esc to return to the upper-level operation interface.

4.5 File management

4.5.1 Memory file

In the main interface, press [File] to pop up the following interface:



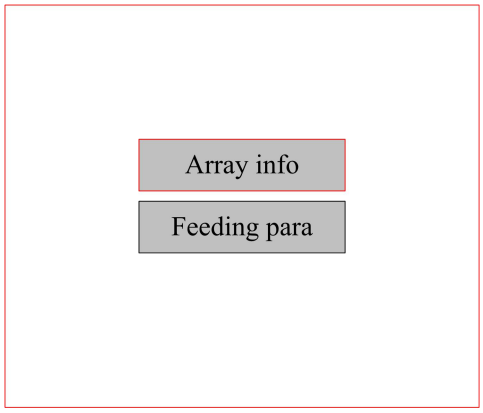
After entering this interface, the controller will automatically read the system memory file. the first column is the file name. The second column is the copies that have been processed. When a file is selected and confirmed, the file will be displayed in the preview area. When there are multiple files, press the up and down keys to select a file, the file will be previewed, and the graphic will be displayed in the upper right of the interface. After pressing [OK], the file will be previewed on the

main interface, and the current file dialog box will be closed. If you want to cancel the preview, press [Esc].
Press the left and right keys to switch the activated area with a blue square between the file list on the left and the item on the right, indicating that the list or item is activated. When the "red selection box" stops on the item, press the up and down keys to select the item and press [OK] to select the item.
Press [Esc] to return to the main interface.
The entries on the right and bottom are as follows:

- Data check: Perform data check on the selected file. Ensure the data safety.
- File parameters: goes to the child menu.
- Work time check: The total processing time
- Clear processed copies: Clear the number of the processed files
- Copy to U disk: Copy selected files to U disk.
- Delete file: delete the selected file.
- U disk file: U disk operating menu.
- Memory operation: go to the child menu of the flash memory operation
- Read memory file: read the list of memory files

4.5.2 File parameters

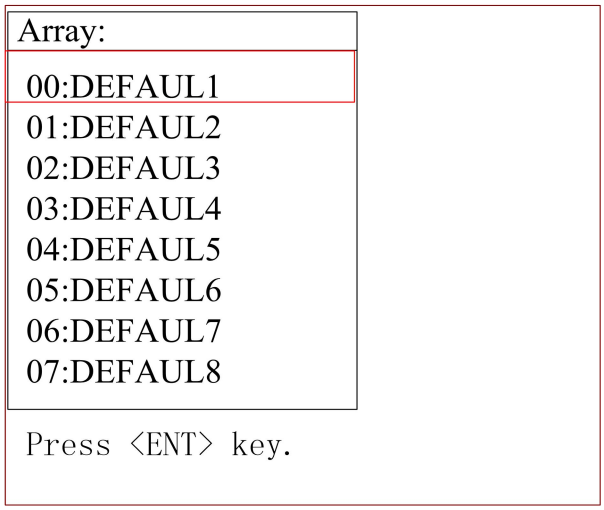
Select the "File Parameter" in the interface above and press [OK], then the pop-up menu is as shown below:



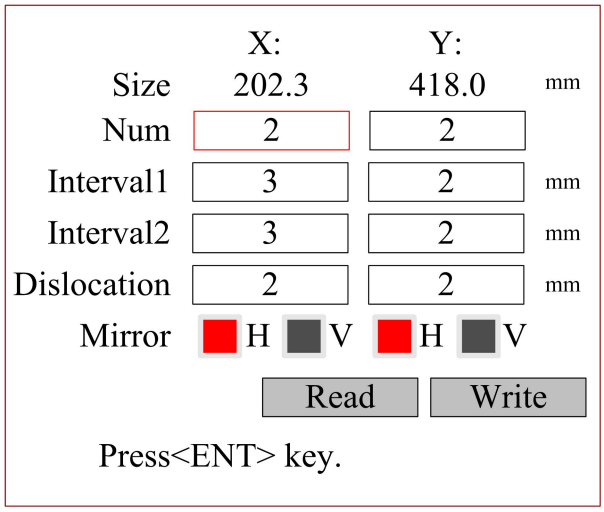
User can modify the file property. User can define the array attribute such as line number and column number and the interval distance. Feeding para are included of the parameters for feeding and cutting.
Press [Esc] to return to the previous menu.

