LASER MACHINE

USER MANUAL

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FOREWORD

Thank you for choosing the AMOR laser series!

This manual provides users with relevant precautions and instructions for installation, commissioning, parameter setting, fault diagnosis and routine maintenance. In order to use this product safely and correctly, please read this manual carefully before operation, fully understand it, and keep it in a safe place for future reference. Laser is a kind of high-power and invisible light. Please pay attention to laser radiation when using it to avoid direct or scattered radiation from eyes or skin. The operator cannot leave when the machine is running. Please read this manual carefully to avoid unnecessary errors and losses. Due to software upgrades that are inconsistent with this manual, the actual software will prevail. The design and technical parameters of the product are subject to change without prior notice. The appearance and pictures of the product are for reference only and are subject to the actual product.

If you have any suggestions for our products or need our help, please call: 86 18863504017.

www.amorlaser.com;

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Precautions!!

-Be sure to turn off the power when wiring.
-The electronic components inside the device are particularly sensitive to static electricity, so do not place foreign objects inside the device or touch the main circuit board.
-After disconnecting the AC power, the internal drive of the device, the main board, and the indicator of the laser power supply are not extinguished, indicating that there is still high voltage inside the device, which is very dangerous. Do not touch the internal circuits and components.
-Be sure to ground the device housing properly.

-The power environment of the machine requires 220V. If your voltage is 110V or 380V, please pay attention to voltage conversion to avoid machine failure.

- Disclaimer: Due to user's special needs or technical upgrades, some structural changes caused by the user will not be notified. You can get the latest content through our website.

Contents

Safety Manual

The laser engraving and cutting machine is used for four kinds of lasers (strong laser emission), and the laser injection may cause the following accidents:

1. Inflammables around
2. Harmful gases may be generated while the device is running
3. Direct exposure to the human body will be harmful to the human body.

Therefore, the place where you work must have a fire extinguisher, strictly prohibiting flammable materials from approaching the machine and keeping it ventilated. Please read and follow the safety manual.

1. The outer casing should be in contact with the ground.

2. Non-professional high voltage power supply. Do not break the outer casing. It needs ventilation and heat dissipation.

3. When the light pipe works, it is necessary to use circulating water to lower the temperature of the superheated laser tube. Therefore, before working on the machine, be sure to add some water to the cooling water pump. When the power is turned on, the pump starts to work and the equipment starts to run. The circulating water should be pure. Check the water pipes for leaks, water is sufficient and the water temperature cannot exceed 35 °C. We recommend changing the water regularly and cleaning the cooling equipment. Cooling equipment is not used for a long time, or long distance transportation requires water to be removed.

4. Turn on the water circulation system before the equipment and ensure that the water circulation system is in normal use. In the winter laser tube, there is no ice water, so after turning off the power, drain the water from the laser tube to prevent freezing.

5. When the temperature is very low, please pay attention to the water in the laser tube after the power is turned off to prevent freezing.

6. The laser beam directly or reflected to the human body will cause great harm to the human body, especially into the eyes. Therefore, the following rules must be followed when laser cutting the cutting machine:

a. Take any part of your body into the light path to avoid being burnt by the laser.

b. Observe the laser through binoculars, microscope, magnifying glass, etc.

c. It is forbidden to place laser reflectors on the stage.

d. Do not place the laser line too close to where the laser is emitted.

e. Smoking while the machine is working can cause harmful contamination of the lens and lens. The user turns on the air pump and fan to regularly clean the dust in the air pump and fan.

f. If a malfunction or sudden fire occurs, please turn off the power immediately, and do not use the machine in the weather of lightning.

g. The machine's power distribution box cannot be turned on when the unit is working or the power is not turned off. The machine is running at high pressure. Non-professional personnel cannot disassemble the machine.

The laser engraving and cutting machine should be placed on the ground. Can't beat, shake, slam the machine, especially the track.

h. The slip surface and contact shaft in operation should be kept clean so that the oil can be in the input hole at any time.

i. Dust contamination of the machine will affect the efficiency of the machine. The user should keep the lens and lens clean. Apply a special lens cleaning solution when cleaning. Wipe it in one direction from the inside out with absorbent cotton or lens tissue. If the laser machine's mirror and focusing mirror are not clean, the output efficiency will be seriously affected. The absorbent cotton cloth should be replaced after one wash.

j. It should be operated in a clean environment. The air pump should be installed above the ground to prevent dust absorption.

k. The system, blower, and debris cleaning system must be unobstructed. Turn on the blower fan and air pump before turning on the power.

l. Connection: When the system is running for a period of time, the screw connection will be loose, and the stability of the machine will be affected. Note: A staff member must be guarded while the machine is running.

AMOR Laser cutting machine structure

2.1,Schematic

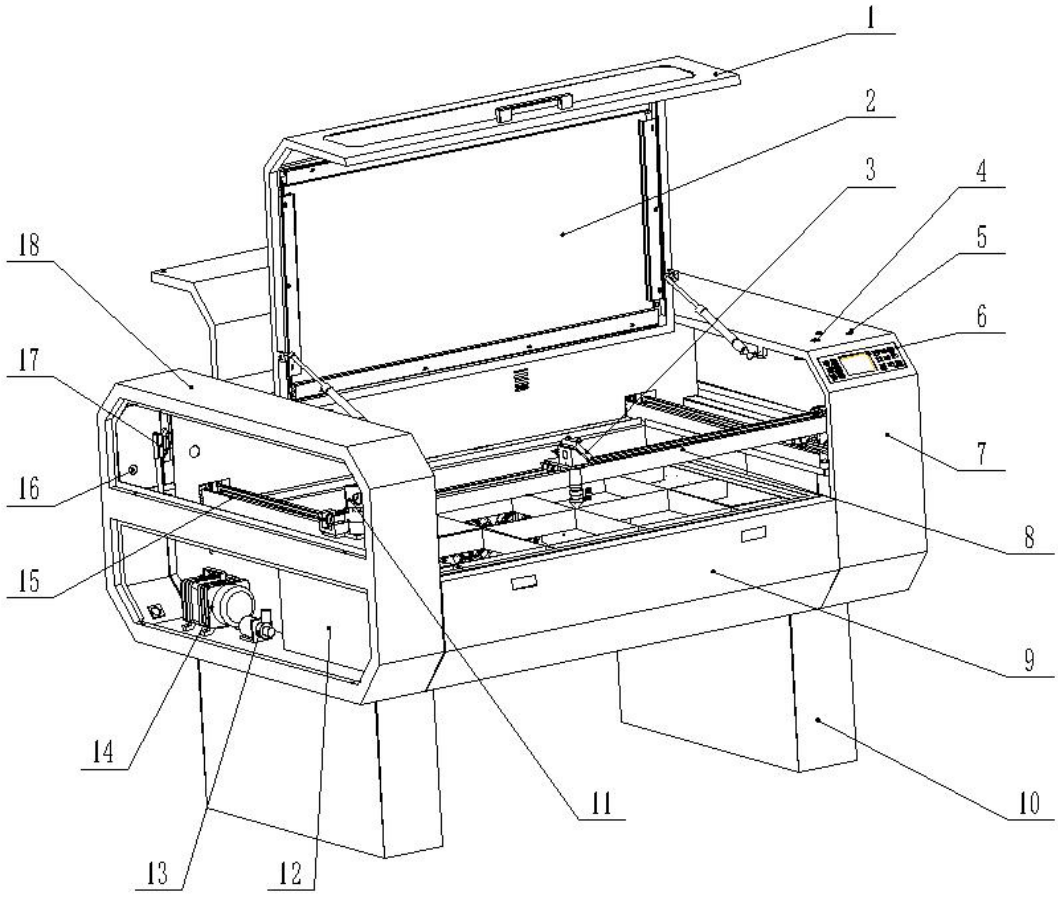


Figure 1 Schematic diagram of the front structure of AMOR laser cutting machine

1. Upper cover 2. Viewing window 3. Laser head 4. Start button 5. Emergency stop button 6. Control panel 7. Right side cover

