Shenhui Laser

SH-G690 User Guide

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Introduction

Dear Shenhui valued customer,

Thank you for buying our product.

Our laser device is a professionally-made, high-technology device combined with high-quality optical, mechanical and electrical components.

In this user guide, we have included real object photographs wherever possible in order to more clearly inform about equipment installation & adjustment, maintenance, safety procedures.

The user should read this manual in detail before using the laser device, both for your safety and for the reliable operation and maintenance of the device.

We welcome any comments or suggestions you may have, and appreciate any feedback to Shenhui@Shenhuilaser.com

WARNING

Liaocheng Shenhui Laser Equipment Co. (Shenhui) cannot be held responsible for any direct or indirect damages, which result from using or working with the products, electric circuits, or software described herein.

The equipment must be used only by suitably-trained and skilled personnel. Before use the manual should be read and understood thoroughly.

Furthermore, Shenhui reserves the right to change or alter any product described herein without prior notice.

SAFETY NOTES

Your laser system uses a high intensity beam of light that can generate extremely high temperatures. Some materials are extremely flammable and can ignite and burst into flame. This open flame is very dangerous and has the potential to destroy not only the machine, but the building in which it is housed.

Experience has shown that high-powered vector cutting has the most potential to create an open flame. Many materials are susceptible to igniting, but acrylic, in all its different forms, has been shown to be especially flammable when vector cutting with the laser.
Please read the following warnings and recommendations and follow them closely at all times!

- Stay with the laser. Never operate the laser system while unattended.
- Keep the area clear. Clean around the machine and keep the area free of clutter, combustible materials, explosives, or volatile solvents such as acetone, alcohol, paint, or gasoline.
- Be prepared with a fire extinguisher. Always keep a properly maintained and inspected fire extinguisher on hand. Shenhui recommends a multi-purpose dry chemical fire extinguisher.
- Use Air Assist. Always use the system's Air Assist feature when vector cutting as this will give the greatest protection from combustion.
- Keep your machine clean. A build-up of cutting and engraving residue and debris is dangerous and can create a fire hazard in its own right. Keep your laser system clean and free of debris. Regularly remove any small pieces that have fallen through the grid at the beginning of every shift or work day.
- Do not operate the machine with any open covers or panels. It has been designed to flow air correctly with the covers and panels in place, as well as to be safe for the user.
- Do not process material whose emissions would fail to conform to local environmental laws and regulations
- There are high-voltages and potentially dangerous mechanisms in the machine - non trained technicians should never disassemble or otherwise work on the machine.
- Ensure you have a good ground wire connection
- Keep the machine in a dry place, without smoke, dust, steam or other air pollution, excess electrical flux (such as high-powered AC and DC environments), strong magnetism and where the environmental temperature should be in the range of 5-40
- The laser machine should be kept away from sensitive EMI equipment
- The working voltage is AC220-240V @50Hz. Do not operate at a different voltage.

Liaocheng Shenhui Laser Equipment Co. bears no responsibility or liability due to improper use and failure to follow the above guidelines.

Machine Appearance and Accessories

Different laser models may have a different appearance, according to their individual specification.

Front View

Figure 1 – Front

Rear View

Figure 2 – Rear

Accessories set

Water pump, water pipe, air assist pump, air pipe.

Figure 3

Exhaust set

Exhaust pipe, extractor fan

Figure 4

Laser Tube

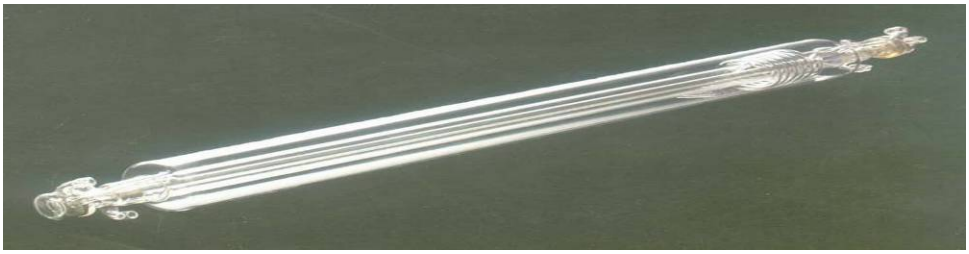

Figure 5

Chiller Unit

Figure 6

Accessory Bag

Manual, cables, software

Figure 7

Figure 8

Ground Wire

Figure 9

Safety

The Shenhui Laser System is a Class 4 laser product, as defined in International Standard IEC 60825-1.

