CALCA® ADVANCED LASER SYSTEM

X700 20" x 28" CO2 Laser Engraver

USER MANUAL

Catalog

Prolog

Thank you for purchasing the laser-engraving machine from Sign-in-Global.us. This equipment is a high-tech product integrating light, machine and electricity, with strong professionalism and high technological content. In order to let our users operate and maintain the equipment better, we write this manual. We add many real pictures of this manual so you can understand easily.

This manual has been designed as the X700 series Laser systems, laser machine installation and user guide; the manual is divided into 6 chapters, including machine appearance and accessories, machine Installation and debugging, how to Adjust optical path of the device and how to confirm the optical path is precise and straight, equipment maintenance and common malfunctions, warranty regulations and common problems and solutions.

At the same time you can also refer to the help files that we uploaded on Google, RDWorks 8.0 Software Download, the link is as below,

https://drive.google.com/drive/folders/1FnPLVf8ZrHbsywKnuyaLLiA4_gW1TKXZ?usp=sharing

Or

https://drive.google.com/drive/folders/1H-3uETsJaLL1n4wUkNMDwKaM9AZgYztj?usp=sharing

Machine Installation Instructions

Safety Precautions:

- For your personal safety, please read this manual carefully before operating the equipment. And please make the operation strictly adhere to the manual direction. Notice and understand all the warning labels located on your machine, non-professionals don't touch.
- This equipment uses four types of laser (strong light source). The Laser radiation may cause the following accidents:
  - ✧ Ignite the Flammable surrounding;
  - ✧ Different radiation and lethal gas may be generated when cutting or engraving different materials;

- ✧ The direct shooting of laser radiation will do harm to human body. Therefore, flying and explosive materials should not be stacked on the workbench and it's surrounding and fire-fighting equipment must be equipped. Please maintain good ventilation when the machine is working.

> Non-professional operators are prohibited from approaching this equipment.

> The materials for cut or engrave and the gas emissions shall comply with the requirements of local laws and regulations.

> Laser cutting or engraving may be risky. Please consider whether the material is suitable to be cut or engraved by laser carefully.

> High pressure or other potential hazards inside the machine, only manufacture and professional person can disassemble the machine.

> When the machine is working, the operator must be by the machine and cannot leave unless the work is stopped. Please confirm all power is turned off before the one is left.

> When the machine is working, the user cannot open the cover at any time.

> The engraving machine can be started only after the machine and other related equipment be safely grounded.

> To prevent the laser from being reflected on the human body or flammable objects, it is strictly forbidden to place any total reflection or diffuse reflection objects in the equipment

> When the machine working, the operator must observe the working conditions of the machine all the time. If an abnormal situation occurs, cut off all power supplies immediately and actively take corresponding measures.

> The equipment should be located at the place where is dry, free of pollution, vibration, strong electricity, strong magnetism and other interference and noise. The working environment temperature is 5-40℃, and the working environment humidity is 5-95% (non-condensing water).

> As the machine may cause electromagnetic interference to the electrical equipment, which is sensitive to electromagnetic interference, the machine should be put far away from this kind of equipment.

> Machine working voltage: AC220V, 50Hz. When the grid voltage is unstable or mismatched, it is strictly forbidden to start the machine. The manufacturer is

not responsible for any loss caused by improper use or non-compliance with the above rules.

DANGER: Laser Radiation

This warning can be found on the laser tube, the laser beam will be initiated in the laser tube itself and it is important to have all panels and access doors closed

DANGER: High Voltage

This warning indicates that precautions should be taken when touching or handling any electrical components of the machine. Please make sure to disconnect the laser from all power sources prior to opening these cabinets or handling the internal electrical components.

Statement

1. The content of this manual may be different from the actual product due to product upgrades and improvements. In addition, the content of this manual may change without prior notice.
2. The pictures in this manual may be different from the purchased product due to product improvement and other reasons. Please refer to the actual product you purchased.

Chapter 1. Machine Appearance and Accessories

1.1 Machine appearance

Different models have different appearances, and the specifics are subject to the actual product. Here is the front of the machine, as shown in picture F1-1:

F1-1

1.2 Specifications

Control system	RuiDa
Working size	20" x 28" (500mm x 700mm) with double side open door
Z table	Motorized Z (8" vertical adjust)
Laser tube type	Reci 90W laser tube
Cooling Type	3000 Series
Transformer	110V to 220V
Laser power	110V - 220V / 60Hz, 1phase, 1000W, 10A
Driver type	Micro Stepping Motor
Focus Lens	Dia. 20mm FL2.5"
Max speed	1000mm/s
Resolution	1000 DPI
Location precision	0.01mm
PC Interface	USB, Ethernet connection and USB Disk
Support Software	LightBURN, CorelDraw, AutoCAD, Photoshop, etc.
Image form	PLT,BMP,DST, DSB, DXF

1.3 Main buttons

1. **Emergency Stop Switch (E-Switch)**

   When the device abnormal situation, can quickly press the button, it will be cut off the laser power and motion power immediately. It prevent the users from suffer big loss.

   Turn the emergency stop button of the laser machine clockwise, the laser head will reset.

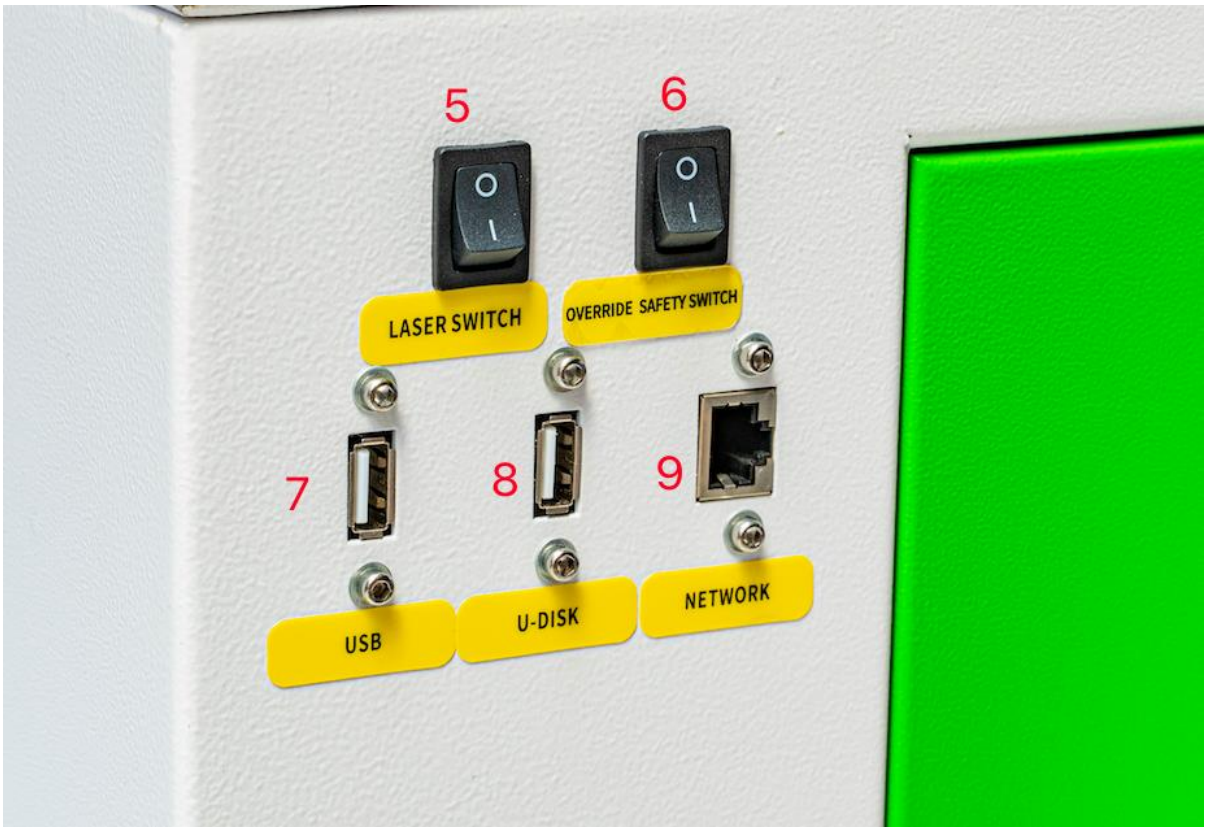
2. **Power indicator light**

   After turning on the power of the machine, this indicator light is green, which can inform you the machine is power-on status.

3. **Main switch: Control the main power on/off.**

4. **Up and Down button**

   You can control the movement of the lifting platform by pressing the "up" and "operate" operation buttons.



5. Laser Switch

The main and the laser supply power ON/OFF Switch. The switch is turned off before shipping.

6. Override Safety Switch (Top flap protection sensor)

If the top flap is opened, no data is processed. When the protection cover is opened during working the motion system is stopped and the laser source is turned off. It means the machine will stop working immediately. Only after closing the top cover, the cutting machine can restart working again. Cover protection system can protect the safety of operators and before the machine leaves the factory, this switch is OFF.

7-8-9. You can choose the way you need to transfer your designed files to the machine via USB cable, U-disk or network cable.