8. X-axis guide rail 9. Front lower flap 10. Foot 11.B-mirror frame 12. Water tank 13. Water pump

14. Air pump 15. Y-axis guide 16. Water tank vent 17. A mirror frame 18. Left side cover

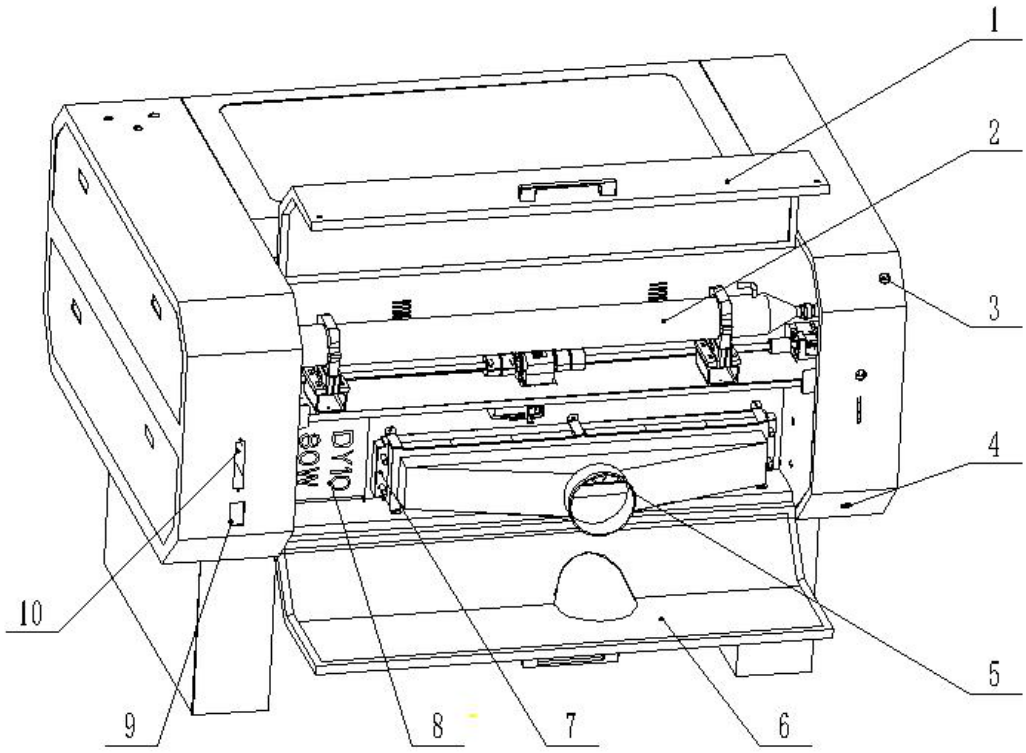


Figure 2 Schematic diagram of the back structure of AMOR laser cutting machine

1. Rear upper cover 2. Laser tube 3. Inlet 4. Water tank exhaust 5. Exhaust pipe connection 6. Rear lower cover

7. Cooling bellows 8. Laser power supply 9. Power interface 10. Network cable, USB data cable interface

2.2,System Composition

AMOR series laser cutting machine has five major components: Optical system, transmission system, control system, mechanical platform and auxiliary system.

Optical System

The optical system is further divided into: laser light guiding system and laser generating system

The laser light guiding system is composed of A, B, C tertiary mirrors and adjustable focusing mirrors;

The laser generation system consists of a CO2 laser and a laser power supply.

Optical system is a key part of the system

Transmission system

The drive system consists of three high-precision roller guides, two two-phase stepper motors, a drive shaft, a timing belt and several synchronous wheels.

Control system

The control system is mainly composed of main control circuit, control panel, hybrid stepping motor subdivision driver, DC power supply, photoelectric sensor, door opening protection switch and water flow detection switch.

Mechanical platform

Auxiliary System

It consists of circulating cooling water system, air pump, gas filter and exhaust system.
The five systems are relatively independent and interrelated, forming the organic whole of the system.

AMOR Series laser cutting machine installation

3.1,Disassembly packaging

(1) After the package is disassembled, the laser tube should be taken out first to avoid damage caused by cracking during handling.

(2) Unpack and organize.

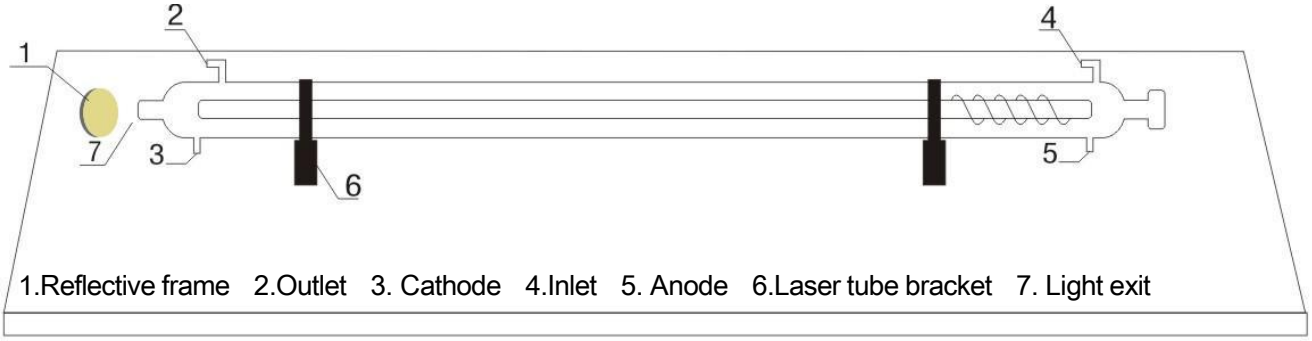
3.2,Install place

a) The back, left and right sides of the machine must be 80 cm away from the wall.
b) The machine tool should be placed so that it can not be shaken. The level of the table must be ensured during installation to fix the four wheels of the machine and the foot cup.
c) Place the machine in a dry and ventilated place

3.3,Installation condition

1. The air humidity is not more than 50% and the ventilation is good.
2. Excessive humidity will cause high voltage discharge and damage the machine. The humidity should be controlled between 6 and 32 °C and must not exceed this range.
3. There should be a good grounding device.
4. The electricity environment meets 220V.