The output of the high-power CO2 laser is fully contained within the chassis with the cabinet doors closed. The laser cabinet has safety interlocks that turn the laser off if the access door is opened during operation, and no special precautions are necessary to operate the high-power laser safely.

The operator of the Shenhui Laser should observe the following general precautions:

- **DO NOT** disassemble the machine or remove any of its protective covers while the unit is plugged in.
- **DO NOT** attempt to defeat the door interlocks.
- **DO NOT** view directly into the beam of the Laser Diode Pointer (Red Dot Pointer).
- **DO NOT** operate the Laser Diode Pointer (Red Dot Pointer) without the machine's focus lens in place. If the unfocused beam strikes a reflective surface, it could be directed out of the cabinet.
- **Caution –** Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

The standard reference for laser safety is the American Standard for the Safe Use of Lasers, Z136.1-2000, developed by the American National Standards Institute (ANSI). This reference is the basis for many of the federal regulations for laser and laser system manufacturers, and for the Occupational Safety and Health Administration (OSHA) laser safety guidelines. It contains detailed information concerning proper installation and use of laser systems.

Electrical Safety

The AC input power to the Shenhui Laser is potentially lethal and is fully contained within the cabinet.

- **DO NOT** open any of the machine's access panels while the unit is plugged in. Opening a panel may expose the operator to the unit's AC input power.
- **DO NOT** make or break any electrical connections to the system while the unit is turned on.

Fire Warning

Didn't you see this before?

Yes, you did. That's how important we think it is for you to read this information!

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- Do not operate the machine with any open covers or panels. It has been designed to flow air correctly with the covers and panels in place, as well as to be safe for the user.

Dos and Donts

Donts

Do Not Run the Laser Unvented: Never operate the machine without a properly operating vent to the outside or to a filtration unit! Most material will only produce an irritating smoke when engraved. Some materials, including but not limited to paint, varnish, composition board and plastics, produce compounds that can be harmful if concentrated. A properly installed vent is the only way to ensure that problems do not occur.

Do Not Engrave or Cut PVC: Never engrave or cut any material containing PVC or vinyl. When engraved, a corrosive agent is produced that will destroy your machine. Your warranty will be void if your machine is damaged by corrosion from engraving or cutting PVC or Vinyl.

Do Not Operate Machine While Unattended: Never operate your machine without someone watching the system. There is a significant risk of fire if the machine is set improperly, or if the machine should experience a mechanical or electrical failure while operating.

Do Not Vector Cut While Machine is Unattended: Never laser cut any material with the laser without someone watching the system. Because vector cutting moves relatively slowly compared to raster engraving, a tremendous amount of heat is applied to the material being cut. This buildup of heat can cause significant fire risk and the machine should always be monitored. Additionally, the Air Assist should always be turned on when vector cutting to reduce the risk of fire.

Do Not Operate The System While Doors are Open: Never operate with any of the covers or enclosures removed, and never modify the enclosure. The laser beam is invisible and is very dangerous!

Dos

Do Clean the System: Please allow a few minutes a week for cleaning your machine. Just a small amount of effort at the end of the week will pay off with years of trouble free operation of your machine. See the **"Section : Cleaning & Maintenance"** for specifics.