1.4 Accessories

Except of the machine your random accessories should include as below:
Water chiller, air pump, air tube, Network line, power cord, USB cable, venting tube, 1 set of inner Hexagon spanner, Clamp, as the picture F1-2 shows below,

F1-2

Chapter 2. Machine Installation and Debugging

The complete working system is composed of the laser machine, air pump, water chiller, data transmission line, etc. According to work needs users can configure their own computers, printers, etc.

First, please connect the machine to power and turn on the main power switch, Emergency stop switch in turn. If the laser head is back to the top right corner, it means the machine startup is normal.

(Note the working voltage of the machine is 220V, if your local voltage is 110V, users must remember to connect the transformer first, and this way 110V voltage will be converted to 220V voltage).

Please check the picture F2-1:

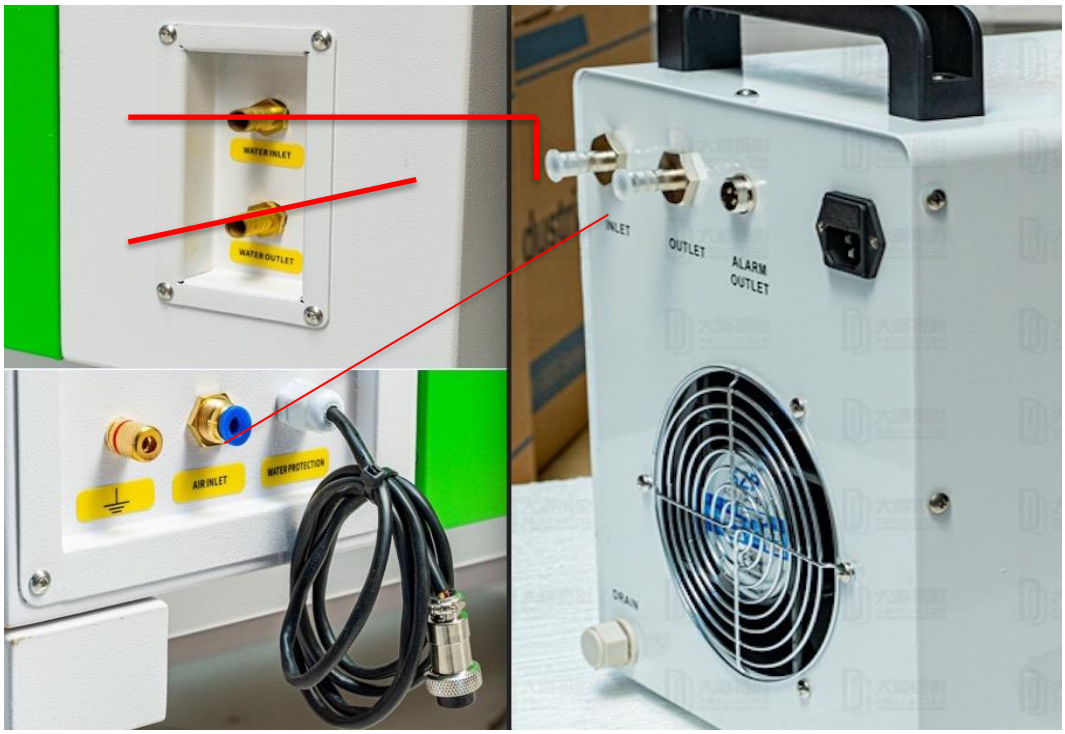
2.1 Water protection system and water chiller connection

To finish this step you need: water chiller, water inlet pipe, water outlet pipe

1) Please open the package, find the chiller, and find the water inlet and outlet on the back of the machine, please check the picture F2-1:

F2-1

2) Water outlet of the water chiller connects to water inlet of the laser machine while water inlet of the water chiller connects to water outlet of the laser machine. Aviation connector of the water chiller connects to the aviation connector of the laser machine, you can check picture F2-2:



F2-2

3) Open the injection port and add water. For best results, use deionized water. Pour slowly and do not fill the chiller completely. There should be about 3-6 inches (80-150mm) between the opening and the top of the water in the machine. Do not allow the water to overflow. For cooling carbon steel equipment, the water should have the appropriate amount of anticorrosive additive.

F2-3

4) Plug in the power and flip the power switch. Don't worry if the fans and other components of the chiller do not activate. They are usually automatically controlled and will not begin working until they are needed by the machine. In different conditions, the time for startup may vary from seconds to a few minutes. Do not become frustrated and switch the machine on and off, except when necessary to add water.
5) Check the water level of the water tank again, as in Step 2 above. The water level of the chiller will lower somewhat as it fill the cooling path of your machine. If necessary, carefully add more water to the chiller to maintain a level about 3-6 inches (80-150mm) below the top of the chiller. If the water level drops sharply or continues to go down during normal use, turn off your devices and examine the water pipes and cooling path for leakage. Repair any such leaks before restarting the devices and continuing work.
6) Note: 3000 series water chillers are equipped high speed fans inside, not able to control the water temperature.
   Must use rust protection coolants to prevent rust and corrosion. The use of tap water is prohibited.

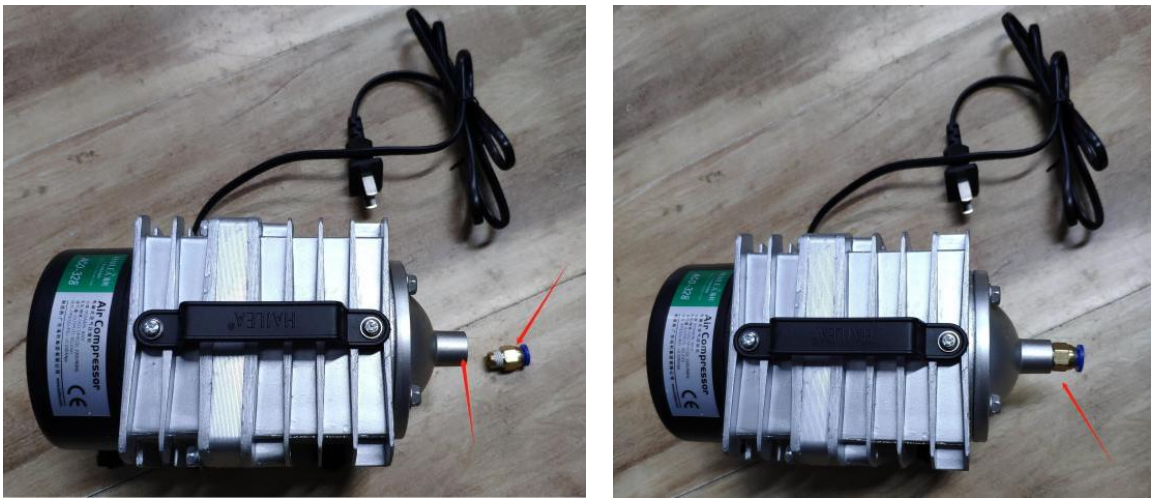
Always keep the vents clean and unobstructed and the filters clear. Periodically confirm that no dust or debris has entered the water tank of your chiller. If any is found, empty and clean the tank completely before continuing use.
Never use a dangerous system like a laser engraver if the water-cooling system is malfunctioning. If the laser or other dangerous device is already on, shut it down immediately and correct the problem with the chiller before using it again.

2.2 Air pump installation

This air pump supplies helps keep the focusing lens clean and cool during the engraving process. Air assist is also critical when cutting to reduce flame-ups and clear the debris field.

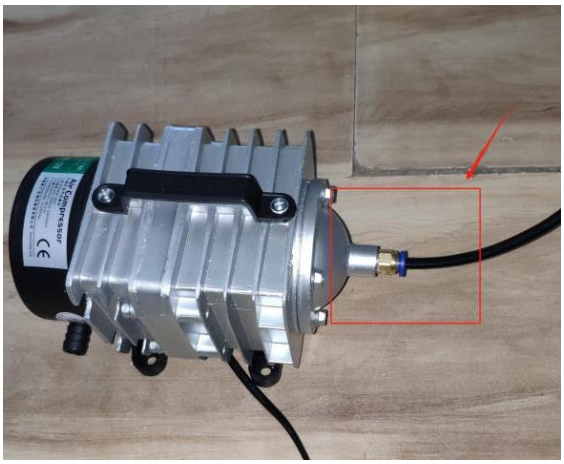
To finish this step you need: Air pump, air pipe, Air blowing mouth (copper)

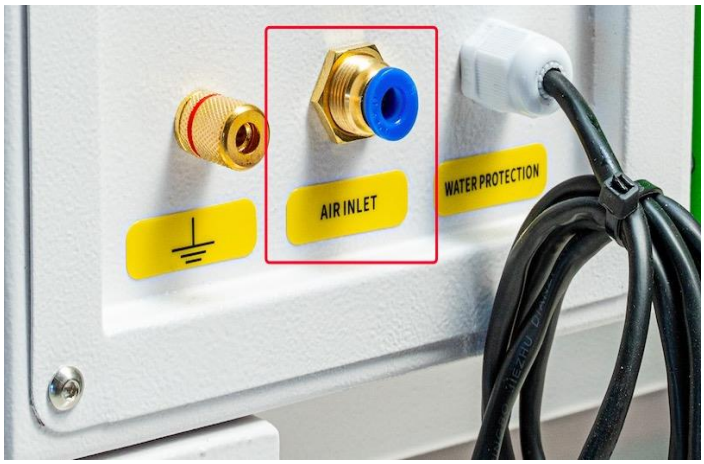
1) Please open the package and put the air pump out. Install an air blowing mouth (copper) to the air system.