3.4,Laser tube installation



1.Reflective frame 2.Outlet 3. Cathode 4.Inlet 5. Anode 6.Laser tube bracket 7. Light exit

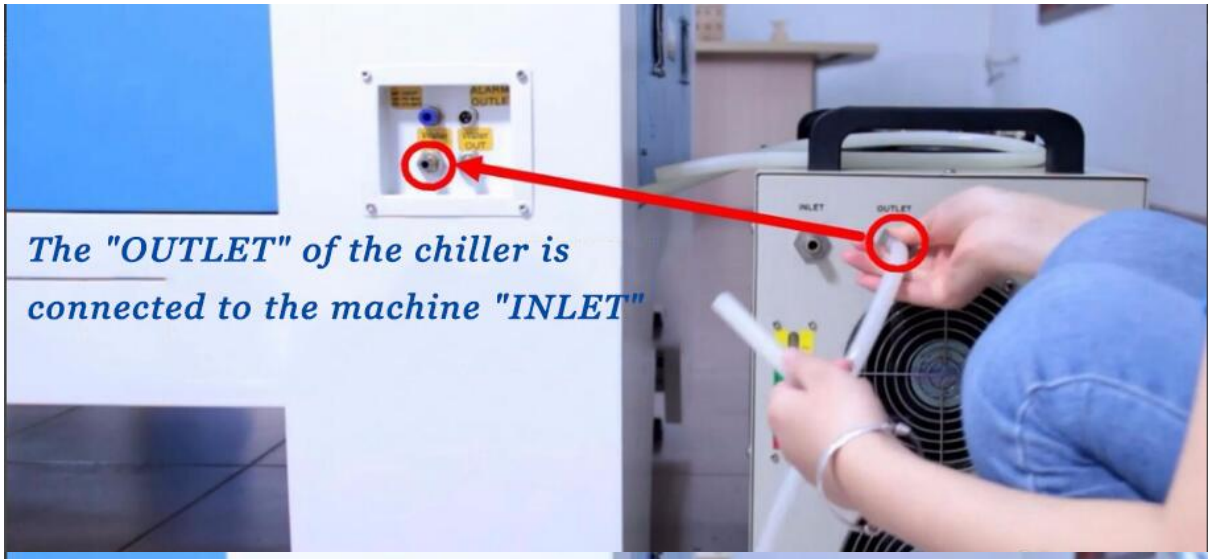
1.反光镜架 2.出水口 3.阴极- 4.进水口 5.阳极+ 6.激光管支架 7.出光口

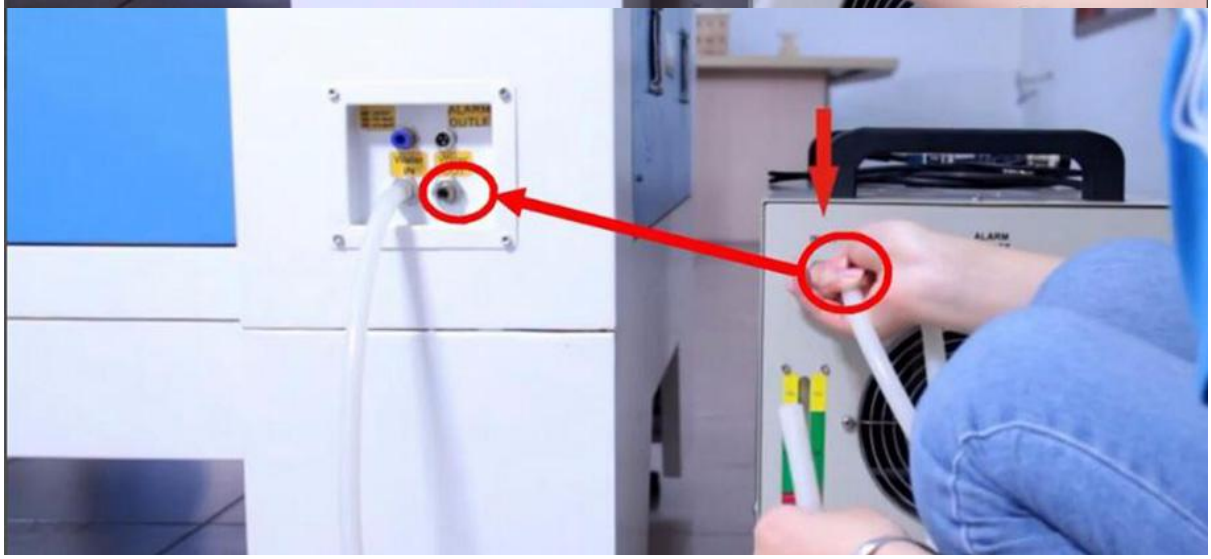
When installing the laser tube, please refer to the attached drawing. According to the picture, the anode wire (pink thick wire) and the cathode wire (black/blue wire) are respectively inserted into the outlet of the laser tube and the water inlet at the specified position (the link of the water pipe follows the water from the water source). The principle of anode entry and exit from the cathode). Please refer to the installation video

3.5. Connection of water pipes, gas pipes, air pumps, water pumps and water tanks

3.5.1 Water pipe connected to the cold water tank :

First connect the outlet of the chiller "OUTLET" to the water inlet of the machine, and then connect the inlet INTLET of the chiller to the outlet of the machine. Then connect the water protection signal line and connect the power supply of the chiller to the 220V power socket. Turn the water protection switch on.


The "OUTLET" of the chiller is
connected to the machine "INLET"