Installation and Commissioning of the Machine

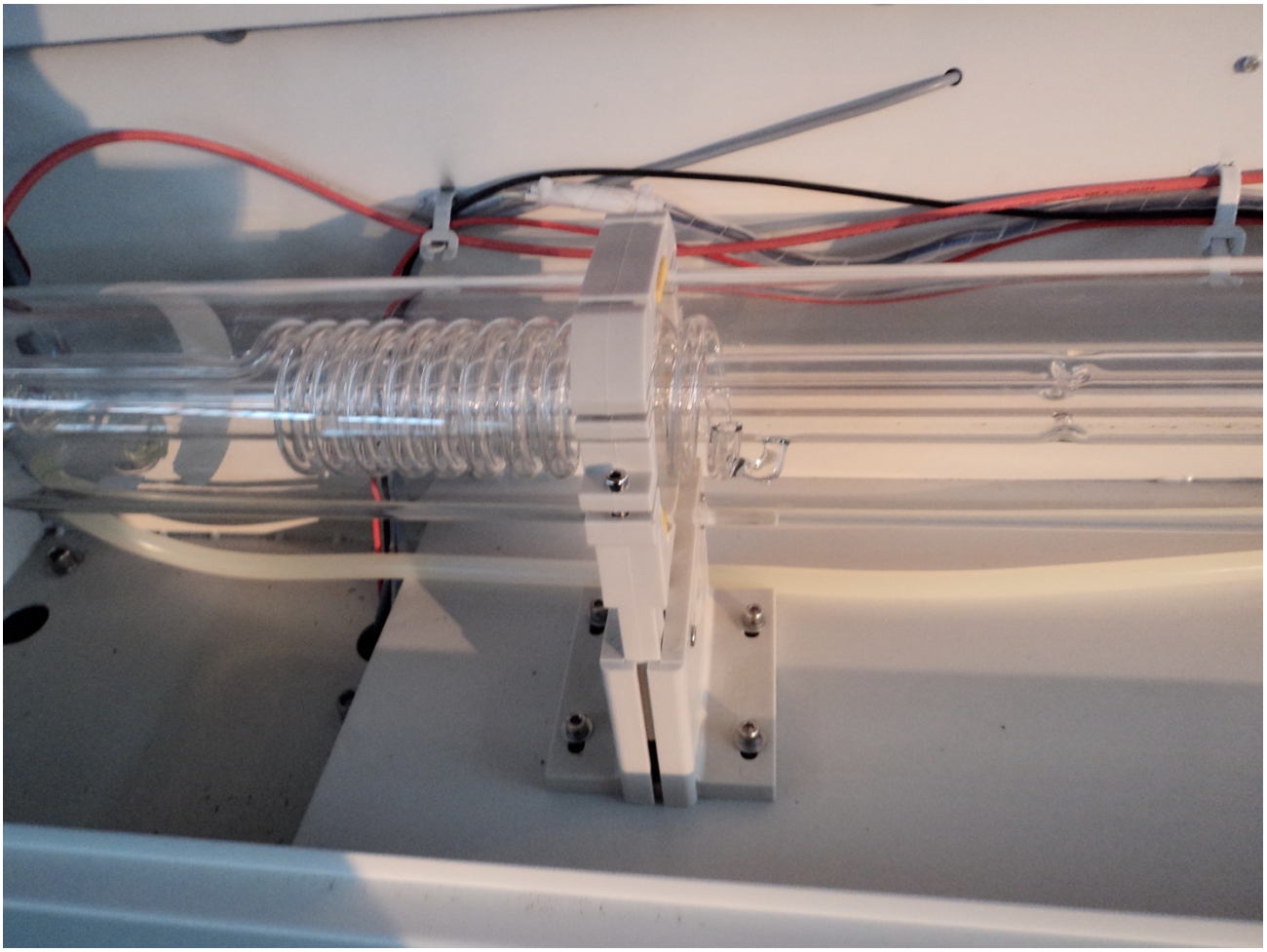
A complete working system is composed by laser engraving machine, the exhaust fan, air pump, water pump, water tank, exhaust pipe, data transmission lines and so on. According to the needs, the users can configure the computers, printers, scanners and so on by themselves.