F2-4

2) Please find the air inlet port on the machine, as marked in picture F2-5, then connect one side of the hoses to the air blowing mouth, the other side to the machine.





F2-5

3) Please connect the power cable (of the air system) to the machine. The air pump works normal if it blowing air in air outlet port on the laser head.

The air pump plays an important role in the machine system. Blowing air can help clean the focal lens and it can prevent the material from being burned. So in daily maintenance, the user should pay attention to check if the air pipe is broken or damaged. Otherwise the abnormal blowing may cause the material to burn.

2.3 Vent-pipe installation

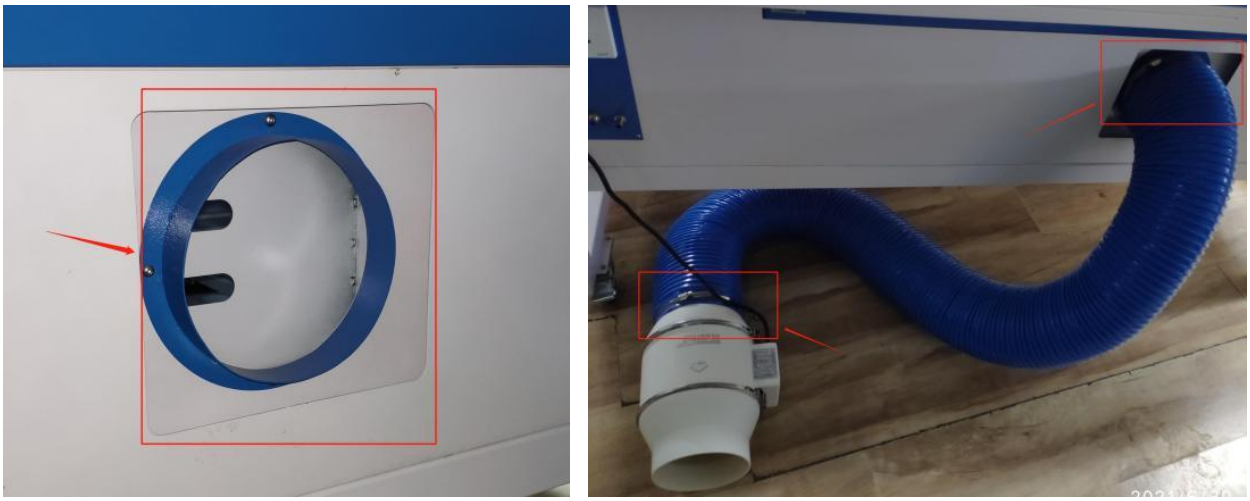
Proper fume extraction is imperative to evacuate the combustible and noxious fumes that are created during the lasing process. This machine must be equipped with an adequate exhaust system. You can further reduce smells from fine particulate matter with an inline filtering system.

To finish set up the duct fan you need: duct fan 1 pc, exhaust pipe 2 pcs, clamps 3 pcs.

1) Please find the exhaust hose on the back of fuselage, as shown in picture F2-6. Insert one side of the exhaust pipe into the fan inlet and the other side into the fuselage.

   And you need to lock the exhaust pipe with clamps on the ends of exhaust pipe. Insert one side of the second exhaust-pipe into the fan outlet and put the other side of the pipe outside of where you work (If the machine is far from the outside room that the gas manufacture by the machine can not be discharged; then you might need an dust/fume filter, it can keep the air quality of your

working environment well). Please refer to picture F2-6 about how to install exhaust pipe.



F2-6

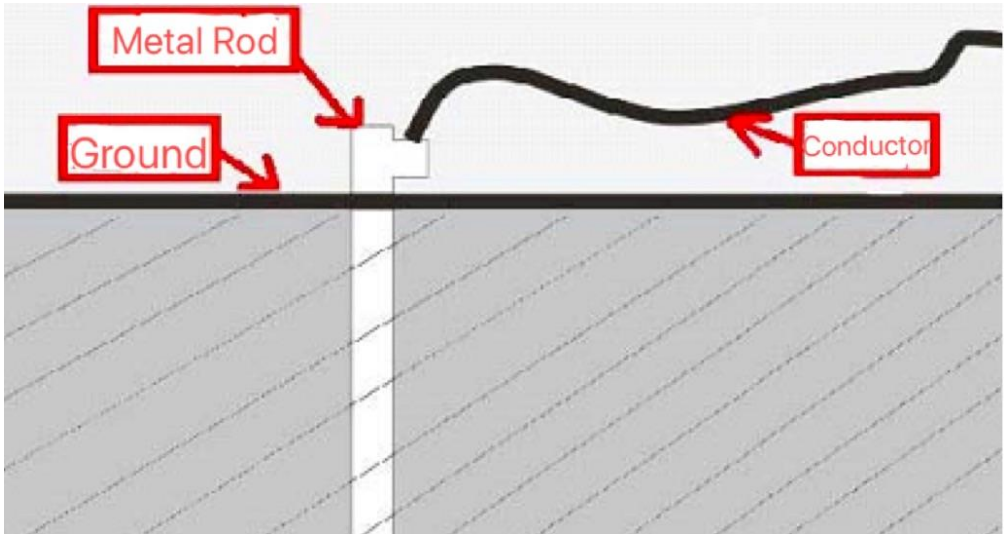
2) Connect the duct fan plug to power (you can directly connect the power plug of the water pump to the power output socket of the machine). And you can test and confirm the fan works normally.

X700 laser machine is equipped with an Air Exhaust Fan, it has already installed in the machine before shipping, if you want to update duct fan you can take this procedures as reference. Here is a picture of X700C laser machine.

2.4 Ground wire installation

The laser tube used in this laser machine is a Class IV laser, and the Class IV laser. When users operate the machine, they must adhere to the "Safety Attention" and we put forward strict requirements for the user's safety grounding. The requirement for the safety ground wire to the ground should be less than 5Ω. The specific connection method is shown in F2-7 and picture F2-8:

F2-7



F2-8

Please note:

The machine must be grounded. Poor grounding will lead to a high failure rate of the equipment and may cause other safety accidents at the same time! ! !

The company does not assume any responsibility or obligation to the failures or accidents caused by no grounding! ! !

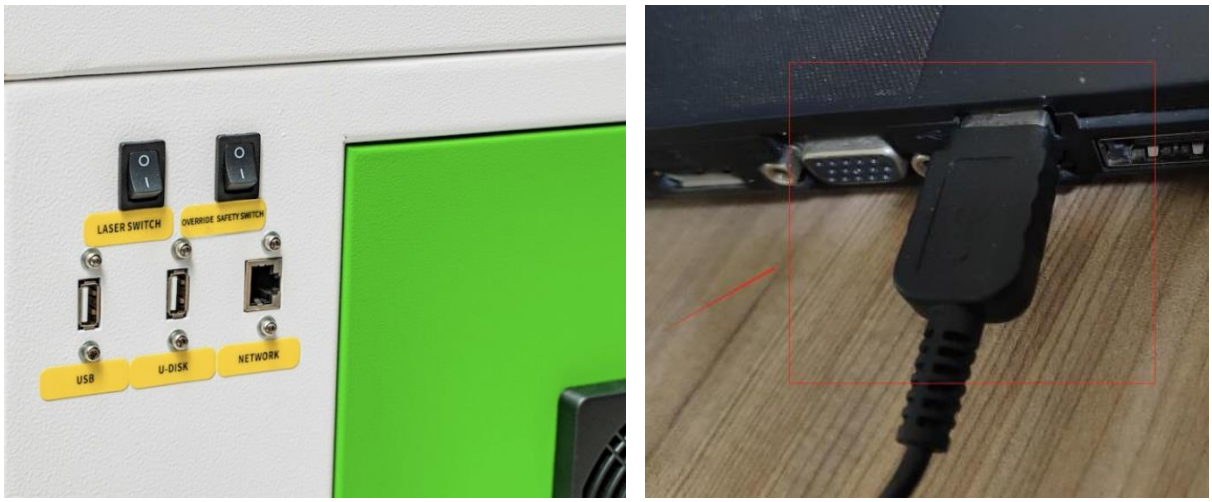
2.5 Connect the machine with computer

1） Firstly connect the machine plug to the power, as is shown in picture F2-9:

F2-9

2) Connect the USB cable.

Connect the computer and the machine by using the USB cable, like picture F2-10 shows below:



F2-10

Note: This machine support output by Ethernet, USB and U-Disc.

2.6 Adjust the focal length

There will be an acrylic sheet on the laser head, we call it focus plate. Put focus plate on the surface of the material you want to cut or engrave, then adjust the table position by pressing up and down button on the machine. You can get the best working effect when focus plate touch the below of laser head, as is shown in picture F2-11:

F2-11

The distance from the laser beam outlet port to the material is fixed and this distance is the width of focus plate.