Connected water protection
signal line

Function：

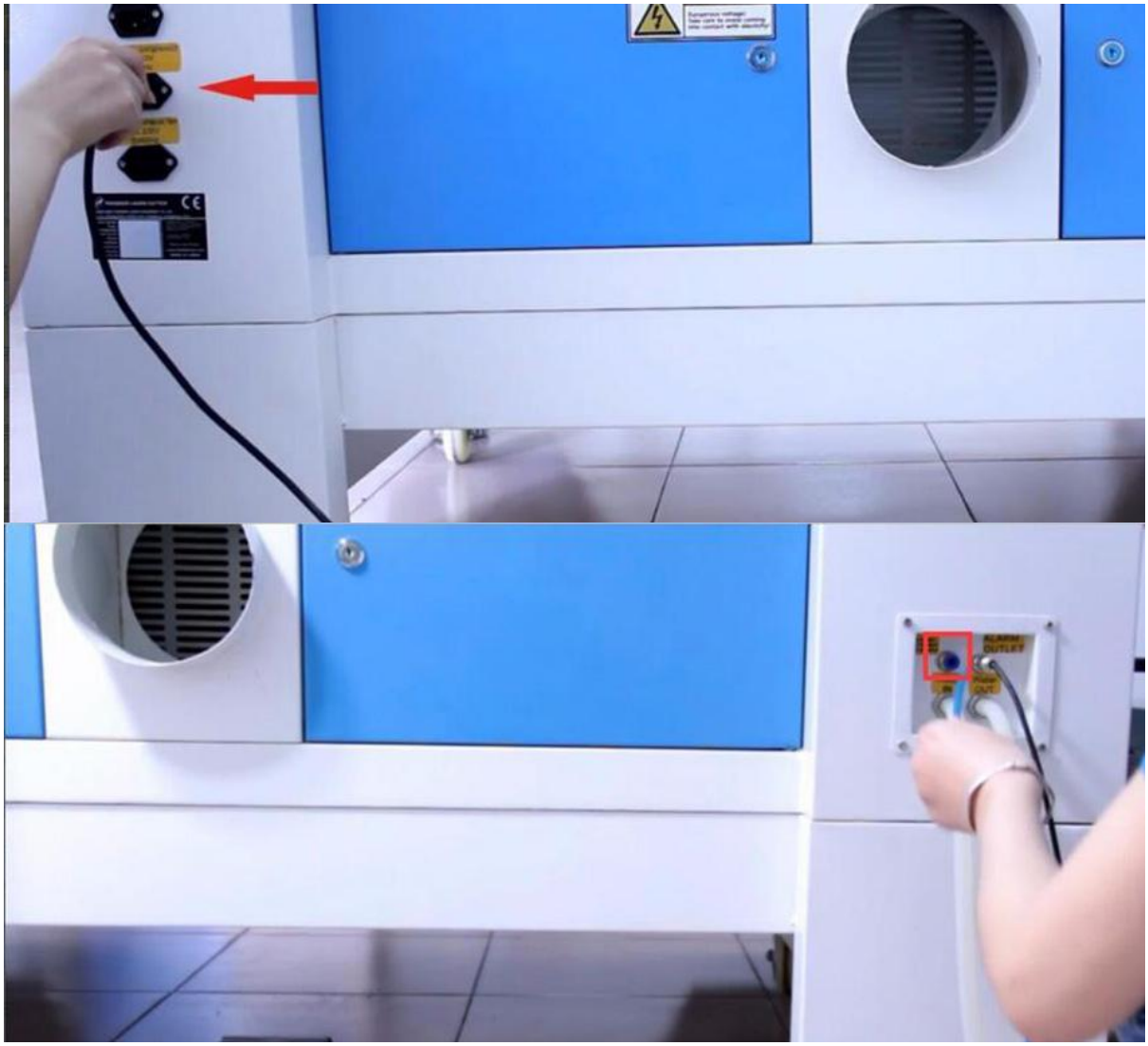
Before the machine works, it must be ensured that the laser tube is filled with circulating water, otherwise the laser tube will be burnt, causing irreparable damage. When passing water, be sure to keep the water clean. Dirty water will affect the light output of the laser tube and reduce the life of the laser tube (pure water is recommended). At the same time pay attention to the water temperature, the water temperature of the laser cutting machine should not exceed 35 °C, the temperature is not suitable may cause the laser cutting machine to work normally, and even burn the laser tube seriously. In the north, when using a laser cutter in winter, the water temperature in the tank should not be lower than 5 °C. After the work is completed, the water in the laser tube

must be drained to prevent the laser tube from freezing and cracking. The water in the water tank should be at least 3/4.

3.5.2 Connecting air pump or air compressor :

(1) Connect the power supply to a 220V power outlet.

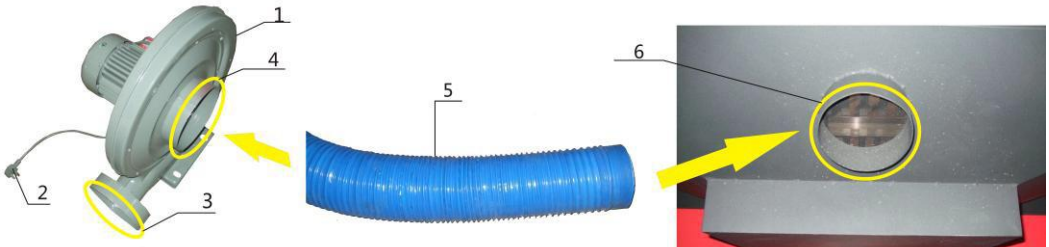
(2) Connect the air pipe to the air inlet of the laser engraving and cutting machine and fasten it.



The role of the air pump /air compressor:

It can prevent the smoke generated by the equipment when processing materials from entering the nozzle and polluting the focusing mirror. The dust generated during the processing can be blown away to make the processing depth deeper. It can prevent the flames from burning objects from being burned during processing.

3.6.Fan connection :



注释：1.轴流风机　2.电源插头：输入AC220V　3.出风口：请置于良好的通风处
4.进风口　5.通风管　6.机器后部排风口

Place the axial fan in a well ventilated area (preferably outside the window) for better smoke evacuation before connecting.

According to the instructions in the figure, connect the ventilation pipe (5) to the air inlet (4) of the axial flow fan and the air outlet (6) of the equipment, and make a reasonable fixing to improve the smoke exhausting effect of the equipment.

3.7.Machine switch boot sequence

1. Plug in the power socket of the exhaust fan.

2. Plug in the chiller power socket.

3. Plug in the gas pump power socket.

4. Plug in the main power socket.

5. Start the main power switch of the device. At this time, the switch indicator light is on, the XY motor is working, and the laser head is returned to the machine origin to enter the ready-to-work state.

6. Lay the materials to be worked on to the workbench.

7. Start cutting or engraving.

Laser engraving and cutting machine sequence:

1. Turn off the main power switch of the device.

2. Pull out the main power outlet.

3. Pull out the air pump power socket.

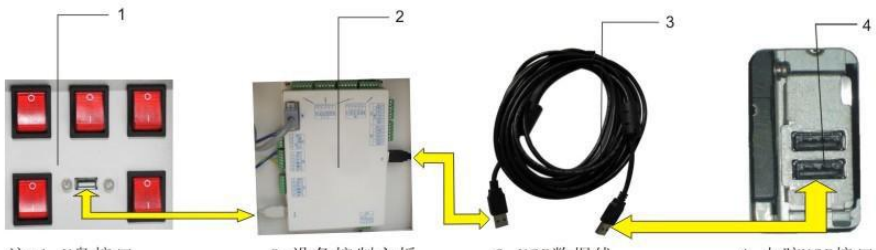
4. Pull out the power socket of the chiller.

5. Pull out the power socket of the exhaust fan.

6. Cleaning equipment is hygienic.

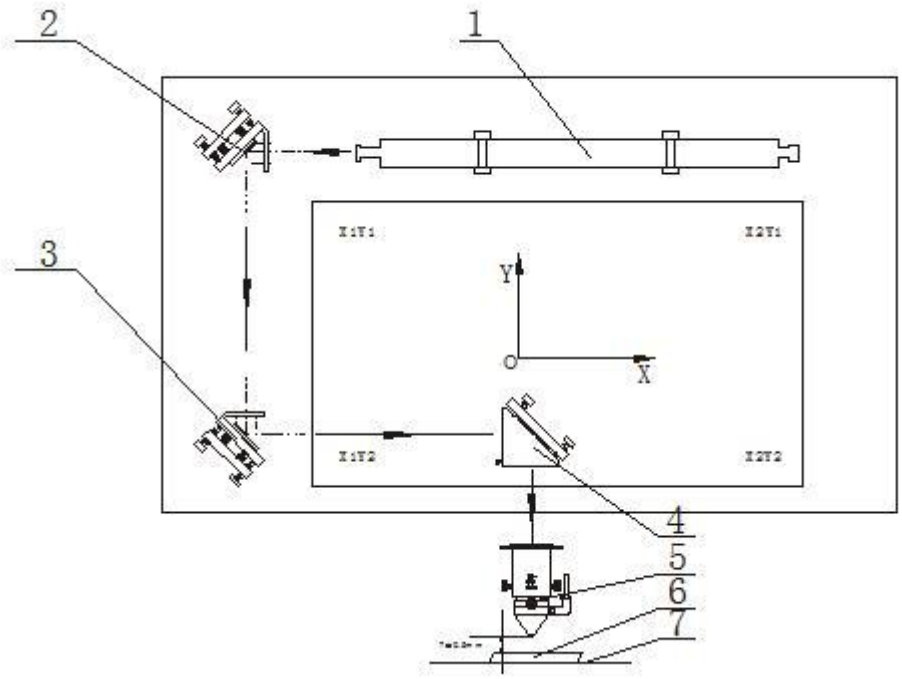
7. Lower the protective cover of the work area.

3.8.USB data cable connection



AMORO machine optical path structure and adjustment

4.1.Optical path system structure



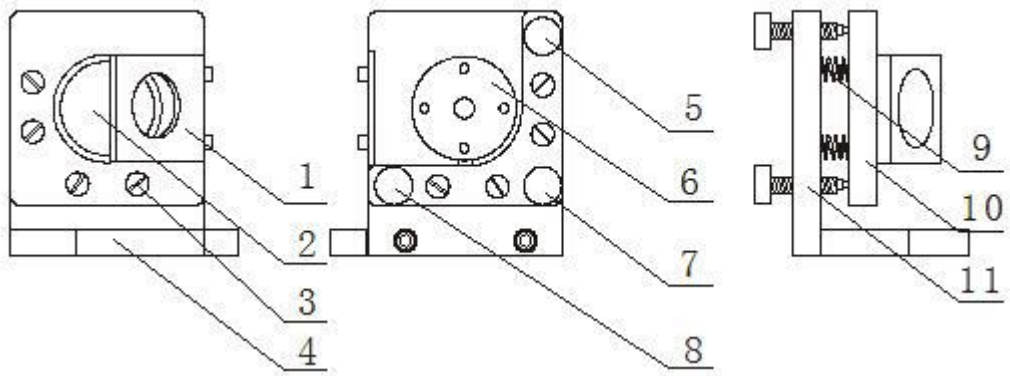
1. Laser
2. Mirror frame A
3. Mirror frame B
4. Mirror frame C
5. Focusing mirror
6. Machining the workpiece
7. Working platform

4.2.Optical component structure

Description: The light path is the light guiding system, and the laser engraving machine adopts a semi-constant flying light path. The complete optical routing laser tube, mirror frame (A, B, C), focusing mirror and corresponding adjustment device are the core part of the laser cutting machine.

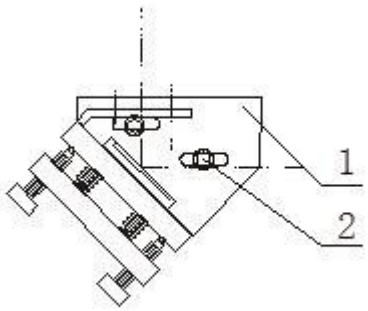
The quality of the optical path adjustment is directly related to the engraving and cutting effect, so it is necessary to adjust it patiently and meticulously.

a、 **Mirror frame A**



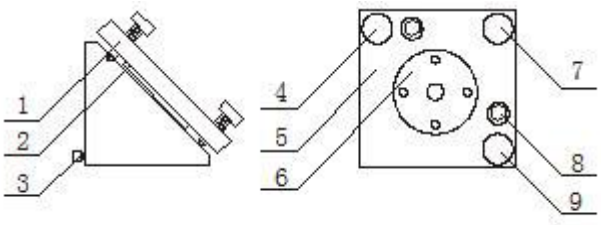
1. Light target placement frame
2. Mirror
3. Tension spring locking screw
4. Base plate
5. Adjustment screw M1
6. Mirror locking piece
7. Adjusting screw M3
8. Adjusting screw M2
9. Pull spring
10. Mirror mounting plate
11. Support plate

b、 Mirror frame B (the structure is the same as A frame)



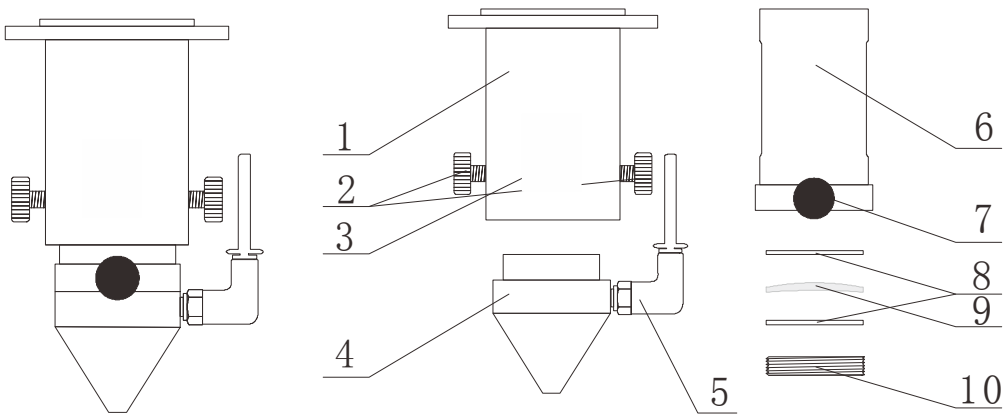
1. Install the bottom plate (can move left and right)
2. Locking screws

c、 Mirror frame C



1. Mirror adjustment plate
2. Mirror
3. Locking screw
4. Adjustment screw M1
5. Mirror adjustment plate
6. Mirror compression plate
7. Adjusting screw M3
8. Locking screw
9. Adjusting screw M2

d、 Focusing mirror



1. Focusing mirror outer tube
2. Lens barrel fastening screw
3. Focusing mirror type
4. Air nozzle
5. Intake tube
6. Lens tube
7. Air nozzle fastening screw
8. Lens compression nylon gasket
9. Focusing lens
10. Lens compression ring

4.3,Optical path adjustment

(1), Adjust the laser tube

Install the dimming target on the dimming target hole of the A frame, insert the thermal paper (facsimile paper), and use the manual light-emitting target (potentiometer about 3.00, current is about 5~8mA), fine-tuning the laser tube bracket and the A mirror. The base of the rack until it is positive (see Figure 4)

Picture4

(2), Adjust the mirror frame A

The dimming target is mounted on the dimming target hole of the mirror frame B, and the frame B is moved closer to the frame A by the direction key to shoot the target. Adjust the M1 and M2 on the frame A to make the target positive; then use the direction key to move the frame B away from the frame A (the first time you can move halfway), and then shoot the target. If not, fine-tune the M1 of the frame A. And M2, make it positive; then to the far end, hit the positive; then use the arrow keys to move the frame B closer to the frame A, and then hit again, if the left and right are offset, you need to adjust the M1, M2 and M3 on the frame A , find the right; so repeated two or three times, you can make the motion track of the lens B lens center coincide with the optical axis. Note: Fine adjustment of the laser tube may be necessary if necessary.

(3), Adjust the mirror B

Install the dimming target on the target hole in front of the frame C, use the arrow keys to move it closer to the frame B, target, adjust the frame B to make it positive; then move it to the far end and press it. Because the frame B and the frame C are the same height and parallel to the X axis during design, the whole process is adjusted after the adjustment.

(4), Adjust the mirror C

The purpose is to pass the beam through the lens and shoot it out from the lower exit aperture and focus.

First use a piece of transparent adhesive tape to stick to the light exit, so that the light hole leaves a circular mark on the tape. Move the focusing mirror to the middle of the table to test the target. Remove the adhesive tape and observe the position of the small hole. Adjust the three adjustment screws M1, M2 and M3 on the mirror frame C as needed until it is correct; be careful and patient.

Use a piece of 8~10mm thick plexiglass under the focusing mirror and the upper surface to the focusing mirror nozzle about 7±0.5mm. Adjust the current to 7~8 points (about 20~22mA), give the gas, and use the manual light to excite and observe the punching condition. The requirements are positive and transparent. If it is plexiglass, the hole should be right and thin (the upper mouth is slightly larger, the more it goes down, the finer it is). If it is not good, fine-tune the mirror C until it is ready, then lock it

AMOR Laser cutting machine protection and maintenance

5.1, Safety protection and precautions

The key to making the laser equipment work properly and stable is to do the daily maintenance and maintenance of the equipment. Good equipment maintenance can not

only extend the service life of the machine, reduce the equipment failure rate, but also improve product quality. In order to make better use of this equipment, the following is a brief introduction to the daily maintenance and precautions of laser equipment:

1. Ground connection

Because the company's equipment contains sensitive power devices such as switching power supplies, laser power supplies, and filters, these components generate a certain degree of static interference during use. In order to minimize static interference and reduce a series of faults caused by static electricity, the following points should be noted before installing the equipment:

1.1 Whether the voltage is 220V, if it is out of range or unstable, the regulator should be installed.

1.2 Whether the power socket is wired according to the left ‘zero’ right ‘fire’ standard, and the ground terminal should be reliable and completely grounded. If not, adjustments should be made.

1.3 Is there a ground wire that is reliably grounded at the customer's site (or an iron bar longer than one meter hits the ground and is completely grounded).
The equipment can be installed when the above conditions are met. When installing the equipment, due to the limited current capacity of the company's plug-in, do not install too much electrical equipment that is not related to the machine. In order to protect the personal safety of the operator and the ground wire of the normal working machine of the equipment, it must be grounded reliably under any circumstances.

2. Before starting the water, you must first pass the water.

Also check the water circulation during the working process of the machine to ensure the normal water circulation in the laser tube and protect the normal use of the laser tube.

3. Boot sequence

Follow the order of the machine's power on/off: first turn on the water pump (water cooler), then turn on the power switch, and finally turn on the laser switch. Turn off the laser switch, turn off the power switch, and finally turn off the water pump (water cooler).

4. Control the temperature of the laser tube

Control the temperature of the water in the laser tube, generally do not exceed 35 degrees. When using the machine in winter, drain the water in the tube to prevent freezing of the laser tube.

5. Cleaning of the lens

Keep the machine clean, especially the lens. If the lens is dirty, it will affect the reflection efficiency of the light, the processed sample and the life of the lens. When the lens is wiped, wipe it with a cotton swab and dry alcohol to prevent rubbing. The surface of the lens.

6. Pay attention to fire prevention

Do not place flammable or explosive materials in the laser reflection area and around the machine. Do not place reflective items on the platform.

7. Worker Management:

During the processing, the operator must not leave the machine, always pay attention to the working state of the machine, in case of abnormal conditions, please immediately shut down the power.

5.2, Maintenance

1. Water replacement and cleaning of the water tank (recommended to clean the water tank and replace the circulating water once a week)

Note: The laser tube must be filled with circulating water before working.

The water quality and water temperature of the circulating water directly affect the service life of the laser tube. It is recommended to use pure water and control the water temperature below 35 °C. If exceeded

At 35 °C, it is necessary to replace the circulating water or add ice cubes to the water to lower the water temperature (users are advised to choose a cooling machine or use two water tanks).

Cleaning the water tank (changing water): first turn off the power supply, unplug the water inlet hose, let the water in the laser tube automatically flow into the water tank, and unplug the water

pipe and signal line. Open the water tank, drain the dirt inside the water cooler, replace the circulating water, connect the water pipes and signal wires, and arrange the joints. Turn on the power and run for 2-3 minutes (fill the laser tube with circulating water).

2. Fan cleaning

The long-term use of the fan will cause a lot of solid dust to accumulate inside the fan, which will cause a lot of noise and is not conducive to exhaust and deodorization. When there is insufficient suction of the fan, the power is first turned off, the air inlet pipe and the air outlet pipe on the fan are removed, the dust inside is removed, then the fan is inverted, and the fan blades are turned until it is clean. Then install the fan.

3. Cleaning of the lens (recommended to clean 2-3 times every week, the equipment must be turned off)

There are 3 mirrors and 1 focusing mirror on the device (the No. 1 mirror is located at the emission exit of the laser tube, which is the upper left corner of the gantry), the No. 2 mirror is located at the left end of the beam, and the No. 3 mirror is located at the laser head. At the top of the part, the focusing mirror is located in an adjustable barrel in the lower part of the laser head. The laser is reflected by these lenses, focused and emitted from the laser head. The lens is easily stained with dust or other contaminants, causing laser loss or lens damage. Do not remove the No. 1 and No. 2 lenses. Just wipe the lens with the cleaning solution carefully along the center of the lens. Edge rotary wipe. The No. 3 lens and the focusing mirror need to be taken out from the frame, and wiped in the same way. After the wiping is completed, it can be put back as it is. Precautions:

The lens should be wiped gently so that the surface coating is not damaged;

Wipe the process gently to prevent it from falling;

Be sure to keep the convex surface facing down when installing the focusing mirror.

4. Cleaning of the guide rails (recommended cleaning once every half month, shutdown operation)

The guide rail and the linear shaft are one of the core components of the equipment, and its function is to guide and support. In order to ensure the machine has high machining accuracy, the guide rail and straight line are required to have high guiding precision and good motion stability. During the operation of the equipment, a large amount of corrosive dust and smoke will be generated during the processing of the workpiece, and these smoke and dust are deposited on the surface of the guide rail and the linear shaft for a long time, which not only has a great

influence on the processing precision of the equipment, but also It will form an etch point on the surface of the linear axis of the guide rail to shorten the service life of the equipment. In order to make the machine work stably and ensure the quality of the products, it is necessary to do a good job in the daily maintenance of the guide rails and linear axes.
Precautions:

Please prepare the cleaning rails - dry cotton cloth, lubricating oil. The guide rails of the engraving machine are divided into linear guides (rails and sliders) and roller guides (nylon wheels, bearings, eccentric shafts).
Cleaning the linear guide: first move the laser head to the far right (or left side), wipe it with a dry cotton cloth until it is bright and dust-free, add a little lubricant, and slowly push the laser head a few times to make the lubricant even. Distribution can be.
Cleaning the roller guide: Move the beam to the inside, open the end cover on both sides of the machine, wipe the place where the guide rails on both sides are in contact with the roller with a dry cotton cloth, then move the beam to clean the remaining place without oiling.

5. Fastening of screws and couplings

After the motion system is working for a period of time, the screws and couplings at the joint of the movement will be loose, which will affect the smoothness of the mechanical movement. Therefore, in the operation of the machine, it is necessary to observe whether the transmission parts have abnormal noise or abnormal phenomena. Rugged and maintenance. At the same time, after the machine is running for a period of time, the application tool reinforces the screws one by one. The first reinforcement should be about one month after the device is used.

6. Inspection of the light path

The optical path system of the laser engraving machine is completed by the reflection of the mirror and the focusing of the focusing mirror. In the optical path, there is no offset problem in the focusing mirror, but the three mirrors are fixed by the mechanical part, and the possibility of offset is higher. Large, so it is recommended that users check whether the light path is normal before each work.

Common problem analysis of the machine:

Fault phenomenon	The reason	Method of exclusion

Bounce at work and the position is roughly fixed	Synchronous belt stretching too long deformation	Replace the timing belt
The starting point of the closed line does not coincide	1, the timing belt is too loose, resulting in backlash	Tighten the timing belt
	2. The connection between the gear and the shaft is loose.	Re-tighten to eliminate clearance
Cutting square is rectangular	X-axis guide and Y-axis guide are not perpendicular	Adjust the X and Y axis guide rails vertically
The slit is not smooth or cut through	1, the focus head is not correct	Adjust mirror C and adjust the entire optical path if necessary
	2, the laser tube power becomes smaller	Replace the laser tube
	3, the nozzle is blocked by the light outlet	Clean the nozzle
	4，Mirror pollution	Cleaning mirror
	5．Protective gas is not available or low pressure	Ventilation or adjustment of air pressure
	6．Focusing lens is contaminated	Cleaning the focusing mirror
	7．Focus lens is not right	Adjust the focus
Sudden limit stop	1.Graphic zero is wrong or the size is wrong	Correct after finding the cause
	2.Mechanical movement	Clean the linear guide and lubricate
No light	1, the laser high voltage does not open	Press the laser power button
	2, the laser power is too small	Adjust potentiometer
	3, the laser high voltage line off	Plug in high voltage line
	4, the water protection switch is not connected	Check if the pump or chiiler is normal, replace the water protection switch

Phenomenon: No response after the device is powered

1. First ensure that the machine input voltage is normal (220V/50HZ).

2. Turn on the power switch. If the power switch light is off, there may be a problem with the input voltage or the power switch. Please check and replace. If the power switch light is on, check the switching power supply. Use a multimeter to measure whether the input voltage of the switching power supply is 220V. If not, repeat the above test. If the input voltage is normal, measure the output voltage of the switching power supply to 40V.24V, and whether 5V is normal. If it is not normal, please replace the switching power supply.

3. If the output voltages are normal, use a multimeter to measure whether the input voltage of the control card is normal. If there is no voltage, please check whether the wiring of the switching power supply and the control card is correct. If there is no problem with the input voltage of the control card, please check the control card and control. The connection cable of the panel (black 232 line), the red and black lines inside the measurement cable are not 5V. If there is no voltage, please replace the control card. If there is voltage but the control panel still does not display, please replace the control panel.

4. If there is no problem with the control panel and the control card, but the machine still does not move, please check whether the indicator light of the drive is normal. If the indicator does not light, check that the wiring between the drive and the optical power supply is good. If there is no problem with the connection, use a multimeter to measure the +V of the driver, whether the GND terminal is normal (40V), and whether the input voltage +5V is normal. If the voltage is normal but the indicator light is off, replace the drive. If the indicator light of the drive is on,
Use a multimeter to measure the voltage at the 1st and 3rd pins of the control card (Y-axis) and the voltage at the 1st and 3rd pins of the Y5 (X-axis). Click the direction button on the control panel, if you click before and click After the voltage has not changed, please replace the control card; if there is voltage change, check if there is any problem with this part of the connection, check and replace.

5. If everything is normal, please replace the motor directly. (If there is a problem with one of the axes, you can exchange two drives for testing, you can know the cause and result of the problem)

Phenomenon, the machine moves normally, but does not emit light.

1. In the control panel "pointing setting", enter the time 150 milliseconds, the power is 100%, press Enter to confirm, press the "laser" button to see if the laser tube has light, and put a cardboard shot from the light exit of the laser tube. If there is a laser in the tube, it indicates that the optical path is offset, the lens is dirty or bad, and it needs to be re-dimmed, cleaned or replaced. If the tube emits light but does not come out, look at the wiring of the laser tube for poor contact, and check the laser tube for obvious cracks.

2. If the tube does not emit light, turn on the power and use a multimeter to measure whether the input 220V of the laser power supply is normal. If the 220V voltage is not input, check if the input voltage part (such as power on, 220V input) is normal. If it is normal, turn off the power and use a multimeter to measure whether the fuse inside the laser power supply is normally turned on. If it is not turned on, please replace it. If the third and fourth feet on the hex plug of the laser power supply are turned on, if it is not connected, please check whether the connection between the high voltage light of the machine and the aviation plug and signal line is normal.

3. If the 3rd and 4th pins are on, use the multimeter to hit the 5V file, measure the voltage of the 1st and 4th pins of the control board Y2, turn on the power, and click the laser button on the control panel to see if there is less than 0.8. V voltage, if not, replace the control card; if there is voltage change, then measure the voltage of pin 1 and pin 2 of Y2, test power input 10%-100%, click the laser button to see if there is 0- 5V voltage change; if not, please replace the control card, if there is voltage change, please proceed to the next step: turn off the power, the first pin of the measurement control card Y2 should be connected with the 4th pin of the laser power supply (Note: the plug of the laser power supply is from 1-6) from left to right, pin 5 is connected to pin 5 of the laser power supply, pin 4 is connected to pin 2 of the laser power supply. If not, check and replace.

4. If they are connected, turn off the power, connect the 2nd and 4th pins of the laser power plug with several wires, connect the 3rd pin and the 4th pin, turn on the power, and see if the laser tube responds, if the laser tube is outside. The cause of the fire may be:
4.1 The high voltage line is loose and the contact is poor;
4.2 The ambient air is humid, the water at the high pressure joint is too large, and the high voltage joint discharges outward to cause a fire;
4.3 The high voltage line is leaking and there is damage.

If the laser tube is inside, the cause may be:
1. The tube is not filled with water;
2. Poor contact of the electrode leads in the laser tube;

3. The power-on sequence is not correct (when booting: first open the water cooler, wait for the water to cycle in the laser tube and then turn on the machine power switch, and finally turn on the high-voltage switch. When shutting down: first turn off the high-voltage switch, then turn off the power switch, and finally turn off Water cooler), please check and replace.
If the above laser tube does not react, replace the laser power directly.

Phenomenon: The machine moves normally, but the laser head does not stop during reset

Solution steps:
1. First check whether the reset piece touches (covers) to the proximity switch while the machine is reset. If it is not touched, please check if the distance between the reset piece and the proximity switch is too far (in general, the reset piece contacts the proximity switch). Half can be), check and repair.

2. If the reset piece can touch the proximity switch, but the indicator light of the proximity switch does not light, please turn off the power of the machine. Check if the wiring of the proximity switch is correct (the brown wire of the X-axis proximity switch is connected to the fifth leg of the X5 end of the control card, The blue wire is connected to the fourth leg of the X5 end, and the black wire is connected to the third leg of the X5 end. The brown wire of the Y-axis proximity switch is connected to the fifth leg of the X4 end of the control card, the blue wire is connected to the fourth leg of the X4, and the black wire is connected to the X4 of the X4. Third foot).

3. If there is no problem with the wiring, turn on the power of the machine and measure the output voltage of the control card with a multimeter: whether the fifth and fourth feet of the X5 end, the fifth and fourth feet of the X4 end respectively have 24V voltage, if there is no 24V voltage, please Replace the control card.

4. If there is no problem above, use a multimeter to measure whether the signal of the control card is normal (X axis: third leg and fourth leg of X5 end. Y axis: third leg and fourth leg of X4 end). —24V voltage change (reset piece on the machine (if it is not convenient, you can find a metal piece of iron) 24V before the proximity switch contact (the proximity switch indicator lights up), 0V after contact (the proximity switch indicator is off)), if there is no voltage change, please replace the proximity switch.

Phenomenon: During the engraving or cutting process, the engraving or cutting depth is obviously shallower than before (the reason for the exclusion of materials)

step:

1. First ensure that the voltage of the machine is stable (220V).
2. Check if the water circulation of the laser tube is normal and the water pipe is bent. Please check or replace the water pipe.
3. Check if the water temperature of the water cooler is too high (not more than 35 degrees). If the water temperature is too high, turn off the water in the machine to be cooled and then open, or replace the water in the water cooler.
4. If the water circulation is normal, check whether the focal length of the laser head is appropriate, and re-adjust with the focusing plate. If the focal length is appropriate, check whether the mirror and focusing mirror of the machine are dirty or damaged. Please clean or replace the lens.
5. If there is no problem with the lens, check if the optical path of the machine is offset. Please debug according to the basic steps of dimming.
6. If there is no problem with the optical path, use the software to test the power input 90% point shot to see if the ammeter can reach 20MA. If it can reach 20MA, check the output power of the machine and the speed is appropriate.
(Note: After the machine has been working for a certain period of time, the power of the laser tube will gradually decrease with the power consumption. At this time, it is necessary to reduce the working speed or processing power.) If the speed is reduced to the minimum (engraving below 100, cutting below 0.5), processing At the maximum power (95%), the depth of the previous processing is still not reached, indicating that the power of the laser tube has been attenuated. Please replace the laser tube.

Phenomenon: The engraved vector is blurred, there are traces and ghosting around (the reason for excluding materials)

step:

1. First ensure that the optical path of the machine is adjusted correctly. If it is not correct, please check and adjust according to the “Basic Steps of Optical Path Adjustment”.

2. Check if the water circulation of the machine is smooth. If it is not smooth, please check if the water pipe is bent. Please check or replace the water pipe.

3. If the water circulation is normal, check whether the focal length of the laser head is appropriate, and re-adjust with the focusing plate to check whether the mirror and focusing lens are tight, dirty or damaged. Please check, clean or replace the lens.

4. Check if the belt of the X and Y axes of the machine is too loose or leaky. Please check or replace the belt.

If there is no problem above, please check the parameter settings of the software as follows:

1. Draw a box (rectangle or square) in the software, set the working mode to engraving, change the engraving step to 0.5mm, and then select the machining output. After the engraving is finished, check the effect. In theory, it should be interlaced. That is, the edges of odd lines should be aligned, and the edges of even lines should also be aligned.

2. If not, please open the "File" - "Machine Settings" - "Engraving Parameter Settings" in the software. The processing parameters corresponding to different engraving speeds are listed in the list. Click the "Back Gap" column corresponding to the machining speed. This value can be positive or negative, and can be adjusted according to the actual situation.

3. If the engraving effect is high, you can choose the engraving method of “one-way light”. In the processing parameter settings, the hook in front of the "two-way engraving" can be removed, but this will reduce the work efficiency.

Symptom: The machine has a sparking phenomenon in the high voltage part of the laser during work or testing.

Failure analysis:

1. The phenomenon of sparking includes two cases of sparking in the laser tube and sparking outside the laser tube. Both kinds of fires can hear obvious sounds like "firecrackers". When observing, the fire inside the pipe can see obvious discharge arc in the pipe, and the fire outside the pipe can see obvious discharge arc in the fire place. External fire is mainly at the high pressure joint or next to the high voltage line.

1.1 Fire in the tube:

The water inside the laser tube is not full and there are serious bubbles.

Poor contact of the laser tube electrode leads.

The power-on sequence is incorrect.

Laser tube quality issues.

Method of exclusion:

1. Observe that there are no bubbles in the laser tube. If so, be sure to remove the bubbles by placing the tube at the outlet of the laser tube with the tube in the water supply and letting the bubbles flow out.
2. If the ignition is at the electrode, turn off the power supply to see if there are loose electrode leads to ensure good lead connections.
3. The order of power supply for customers is: first open the water cooler (water pump), wait for the water circulation in the laser tube to be normal, then turn on the main power switch, reset the standby device, and finally turn on the laser power (laser switch). Pre-ionization sparks the laser tube.
4. Replace the laser tube.

1.2 Fire outside the tube:
The high pressure connector is loose and the contact is poor.
The ambient air is humid and the water at the high pressure joint is too large.
The high voltage connector discharges outward, causing a fire.
The high voltage line is leaking and there is damage.
Method of exclusion:
1. Pull the two ends of the high-voltage connector to see if there is looseness and ensure that the connector is well connected.
2. In wet weather, ensure that the air at the high pressure joint is dry and that there is no water on the high pressure joint.
3. The high-voltage line is damaged, it must be replaced, and it should be wrapped with high-pressure waterproof tape.
Note: High-voltage ignition will cause the motherboard to work abnormally, which can cause the motherboard to crash when it is serious.

Phenomenon: After the graphic is output, the processed sample and the actual graphic size are incorrect.

Solution steps
1. First ensure that the movement of the laser head in each direction is normal.
2. Check the parameter settings of the software: Open “File” - “Machine Settings” - “Workbench” in the software, click the small box in the “Pulse Equivalent” of the X axis, and display “Equivalent Calculation”. Among them, the parameter “per motion” is changed to 24 and the number of “transmission pulses” is 5000. Click the small box in the “Pulse Equivalent” of the Y-axis to display “Equivalent Calculation”, in which the “per motion” parameter is changed

to 33.33 and the “number of pulses” is 5000. "Save" - "OK" after the modification is completed.

3. Check the drive subdivision of the drive: Open the side door of the machine. There are two black drives in the circuit installation section. Check the 8 white DIP switches of the two green plugs of each drive. Adjust the setting of the DIP switch according to the parameter description of the drive, check and modify (if in doubt, please consult the technician).

4. Check the actual size of the graphic: first import the graphic to be processed in the EASYCUT software, click the software shortcut "Select" button, click the left mouse button, pull the box to select the graphic to be processed, release the left mouse button, click The software shortcut "Size" looks at the actual size of the graphic to confirm the size (in mm).

5. After the modification is completed, the machining pattern test can be output. If it is a separate one-axis problem, the drive test can be exchanged.

Note: Due to the different materials of the processed materials, the hardness is soft or hard, plus the unreasonable factors such as the laser power and speed of the machine, the processed materials must have an error of 0-1 mm.