I. 2.1 Installation and Adjusting Steps

1. Laser Tube Installation

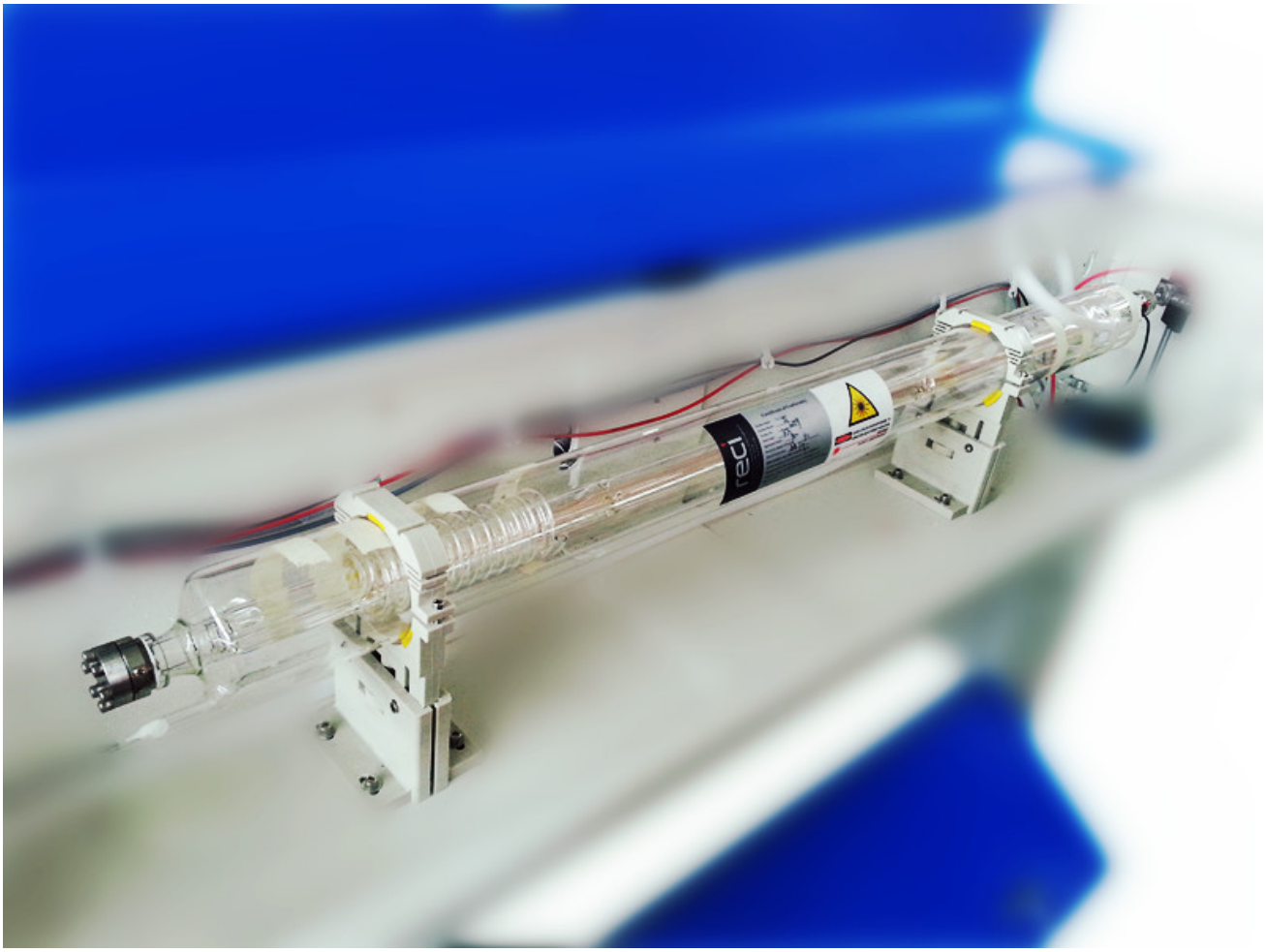
As the laser glass is fragile goods, the laser tube should be packed separately in order to ensure its safety during the transportation. So the users must install the laser tube before machine installation and commissioning.

Laser tube should be mounted on the back of the machine, open the protective cover of laser tube; you can see the two Vee-blocks. As shown in Fig. F2-1:



F2-1

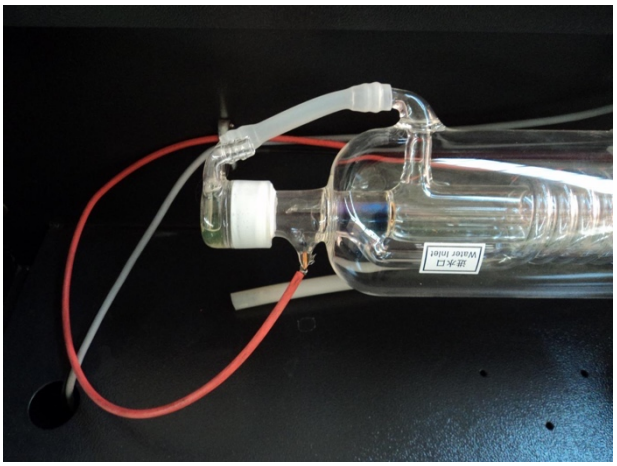
Put the light-emitting window (low-voltage end)of laser tube with the same side of No.1 reflector mirror on the Vee-blocks carefully, and then latch on the rubber strip on the Vee-blocks wear of laser tube , fix laser tube well. As shown in Fig. F2-2:

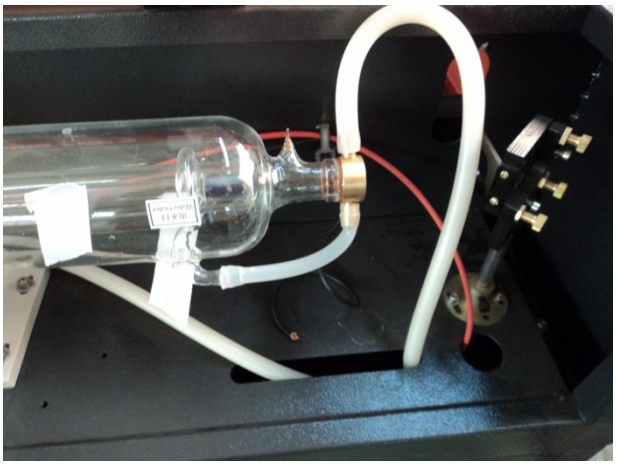


F2-2

Attention: ①The laser tube can't be fixed too tightly to avoid damaging it; ②Be sure to keep the water inlet (laser tube high-voltage side) is located at the bottom of tube to keep the water filling the laser tube fully.

After Fixed the laser tube, the water inlet pipe which connect with water sensor should be connected with the high-voltage side water inlet mouth of the laser tube; the water outlet pipe should connect with the low-voltage water outlet mouth of laser tube (if the weather is cold, ,in case of break the laser tube, we'd better scald the end of the water pipe with boiled water to make it soft.),As shown in Fig. F2-3, F2-4:

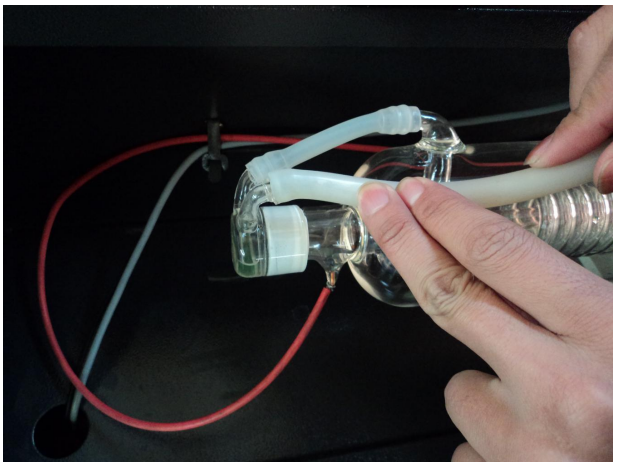


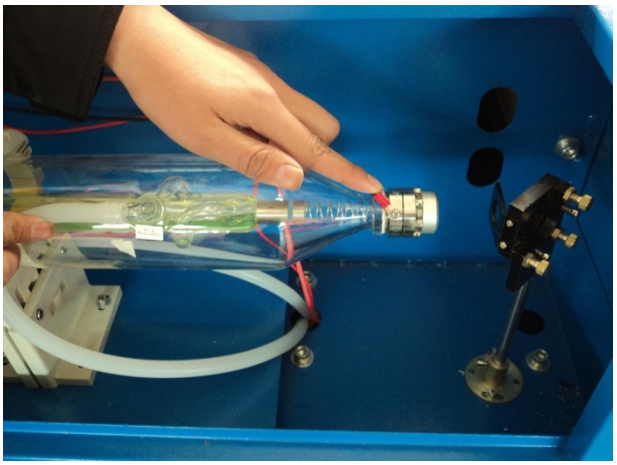


F2-3 F2-4

All the connectors must be butted firmly to prevent water leakage. The rubber pipe must be straight, can not be curled in order to avoid poor water flow.

Finally, let the high-voltage cable of the laser power supply connect to the high-voltage side post head of laser tube, the low-voltage cable of laser power supply connect to low-voltage side post head of the laser tube, as shown in Fig.F2-5 F2-6:





F2-5 F2-6

For security, please seal the post head of the high voltage side and low voltage with silicon gel.

