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Laser engraving machine & cutting machine installation

# Manual

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# Foreword

Thank you for purchasing our laser engraving machine, and laser cutting machine. The device is a high-tech product consisting of light, machine, and electricity. It is a strong professional and high technology product. So that users can better use and maintain this equipment, we special write this manual.

In this manual, there are a large number of product original pictures for your better understanding, which explains in detail about the installation, debugging, daily maintenance, safety precautions, and so on.

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The manual will bring you greater help in the operation and maintenance of this equipment. Please read the manual in detail before using it.

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# Installation instruction

## Safety Precaution

♥Before operating the equipment, the user must carefully read the operating manual of this specification, and strictly abides by the rules.

★This device uses four lasers (intense laser radiation), the laser radiation may cause the following incidents:

① Ignite surrounding combustibles; ② During laser machining working, it may produce other radiation and other toxic and harmful gas due to the different object processing ③ Direct laser radiation may cause human injury. Therefore, the device must be equipped with fire-fighting equipment. Stacking the inflammable and explosive materials around the working table and equipment is strictly prohibited. At the same time, make sure to keep a well-ventilated, and non-professional operators prohibit close to the equipment.

★ Laser processing objects and emissions should comply with local laws and regulations.

★ laser processing may be at high risk, so you should seriously consider whether the object is suitable for laser processing.

★ There is high voltage and other potentially dangerous in the internal laser equipment. The disassembly is strictly prohibited except for factory processional staff.

★ During the device is in the boot state, there must be someone to keep guarding, prohibiting the unauthorized leave. All power must be cut off before the officers leave.

★ It is prohibited to open any door during the device at working

★ Before the boot operation, the engraving machine and other equipment must be

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associated with safety ground.

★ Do not place any irrelevant total reflection or diffuse reflection object in the device to prevent laser reflection on the human body or flammable materials.

★ During the device operation, the operator must always observe the operation of your device, pls cut off all power immediately if any abnormal situation happens, and actively take corresponding measures.

★ The equipment should be in an environment of dryness, with no pollution, no vibration, no strong electric and magnetic interference and influence. The operating temperature is in 5-40 degrees Celsius and humidity is in 5-95% (non-condensing).

★ The equipment should always be away from the electrical equipment which is sensitive to electromagnetic interference because it could cause electromagnetic interference.

★ Operating voltage of the equipment is AC220V / 50Hz. AC110V / 60HZ

It is prohibited to turn on the device when the grid voltage instability or does not match, Improper use or non-compliance with the rules for any loss caused by the above, the manufacturer is not liable.

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## Statement

1. Due to product upgrades and improvements and other reasons, the contents in this manual may differ from the actual product. In addition, the contents of this manual are subject to change without prior notice.
2. The picture in this manual may be different from the purchased product due to product improvements and other reasons. Kind to buy prevail.

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## Chapter 1 Appearance and random machine parts

**1.1 Overview of the machine** (Different models, the appearance will vary, the specific kind prevail)

Front of the machine: As F1-1:



F1-2



**1.2 Random accessories** (whichever kind, the following may be inconsistent with the actual)

In addition to the engraving machine host, your random accessories should contain the following accessories (optional accessories excluded):

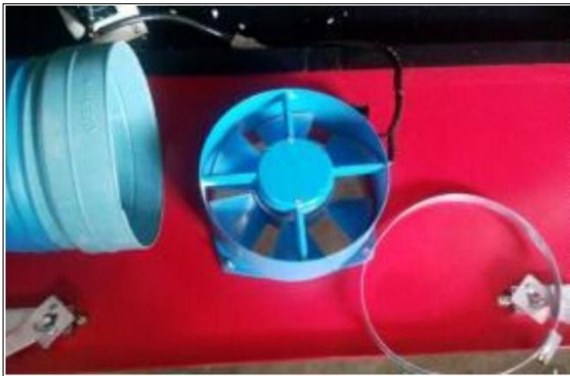
Pipes. Trachea, air pump, water pump. Chimney. Chimney clamp, software. Power cord. Data cable, network cable. Dimming paper. Silica gel. (1. Some models are equipped with water tanks on the machine without water pumps, 2 there are optional rotary axis random packages), as F1-3:



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### F1-3

2. Fans, smoke pipe, F1-4-1 :( some models of the machine are installed on the axial fan of the machine. As picture F1-4-1)



F1-4-1

3. Laser Tube. As picture F1-5:



F1-5



4. Water tank, water pump, air pump (some models not equipped with water tank machine), as F1-6:



F1-6

5. Bag and internal items. As F1-7:



F1-7

6. Ground (Customer) As F1-8:



F1-8

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## Chapter 2 Machine installation and debugging

The complete working system consists of laser engraving machine hosts, fan, air pump, water pump, (tank) pipe tube, data transmission lines, and other components. Configure the computer to work according to their own needs of users, and so on.

### 2.1 Installation steps.

#### 1. Laser tube installation

Because glass laser tubes are fragile, we pack them independently for the safe transport purpose, (sometimes we install it on the device, and no need customer's installation) The laser tube must be installed well before installation and debugging of the machine.

The laser tube is installed in the back of the machine, turn the laser tube protective cover, and you can see two laser tube brackets. Figure:



Put the output of the laser tube (low side) on the V-shaped bracket toward the direction of the no. 1 reflector mirror, and then fasten the rubber strips fixed on laser tube support. As figure:



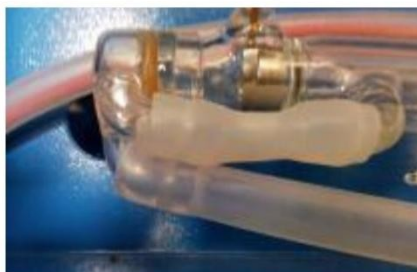


Note: ① Do not fix tightly to avoid damage to the laser tube; ② Make sure to keep the water inlet port (laser tube high-pressure side) located beneath the body tube. After fixing the laser tube, make the connection between the water inlet pipe that connects to one side of the water protection switch and the water inlet that is located on high-pressure side of the laser tube. Connecting the other water outlet pipe to the outlet of the laser tube located at the low-pressure side of the laser tube. (if the weather is colder, it is better to scald the tube head with boiling water to soften, to prevent broken laser tube spout installation).

Figures F2-3, F2-4:



F2-3



F2-4

Each pipe joints to connect firmly to prevent leakage; Rubber hose must be straightened out and can not be twisted or folded to avoid poor water flow. Finally, connect the high-voltage and low-voltage lines of the laser power to, the high-pressure side and low-pressure end of the laser tube respectively, see Figure F2-5 F2-6:



F2-5



F2-6

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For safety, seal the terminal with silicone at the high and low-pressure ends.

## 2. Water pump and water tank installation

Water pump connection. Connect the inlet of the device (with plumbing) to the outlet of the pump. The outlet of the device is directly put into the bucket (filled with pure water, water level higher than the pump at least 10cm, put the pump into a bucket inside the submerged pump). As Figure



F2-7

Links to water-cooled machines and water tank. Firstly, fill pure water full in the water-cooled machine, connecting the intake of the device to the outlet of the water-cooled machine through water pipes, then connecting the outlet of the device to the inlet of the water-cooled machine through the water pipe (make connection firmly to protect water-cooled machine ). All connected firmly, send electric power to water-cooled machine safely, as figure F2-8



F2-8

Connected to the water pump, and plugged into a water-cooled machine, then you can see the water gradually filled into a laser tube. Water flows smoothly through the outlet pipe, indicating that the pump is working properly.

To ensure normal flow of cooling water in laser tube, water protection sensors are installed in the water circulating system, the laser engraving machine will automatically be in working state, and there will be no laser emitted from the laser tube when the water can't flow smoothly or water pump works in abnormal. Therefore, during routine maintenance, should pay attention to cleaning the pump and pipe water-cooled machine.

### 3. Air pump installation

Connecting the outlet of the air pump to the inlet of the engraving machine through an air pipe. Plugged in power to ensure that the outlet vent properly. Figure:



The air compressor is very important in this system. The high-pressure gas is ejected through the outlet of the laser head through a gas pipe. On one side, it can ensure the cleaning of the focus lens, on the other hand, it also can prevent ignition of the material by the laser effect. Therefore, during routine maintenance, pay attention not to fold or damage the gas pipe. Otherwise, it may cause combustion of material by abnormal



ejecting wind.

#### 4. Fan installation (Only need to install the smoke pipe if not equipped with fans)

Fans of the first tube to suction outlet and engraving machines with a vacuum port to connect the wind, and closely fixed with a lock, and then use the other duct connected to the fan outlet and lead outdoor, connect the fan's power lines. As shown:

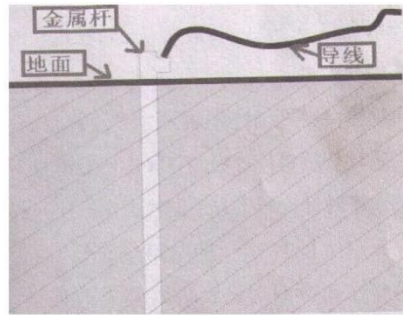
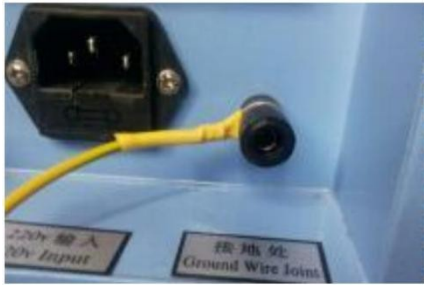


Big fan's connection as figure:



#### 5. Safety ground

The laser tube that the laser engraving machine uses is the fourth laser device. The driving way is high-voltage excitation. All users must observe the <Safety Precautions>. On the other hand, the user is also presented a safety ground stringent requirements on safety ground. The ground resistance should be less than  $5\Omega$ . Specific connection methods shown F2-13, F2-14:

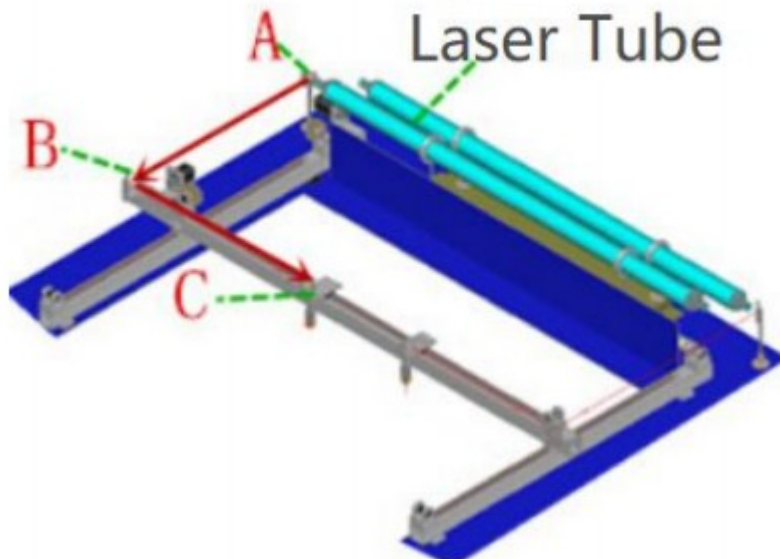


Please pay attention, poor grounding can cause a high breakdown rate of the device, and may lead to other accidents!

We don't assume any responsibility and obligation caused by the above.

## 6. Optical path adjustment

All the power cord are connected and plugged in, turn on the power of the laser engraving machine, then the machine starts to reset and return to the last anchor point, indicating that the machine operates normally. Turn on the laser power, and began to adjust the optical path. The optical path indicated in Figure F1-15,

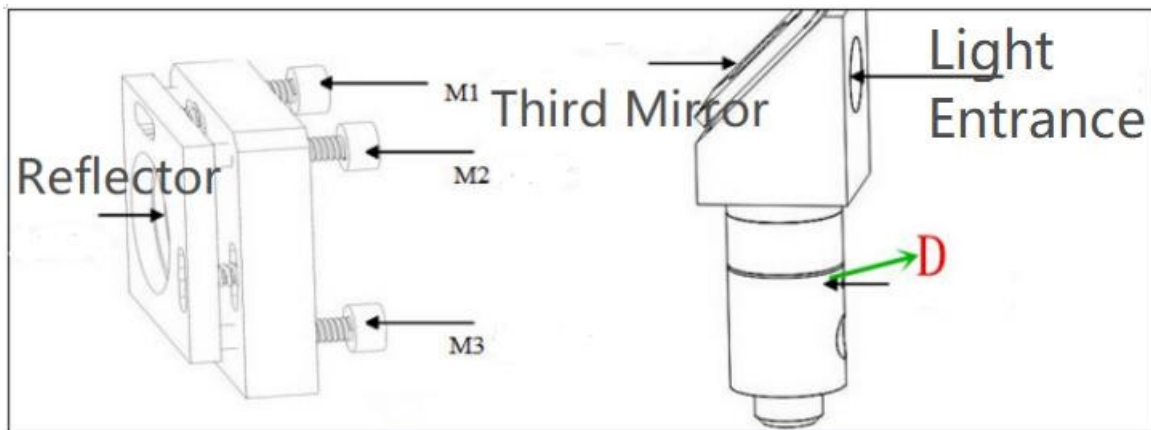


F1-15

A.The first laser mirror. Frames, B. the second mirror.Frames .C. The third mirror. Frame  
D. focusing lens of the laser head



B.



Note: M1, M2, and M3 are three hexagon screws to be determined the angle of the mirrors. When making the optical path adjustment, it can reach the optical path adjusting purpose by adjusting these three screws to change the angle of the laser reflection.

Firstly, adjust the position of the laser tube, Adhere multilayer dimming paper to frame A, and then press the "burst" button on the control panel. Make a point on the dimming paper, and observe if the light spot is in the centre of the lens. If it is not at centre, try to make it at the centre of the lens by adjusting the position of the laser tube as far as possible.

Then adjust the mirror B, stick the dimming paper to the frames B. Beam moves to the nearest A lens and marks a point, and then moves to the farthest and marks another point, Please adjust the three screws behind the A lens to change the angle of the lens if these 2 points can't coincide (M1.M2.M3. Clockwise rotate the screw at the upper, and make the light points move down; clockwise rotate the screw on the left side of the bottom, and make the light spot move to the right; clockwise rotate the screw on the right side of the bottom, and make the light spot move to the left.) Repeat this until the farther light point coincides with the first one.

After finishing adjusting mirrors A and B, the next to adjust the mirrors B and C. It is the same as above to move the laser head closest to lens B and make a point, and then move to the farthest placement and make another point. Adjust the farthest point to coincide with the first one.

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Note: It is better to make the above light point in the centre of the lens. If playing at the edges, continue to adjust the lens until the point in the centre.

After adjusting the optical paths B and C. The next to adjust the laser heads C and D, Adhere the dimming paper to the lowest part of the laser head D and make the point to see if this point is in the middle of the optical outlet. If not, please adjust the screws at mirror C (M1.M2 .M3.) until the point is in the centre.

If unclear, please contact the vendor and professional technicians.

After the optical path adjustment is completed, close the laser tube protective cover.

Equipment has been completely installed, below is the software installation