4.5.3 Array parameters modification

Select the "Array Information" item in the interface above, and press [OK]. The pop-up menu is as shown below:



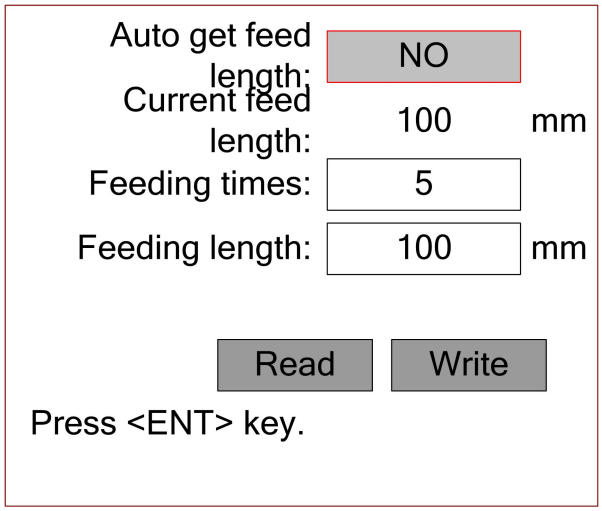
Then select any items in the interface above, and press [OK], and then the pop-up menu is as shown below:



Refer to Section 4.8 for parameter setting operation. Press the [Esc] key to cancel parameter modification and return to the previous interface.

4.5.4 Auto feeding parameters

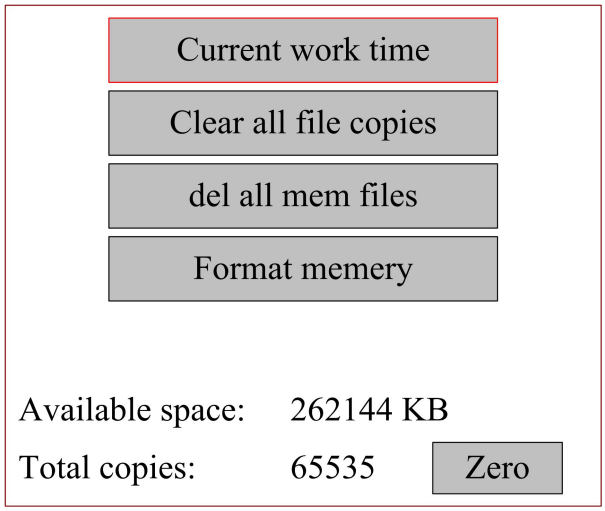
Select the "Feeding Parameters" item in the interface above, and then the pop-up menu is as shown below:



Refer to Section 4.8 for parameter setting operation.

4.5.5 Memory operation

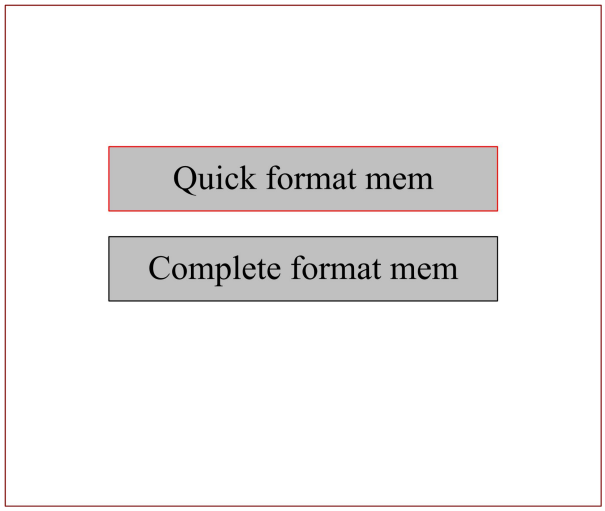
Select the "Memory Operation" item in the interface above, and the pop-up menu is as shown below:



- Current work time: Preview the processing time of the currently selected file.
- Clear all files: Clear the number of processed files in flash memory.
- Del all memory files: delete all memory files.
- Format memory: Format the flash memory.
- Memory space: displays the available space of flash memory.
- Total Pieces: Shows the total number of processed pieces for each file, which can be cleared through the “Clear” entry on the right

4.5.6 Format memory

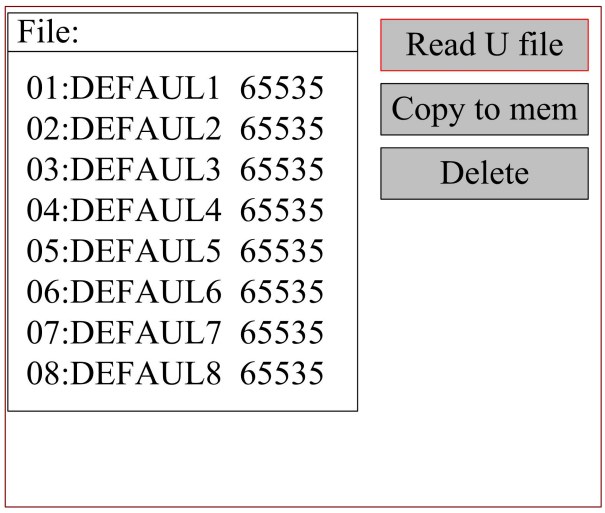
Select the "Format Memory" item in the interface above. The pop-up menu is as shown below:



After formatting the memory, all memory files will be erased.

