

Declaration

Wuhan Tian Xing Tong Photoelectricity Technology Co.,Ltd

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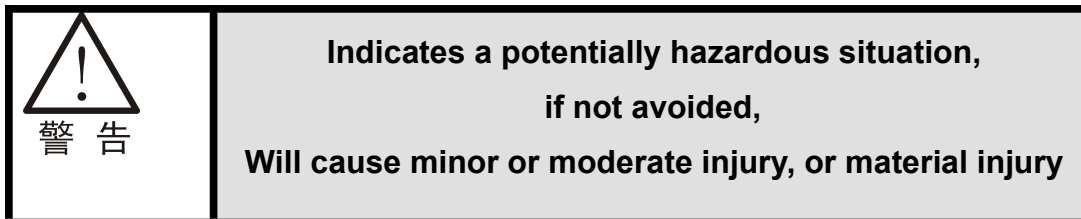
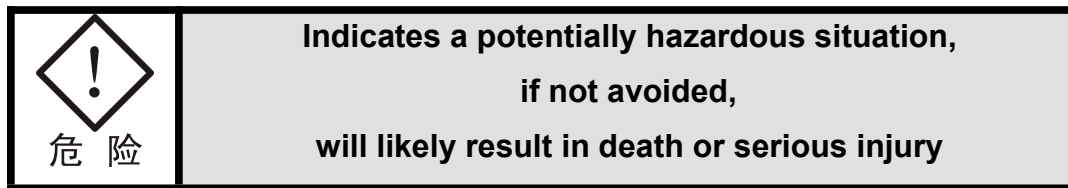
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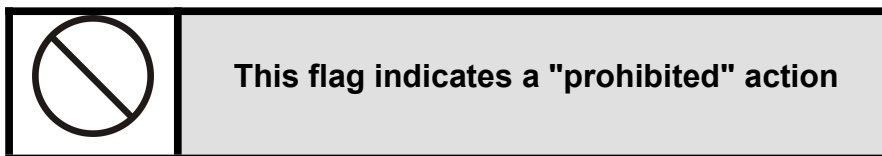
- **Guarantee: All "Tianxingtong Optoelectronics" and "Tianxing Laser" brand products will receive the perfect service of our company.**

- To ensure safe operation and optimum performance of the product, please follow the warnings and precautions below and other information in this manual.
- The DANGER and WARNING symbols below are indicated according to their degree

of accident hazard.



- The following symbols indicate which are prohibited and which must be followed.



- Finally, particular attention is drawn to the following related matters:
Before applying power to the product, be sure to fully understand the important precautions contained in this manual regarding the safe operation and maintenance of the laser.
If not mentioned in this manual, please do not make modifications or adjustments to the product or its parts, which may cause dangerous laser radiation.

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1 Safety

1.1 Basic Information


- Only authorized and trained personnel who fully understand the necessary safety procedures should operate this laser product.
- Please allow access to this laser product only to authorized personnel and place appropriate warning signs around the area in which it operates.
- Please follow the local safety regulations for the relevant equipment.

1.2 Optical safety

- This laser product is a four-class laser product, which can output more than 60W/80W/100W (depending on different models) infrared laser radiation in the 10.6 μm wavelength range. Avoid eye and skin contact with radiation directly emitted or scattered by the laser output. This laser radiation may cause the following accidents: ①Ignite nearby flammables ; ②In the process of laser processing, other radiation and toxic and harmful gases may be generated due to different processing objects.
- **Since the optical path from the second reflector to the third reflector has no protection, please be careful not to put any part of your body into this optical path when engraving, cutting and debugging the optical path to avoid injury!!**
- There may be risks in laser processing, and users should carefully consider whether the processed object is suitable for laser operation.
- It is strictly forbidden to place any irrelevant total reflection or diffuse reflection objects in the equipment to prevent the laser light from being reflected on the human body or flammable objects.
- Operators should wear appropriate laser safety glasses when the system is working, which should match the wavelength of the laser emitted by the system.

 危 险	<p>Direct viewing of the main beam or any reflected laser beam is not permitted, even when wearing laser safety goggles - may cause blindness</p>
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- In the laser radiation area of the working range, it is forbidden to enter mirror objects to prevent damage to human eyes or human body due to accidental mirror reflection.
- It is strongly recommended that users do not point the laser output port to the entrance or window of the room when placing the product.
- On the door of the equipment workshop or near the work area, warning signs with the words "Be careful of laser, do not approach" should be set up.
- Avoid flammable and explosive items from entering the direct laser radiation area.



	<p>Accidents such as fire may occur</p>
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- Unless permitted or authorized by the company, even in a shutdown state, no one is allowed to adjust the optical system at will.
- Safety Signs and Locations

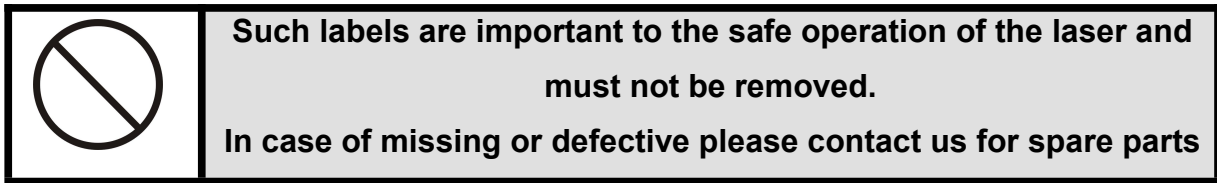


Paste at the laser output head

	
	<p>可见 和/或 不可见激光辐射 避免眼或皮肤受到直射或散射照射</p> <hr/> <p>4类激光产品</p>

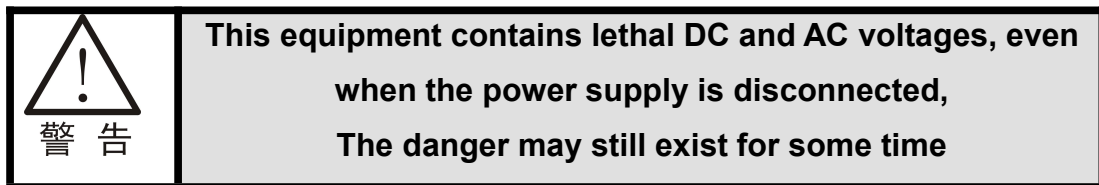
	
	<p>VISIBLE AND/OR INVISIBLE LASER RADIATION AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION</p> <hr/> <p>CLASS 4 LASER PRODUCT</p>

Or



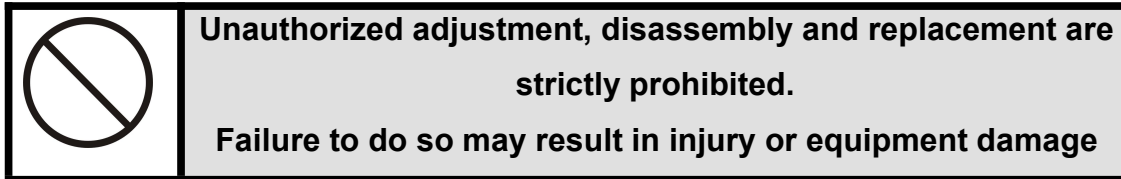
Paste on the front of the laser

1.3 Electrical safety



- This product must be used under the specified electrical conditions.
- Please connect the power cord correctly and make sure the circuit wiring is correct.
- There is no electrical hazard when the equipment is operating normally, make sure it is properly grounded and in good condition.
- When the equipment is not in use, the key of the key switch should be removed to prevent unauthorized use.
- When there is a sound or light fault alarm, it should be stopped first and then checked, and the machine can be turned on again until the fault is eliminated.
- During the operation of the equipment, the laser tube may be ruptured and the laser power supply may be damaged due to serious faults. At this time, the emergency stop button must be pressed or the main power supply must be cut off immediately.

- When an abnormal situation occurs, stop working immediately, cut off the power supply, and then consult our company.



- Sudden interruption of the power supply has a great impact on the laser, please ensure a continuous and stable power supply. In order to avoid the sudden change of voltage causing the electrical appliances and circuits of the equipment to be burnt out, it is recommended to install a power regulator of more than 2000W per unit.
- Avoid starting work during thunder and lightning
- Excessive humidity will cause high voltage discharge of the laser, endanger personal safety, and also cause damage to the laser power supply.
- When the machine is working, there is a fan at the rear of the chassis for heat dissipation, and sufficient space and airflow must be ensured.
- When the cooling water temperature is greater than the maximum allowable value of 30°C, the laser energy output will drop rapidly; when the cooling water temperature is lower than the minimum allowable value to 0°C, the cooling water in the laser tube will freeze, resulting in the laser tube breaking.
- The replacement of wearing parts must be operated by professional maintenance personnel according to the relevant requirements of this manual.

1.4 Equipment related safety standards

The design of this product follows the following national standards:

- **GB 18217-2000** - Laser Safety Sign
- **GB 7247.1-2001** - Radiation Safety, Equipment Classification, Requirements

and User Guide for Laser Products

- **GB 10320 -1995** - Electrical Safety of Laser Equipment and Facilities
- **GB/T 5226.1-1996** - Industrial Machinery and Electrical Equipment Part 1: General Specifications

2 Overview

2.1 Product Introduction

1390 series laser cutting machines are widely used in the cutting of non-metallic materials (such as acrylic, leather, cloth, etc.). This machine adopts glass tube carbon dioxide laser as the working light source, and the two-dimensional working platform controlled by computer can make various precise movements according to the preset graphic trajectory. This model integrates high technologies such as laser, automatic control, precision machinery, and computer control software.

This series of models has first-class core technology in optical system and control system. The running speed and cutting accuracy are close to the performance of similar foreign products, and have extremely high practicability.

2.1.1 Features

1、The CO₂ laser is used as the working light source of the equipment, and the output power is adjusted according to the current, and its adjustment range can be adapted to the needs of cutting different material thicknesses. Using its excellent processing performance, the non-contact processing method will not damage the workpiece at all, so that the processing quality is greatly improved.

2、The two-dimensional worktable adopts a double-layer structure driven by a servo motor, and realizes high-precision motion control through a 17-bit rotary encoder. The servo closed-loop control method has a system resolution of up to 0.02mm. Cooperate with imported linear guides and high-precision lead screws to ensure that the light knife runs accurately and smoothly, and can work stably and reliably for a long time.

3、The semi-flying optical path system is adopted, and the processing format is large; at the same time, the three sides of the equipment are designed with openings, which is

convenient for feeding.

4、 It supports PLT, BMP (1-bit) and DXF file formats generated by various general graphics software, and can produce various graphics and texts, which are rich in graphics and texts and standardized.

5、 Adopting the current international popular modular electrical design scheme, the electrical modules of the series products can be used universally. The whole machine has the advantages of good continuous working stability, fast cutting speed, high positioning accuracy, simple and convenient operation and maintenance.

6、 Using special laser cutting software, it has rich functions, friendly man-machine interface and simple operation.

7、 Using the mixed working mode of vector and dot matrix, the cutting work can be completed on the same layout.

2.1.2 Scope of application

1、 cutting material:

Non-metallic materials such as rubber sheet, organic sheet, plastic sheet, acrylic sheet, two-color sheet, plywood, wooden board, marble, ceramic tile, fireproof board, insulating board, cardboard, leather, artificial leather, fabric, emery cloth, sandpaper, etc.

2、 Application areas and service objects

Packaging and printing plates (corrugated boxes, woven bags), models (construction, aviation, navigation), billboards, handicrafts, decorative panels, jet printing templates, templates for shoe and clothing, die-cutting boards, light box boards, etc.

2.2 Working principle and technical parameters

● Working principle:

The laser power source generates instantaneous high voltage (about 20,000 volts) to excite the carbon dioxide gas inside the laser, and the excited particle flow oscillates in the resonant cavity in the laser tube, and outputs continuous laser light. The computer engraving and cutting program controls the worktable to move accordingly on the one hand, and controls the laser output on the other hand. After the output laser is reflected and focused, a high-density light spot is formed on the surface of the non-metallic

material, so that the surface of the processing material is instantly vaporized, and then A certain air pressure blows away the gasified plasma to form a slit, so as to achieve the purpose of laser cutting.

- Technical parameter:

Laser wavelength	10.6 μm	cutting speed	≥6000mm/min
Laser	Sealed off CO2 laser	(According to the material thickness, the cutting speed will be slowed down accordingly)	
working format	1300×900mm	Laser maximum output power	80W (Option)
Cutting thickness	≤20mm	Laser energy adjustment	0~100%Manual/Auto (software setting)
Cutting line width	≤0.5mm	cooling method	Circulating water cooling
Cooling water temperature	5°C~30°C	using electric	220V/50Hz/2KW

2.3 System structure composition

TXT-QGThe series of laser cutting machines are composed of operation panel, electric control cabinet, laser, workpiece operation platform, constant temperature water cooler, negative pressure dust collector and other systems.

2.3.1 Machine appearance

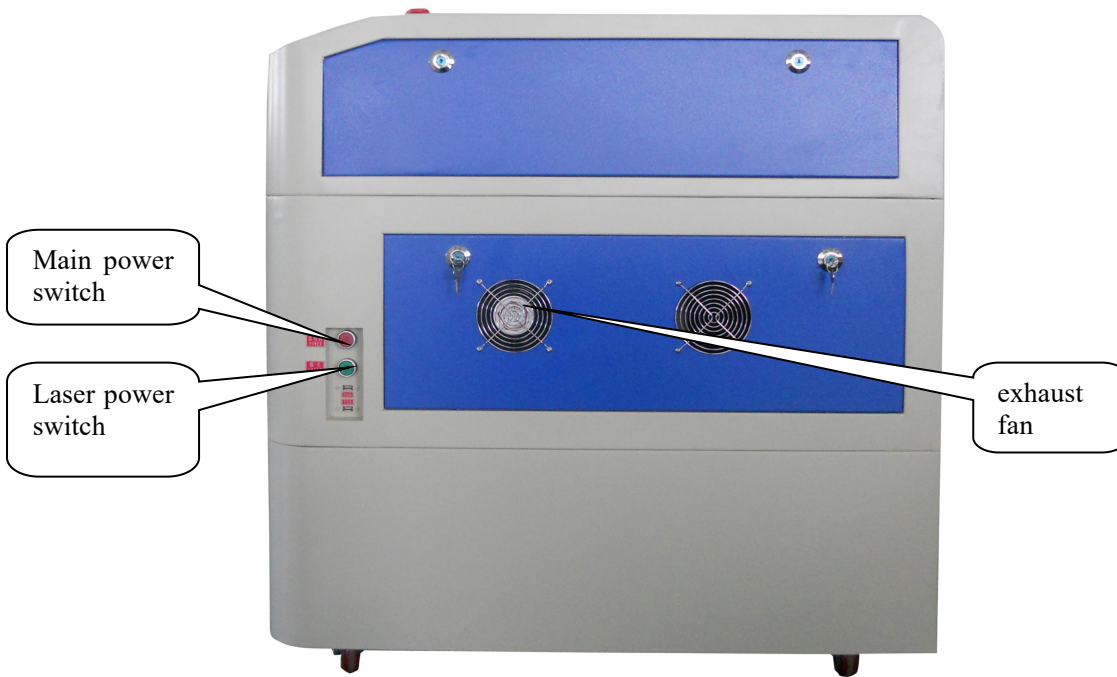
Machine front:



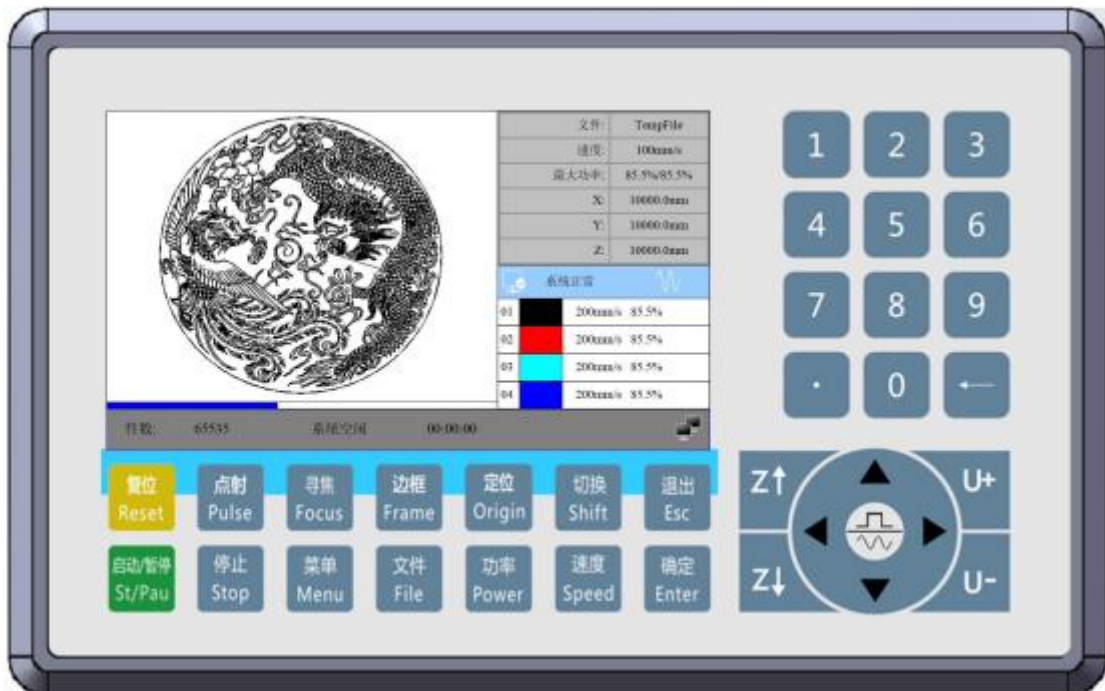
Back of the machine:



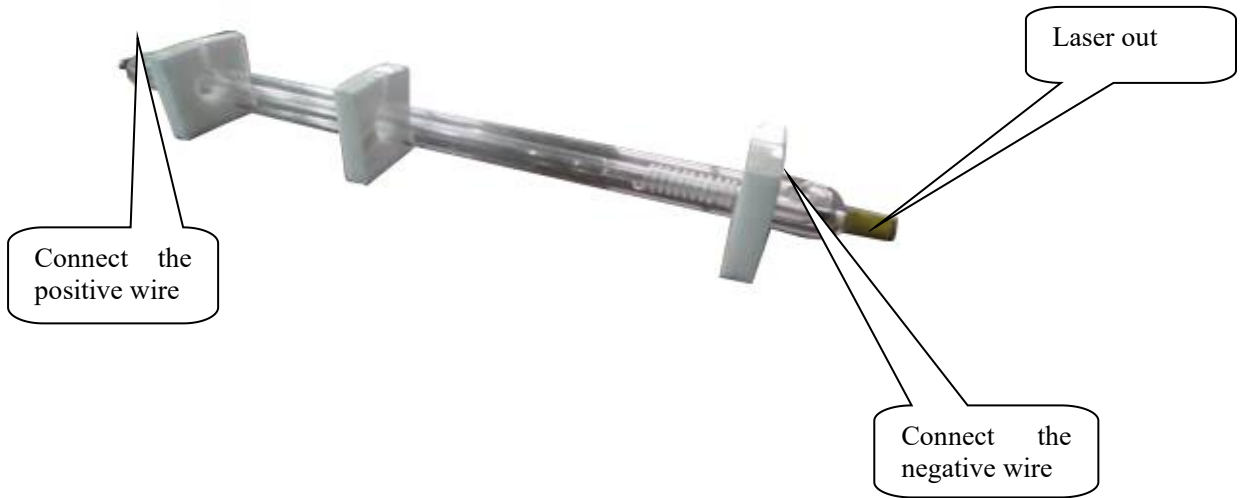
Machine side:



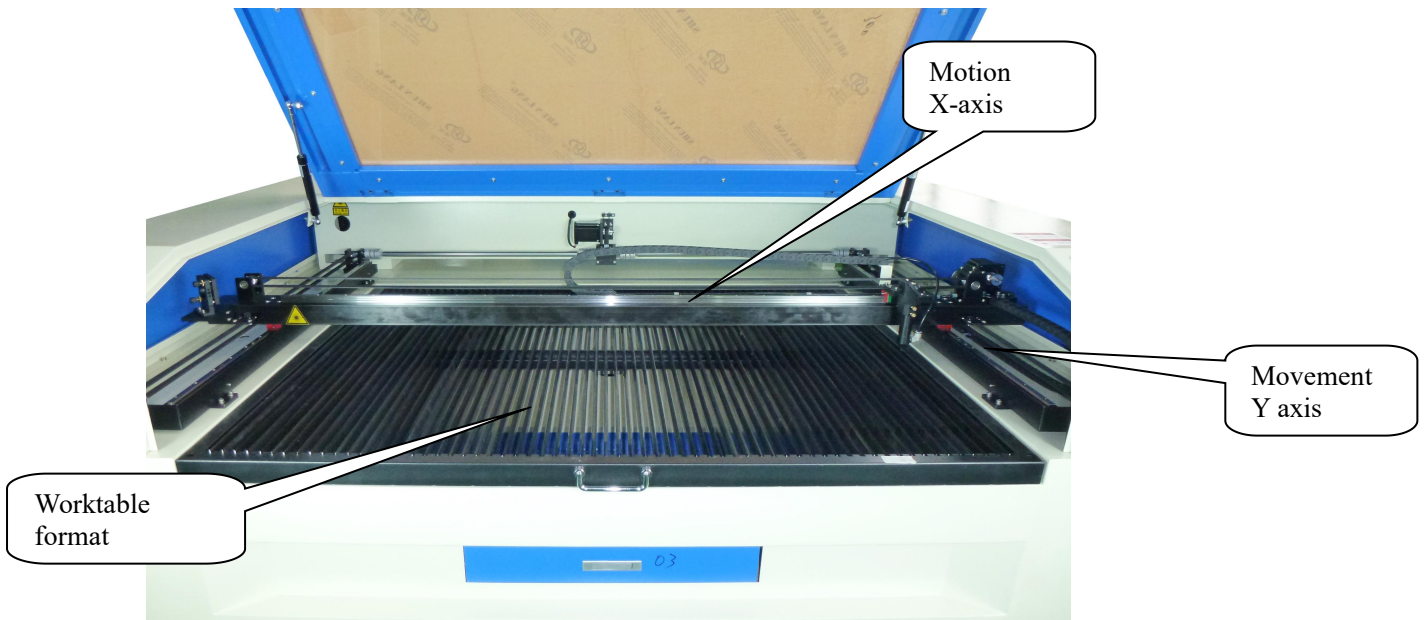
2. 3. 2 Main operation control panel



2.3.3 CO2 Laser



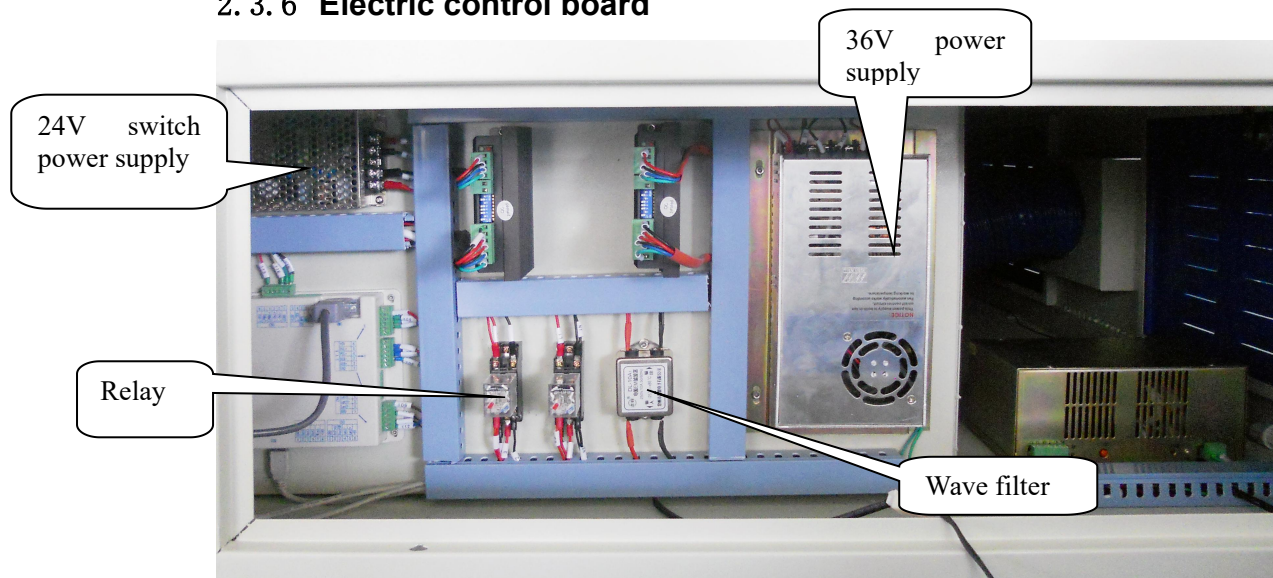
2.3.4 Work platform



2. 3. 5 Constant temperature water cooler



2. 3. 6 Electric control board



2. 3. 7 Negative pressure vacuum fan



3 Installation and commissioning workflow

3.1 Unpacking inspection

After opening the package, please carefully check whether the product model is consistent with the ordered product; whether the appearance of the equipment is in good condition; and please check whether the products and accessories are complete according to the equipment packing list. If you find that the product model does not match, or is damaged, and the accessories are not complete, please do not use it and contact us in time.

3.2 Preparation before installation and commissioning


- Tools: Forklift over 1 ton (easy to unload), 12" or 15" adjustable wrench, multimeter, vernier caliper
- Materials: 1 sheet of acrylic sheet, 1 roll of insulating tape for spare, 1 roll of transparent tape.
- Personnel: Installation and cooperation personnel: 3 to 4 people cooperate;
Equipment operator: should be able to operate and use computer.

3.3 Site and supporting facilities requirements

- The ground is flat, not easy to get dust, far away from vibration sources, and away from strong electromagnetic interference. It is best to have a relatively independent closed room, clean and less dusty with air conditioning. Keep the ambient temperature at 15 ° C to 30 ° C and relative humidity <85% (non-condensing). The size of the entrance and exit is less than 0.8m, otherwise the device cannot enter. It is best to have ventilation equipment indoors. When the machine is cutting materials, toxic gases and odors may be generated due to poor material vaporization.
- Power supply: The power supply capacity is $\geq 2\text{kW}$, which depends on the laser tube power selected by the user.
- For single-phase three-wire (220V10A), there must be a protection terminal directly connected to the ground, and a leakage protection switch must be

installed.

- The air switch of the corresponding specification is installed on the wall no more than 2 meters away from the equipment station, and the height is about 1.2 meters. If the voltage of the local power grid is unstable or low, please equip it with a regulated power supply of corresponding specifications if necessary.
- Water source: Purified water must be used, and deionized water or distilled water with higher purity can be used if conditions permit. Please prepare a bucket of about 18 liters of water that meets the requirements in advance (please prepare more pure water for easy replacement)

	<p>The quality of water quality will directly affect the normal use and life of the equipment.</p> <p>If the equipment is damaged due to water quality, it is not covered by the warranty</p>
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- Air source: The equipment is equipped with an exhaust system as standard. The centrifugal fan can be installed indoors or outdoors to isolate noise, but corresponding measures should be taken to prevent the fan from being wetted by rain. Please pre-arrange and handle the ventilation pipes (pipe diameter 100 mm) for air extraction and dust removal. When the equipment is working, it must be ensured that there are staff on duty on site.

3.4 Installation method

The machine must be installed by our customer service personnel. Any damage caused by the installation not authorized by our customer service personnel will not be guaranteed by our company.

3.5 Machining Workflow

1. Turn on the main power switch.
2. Turn on the "laser power" and preheat for 5 minutes before proceeding with the

following operations. (At this time, check whether the water outlet pipe is out of water)

3. Run the control software, open the engraving graphics file, and set the corresponding operating parameters.
4. Put the workpiece and use the reset button on the control panel to return the laser head to the starting position.
5. Use the focal length adjustment gauge to adjust the upper and lower positions of the focusing lens barrel according to the thickness of the processing material.
6. Press the test button and adjust the laser power knob to make the laser output to an appropriate value. (Note that there is a laser output at this time!)
7. Put the processing material in the proper position as needed, and adjust the position of the processing range through the software or keyboard direction keys.
8. Turn on the exhaust and blow switches.
9. Operating software for laser cutting or engraving.
10. After processing, turn off the switches of exhaust, blowing, laser power, scanning, and main power in turn.

3.6 Processing precautions

1. Set appropriate working parameters according to the processing material and processing method (cutting or engraving), including processing speed, laser output power, sealing overlap length (cutting), step distance (engraving), idle speed, etc. (see software manual for details) in order to achieve the best processing effect.

2. When the machine is working, it will output 10.6 μ M wavelength laser, which is invisible to the human eye. Therefore, when the machine is working, it should be ensured that the entire optical path is not blocked by any objects, and care should be taken not to allow any part of the human body or materials with high reflectivity to be inserted into the optical path, so as to avoid unnecessary losses or injuries! !

3. The processing material must be placed flat, so that the focusing mirror always maintains the same distance (the height of the focal length adjustment gauge) from the processing material in the processing range to ensure the best processing effect.

4. Objects that hinder the operation of the laser head should not be placed in the processing area, so as to prevent the stepper motor from being blocked and out of step, resulting in defective processing.

5. The whole processing process must ensure that the circulating cooling water

works, and at the same time, the temperature and cleanliness of the cooling water should be observed at regular intervals (such as every hour), and the water should be changed in time.

6. In the process of processing, be sure to keep the ventilation and smoke unobstructed. The smoke generated during processing will cause damage to the surface of the optical lens and the moving mechanism, and affect the service life of the whole machine.

7. When processing, it should be noted that the signal line between the device and the computer must be firmly connected, and the connector cannot be plugged or unplugged with electricity, so as not to damage the motion control card.

4 Operation Instructions

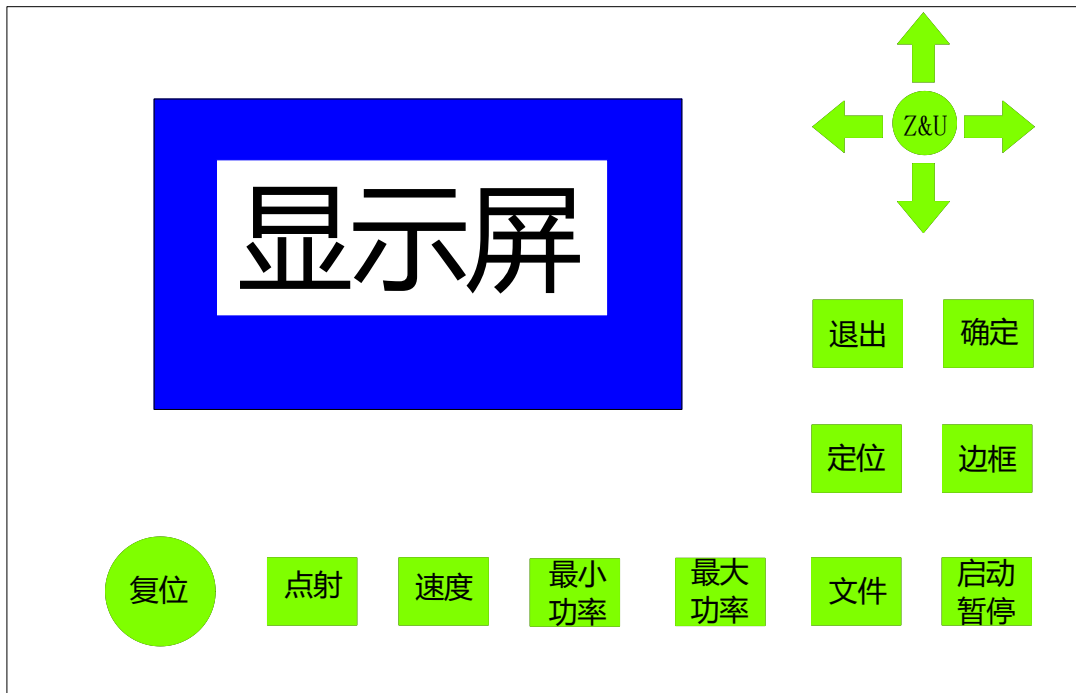
4.1 Boot process

The power-on process is mainly completed on the main operating console.

- Turn on the red (motion control) push button switch.
- Keep pressing the "WATER/Water Cooling" button switch until the button switch light is on.
- ※ Press and hold for about 5 seconds, the cooling water tank will start, and the "WATER/cooling" indicator will be on after about 10 seconds, then release the button.
- ※ Check the water circulation after the cooling water tank is started: whether the water pipe is bent; whether the panel display of the cooling water tank is normal; whether there is an alarm display and buzzer sound.
- Turn on the computer, double-click the icon of "RuiDa Cutting Control Software" to enter the laser engraving software.
- Press the green (laser power) button switch.
- Start the vacuum fan.

4.2 Use Operation

4.2.1 Operation panel



1. TXT Laser There are 16 function keys on the touch control panel of the laser engraving machine and a LCD screen.

The 16 function keys are: reset, burst, minimum power, maximum power, file, start-pause, positioning, border, exit, OK, up, down, left, right, Z&U.

The document name or system working parameters are displayed on the LCD screen: system cutting speed, working light intensity and system working status (initialization, waiting, working, pause, etc.).

2. Terminology Explanation

Mechanical origin: It is located at the upper right of the workbench. Every time the cutting machine is powered on or reset, it must first return to this position.

Cut origin: The point set by the operator is the starting position of the cutting machine. After each power-on or reset, the laser head first returns to the mechanical origin, and then moves to the cutting origin newly defined by the operator. If the home point is set as the machine origin in the equipment parameter setting, the laser head will stay at the machine origin after the equipment operation is completed or the reset operation is performed.

Definition of orientation (operator facing workbench definition):

Up... The direction in which the beam is moving away from the operator (also

defined as the "front" side).

Down... The direction in which the beam moves towards the operator (also defined as the "rear" side).

Left... The direction of the operator's left hand.

Right... The direction of the operator's right hand.

3. Description of each function key:

复位

Reset: Let the laser head return to the mechanical origin. This key is only valid when the system is in the waiting or pause state; it is invalid in other states.

点射

Laser: After starting the device, every time this key is pressed, the laser tube emits light once. Press and hold the "Shot" button, the laser tube will emit light for 0.5 seconds. This key is only valid when the system is in the waiting or suspending state; it is invalid in other states.

速度

Speed: Set the cutting speed of the system, selectable from 0% to 100%. This key is valid when the system is in the waiting or suspending state, and is invalid in other states. 100% speed corresponds to the limit speed in the machine parameters. Set the cutting speed of the system, selectable from 0% to 100%. This key is valid when the system is in the waiting or suspending state, and is invalid in other states. 100% speed corresponds to the limit speed in the machine parameters.

最小

功率

Minimum power: Set the minimum power, optional from 0% to 100%. This key is valid when the system is in the waiting or suspending state, and is invalid in other states.

最大

功率

Maximum Light Intensity: Set the maximum light intensity, selectable from 0% to 100%. This key is valid when the system is in the waiting or suspending state, and is invalid in other states.

文件

File: View and run files loaded in the operation panel

 启动

暂停

Start/Pause: Switch the system state between working and suspending.

When the system is in the working state, press this key, the system enters the pause state, and if this key is pressed again, the system returns to the working state. This key is valid in work or pause state, and invalid in other states.

 定位

Positioning: This key is used to define (change) the origin of the cut. Before cutting, if you want to modify the cutting origin, use the arrow keys to move the laser head to the starting position of cutting, then: 1. If you press this key for a short time, the current position of the laser head is determined as the cutting origin; 2. If you press this key for a long time Press the key for more than 3 seconds to determine the cutting origin, and the system will self-check and draw a self-check graph. 3. This key is valid in the system waiting state, and invalid in other states.

 边框

Frame: The laser head moves along the edge

 退出

Exit: Cancel the operation. When setting cutting parameters, cancel the modification; when selecting a job file, cancel the selection; when the system is in the pause state, press this key to make the system return to the waiting state. In other states, the "Exit" key is invalid.

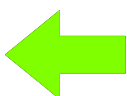
 确定

Confirm: Confirm the action. Only valid when setting cutting speed and working light intensity or selecting job document; Invalid in other states.

Direction keys (up, down, left, right, middle key Z&U): used to adjust the position of the laser head, select the job document, and change the cutting speed and the minimum/maximum light intensity.

 Z & U

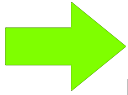
Adjust the movement in the X and Y directions



Left: Move the laser head to the left.

Press and hold this key, the laser head will move to the left, when the laser head

reaches the maximum travel of the X axis, the laser head will stop moving, and this key will be invalid. (The maximum travel of the X axis can be set when setting the machine parameters, which is limited by the width of the worktable). When setting the cutting speed and working light intensity of the system, each time you press it, the value of the speed and light intensity will increase by 10. When a job document is selected, this key is used to display the previous document page of the current document.



Right: Move the laser head to the right.

Press and hold this key, the laser head will always move to the right, when the trolley reaches the origin of the X axis, the laser head will stop moving, and this key will be invalid. When setting the cutting speed and working light intensity of the system, each time you press it, the value of the speed and light intensity will decrease by 10. When a job document is selected, this key is used to display the next document of the current document.



Up: Move the laser head up.

Keep pressing this key, the laser head will move up, when the beam reaches the origin of the Y axis, the laser head will stop moving, and this key will be invalid. When setting the cutting speed and working light intensity of the system, each time you press it, the value of the speed and light intensity will increase by 1. When selecting a job document, this key is used to select the previous document of the current document.



Down: Move the laser head down.

Keep pressing this key, the laser head will move all the way down, when the beam reaches the maximum travel of the Y axis, the laser head will stop moving, this key will be invalid (the maximum travel of the Y axis can be set when setting the machine parameters, limited by the work table format). When setting the cutting speed and working light intensity of the system, each time you press it, the value of the speed and light intensity will decrease by 1. When selecting a job document, this key is used to select the document next to the current document.

4.3 Shutdown process

The shutdown process is primarily done on the main operations console.

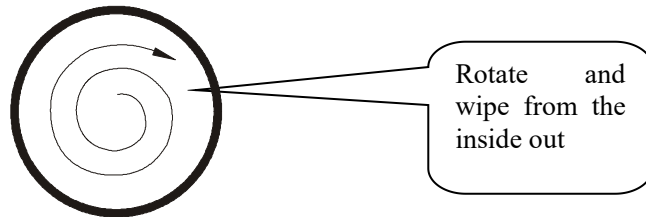
- Press the green (laser power) button switch.
- **Turn off the vacuum fan.**
- Press the "WATER/Water Cooling" button switch to turn off the water tank.
- Turn off the computer
- Press the red (laser power) button switch.

5 Maintenance and care

5.1 Maintenance and maintenance of the optical path system

- The carbon dioxide laser tube should be replenished with gas or replaced in time, especially when the working time of the laser tube exceeds 1000 hours, please pay attention to the output power of the laser tube at any time. If the power becomes smaller under the same current condition, the laser tube needs to be replaced.
- The mirror will be polluted by the smoke and dust generated by processing after a long time, which will reduce the reflectivity and affect the output of the laser. It must be kept clean and checked regularly. Absolute ethanol or special lens cleaning solution can be used, and carefully wipe with absorbent cotton. Be careful to avoid scratching the mirror surface with objects.
- The lower surface of the focusing lens inside the focusing lens may also be contaminated with workpiece volatiles. When it is contaminated, it will also greatly affect the output of the laser. Be sure to pay attention to smoke exhaust and blowing protection during processing, and try to avoid contamination of the focusing lens. If the contamination is serious, take the following steps to clean it carefully:
 1. Remove the air blower, pressure ring and protective sleeve, and carefully remove the focusing lens
 2. Use a blower to blow off the dust on the surface of the lens;
 3. Carefully clamp the absorbent cotton ball with tweezers, dip it in anhydrous ethanol or special lens cleaner and wipe it gently, from the inside to the outside and gently

wipe in one direction (as shown in the figure below). until later.



Note: It is not allowed to rub it back and forth, and it is not allowed to be scratched by sharp objects. Since the lens surface is coated with an anti-reflection coating, the damage of the coating layer will greatly affect the laser energy output.

5.2 Maintenance and maintenance of sports mechanism

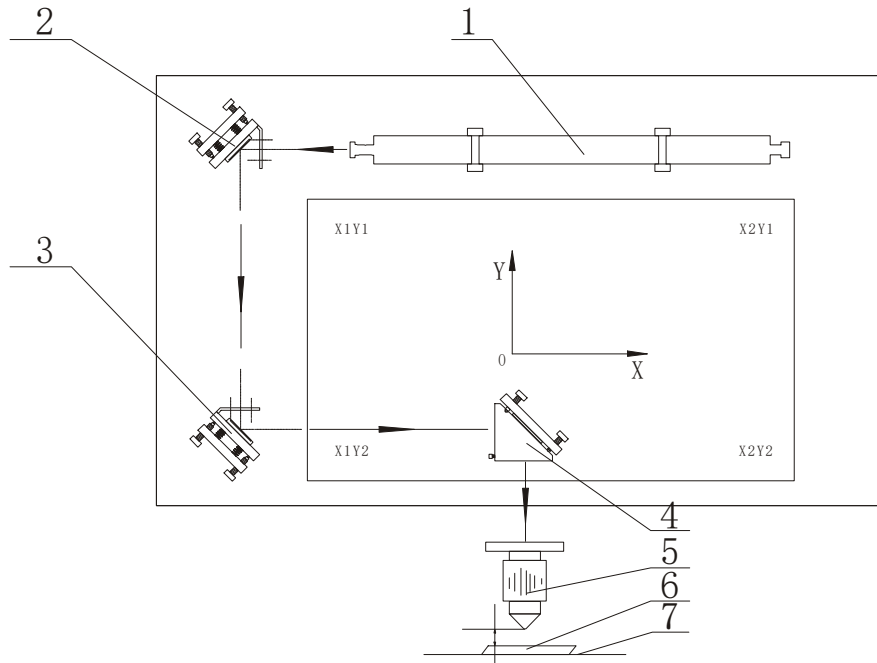
- Please keep your device clean at all times
- The linear guide of the two-dimensional motion table should be regularly lubricated with lubricating oil, which is determined according to the use of the machine.
- The equipment casing, laser power supply, and computer power supply must be well grounded. Regularly check whether the grounding screws are rusted or loose, clean and fasten them in time.
- If the moving parts such as trolley pulleys, slideways, and linear guides are polluted or corroded, it will directly affect the processing effect. They should be cleaned regularly, and lubricating oil should be applied to the guide rails to prevent corrosion.
- Note that the exhaust vents and exhaust ducts cannot be blocked, and check and remove the obstructions at any time to keep them open.
- The cooling water should be kept clean and replaced regularly. During processing, check whether the water level is sufficient and whether the water temperature is too high.

5.3 Optical path adjustment and replacement of laser tube

5.3.1 Optical path adjustment

During the use of the 1390 series engraving machine, the optical path may be offset, resulting in no light or abnormal optical path, which will directly affect the processing

efficiency and processing effect, and should be paid enough attention. In this case, please refer to the following methods to adjust the optical path correctly.

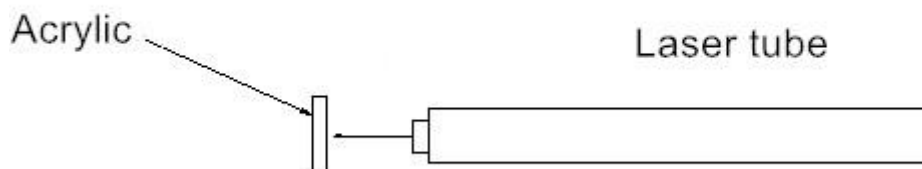


- | | | | |
|---------------------|----------------|-------------------------------|----------------|
| 1 Laser tube | 2 first mirror | 3 second mirror | 4 third mirror |
| 5 Focus lens barrel | 6 workpiece | 7 Workpiece carrying platform | |

The optical path system of this machine is shown in the figure above, and the adjustment of the optical path system should start from the transmitting end.

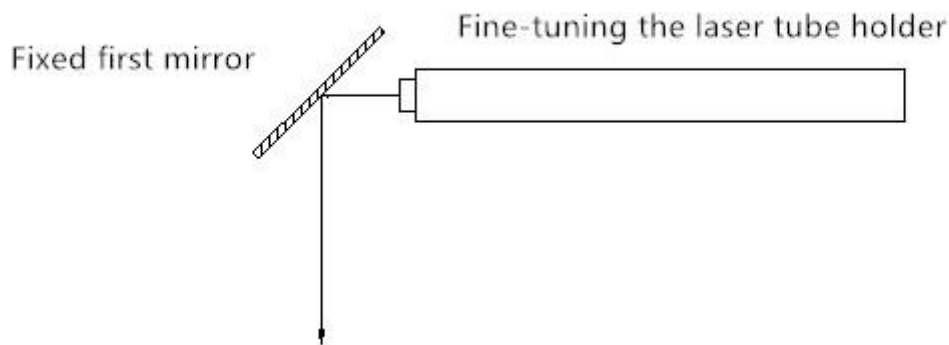
1. If the following steps are not performed properly, the emitted laser may cause damage to the equipment or the operator. Special attention should be paid to it!

2. Use the test button (click) on the panel to adjust the laser output current to an appropriate value (usually 4~8mA when the output power is not too large). Note that there may be strong laser emission at this time, so place a piece in front of the laser tube output window. For the transparent organic plate used for dimming, keep a proper distance to prevent the smoke and dust generated by the laser acting on the material from contaminating the output mirror. When finished, remove the organic board.

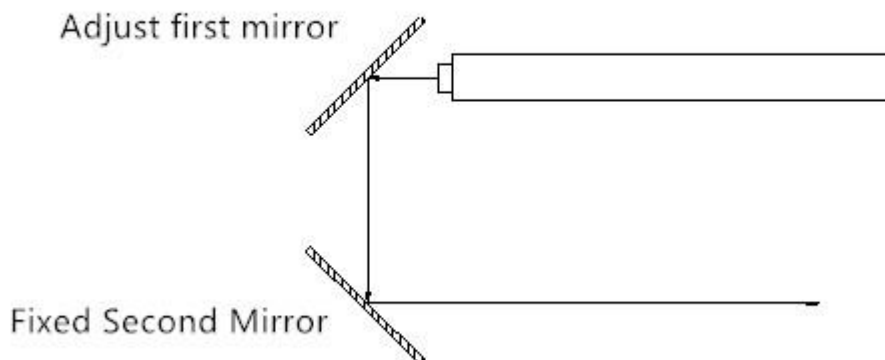


3. Clamp a small piece of organic board on the surface of the first reflector, fine-tune the laser tube adjustment frame, and use the test button (click) to make the

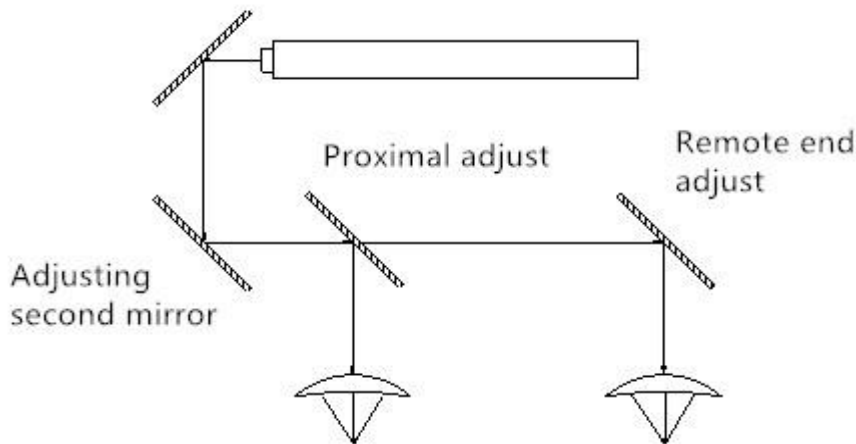
emitted laser energy completely on the first reflector and as far as possible on the first reflector in the middle. When finished, remove the organic board.



4. Clamp a small piece of organic board on the surface of the second reflector, fine-tune the adjustment knob of the first reflector, and use the test button (click) together to make the laser energy reflected by the first reflector completely on the second reflector and Try to place it in the middle of the first reflector. At the same time, it should be ensured that the laser light spots received at the front and rear ends in the Y-axis direction coincide. When finished, remove the organic board.

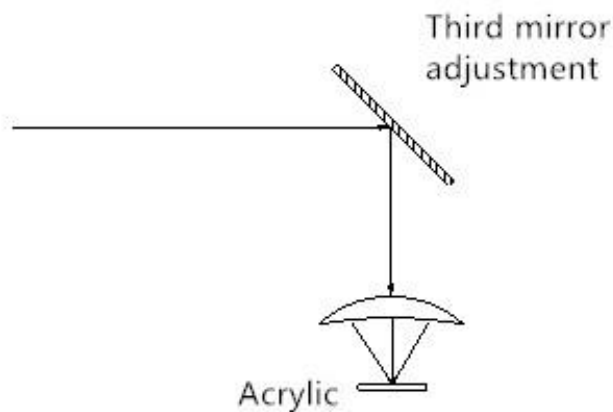


5. Clamp a small piece of organic board on the surface of the third reflector, fine-tune the adjustment knob of the second reflector, and use the test button (click) to make the laser energy reflected by the second reflector completely on the third reflector hole And try to inject from the middle of the third mirror hole. At the same time, it should be ensured that the laser light spots received at the left and right ends in the X-axis direction coincide. When finished, remove the organic board.



6. Place a small piece of organic board above the focusing lens barrel, fine-tune the adjustment knob of the third reflector, and use the test button (click) to make the laser energy reflected by the third reflector completely in the focusing lens barrel and as far away as possible. The center of the focusing barrel is injected. (Note that the smoke generated at this time may contaminate the third reflecting lens, and the generated smoke should be prevented from entering the third reflecting lens as much as possible). When finished, remove the organic board.

7. Adjusting the focal length: A special focal length adjustment gauge can be used. If the size of the adjustment gauge changes, you can place a small organic plate flat on the processing platform, click the test button, and fine-tune the height of the focusing lens barrel up and down to minimize the vaporization point of the laser on the organic plate, and fix the focusing lens barrel. . Place the focal length adjustment gauge between the lens barrel and the organic plate, adjust the height and fix it, and then just place it between the focusing mirror and the workpiece for later use.



8. The quality of the above adjustment will directly affect the processing effect of the whole machine. Remember to repeat and carefully adjust it!

5.3.2 Replacing the Laser Tube

It will be replaced by our customer service staff.

5.4 Constant temperature water cooler maintenance and maintenance

- The water in the laser chiller should be changed and cleaned regularly, once a week.



The cleaning of water quality will directly affect the normal use and life of the equipment.

If the equipment is damaged due to water quality, it is not covered by the warranty

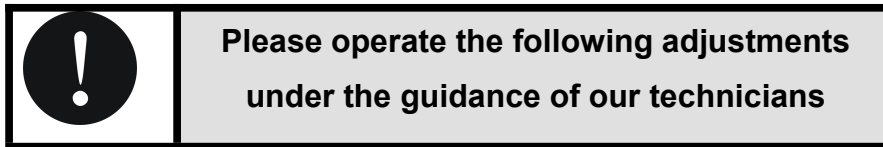
5.5 Negative pressure fan and suction line maintenance and maintenance

- Regularly clean the dust inside the negative pressure fan and vacuuming pipeline,

every three months.

6 Common problems and solutions

6.1 Main Equipment Section



- Fault phenomenon: no response when the key switch is turned on

Cause of issue	Solution
Is the main power switch closed?	Turn on the main power switch
Is the power connected?	Check whether the power is connected step by step
Main power switch damaged	Please contact our after-sales service staff

- Fault phenomenon: no laser output or very weak laser output; insufficient scribing depth

Cause of issue	Solution
Device focus focal length change	Focus carefully
The optical path is shifted	Adjust the light path
Contamination of the focusing lens	Clean the focusing lens
Reflector contamination	Clean the mirrors
Cooling water circulation	Clear the cooling water circuit
Damaged or aged laser tube	Replace the laser tube
Damaged laser power supply	Replacing the Laser Power Supply

- Fault phenomenon: Unsatisfactory cutting/engraving depth

Cause of issue	Solution
The laser power setting is abnormal	Set proper laser power
The cutting/engraving processing parameters are abnormal	Set appropriate processing parameters
Laser output becomes weaker	see previous point

- Fault phenomenon: There are errors or malfunctions in the machining dimensions

Cause of issue	Solution
The signal line is not working properly	Replace the signal cable
The grounding of the whole machine and computer is abnormal	Good grounding of equipment and computer
Computer operating system malfunction or virus infection	computer system organization
Application software is not working properly	Reinstall the software and the driver software of the motion control card
The power supply is unstable or there is interference signal	Install a voltage stabilizer or eliminate interference signals
The machining program is not written correctly	Check the programmed processing program and modify it until it is normal

- Not working well

Cause of issue	Solution
Contaminated or rusted rails	Clean the rails and add oil
Slider and pulley contamination	Clean sliders and pulleys
Drive belt loose	Adjust the belt tension
The drive synchro wheel is loose or worn	Check the synchro pulley mechanism, adjust or replace parts

6.1 Constant temperature water cooler part

- Trouble phenomenon: no power on

Cause of issue	Solution
Poor power cord contact	Check if the socket is making good contact
Fuse blown	Pull out the fuse to check, Replace the fuse

- Fault phenomenon: traffic alarm

Cause of issue	Solution
Water tank level is too low	Check the water level, add circulating water and check the water lines for leaks
Bending the cooling water pipe and blocking the waterway	Check that the hose is straight

- Fault phenomenon: water temperature is too high

Cause of issue	Solution
The dust filter is blocked and the heat dissipation is poor	Regular cleaning
Poor air outlet ventilation	Ensure smooth ventilation at the entrance and exit
Severely low or unstable voltage	Improve the line or use a voltage regulator
Frequent switch on and off of cooler	Ensure that the chiller has sufficient cooling time
Excessive heat load	Reduce the heat load or choose a model with a larger cooling capacity

- **Fault phenomenon: high temperature alarm**

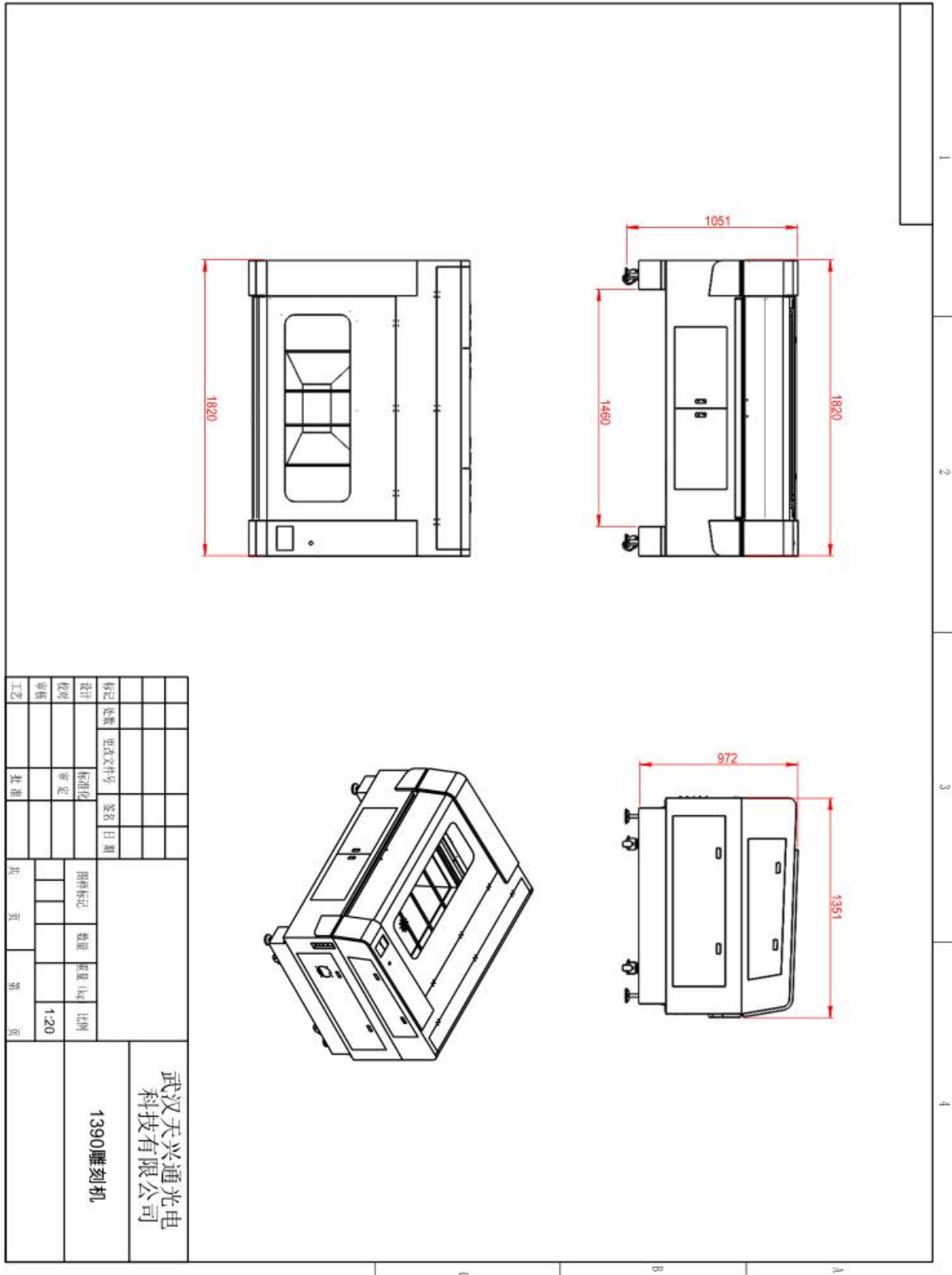
Cause of issue	Solution
The ambient temperature of the cooling water is too high	Improve ventilation to ensure that the operating environment of the chiller is below 40 degrees

- **Fault phenomenon: the drain outlet drains slowly when changing the water**

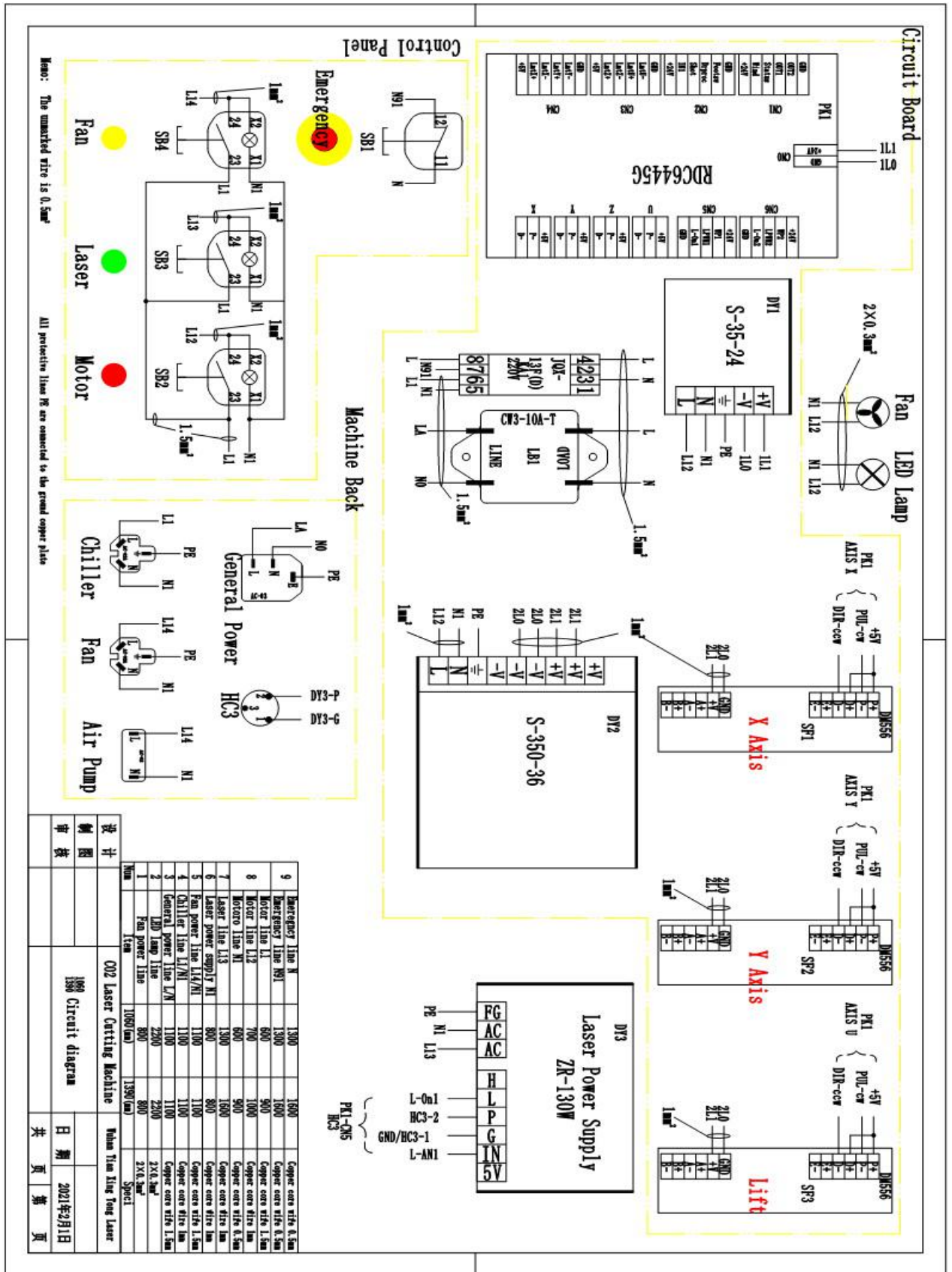
Cause of issue	Solution
The water inlet is not open	Open the water inlet

7 Diagram drawing

7.1 Dimensions



7.2 Electrical wiring diagram



8 Consumable parts

8.1 Laser tube

When it is found that the laser power is gradually attenuated and cannot be cut normally. After eliminating other factors, the laser tube needs to be replaced.



8.2 Optical lens

If the optical lens is contaminated, the laser will damage the coating layer on the lens and should be replaced at this time. This machine includes 3 reflecting lenses and 1 focusing lens.

9 Software Operation Manual

9.1 Software introduction

The special software for 1390 series laser engraving machine is an application software specially designed and developed by Shenzhen Ruida Technology Co., Ltd. for small format laser engraving machine. The software has friendly man-machine interface, strong functionality, and is easy to operate and use.

9.2 Installation of software programs

See the attachment "RDCAM Software Installation Instructions"

9.3 Software operation

See attached "RDCAM Operation Manual V5.0", "RDCAM Embedded Software Manual V5.0"