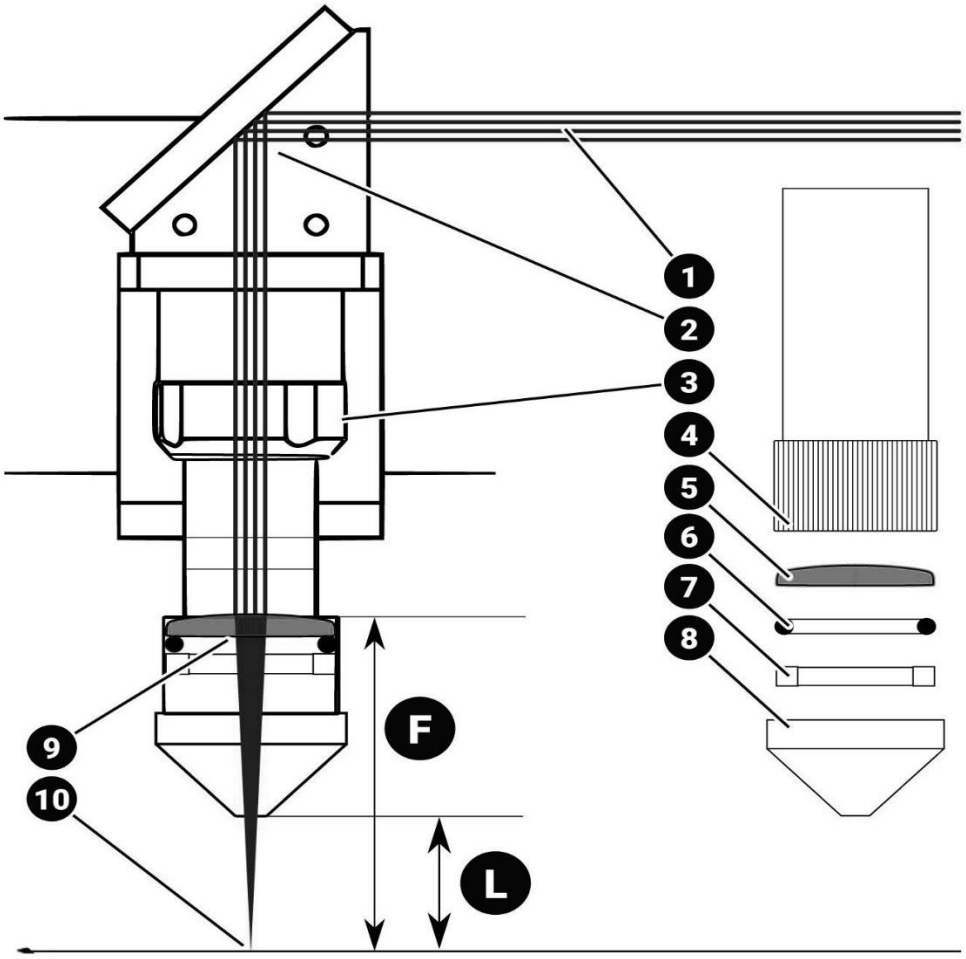
Note: If you lost your focus plate by accident, the reference focus plate width of this machine is 7 mm.

The laser will enter the head assembly and concentrate via the focal lens. Making sure that the laser has a correct (f) Focal Spacing is extremely important to the quality of the process.

Lens is 0.79" (20mm) in diameter, and has a focal length of 2.5" (63.5mm). The lens should be checked often for cleanliness and can be changed for lenses of different purpose.

Focal Lens Assembly

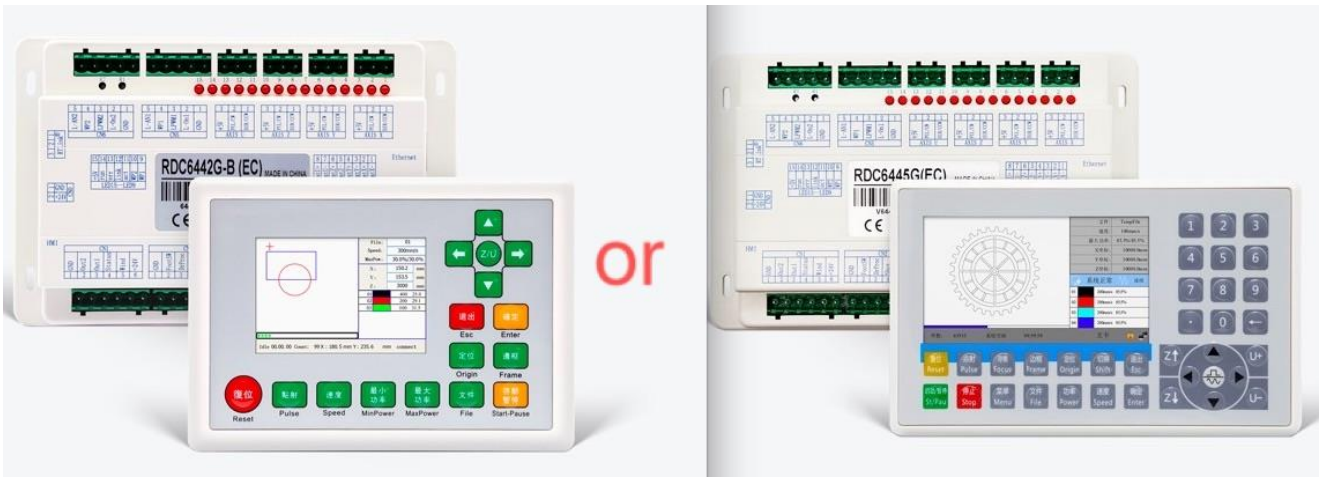
(F) Focal Length. (L) Focal Spacing. (1) Unfocused Laser Beam. (2) Laser Head Mirror. (3) Head Removal Set. (4) Lens Removal Set. (5) Focal Lens. (6) Rubber Gasket. (7) Locking Nut. (8) Nozzle. (9) Focusing Beam. (10) Focused Beam -- Surface. As is shown in picture:



2.7 The introduce of control Panel

The operation of control panel and software, please take the user manual or instruction manual of the corresponding control system manufacturer for reference.

RDWorks 8.0 User Manual Download, the ink is as below,
https://www.rdacs.com/en/download

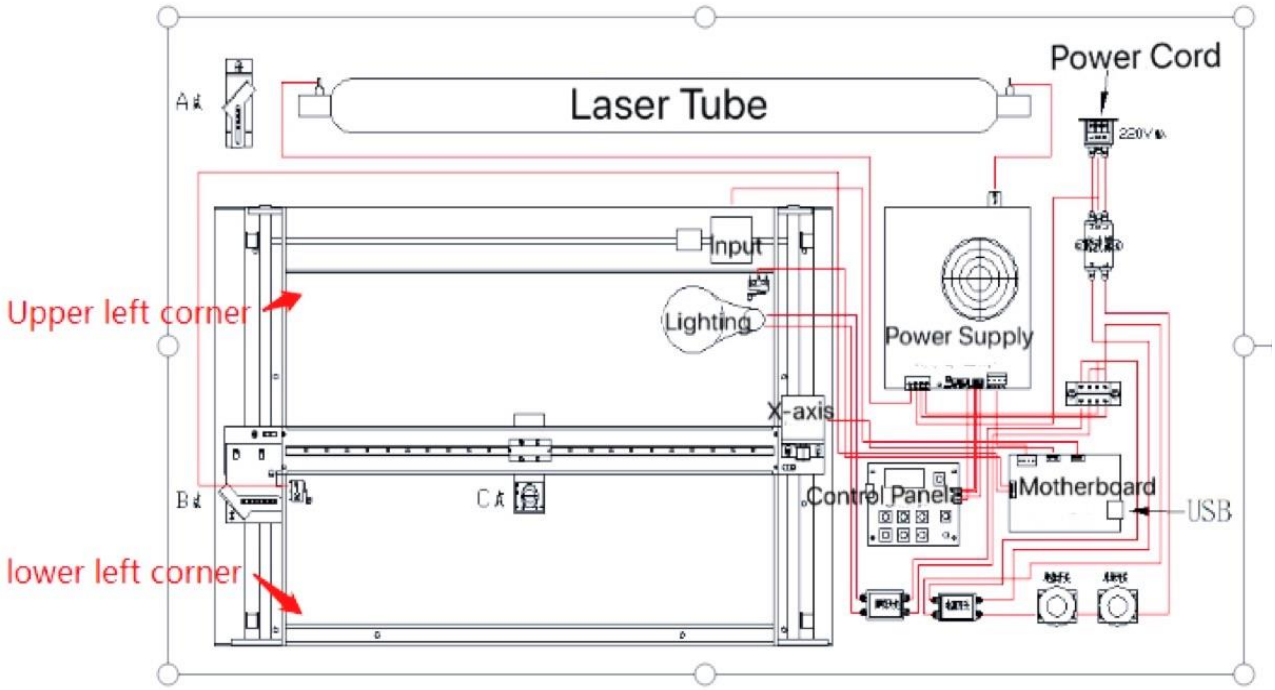


Control & Display Elements

Key	Description
▲ → ← ▼	Jogs the laser head or moves the curser of Ruida Interface.
Z/U	Show entries in interface. Selects the Z Axis navigation.
Esc	Stop Work or Escape a menu
Enter	Validate the change
Origin	Displays the "Set the relative origin" prompt.
Frame	Samples the file specified or default frame size
Start-Pause	Start or Pause the selected file.
File	Enters the file manager menu.
Max-Power	Set maximum laser power of current layer
Min-Power	Set minimum laser power of current layer
Speed	Set speed of current layer
Pulse	Pulse laser control. **NOTICE!** Pressing the pulse key will fire the laser beam. Use caution not to damage workpiece.
Reset	Reset the controller and return to the home position.

Chapter 3. Laser Beam Path Adjustment

3.1 Device schematic diagram



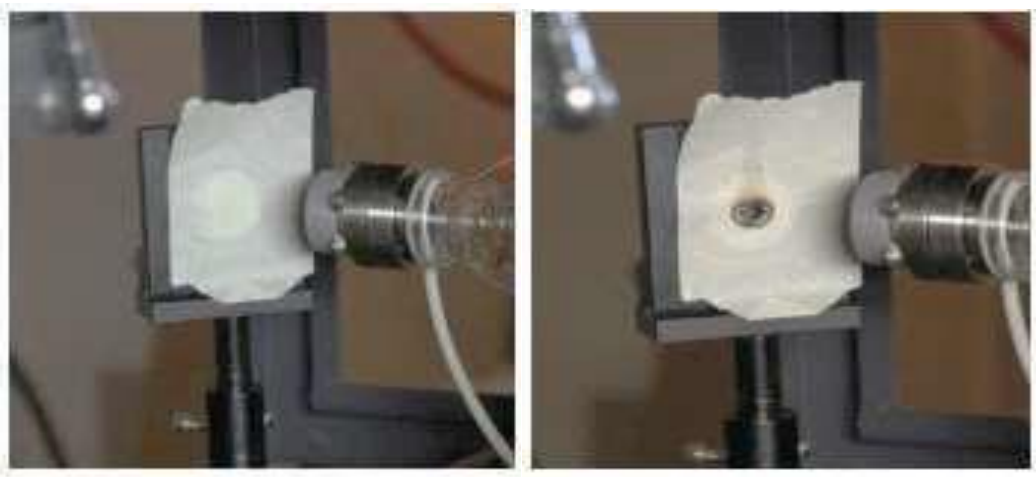
F3-1

3.2 How to adjust optical path of the device

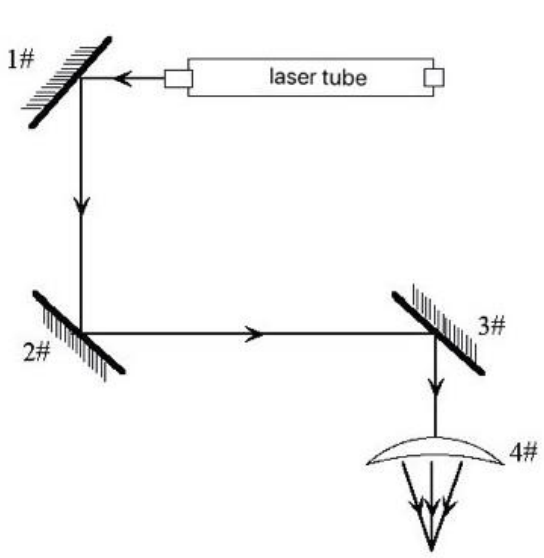
Before the machine is shipped from factory, technician has adjusted the laser path. However, it is inevitable that the light path will deviate during transportation. Please connect all the power cord and power on and power on the laser machine. At this time, the machine starts to reset and returns to the last positioning point, which indicates that the machine is operating normally.

Turn on the laser switch and you can start to adjust the light path.

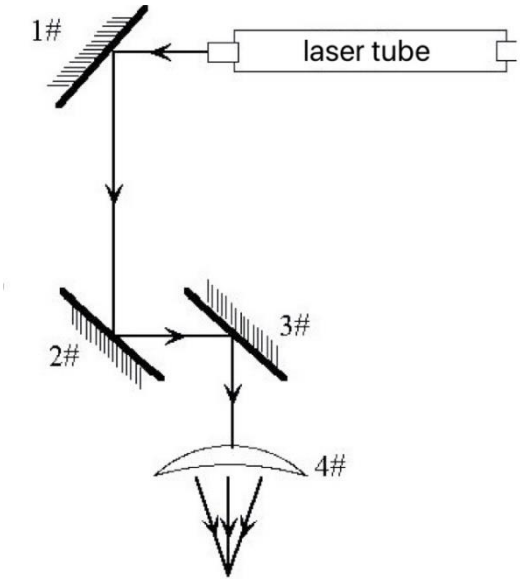
1) **Put the dimming paper (paper tape) on front of the first lens A (#1).**
   Change the laser power to ... then click on "Pulse" button on the panel (tap it immediately released, can be seen laser hit spots in the dimming paper).



It is ok if the spot falls almost in the middle position of the first lens.



F3-2



F3-3

2) Adjustment of optical path B (#2).

Put the lens dimming paper onto front of the second mirror frame B (#2). Press the arrow keys on the control panel and move X rail to the upper left corner of the rail position. Click the "Pulse" button to see the location of the laser spot. As shows in Picture F3-2.

Then press the arrow keys on the control panel and move X rail to the lower left corner, the same press "Pulse" button and there will be the other laser spot. As shows in Picture F3-4.

Please check if these two spots (upper left and lower left corner) position are coincident.

If the spot overlaps is located near the center of the lens, this mean the optical path between of first lens with the second lens is correct;

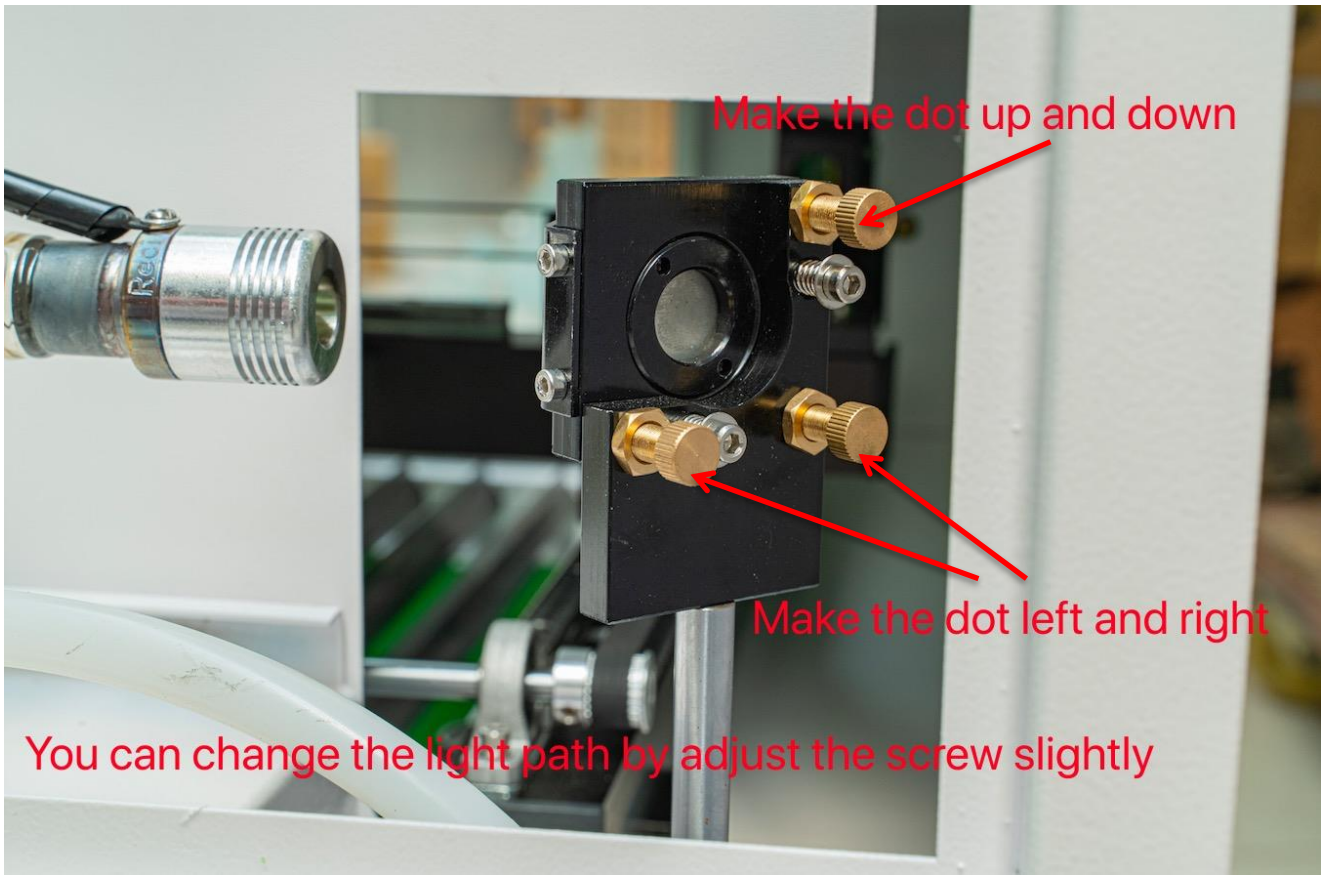
If the spot is above the middle of the lens, you can adjust the top screw of the three screws; if the spot is left or right to the middle, you can adjust the screws on the bottom, just move two of the three screws are ok.

Please refer to F3-2

Repeated adjustments and tests until the two mark centers completely coincide;

(Note: First pulse at the point closest to point A and leave a spot on the dimming paper, then pulse at the farthest point from point A and leave a spot, this is the second step. In the next step, the closest point will be fired first, and then the farthest point will be fired.

The essence is to compare the spot position made by pulsing in the farthest point to the nearest point and repeat the process of pulsing in the nearest point and the farthest point.)

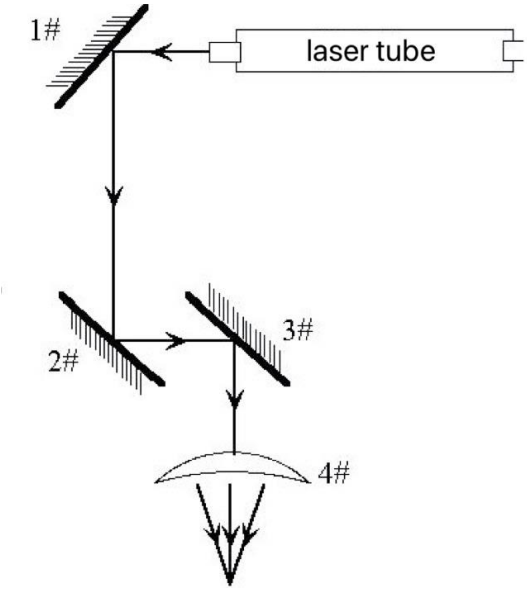


F3-4

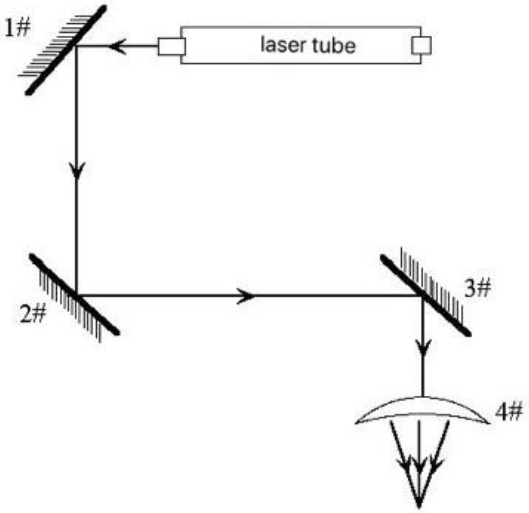
3) Adjustment of optical path C (#3).

Put the lens dimming paper onto front of the second mirror frame C (#3). Repeat pulsing in the farthest point to the nearest point of C (#3). As shows in F3-6 & F3-7.

(First, move the laser head to the left of the X axis, put the test paper in front of the hole of the laser head, press "pulse" slightly and check the spot. Then move the laser head to the right of the X axis, press "pulse" again, and check whether the two spots coincide with each other).



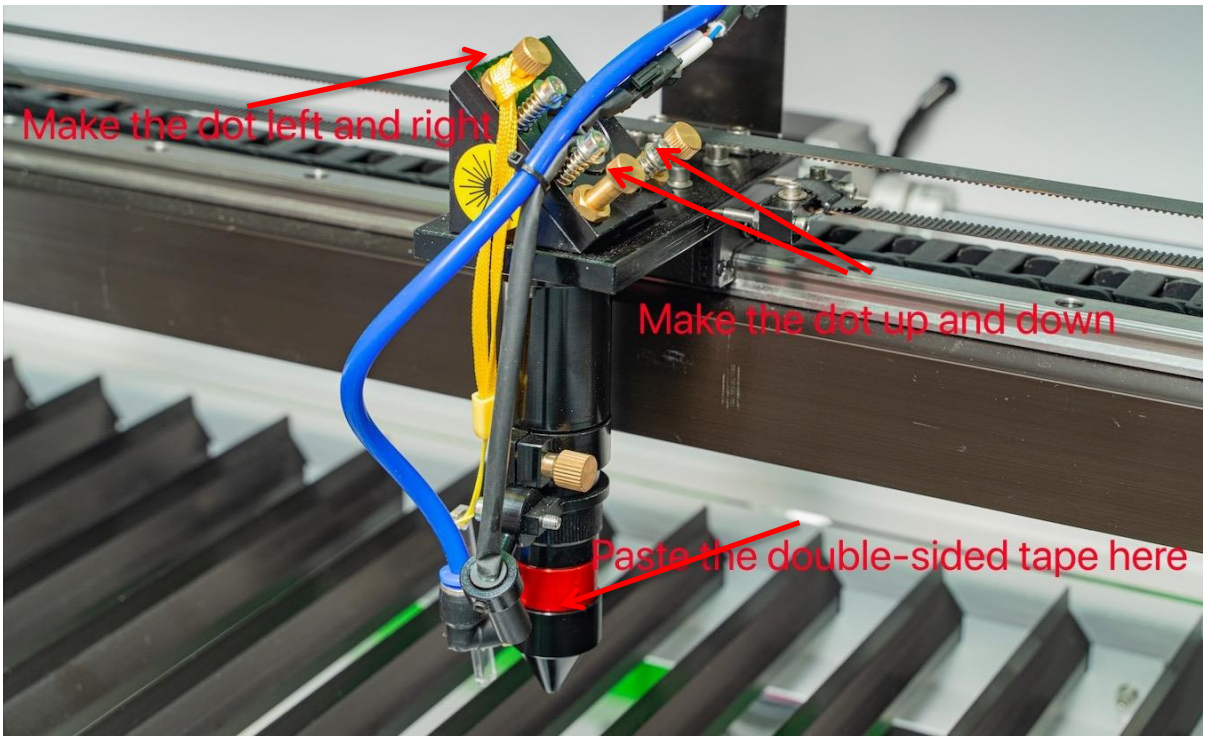
F3-5



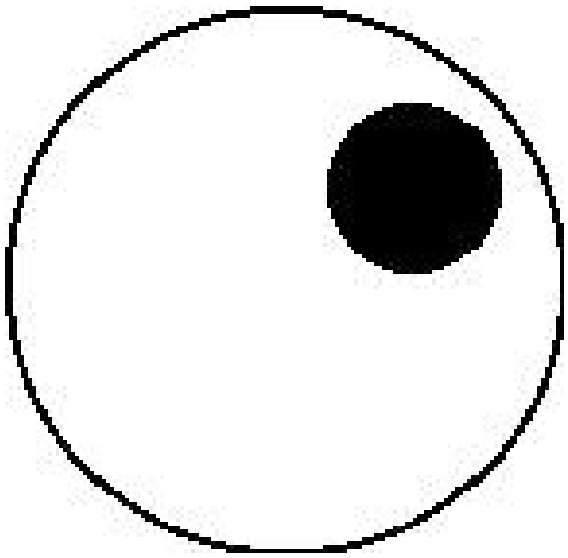
F3-6

4) The optical path adjustment between the third reflective lens and the focusing lens.

Put the dimmer paper into the below of laser head, then press the “Pulse” button, check if the spot hit the middle of dimming paper. If it happened to be in the middle of the below of laser head, the light path is positive.



F3-7



In this example, the spot is on the upper and outer sides, not in the middle:

1. **Adjust up and down deviation:**
   Only raise or lower the laser tube;
2. **Adjust inside and outside deviation:**
   The laser tube can only be adjusted inward or outward;
3. **In this example, the laser tube (referred to here as the low-pressure end of the laser tube) must be lowered, and then all readjusted from the first step;**

Note: The above work must be performed by professionally trained personnel. Otherwise, the relevant personnel must be asked for help.

Users must pay attention to safety when adjusting.

Chapter 4. Equipment Maintenance

Caution-use of controls or adjustments or performance of procedures other than those specified here in may result in hazardous laser radiation exposure.

Before starting cleaning and maintenance work always switch off the device and unplug the main plug.

Always keep the system clean, as flammable parts in the working area or exhaust area rise the fire hazard.

You should check at least once a day, weather 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.

4.1 General cleaning notes:

- Make sure that the device is switched off and unplugged. Open the protective cover.
- 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.
- Thoroughly remove all loose dirt particles and deposits in the interior of the machine.
- Clean the cover of the laser tube.
- You can clean the viewing window with a cotton cloth. Do not use paper towels as they could scratch the acrylic.

4.2 Water change

Check the water volume in the tank of chiller: it is recommended to check once a half-month in summer and once a month in winter. If the volume of cooling water is below 60% of the total volume, please input more water in time (should be soft water or distilled water, completely replace the cooling water every two months). You can also simply follow the sign marked on the chiller and make sure it is in the middle part of “normal” range.

Note: Before the machine is started to run, make sure the laser tube is full filled cooling water.

4.3 Clean and install laser tube

Generally, the glass turns yellow because of oil stains in the air and alkali in water vapor, such as scale. In addition, the laser tube will have a burning smell after use, and the surface color of the laser tube will turn brown. This is because static electricity will be generated in high-voltage environment, and static electricity will produce adsorption phenomenon. There is a lot of dust in the working environment, especially in the case of long-term carving wood, this discoloration will be more serious, but this will not affect the normal operation of the machine. This is not the fault of the power supply or the laser tube. As long as you pay more attention to the hygiene of the working environment, this situation can be avoided. If the laser tube has changed color, you can wipe the outside with water or alcohol. Regularly remove the dust and sundries on the laser tube and the water cooler to ensure that less dust pollutes the laser tube. However, if the interior of the glass tube has been polluted, it needs to be cleaned in time.

1) Disconnect the anode and cathode wires and the water inlet and outlet of the Co2 laser tube, at the condition that the power is off.
2) Pour out all the water from laser tube, stick adhesive tapes onto the laser beam exit, and make sure the output optic will not be contaminated at all when cleaning the tube.
3) Input vinegar or hydrochloric acid into the water inlet of the laser tube until it is full.
4) Place it carefully on the table and wait for 30 minutes, then shake it smoothly, and then make liquid out of the tube.
5) Pour out the mixed liquid, and rinse the laser tube with a lot of water (purified water). After this, if there still is some dirty adhering to the tube, repeat step 4 and 5. Notice: the mixed liquid shall not be kept in the glass tube for more than 30 minutes, and rinse it right after the solution is out.
6) Dry the water on the laser tube, the beam exit, and the high voltage end with absorbent material, especially on the electrodes.
7) Take the adhesive tape away from the laser output window, check if the optic is contaminated, clean it properly and carefully if any contamination or water left on it, and then mount the Co2 laser tube on the machine.

Connect the power and run for 2-3 minutes (let the laser tube full filled with recycled water)

Laser Tube Installation

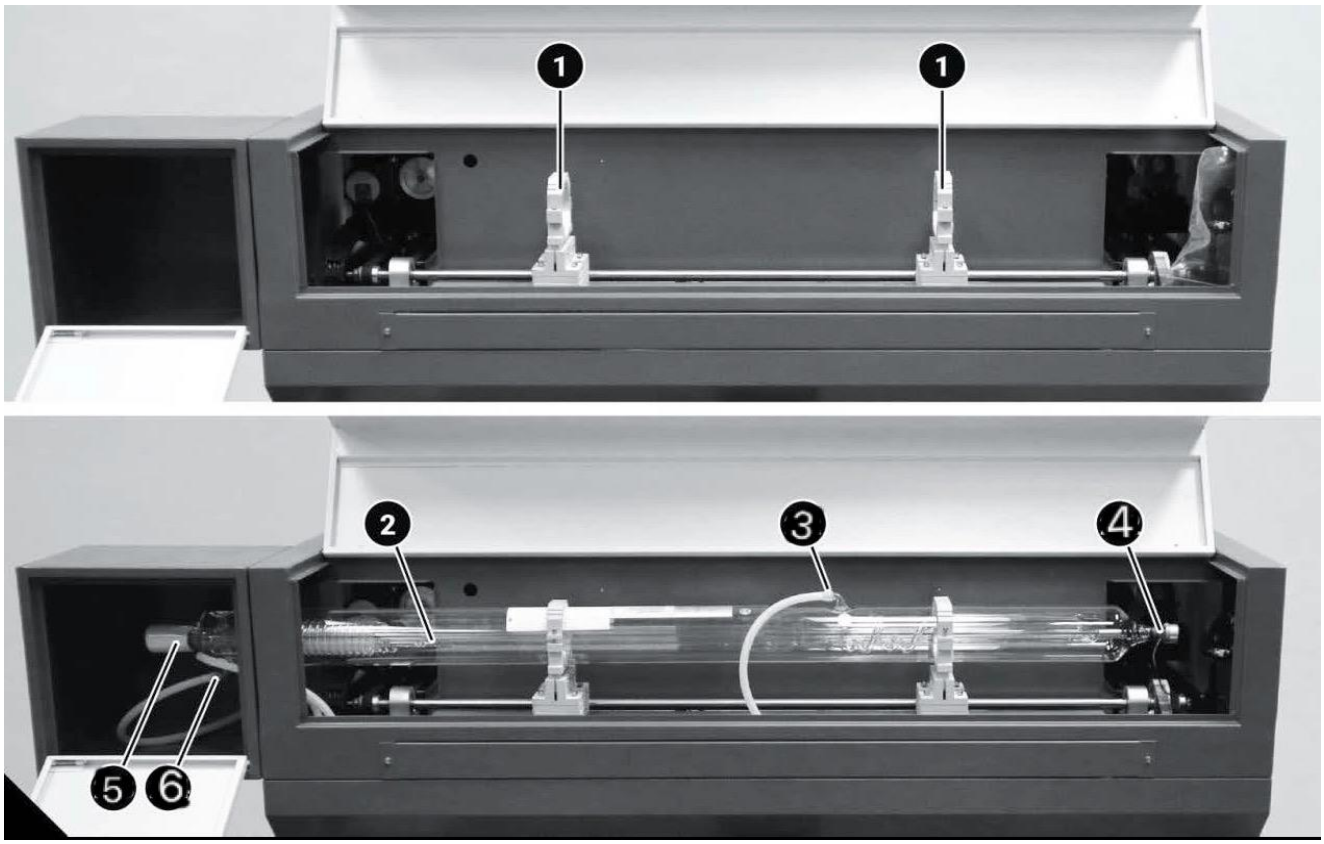
To reinstall the laser tube, follow the procedure exactly. Avoid any adjustments to mirrors or laser tube mounts during the installation.

Tools Needed:

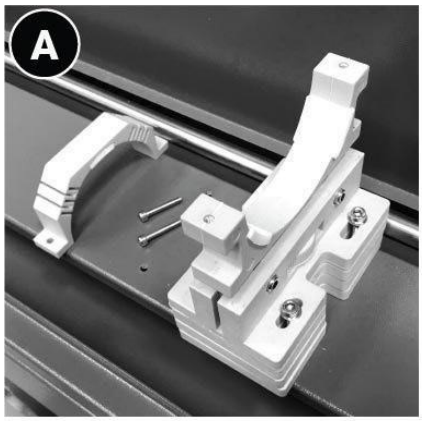
Allen wrenches. Phillips head screwdriver (short)

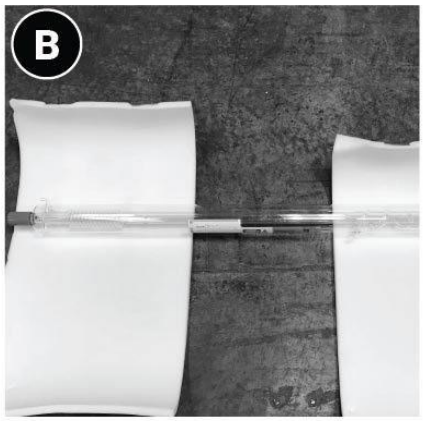
Make absolutely sure that the machine is not connected to the power source.

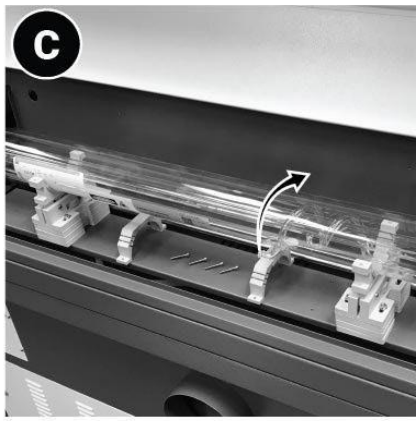
Laser Tube Installation, as is shown in picture:

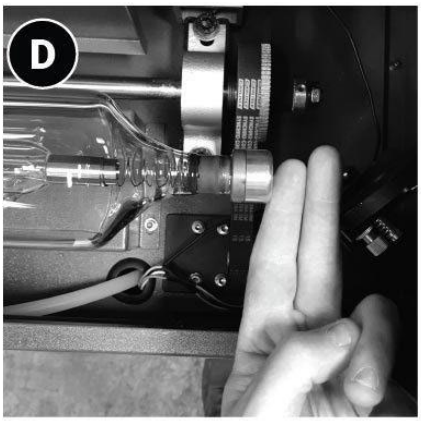


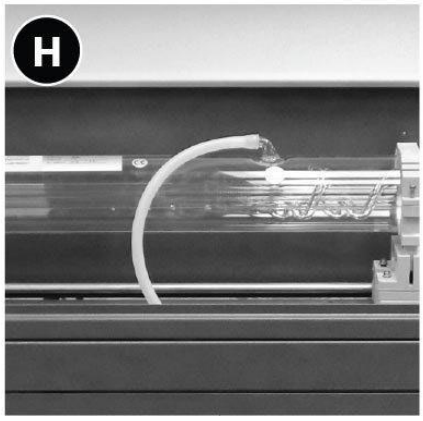
(1) Laser Tube Mount. (2) Laser Tube. (3) Water Outlet.
(4) Anode Terminal. (5) Cathode Terminal. (6) Water Inlet.











(A) Laser tube mount.

(B) Laser tube packaging.

(C) Laser tube in place, rotate water outlet vertical.

(D) Laser tube two-finger spacing from mirror.

(E) Laser tube mounted.

(F) Cathode connection & water inlet connection.

(G) Cap.

(H) Water outlet connection.

(I) Anode connection.

A. Remove the top portion of each (1) laser tube mount with an allen wrench. Do not make any adjustments to the other components of the laser tube mounts.
B. Carefully remove the (2) laser tube from the packaging.
C. Carefully place the (2) laser tube in the laser tube mounts. Once in place, rotate the laser tube so that the (3) water outlet tube is pointed straight up. This will eliminate any air bubbles form staying stagnates in the laser tube.
D. Position the laser tube by translating the position of the laser tube to a distance of 1.5-2" form the first mirror assembly. A width of 2 fingers is adequate.
E. Reinstalled the top mounts of the (1) laser tube mounts. Only tighten down enough to secure the tube, do not over tighten. Do not adjust the height or position of the tube mounts at this time.
F. Unscrew the red cap and connect the (5) cathode wires to the laser tube with the Phillips head connection screw. Install the (6) water inlet connection by wetting the tube with water and pushing it completely into place.
G. Screw the red safety cap back in place.
H. Connect the (3) water outlet tube by wetting the end of the tube and pushing into place.
I. Connect the (4) anode wire to the laser tube with the Phillips head connection screw.

4.4 Clean fan

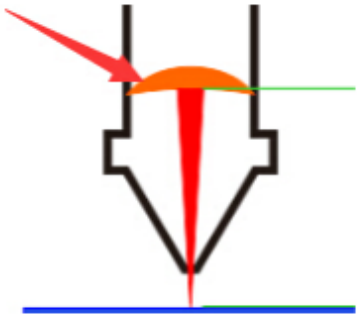
There will accumulate a lot of solid dust inside of the fans after prolonged use of fan. So fans have a lot of noise and not good for exhaust and remove taste. When the fan suction is inadequate and smoke can not be exhaust smoothly, it should be powered off firstly, then unplug vent pipe connected with the fan.
Remove dust inside of the vent-pipe and then make the fan upside down, slide the fan, until clean up the dust. After all pipelines and fans are cleaned, install the fans.

4.5 Clean the mirrors / lens

It is recommended to clean mirrors/lens before work everyday in order to run the machine at maximum efficiency. Please turn off the power before cleaning the optical parts.

There are 3pcs reflection mirror and 1 pc focus lens on engraving machine. You refer picture F3-1 in Chapter 3. Laser beam is emitted from the laser head after reflected and focused by the lens. Lens is easily covered by dust or other pollutants, and dust or other pollutants on the surface of the lens can damage the lens.
When you do the first, the second and third reflection mirrors cleaning, you don't need to remove the mirrors from the machine. You only need to wipe with the cotton swab dipped in detergent (acetone or absolute alcohol) carefully along the center of the lens to the edge.
When you do focus lens cleaning, you need to move the working head to the center of the working surface. Then loose the lens holder slightly and take the lens out with a tool. You can clean concave side and convex side with swabs. After you finish cleaning, please install the lens back to original place in the lens holder with the installation tool.





NOTES:

- Please wipe the lens gently, not damage the lens surface coating;
- During wiping process please handle with care and prevent lens damage caused by accidental fall, after wiping don't touch the lens with your hands;
- Make sure to keep concave side of the focus mirror down when installation.
- Never use the cleaning swab twice.

4.6 Cleaning of the guide rail

It is recommended to clean it one time every two weeks and please turn the power off before you start to clean.
First move the laser head to the rightmost of X axis (or leftmost), wipe it with a dry cotton cloth until it is bright and dust-free, then add a little lubricating oil (or sewing machine oil), slowly push the laser head to the left and right several times

and let the lubricating oil distribute it evenly. You can clean the Y-axis guide rail the same way.

Note: Please prepare dry cotton cloth and lubricating oil to clean the guide rail.

4.7 Inspection of the light path

In the optical path, the focus lens does not have deviation problem. However, the three mirrors are all fixed by mechanical parts, and the possibility of deviation is relatively large. Although there will be no deviation under normal circumstances, it is recommended that the user should check whether the optical path is normal before each work. For details, please refer to Chapter 3.

Chapter 5. Warranty Regulations

5.1 Warranty

The machine warranty is 12 months from the day you order the machine (except the consumable parts).

WARNING!
VOLTAGE. Before connecting this tool to a power supply (receptacle, outlet, etc.) make sure that the voltage supplied is the same that is specified on the nameplate of the tool. IF in doubt, do not plug in the machine. Using this tool with a voltage different than that stated on the nameplate can damage the electrical components of this machine and any such damage will not be covered by a warranty.
CIRCUIT BREAKET. Also make sure that the power supply is equipped with the appropriate breaker and plug according to your local electrical code. To do this, first check the motor plate to get the FLA amperage of the appropriate circuit breaker, please consult an electrician or an electrical supply source.
ELECTRICAL SHOCK. It is extremely dangerous to work on live wires and or electrical systems that are connected to a power source. ALWAYS disconnect the power from the machine prior to performing any maintenance or adjustments work.
MOTOR WIRING: The information in this manual was current at the time of printing but may be different than the diagram on your machine. ALWAYS use the supplied wiring diagram with the machine or motor (under the electrical covering) if present.

5.2 Warranty Clause

This warranty clause is based on the products sold by Sign-in-Global.us. as the object of warranty.

During the warranty period, if the normal use of the company's products fails, you can present the warranty card or invoice according to the content of this warranty clause to enjoy the company's free warranty service.

Under the following circumstances, you will not enjoy free services, and you will be charged according to the specific circumstances:

1) Maintenance services are not caused by the quality of the equipment;
2) The warranty period has expired;
3) Failure to perform the agreed obligations in accordance with the provisions of the contract;
4) Unauthorized disassembly, modification, and maintenance of the product without the consent of the company;
5) Do not operate according to the items specified in the "Instruction Manual" (such as: grounding, etc.).
6) The high-quality accessories provided by our company are not used.
7) Force majeure such as natural disasters, fires, thefts, etc.
8) Damage caused by smoke, chemicals and other similar factors.
9) Damage caused by dismantling and repairing by the maintenance department not designated by the company.

The equipment malfunctions due to human factors or force majeure.

The company only assumes due legal obligations for the products sold, but does not assume other responsibilities arising from the use of the company's products.

Warranty Card 1 year warranty from date of purchase	
Reference No.	LCM-RS-X700-US
Serial No.	
Date of Purchase	
www.sign-in-global.us	

Chapter 6. Common Problems and Solutions

1. **Problem: No reset, chaotic engraving, misplacement after booting.**
   Reason: The ground wire is not connected or the ground wire is not connected well.
   Solution: Connect the ground wire as required.
2. **Problem: The engraving depth is uneven.**
   Reason: The water circulation system does not work, and the light path is not adjusted properly.
   Solution: Turn off the machine and wait for 1 hour, restart the water circulation until there is water out of the outlet pipe, and then turn on the dimming.
3. **Problem: There is no voltage when starting up.**
   Reason: The fuse on the right side of the machine has been looped.
   Solution: Replace the spare fuse.
4. **Problem: The engraving depth is too shallow.**
   Reason: The laser beam is not in the center of the lens or the lens is too dirty.
   Solution: Adjust the laser light path and clean the lens.
5. **Problem: The lettering is blurred.**
   Reason: The lens is reversed or the focal length is wrong.
   Solution: Align the lens and adjust it to the specified focal length.
6. **Problem: The machine discharges and ignites.**
   Reason: The connection of the wiring is not good or the air is too humid. There is dust on the terminal.
   Solution: Connect the ground wire, clean up the dust, ventilate and dry.
7. **Use the table below and select the material whose material properties are closest to the work piece being cut or engraved.**

	LASER TUBE WATTAGE		
Material	Examples or sub categories of material.		
Process	Speed (mm/s) – Min Power%		
	60W	90W	130W
Hard Plastics	Acrylic (Lucite, Plexiglass, PMMA), Delrin, Polyethylene film (Mylar)		

Engrave	450 - 40%	450 - 35%	450 - 25%
Cut 1/8” (3.2mm)	35 -100%	50 -100%	60 -100%
Cut 1/4” (6.4mm)	15 -100%	20 -100%	35 -100%
Cut 3/8” (9.5mm)	-	5 -100%	15 -100%
Cut 1/2” (12.7mm)	-	-	5 -100%
There are commonly two types of acrylic. Casted acrylic produces a frosted-look engraving. Extruded Acrylic (the cheaper of the two) is best for cutting and produces a clear engraving.			
Wood	Hardwoods, Plywoods, MDF, Particle Boards		
Engrave	200 -100%	300 -100%	450 -100%
Deep Engrave	100 -100%	175 -100%	300 -100%
Cut Veneer	200 - 80%	250 - 80%	300 - 80%
Cut 1/8” (3.2mm)	50 -100%	100 -100%	200 -100%
Cut 1/4” (6.4mm)	15 -100%	25 -100%	50 -100%
Cut 3/8” (9.5mm)	-	5 -100%	40 -100%
Cut 1/2” (12.7mm)	-	-	5 -100%
Cut with the grain when possible. Consider that the density and water content of the wood will play a role in the above parameters. Do not process woods with flammable surface finish like lacquer or varnish.			
Rubber	Silicone, Vulcanized Rubber, Polyurethane, Neoprene, Gaskets, Rubber vibration mats, Rubber stamps		
Engrave	200 - 80%	325 - 80%	400 - 80%
Cut	80 -100%	120 -100%	150 -100%
Fabric	Polyester, Nylon, Leather, Denim, Netting, Neoprene, Cotton.		
Cut / Engrave	450 - 20%	450 - 15%	450 - 15%
Paper (thin materials)			
Cut / Engrave	500 - 10%	500 - 10%	500 - 10%

When cutting paper, be very cautious of the fire danger. Achieve laser settings such that the laser cuts the material as quickly as possible without leaving burn marks.

If there are other problems, please call the company's technical service hotline or dealer phone.