4.5.7 U disk file

Select the "U disk file" entry on the "File" interface and press [OK] to pop up the U disk file list, as shown in the figure:



- Read U-disk file: read U-disk file list.
- Copy to memory: Copy selected files to memory on board.
- Delete file: delete the selected file of U disk.

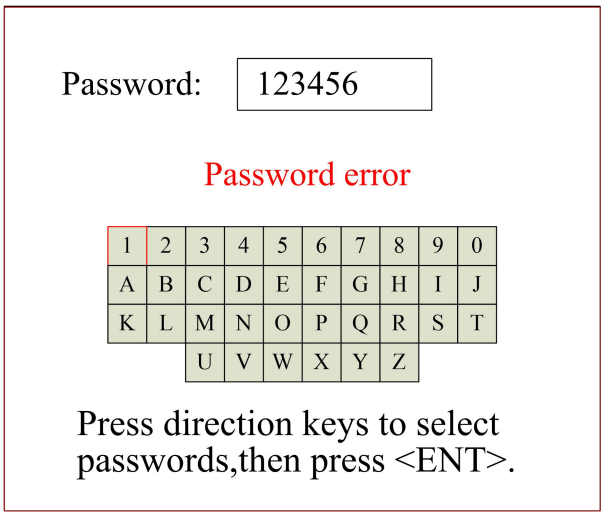
Prompt

This system supports the FAT32 and FAT16 file formats of the U disk. The file must be placed in the root directory of the U disk to be recognized by the system. File names longer than 8 characters will be automatically cut off by the system. Except for English and numbers named files. Others will not be displayed on the controller. Files copied from the controller to the U disk are placed in the root directory of the U disk.

4.6 Password and setting

4.6.1 Password

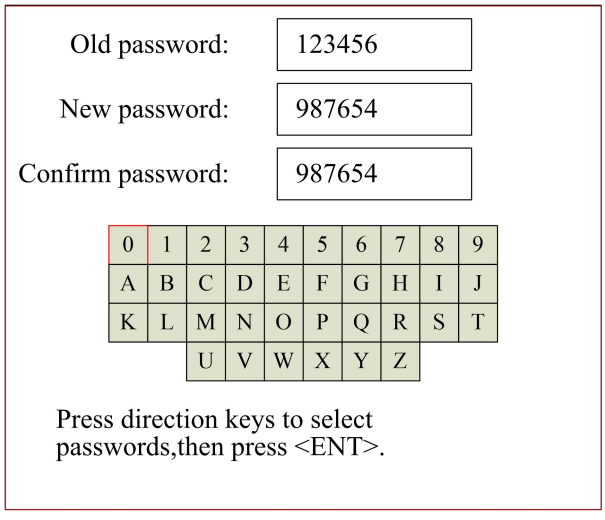
You need to enter a password when operations. The pop-up interface is as follows:



User can directly press the number keys to enter the password, press left and right arrow can select letters and press ok to confirm it. When user enter a full six-digit password, press [OK], if the password is correct, then go to next step. Otherwise "Password Error" is displayed. Please input the password again.

4 .6.2 Password setting

The password setting interface is shown below:



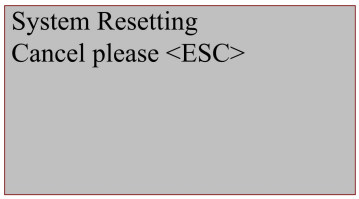
User can directly press the number keys to enter the password, or you can press a left and right arrow on the panel to select a number or letter, and then confirm it. When you have entered six passwords, press the [OK] key to perform the operation, otherwise "Password Error" is displayed, and input the password again.

4.7 Alarms information

During the system is working, some alarm or messages will pop up, such as resetting, water protection fault, hard limit protection, border crossing, etc when executing some actions.

- Information display

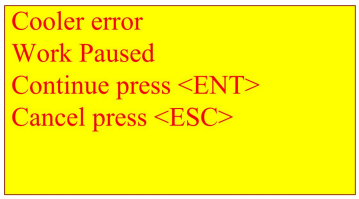
When enable the axis reset or system reset, the reset page will pop up. Interface is as follows:



Follow the information on the interface to operate the next step

- Alarm information

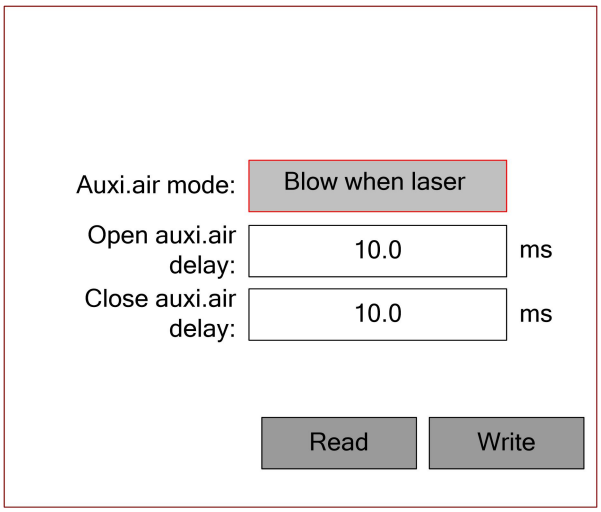
The system displays water protection information when there is water cooling system fault, and the interface is as follows:



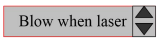
At this time, press [OK] or [Esc], and the system will perform related operations.

4.8 Parameter setting operation

This chapter introduces some parameter modification operation methods when using the product.

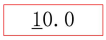


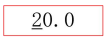
4.8.1 Option Box operating

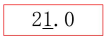
When users modify the parameter of the selection parameter box, first select the parameter, and then press the OK key. The up and down arrows appear on the right side of the selection parameter box. As shown in the figure 

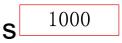
, you only need to press the "Up and Down" key to select other options, and press [[OK] key confirms the currently selected parameter. When the cursor moves to "write parameter", press [OK] key to complete the parameter modification and the parameter takes effect.

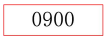
4.8.2 Number modification operating

When user modify the numerical parameters, select the parameter box and press the [OK] key, the cursor appears below the first digit (

),At this time, press the "up and down" key to modify the number at the cursor position (

) , For other digits, press the left and right keys to move the cursor to the digit to be modified and repeat the operation described above 

.
If the number of digits required for the parameter setting is greater than the current display digits, the highest display here is up to ten digits. When you need to set hundreds or more parameters, just move the cursor to the leftmost side and continue to press the "left direction" key or the rightmost to press the "right direction" key on the side, other operations are the same as above. At the same time, if the current number of display digits is greater than the number of digits required for the parameter, if the highest digit of the current display is thousands 

, and the parameter only needs to set the highest digit as the hundredth, and then set the number of digits before the hundredth to 0 

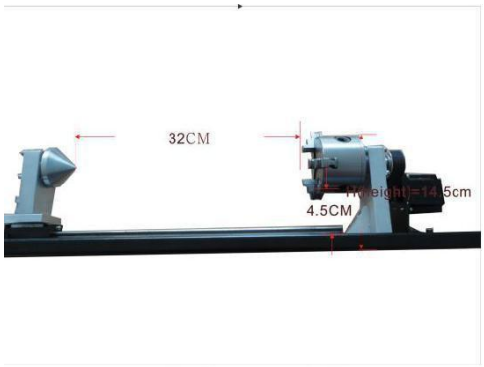
.
When user need to set other digits, use the "up and down arrow keys" to select the parameter to be modified and perform.

Note: The parameter box has a limit on the number of digits. When the parameter digit was limited, pressing the left and right arrow keys will not increase the number.

4.9 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.

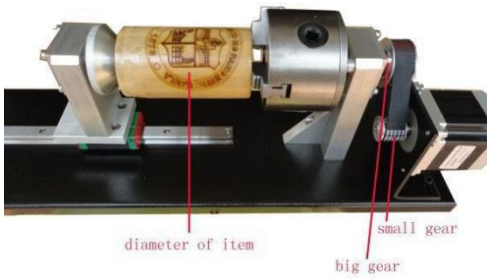
The Rotary size:



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

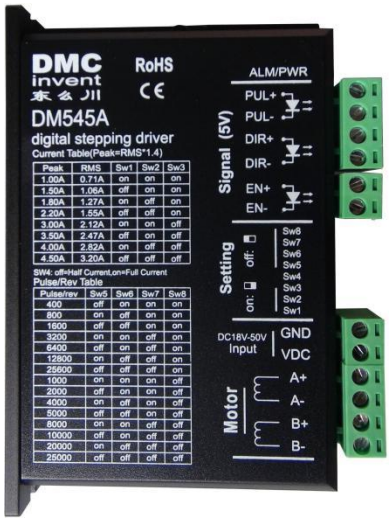
1. Move the working table to the lower position switch off the laser and open the top lid.
2. Put the rotary axis attachment onto the working table, connect the rotary shaft plug and fixed. Before you fix the rotary axis attachment, align it so that its sides are parallel to the X axis and Y axis.

3. Before you mount the object into the rotary axis attachment, measure the diameter of the object at the position to be engraved with a sliding caliper or a similar tool. Write down this value. And how to set the parameter about “Circle Pulse”, please refer to following the picture indicates. Like below:



① Diameter of item = 80mm

② Gear ratio = big gear/small gear =2

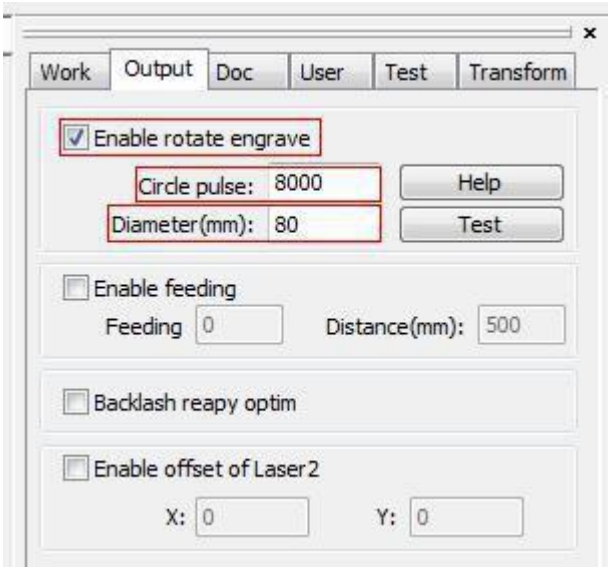


① See the settings of your motor driver

② The subdivision of our motor driver is set to 4000（the “Pulse per round” is 4000 x 2 ）

4. Adjust and fix the slider to make the work piece fitting into the rotary axis attachment.
5. 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.
6. 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.

7. Select “Output”, and 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

8. Select "Download", click “Original” and “Frame” on the display, please make sure that the material is in the right location and enough space for working.

9. Switch on the cooling system, and connect the exhaust system and the air pump to the back of the laser. Please check 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 the high temperature.

10. Finally press the “Start-Pause” button in the display, to start the engraving or cutting process.

11. When you don’t need to use the rotary axis attachment to work, please remove it out of the working table, and then reset the laser machine.

4.10 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 of 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, 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.

3. **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 more high 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 using the engraving function, you can choose “Ramp Effect” or common engraving, once you choose “Ramp Effect” and 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 what 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.

4 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 Acrylic					
		3mm	5mm	10mm	15mm	20mm	30 mm
60W	**Power**	23MA	23MA	23MA			
	Speed	8MM/S	3MM/S	1MM/S			
80w	**Power**	23MA	23MA	23MA	23MA	23MA	
	Speed	12MM/S	5MM/	2MM/S	1MM/S	0.7MM/S	
100w	**Power**	23MA	23 MA	23MA	23MA	23MA	
	Speed	20MM/S	12MM/S	4 MM/S	2 MM/S	1 MM/S	

Description		Cutting Thickness of MDF		
		3mm	5mm	10mm
60W	**Power**	23MA	23NA	
	Speed	5MM/S	3MM/S	
80w	**Power**	23MA	23MA	
	Speed	8MM/S	4MM/S	
100w	**Power**	23MA	23MA	23MA
	Speed	13 MM/S	8 MM/S	2 MM/S

Description		Cutting Thickness of Plywood		
		3mm	5mm	10mm
60W	**Power**	23MA	23MA	
	Speed	12MM/S	3MM/S	
80w	**Power**	23MA	23MA	
	Speed	15MM/S	7MM/S	
100w	**Power**	23MA	23MA	23MA
	Speed	20 MM/S	12 MM/S	2 MM/S

Description		Cutting Thickness of Rubber		
		3mm	5mm	10mm
60W	**Power**	23MA	23MA	
	Speed	12MM/S	4MM/S	
80w	**Power**	23MA	23MA	
	Speed	15MM/S	8MM/S	
100w	**Power**	28MA	28MA	
	Speed	30MM/S	30MM/S	

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
60W	**Power**	8MA	10MA	12MA	15MA	15MA
	Speed	300MM/S	300MM/S	200MM/S	200MM/S	160MM/S
80w	**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 here in may result in hazardous laser radiation exposure.
2. Before starting cleaning and maintenance work always switch off the device and unplug the mains plug.
3. Always keep the system clean, as flammable parts in the working area or exhaust area rise the fire hazard.

Tips:

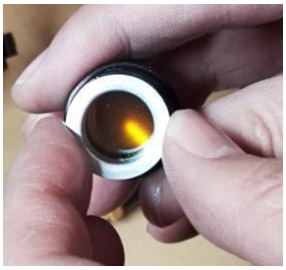
You should check at least once a day, whether dust has accumulated in the engraving system. In case of soiling the machine must be cleaned. The cleaning interval strongly depends on the material that is being processed and the operating time of the device. Please bear in mind that only a clean machine 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 easiest for you to clean the surface with a window cleaning agent and paper towels.
3. Thoroughly remove all loose 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 and the mirrors and the beam combiner according 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:

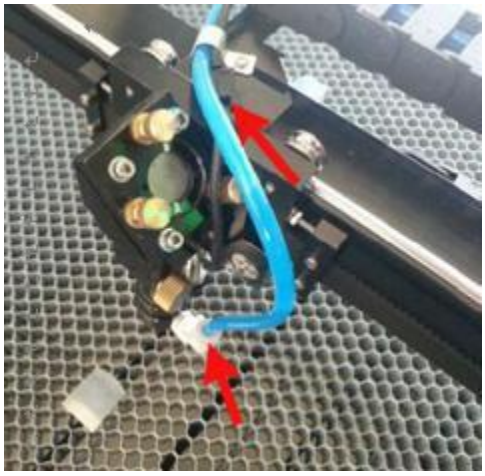
5.2.1 Cleaning the Focus Lens

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, 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.
7. 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 of the lens, to wash away coarse soiling.
9. Put the lens on a clean lens cleaning tissue. 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. 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 as following the picture indicated:

1. Remove the air pipe parts



2. Rotation the left, and the head is divided into two

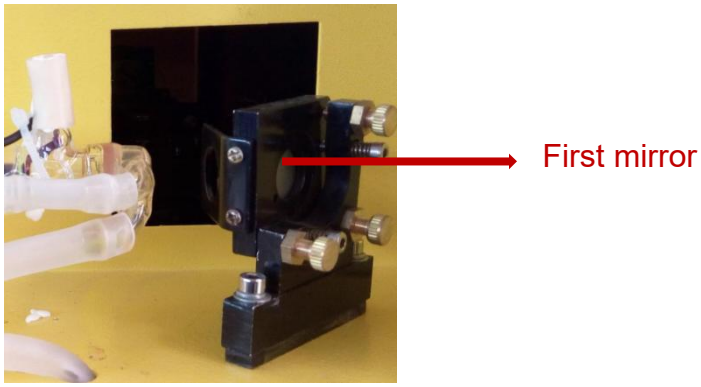
3.Installation and please concave downward and be careful not (convex side of the lens is facing upwards) to scratch the lens, then merge both parts together

4. Fixed back the focus lens,

5.2.2 Cleaning 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



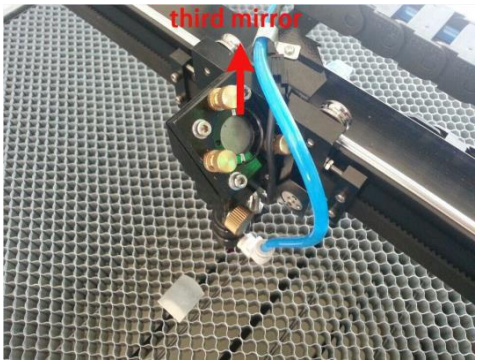
The mirrors are easily get dirty. And this will reduce the efficiency of the laser beam. Meanwhile, laser energy absorbed by the mirror may cause heat and destroy the mirrors too. For the first mirror, you can clean them directly.

The Mirror#2

Make sure 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:

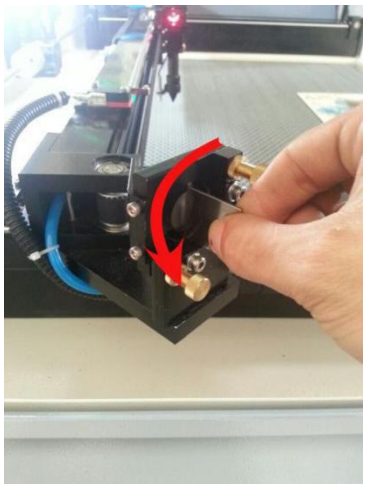
1) Mirrors must be cleaned carefully by using lens cleaning paper/lens cleaning cloth to avoid scratching the surface.

2) Do not touch the surface of the mirrors/lens after cleaning

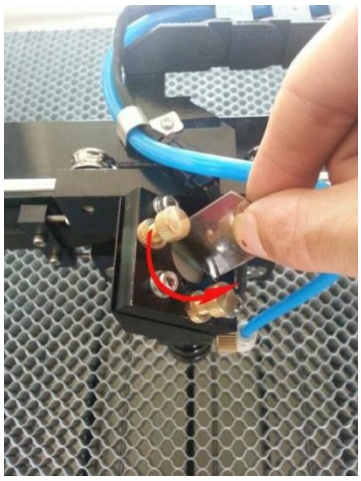
3) The concave side of the lens must be on the bottom when installed

How to take out the mirror#1 #2 and#3, and please just as following the picture indicated:

1. The mirror#1



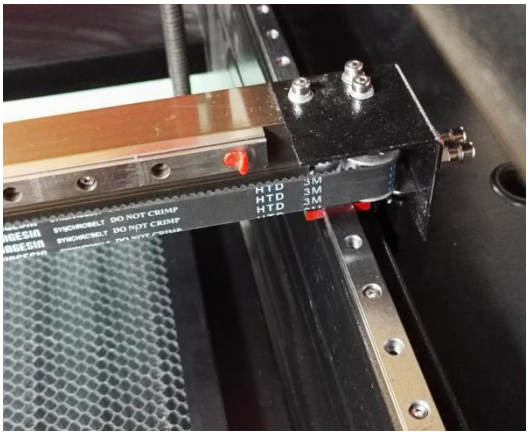
2. The mirror#2



3. The mirror#3

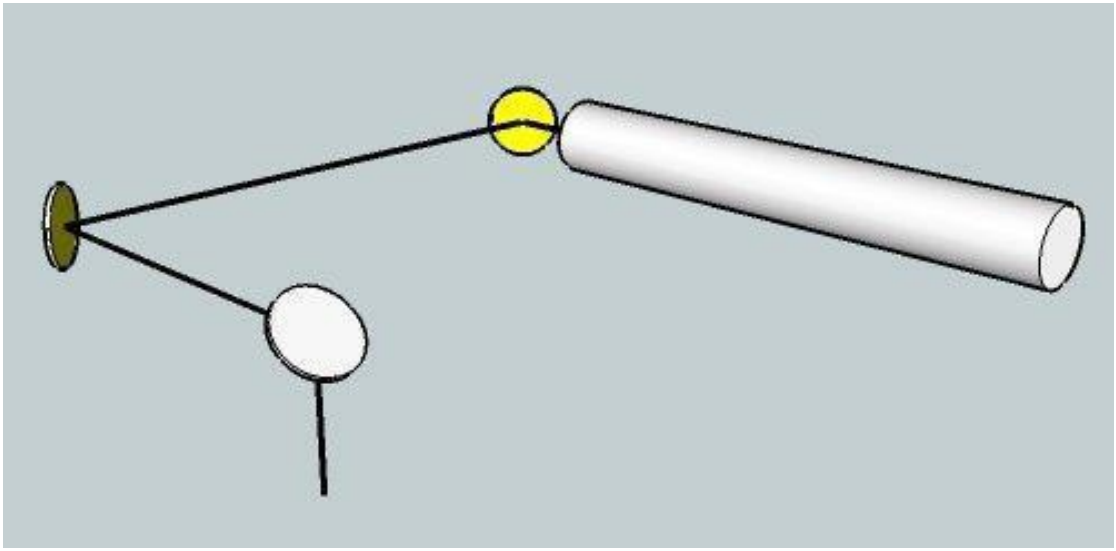
5.3 Maintain the X/Y/Z Rails

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 efficient 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

Make sure the laser tube is filled with water before starting the machine. It is advised to add water every 3 days.

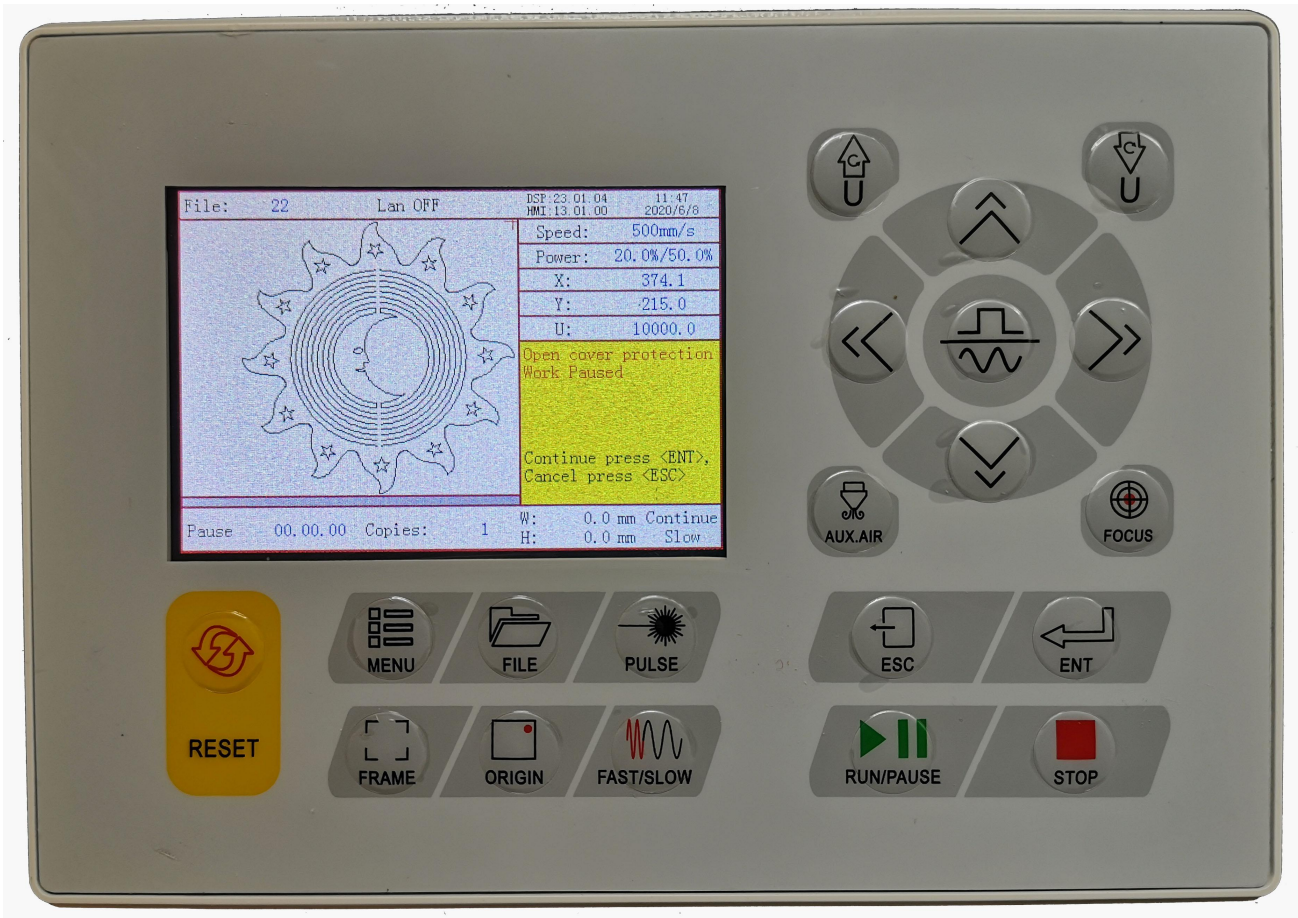
The quality and temperature of the cooling water affects the life time of the laser tube. You need to use pure (distilled) water and control the temperature below 35℃(95℉).

5.6 Maintenance Plan

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

5.7 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 “ENT” on the screen and the machine will start working again.

5.8 Digital Display Power Supply

5.81 Images

Embedded LCD Type

LCD Display Current and Fault Code

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

5.8.2 Advantages

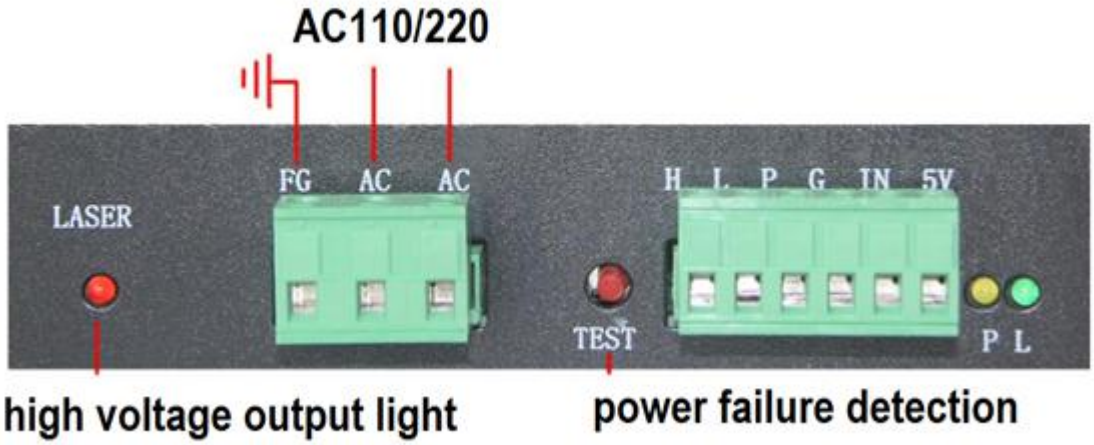
1. This series power supply has high stability feature. Because of low repair rate, it is widely used by most machine factories.

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.

2.9.4 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

5.9 Troubleshooting

Below are some solutions to this problem: we advise our customers to check the following thinking if they encounter problems, and hope they can revise it at any time.

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Laser head impact Limit switch while resetting

Here are the fault factors:

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

Here are the solutions:

Step 1. Wrong pulse setting

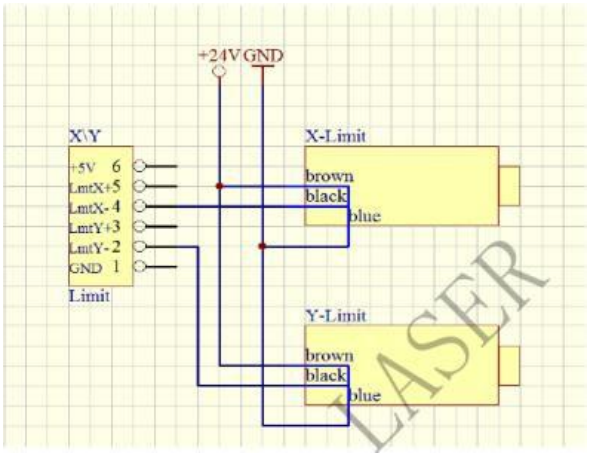
Resetting the pulse equivalent, for how to reset, please refer to the lesson "why cutting size doesn't match design size"

Step 2. Limit switch type mismatch laser controller Our controller support sensor switch.

Step 3. Wiring mistake

Please refer to following diagram for how to wiring the limit switch:

Sensor 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.