2. Water Pump Installation

Please fill pure water into the water tank (the water level should be higher than the pump at least). Let the water pump outlet connect to water inlet of the machine, using another piece of water pipe connect to the water outlet of the machine ,and put the other side of this water pipe into the water to complete the circulating water piping connection. As shown in Fig.F2-7, F2-8:

at this time we can see that the laser tube is
can through the water outlet pipe smoothly, it
shows that the pump is working properly.

In order to ensure the cooling water flow of the laser tube normally, a water protection sensor is installed in the water recycling system, when water pumps working poor or abnormal, the laser engraving machine will come into the protection state automatically. Then the laser tube will not emit the laser light. Therefore, in the course of routine maintenance, you should pay attention to the clean water pumps and water pipes.

3. Installation of Air Pump

Make the air outlet of the pump connected to the air inlet of the engraving machine with air pipe; ensure the outlet can vent air normally after turn on the power. As shown in Fig. F2-9, F2-10:

F2-9 F2-10

Air pump is very important in the system. High-pressure air runs through the air pump and blew out from the laser light-emitting window of the laser head. On the one hand, it can ensure the cleanliness of the focus lens, on the other hand, it can prevent the material inflame by the laser light. Therefore, in the routine maintenance, the user should pay attention to the air pipe, must ensure that it can not be twisty or damaged, otherwise abnormal air may lead to burning materials.

4. Installation of Exhaust Fan

First, let the suction inlet of the exhaust fan connect to the dust suction outlet of the engraving machine by a smoke pipe, and fix them with lock. And then take another smoke pipe connect the outlet of the fan, and put the other end of smoke pipe to outside. At last, connect the power supply wire well. As shown in Fig.F2-11, F2-12:


F2-11 F2-12

5. Safety Grounding

Morn laser engraver uses fourth type of laser tube. The type of drive is high-voltage-driven, so during users use the machine, they must comply with the "Safety Note ". On the other hand, it asks stringent requirement about the safety grounding to the users. The safe Line-to-Ground Resistance should be less than 5Ω. Specific connection method are shown in Fig.F2-12, F2-13

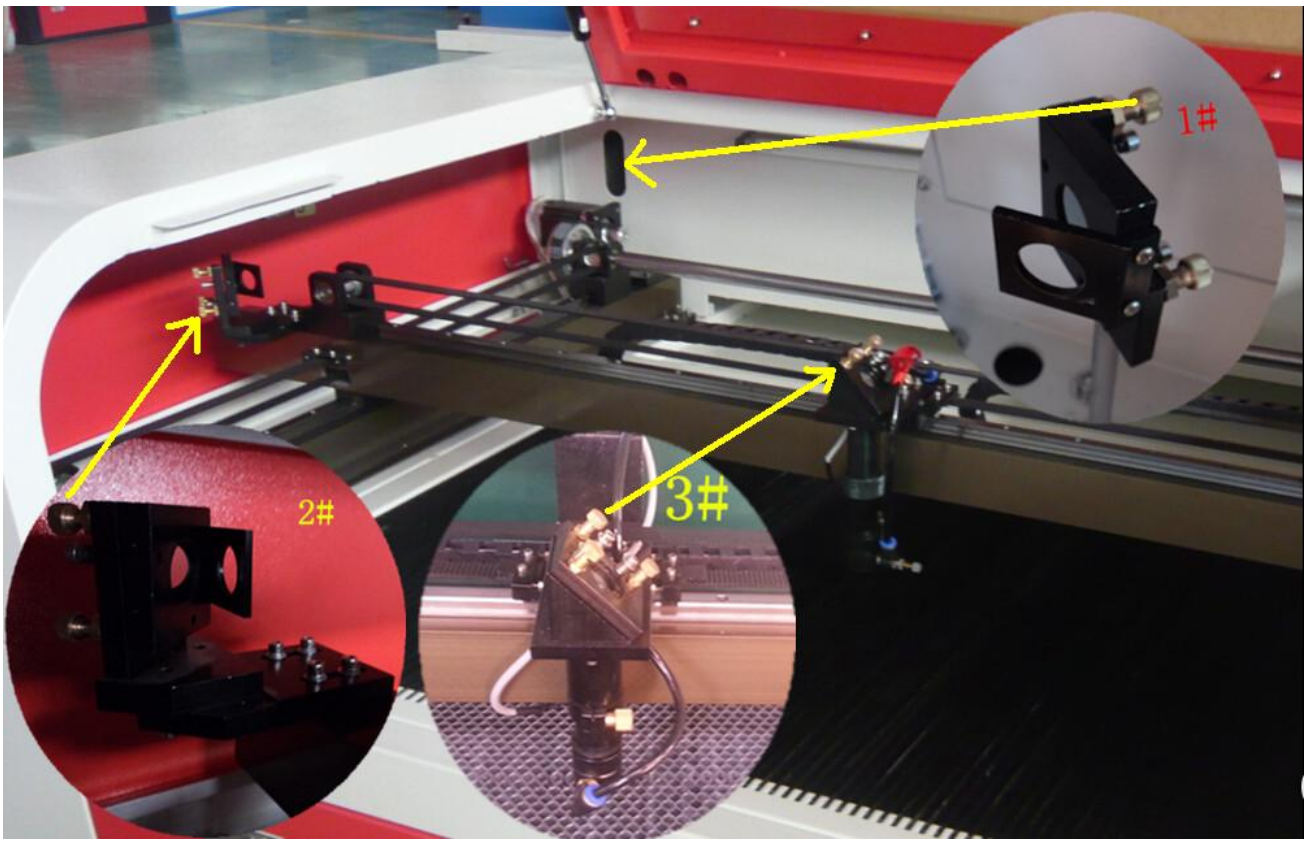
F2-12 F2-13

Attention please, bad grounding can cause high failure rate of equipment and at the same time may cause other safety incidents! ! !

The company won't **assume** any responsibility and obligation to the fault and the accident caused by bad grounding!!!

6. Optical Path Adjustment

After let all power cables connect well and electrify, turn on the engraving machine power supply, at this time, the machine starts to reset and return to the last origin point . All above shows that the machine is running normally, then turn on the laser power supply, begin to adjust the optical path. As shown in Fig.F1-14:



F2-14

Firstly, adjusting the laser position. Make the multilayer adjusting paper stuck on the 1# mirror frame, and then push the "Pulse" key on the control panel. There will be a burned point in the paper, check whether the light spot is in the center of the mirror, if the light spot is not in the center o f the mirror center, we have to make the light spot in the center of the mirror by regulating the location of the laser tube.

Then adjust the 1# reflector mirrors. Move the beams to the nearest place to the 1# reflector; push “Pulse” to get a spot in the paper. And then move the beams to the farthest place from the 1# reflector, get another spot in the paper. We adjust the angle of the mirrors by adjusting the three screws on the back of mirror (clockwise rotation the above screw, the spot will be down; clockwise rotation of the lower left corner of the screw, the spot will move to right; clockwise rotation of the lower right corner of screw, the spot will move to left.), to insure that all the spot are in the same place in

the paper when and where the beam we move.

After adjust the 1# reflector mirror well, the next, adjust the mirror 2# as we do at the first step, move the laser head to the nearest side to 2# reflector , then make a spot in the paper , then move the laser head to the farthest place to 2# , make a spot. We have to adjust the further spot overlap with the first spot by adjust the screws on the 2# reflector frame.

Note: As the best, the location of light spot should be in the center of mirrors. The light spot can not hit the edges of the mirrors. If playing in the edges, please continue to adjust the mirrors until the light spot in the central of them.

At last we have to check whether the light spots are superposition wherever the laser head is. If the spots can not coincide, please re-adjust the optical path by the way we talked above until the spots coincide

After finished the adjustment, we will check whether this laser spot is playing in central of the laser head light hole. If not, turn off the laser power supply, adjust the laser tube position. If it is left and right excursion, which side is biased on, we move the laser tube to this side direction. Such as: if left, we adjust the laser tube to left ; if right , we adjust the laser tube to right .

If the migration is up and down, we have to adjust the laser tube to the opposite direction, that is, if up, we will make the laser tube down; if down, we will make the laser tube up.

Note: The above adjustments is just for a low-voltage side of laser tube (light side), if we want to adjust high-voltage side of the laser to achieve the same effect, then the adjusting direction is opposite.

The detailed description of how to adjust optical path, please see Chapter 4 "Alignment Standards of Optical Path".

After adjustment of optical path, please close the laser tube protective cover.

Operation of laser machine

Besides use the computer to control the function key, we can use the Control Panel. The following is the brief instruction of control panel and main function.

There are 16 function keys and one LCD Panel in the Control Panel: