

# Maintenance & Repair Manual



**Exit**

# Content

- [Maintenance & Repair](#)
- [Common Faults and Troubleshooting](#)

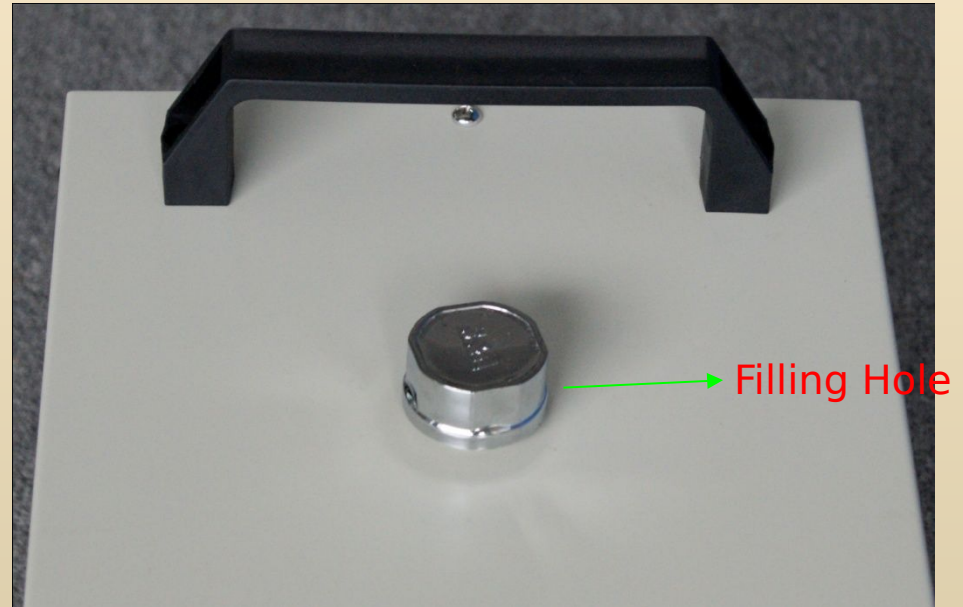
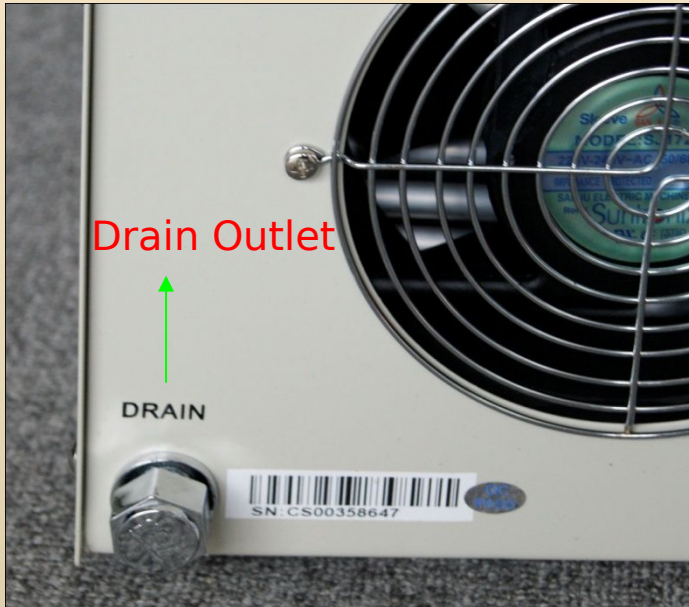


# Maintenance and Repair

## Method of exchanging water in the water tank and the exchanging frequency

### Method of exchanging water in the water tank

Drain the waste water out of the water tank through the drain outlet and fill the clean water into the tank through the filling hole.



### Exchanging Frequency

The purified water should be exchanged once a month and the running water should be exchange twice a month.

The quality of the circulating water will directly influence the service life of the laser tube. It is recommended to use purified water.



## Water Temperature Control

### Introduction to CW3000 Water Tank

The temperature of the circulating water will directly influence the service life of the laser tube. Therefore, the temperature should be controlled in the range between 5°C and 35°C. In case of too high or too low temperature, the alarm indicator lamp will flash and the water tank will automatically sound the alarm. If the water temperature is below 5°C, the user should slowly inject water (not more than 35°C) into the water tank and start the water tank to circulate the water. If the water temperature is more than 35°C, the user should exchange the circulating water or add ice into the water tank so as to cool down the water.



## Introduction to CW5000 Water Tank

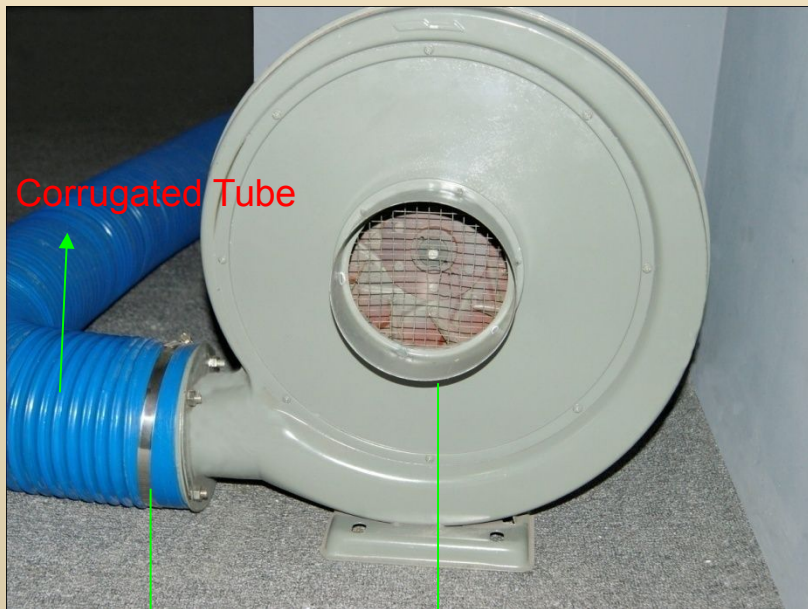
One of the differences between the CW5000 water tank and the CW3000 tank lies in that the CW5000 water tank can keep the water at a uniform temperature. Its cooling function can keep the temperature at a certain value, which can be adjusted manually. All the parameters related to the water tank have been set as the correct value by our company before delivery. The user may refer to the parameter instruction manual of the water tank for detailed description on the parameters. It is strongly suggested that the user should not change the parameters without authorization. Our company accepts no responsibility for any insolvable problems caused by the user's unauthorized changing of parameters.



# Installation of the Exhaust Fan and Operation Requirements

## Installation of the Exhaust Fan

Connect the air inlet of the exhaust fan to the air outlet of the laser machine ( by using the corrugated tube )  
And then connect the outlet of the exhaust fan with the corrugated tube to exhaust.



Air Outlet of the Exhaust Fan

Air Inlet of the Exhaust Fan

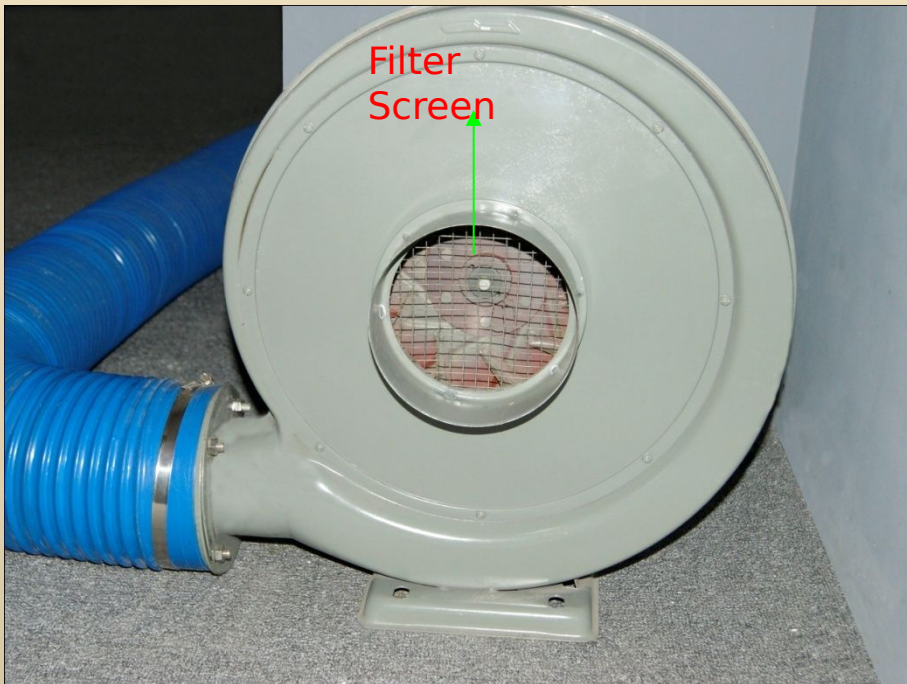


Air Outlet of the Laser Machine

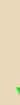


## Operation Requirements

There is a filter screen in the air inlet of the exhaust fan. After long time usage, the solid wastes will be accumulated on the filter screen, which will increase the noise of the exhaust fan and influence the effect of exhausting. If the suction power of the exhaust fan becomes weak or the smoke is difficult to be exhausted, you have to clean the filter screen. Switch off the power, remove the corrugated tube between the air inlet of the exhaust fan and the air outlet of the laser machine, clean the wastes on the filter screen, and then put the exhaust fan upside down and knock the case to clear up the waste inside.



Complete Installation



# Connecting Method and Functions of the Air Pump

## Connecting Method

Connect the outlet of the air pump to the air inlet of the laser machine.



Air Outlet of the Air Pump ↔ Air Inlet of the Laser Machine

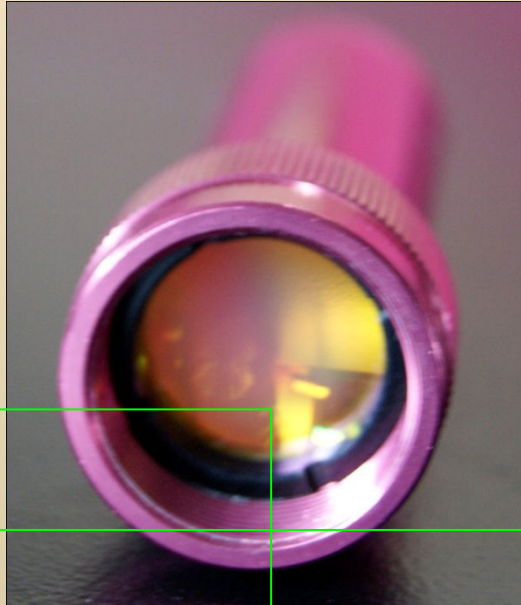


## Function of the Air Pump

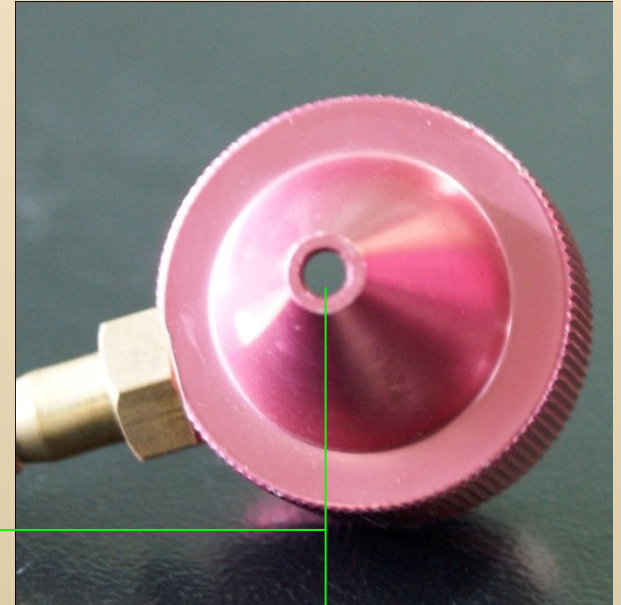
The air pump is used to suck in the surrounding air, deliver the air through the air pipe, and finally blow

out the air through the **laser exit hole** of the laser head. It has three main functions.

1. Cool down the cutting materials below ;
2. Cool down the focusing lens inside the lens cone ;
3. Prevent the smoke from getting into the lens cone through the laser exit hole and damaging the focusing lens.

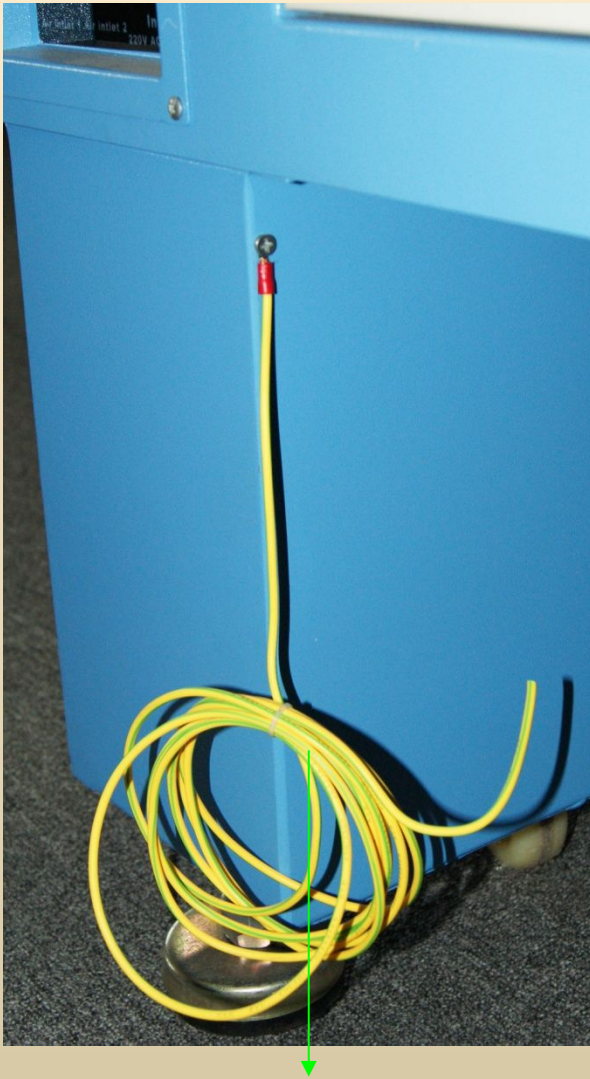


Focusing Lens



Laser Exit Hole

# Grounding



Grounding Wire : for  
discharging the static electricity.

## Grounding Method

- ① Find a damp place near the house , dig a hole with one-meter deep, and then put a piece of angle steel inside and connect on end of the grounding wire onto the angle steel (by using the electric wire with 2.5 square meters).
- ② Then measure the voltage to earth. The standard voltage is less than 5V.

## Hazard of No Grounding

No grounding or bad grounding will shorten the service life of the laser tube and result in the malfunctions of the equipment. The high voltage discharge may damage the control circuit and cause other safety accidents and even casualties !

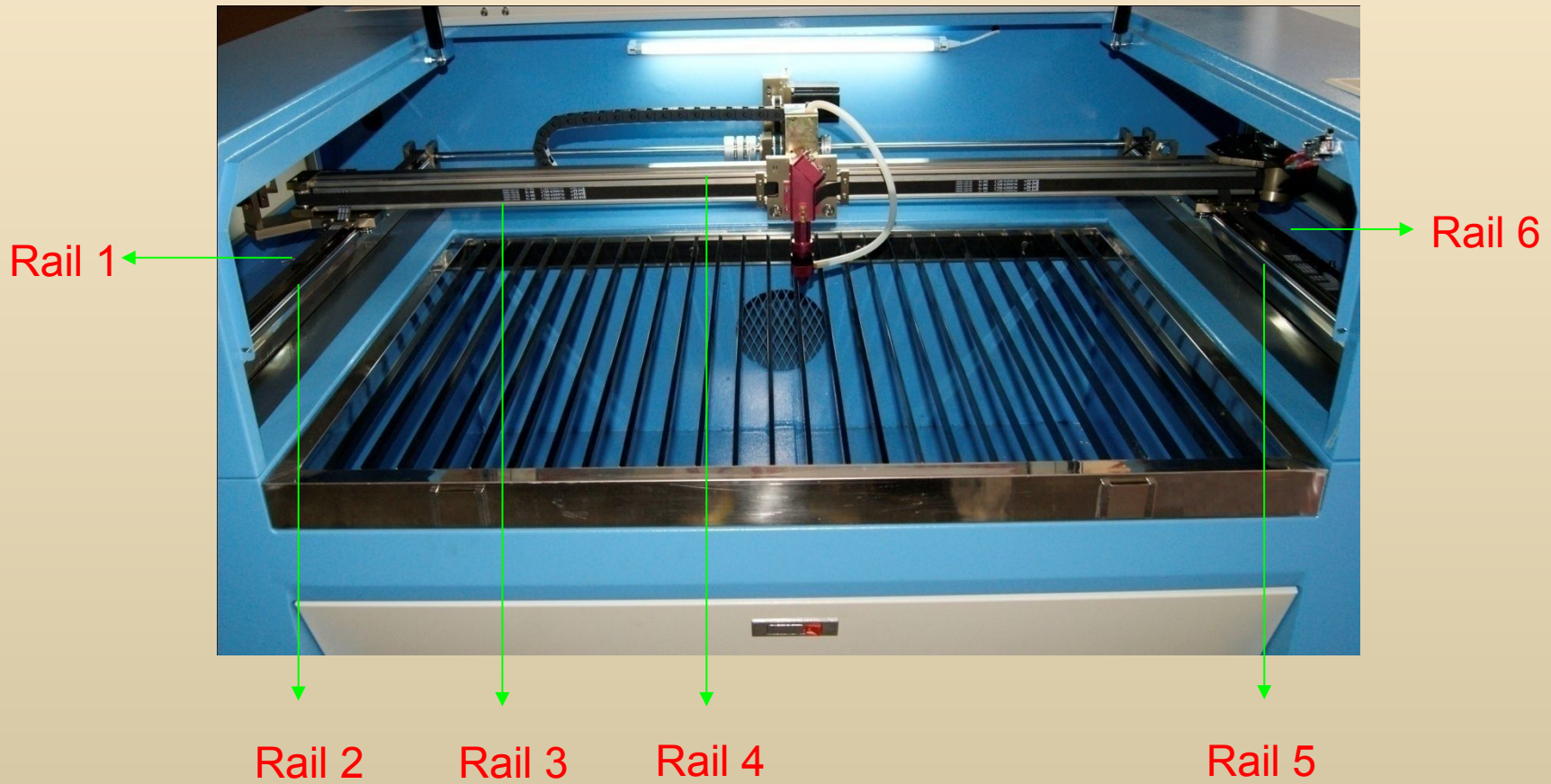
Attention: The device is prohibited to be used without grounding. We accept no responsibility for any problems caused by the operation without grounding.



## Maintenance for the Guide Rail

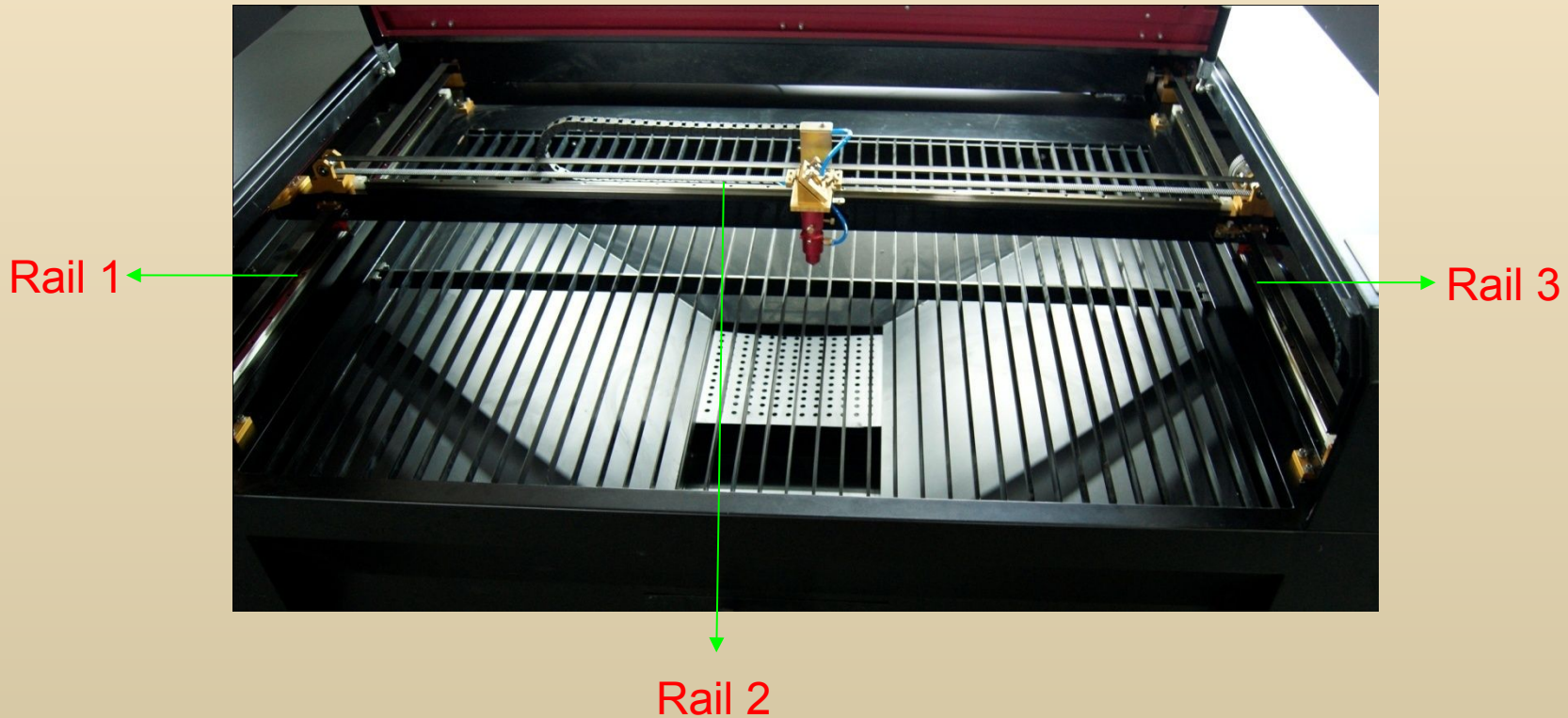
### Maintenance for the Out-sliding Guide rail

Clean the wastes and dust on the 6 rails of the 3 guide rails with clean towel or paper towel. Add new lubricating oil on the 6 rails (once a week, or according to the actual situations.)



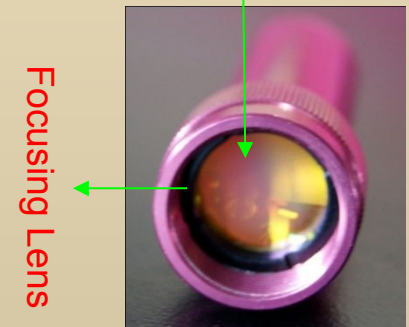
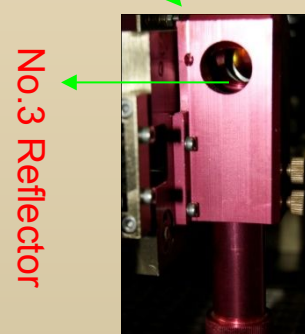
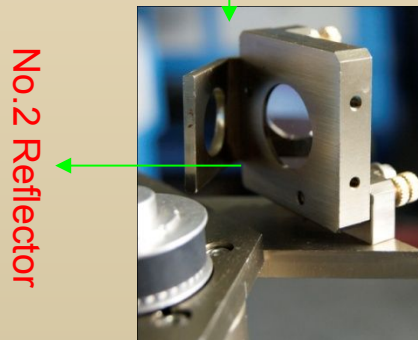
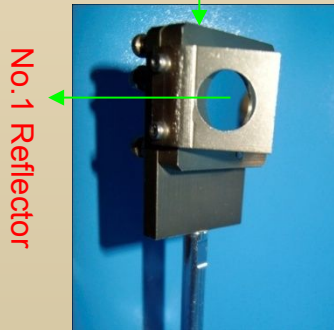
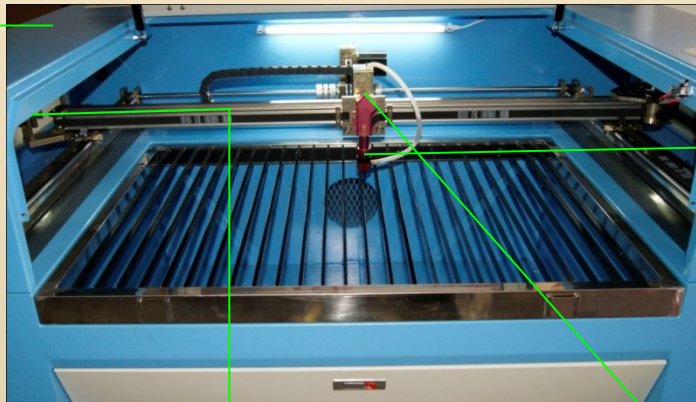
## Maintenance for the Linear Guide Rail

Clean the wastes and dust on the 3 rails of the 3 guide rails with clean towel or paper towel. Add new lubricating oil on the 3 rails (once a week, or according to the actual situations.)

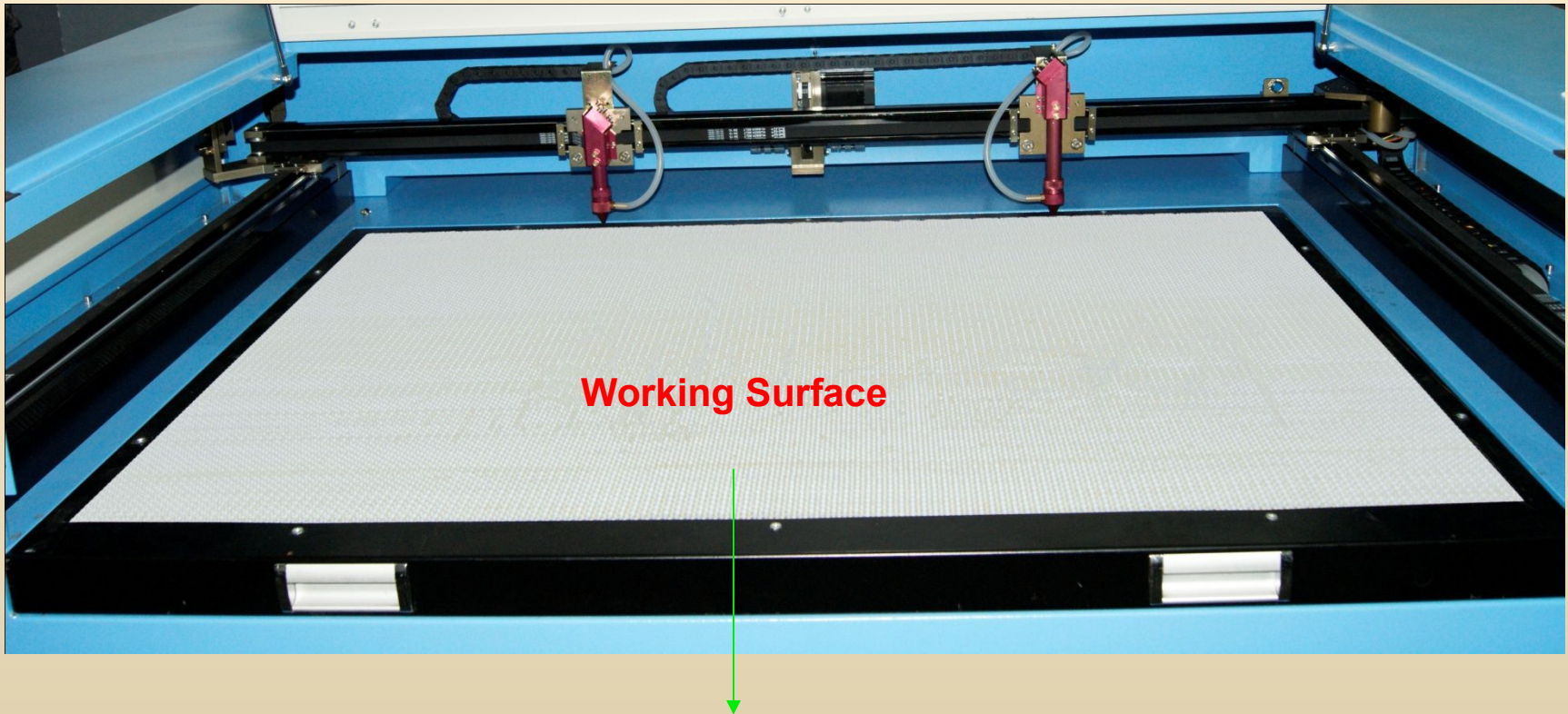


## Maintenance for the Lens

Take a piece of clean cotton swab, dip it in the alcohol solution, and softly wipe the 3 pieces of reflectors and 1 piece of focusing lens. It should use industrial alcohol, or ethanol, instead of medical alcohol because it contains too much water. Do not wipe the lens too hard, otherwise the layer of membrane on the surface of the lens will be damaged and thus influence the reflecting effect. As for reflector, the reflecting surface is necessary to be cleaned; as for focusing lens, both sides should be cleaned. After cleaning, use a piece of clean cotton swab to wipe out the remaining alcohol on the surface.



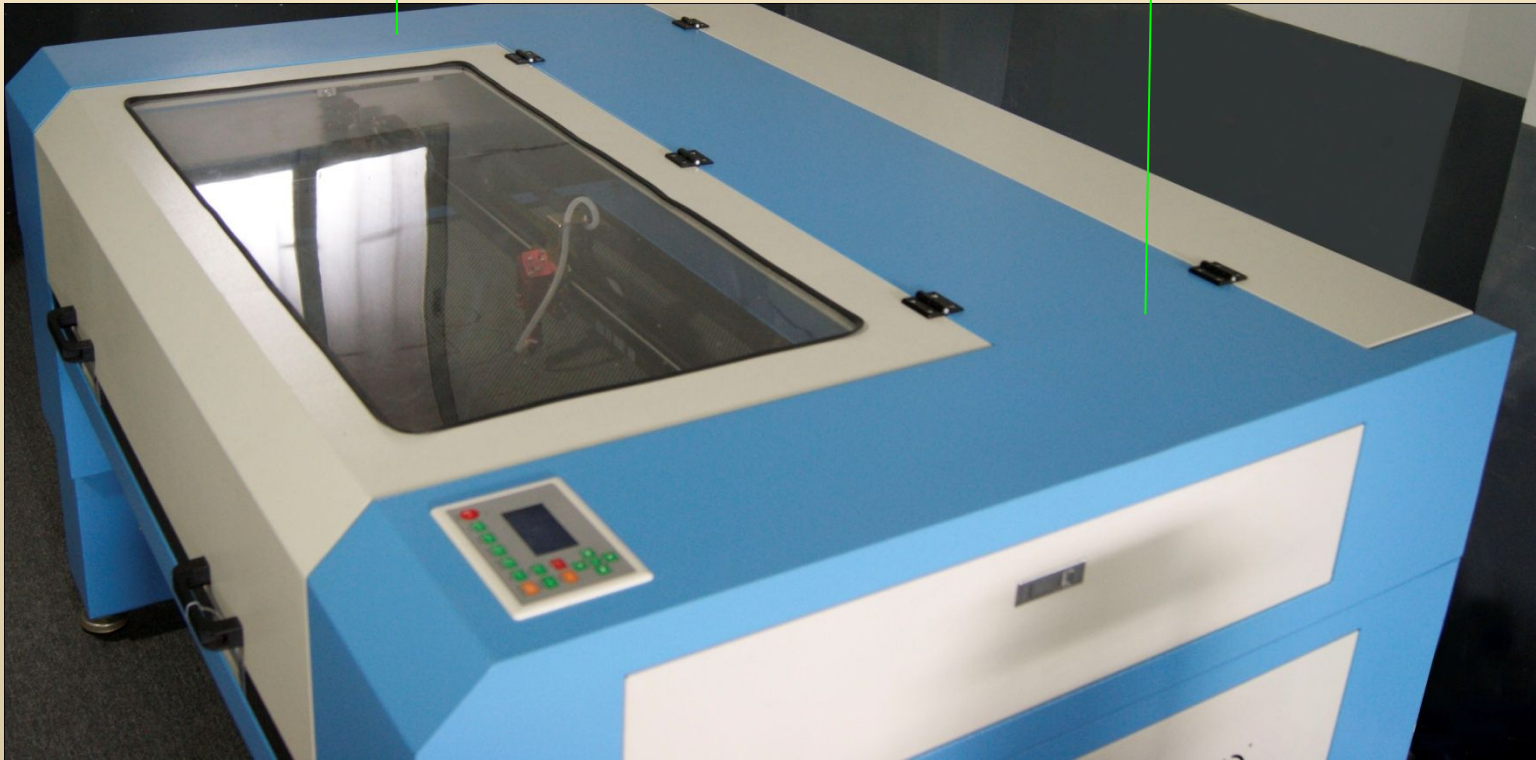
## Maintenance for the Working Surface



The flatness of the working surface directly influences the processing effect. The more flat surface will result in the better processing effect, vice versa. Therefore, during the operation, do not hit or strike the working surface forcefully and do not push the surface by your hands. Otherwise, the working surface may be deformed.

## Maintenance for the Cabinet

Do not put heavy objects on the cabinet. Otherwise, the cabinet will be deformed.

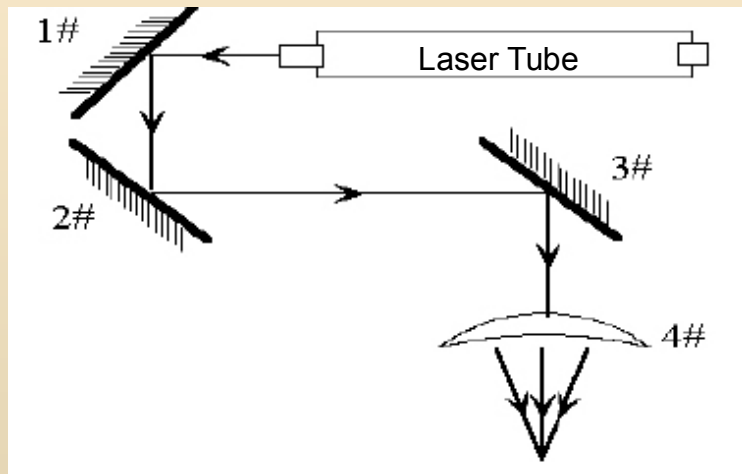


# Calibration of the Optical

## Path

During the operation of the cutting machine, the optical path may be deflected sometimes and cause the phenomenon of no laser or oblique optical path. In this case, please calibrate the optical path in accordance with the following method.

Step 1: adjust the laser beam emitted from the laser tube to shoot at the center of the No.1 reflector.

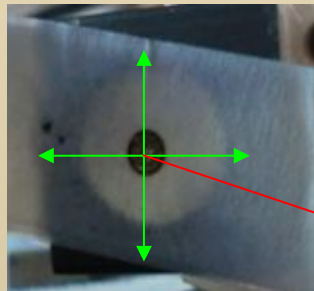
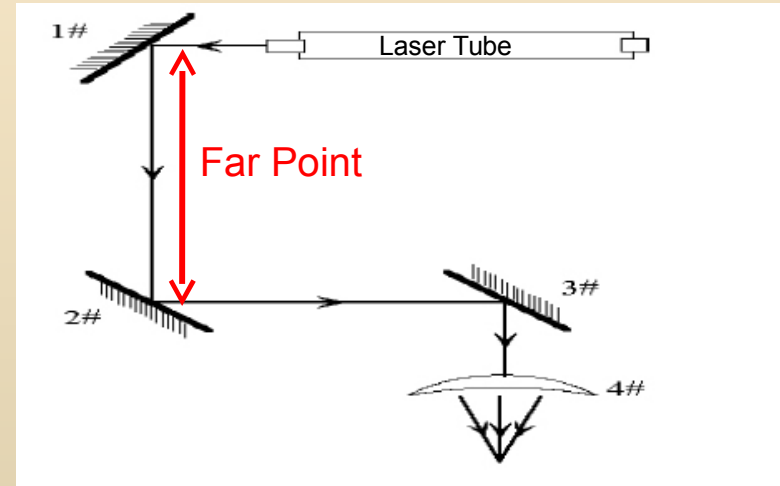
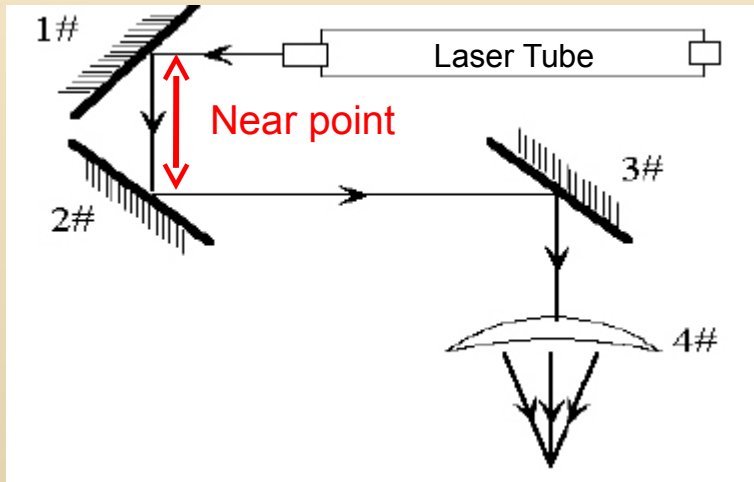


Shoot at the center  
of the circle.



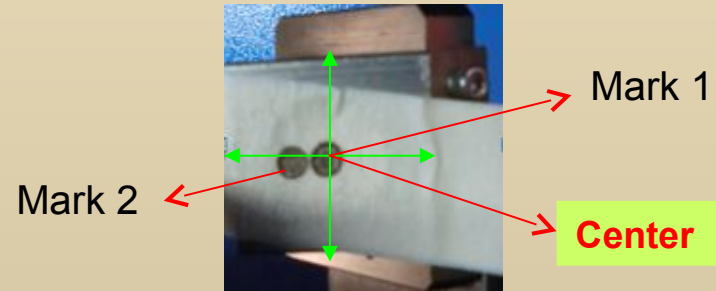
Step 2 : Paste a piece of crepe paper, or other objects that can be marked, on the No.2 reflector. Move the crossbeam to the nearest position to the laser tube. Then press 'Laser' with proper light intensity to make a mark 1. Attention: to prevent the laser from radiating and injuring people, please firstly use a paper board to determine the approximate location of the light spot and then make adjustment.

Step 3 : Slowly move the crossbeam to the farthest location from the laser tube. Press 'Laser' and make mark 2.



**Center**

Near point mark on the No.2 reflector



Mark 2

Mark 1

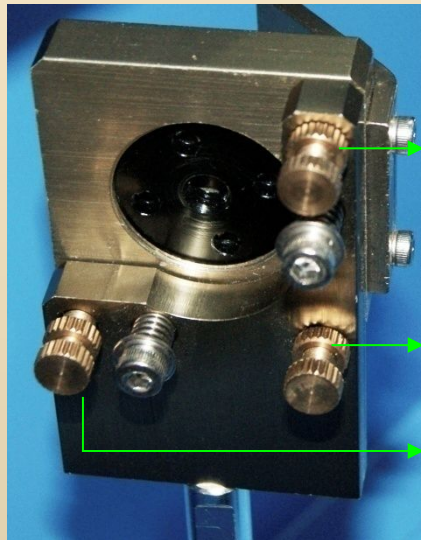
**Center**

Far point mark on the No.2 reflector



Example : It can be seen from the above picture that the near point mark and the far point mark of the No.2 reflector do not coincide. Tighten the screw 3 on the No.1 reflector to make these two points coincide.

### Regulating Screws on No.1 Reflector



**Screw  
1**

**Tighten : Move the light  
downward**

**Loosen : Move the light upward**

**Screw  
2**

**Tighten : Move the light up left**

**Loosen : Move the light down  
right**

**Screw  
3**

**Tighten : Move the light to the  
left**

**Loosen : Move the light to the  
right**

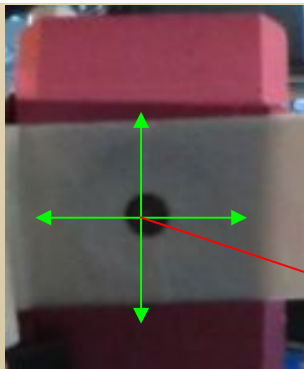
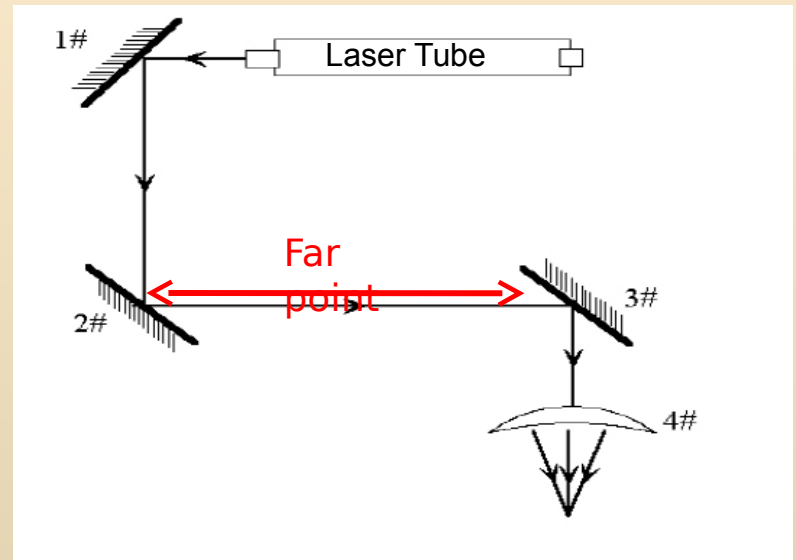
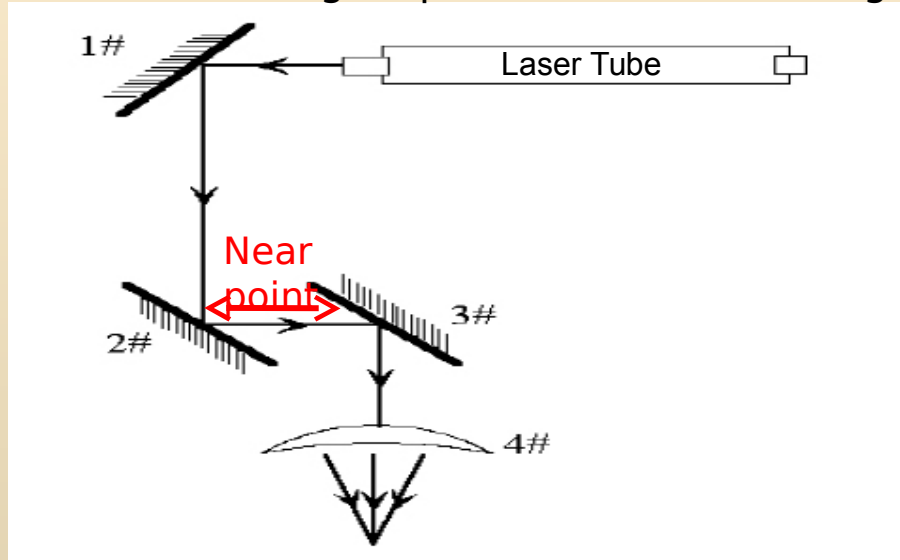
Step 4: If the two marks do not coincide, adjust the No.1 reflector by using the above method to make these two marks coincide.

Step 5: Repeat the procedure from the step 2 to step 4 until the two marks completely coincide and both of them are located at the center of the circle.

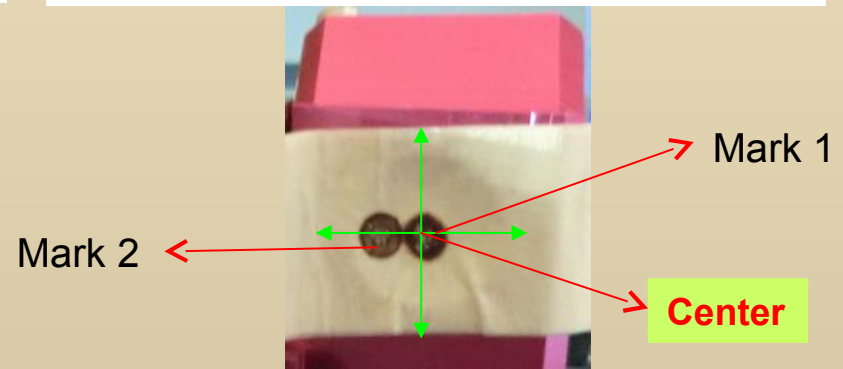


Step 6: Paste a piece of crepe paper on the No.3 reflector, move the laser head to the nearest position to the No.2 reflector, and then press 'Laser' with proper light intensity to make a mark 1.

Step 7: Slowly move the laser head to the farthest position from the No.2 reflector and then press 'Laser'. It is better to use a paper board to determine the approximate location of the light spot so as to avoid danger.



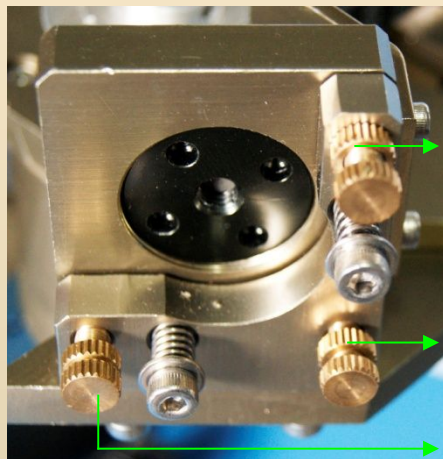
Near point mark on the No.3 reflector



Far point mark on the No.3 reflector

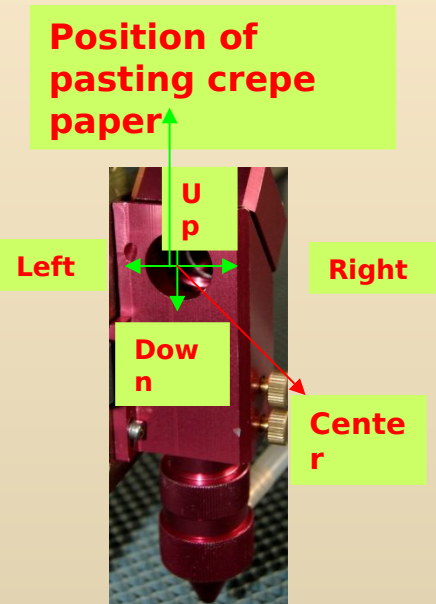


For example : It can be seen from the above picture that the near point and far point on the No.3 reflector do not coincide. It has to tighten the screw 3 on the No.2 reflector to make these two points coincide.



- Screw 1**
  - Tighten : Move the light downward
  - Loosen : Move the light upward
- Screw 2**
  - Tighten : Move the light up left
  - Loosen : Move the light down right
- Screw 3**
  - Tighten : Move the light to the left
  - Loosen : Move the light to the right

Regulating screws on the No.2 reflector



Position of the No.3 reflector



Step 8: If the two marks do not coincide, adjust the No.2 reflector by the above method to make them coincide.

Step 9: Repeat the procedure from the step 6 to the step 8 until the two marks completely coincide.

Step 10: If the two marks in the step 9 are completely coincide and at the center of the circle, then it's qualified.

Step 11: If the two marks are not at the center of the circle, as shown below.



→ Deviate to Outside

In this instance, the mark deviates to the upper side and outside.

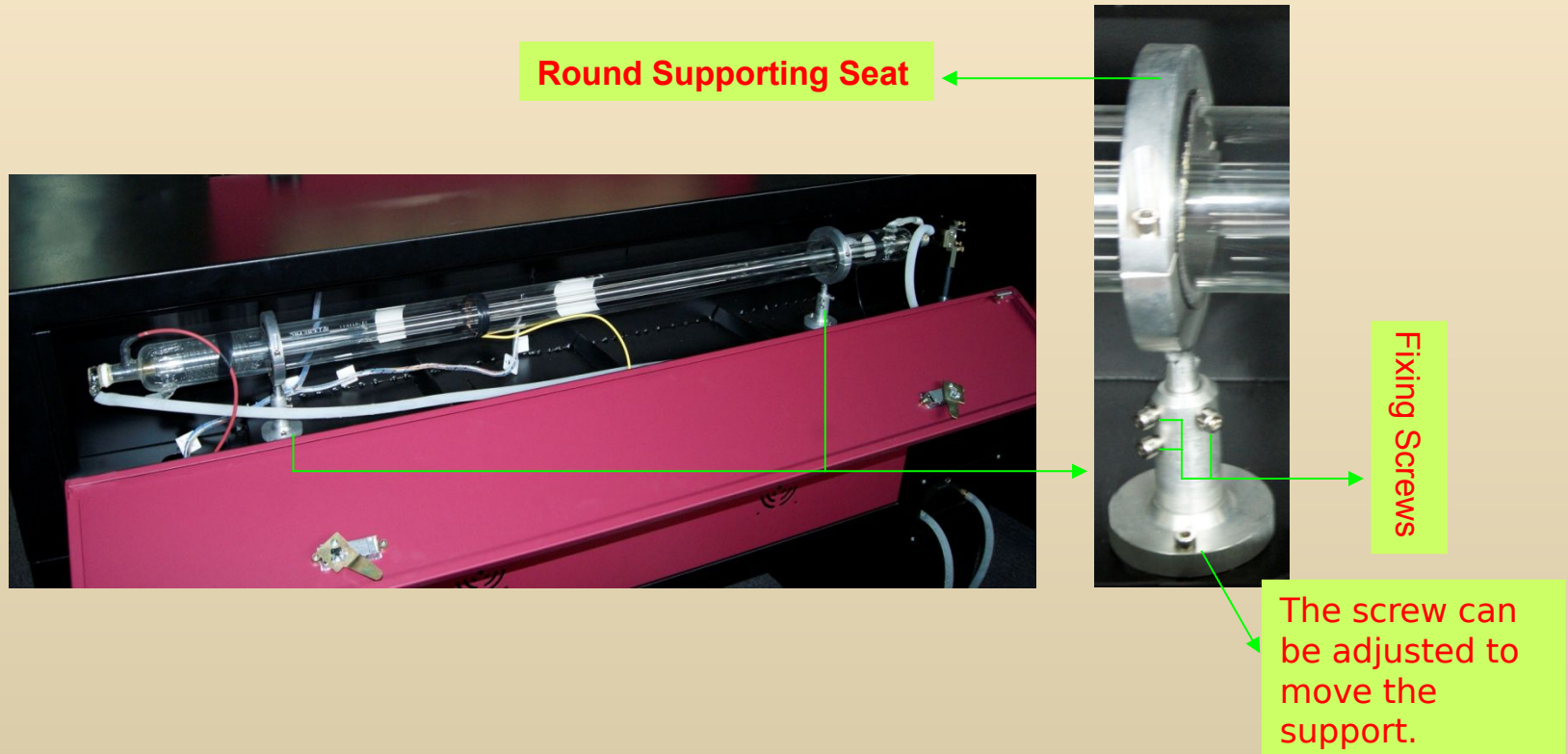
Vertical deviation: Move the laser head to adjust.

Internal and external deviation: Adjust the laser tube internally or externally.

As for this instance, we can adjust the laser tube to the outside and repeat the procedure from the step 10 to the step 11.



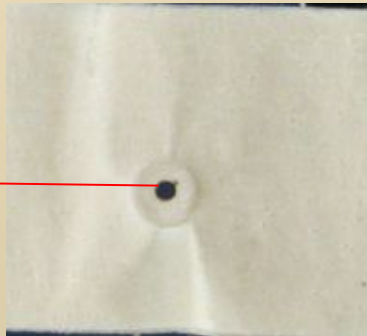
It can be seen from the following picture that only if we loosen 3 fixing screws on the two round supporting seats of the laser tube, the laser tube can be lifted or lowered down.



Step 12: Paste a piece of crepe paper on the tip of the laser head. Press 'Laser' to make a mark. Check if the mark is at the center of the circle. If not, adjust the No.3 reflector to make the mark at the center.

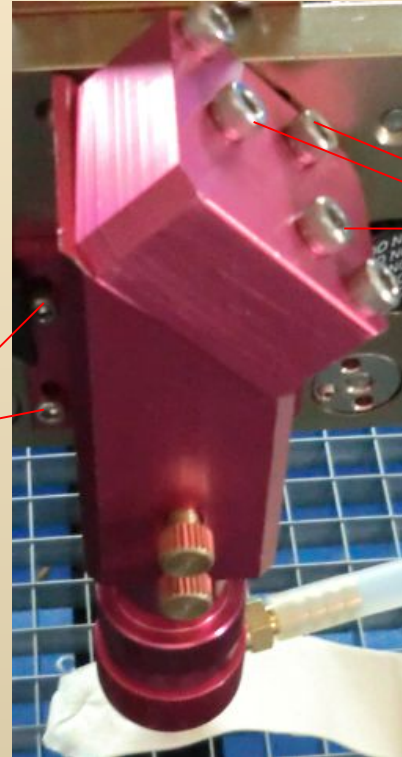


Deviate to the left



Right at the center

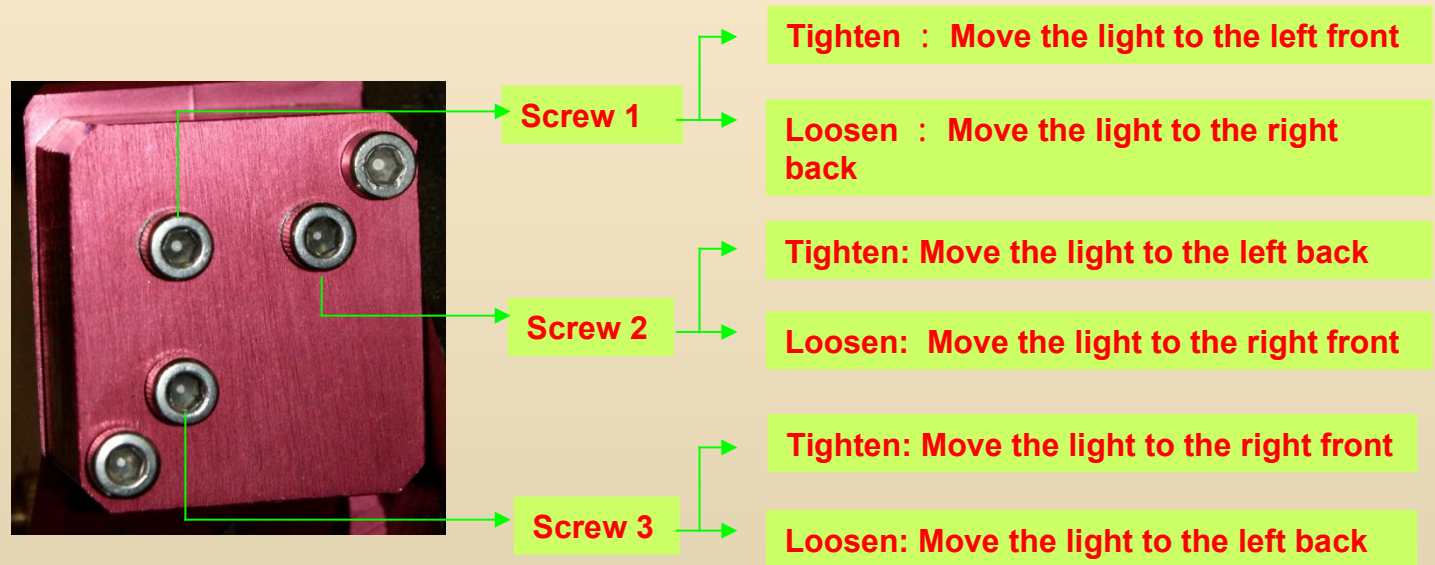
Fixing  
Screws  
on the Laser  
Head



Light adjusting screws



For example, the problem of deviation to the left, as shown in the above figure, can be solved by adjusting Screw 1 and 3, and the mark will be centered.



### Regulating Screws on the No.3 Reflector

Note: The adjustment should be done by the qualified operators who have accepted professional training, or operate by asking for other person's help. During adjustment, be careful not be damaged by the laser radiation.



## Common Faults and Troubleshooting

1. There is no light during the operation of the machine

1) The laser tube itself has light;

a. There is light inside the laser tube while no light is at the light outlet, as shown in the following picture. It indicates that the laser tube has been damaged and needs to be replaced.

No light at the light outlet



b. There is light in both the laser tube and the light outlet, however, no light is at the laser head, as shown in the following picture. It indicates that the optical path is skewed and the problem can be solved by adjusting the optical path.



No.1 Reflector



No. 3  
Reflector



2) The laser tube has no light :

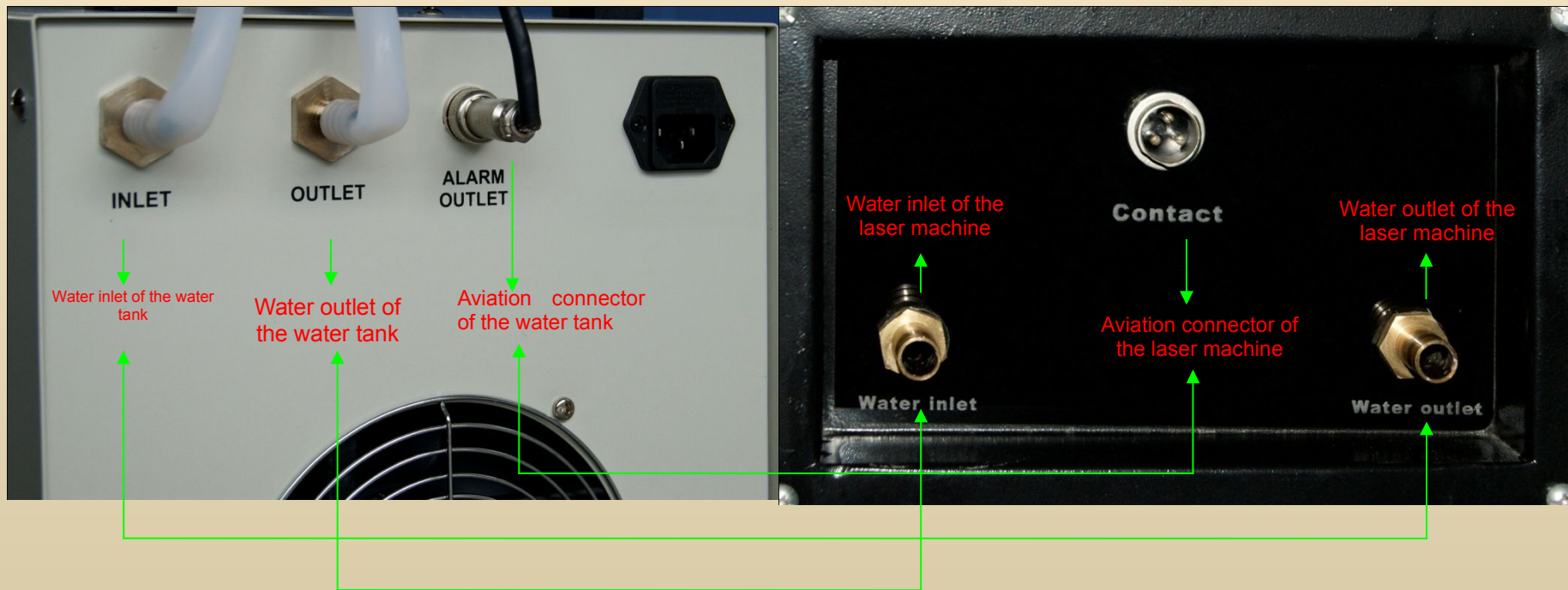
a. Check if the laser tube is broken. If the tube is broken, as shown in the following pictures, it indicates that the laser tube cannot be used any more and has to be replaced.



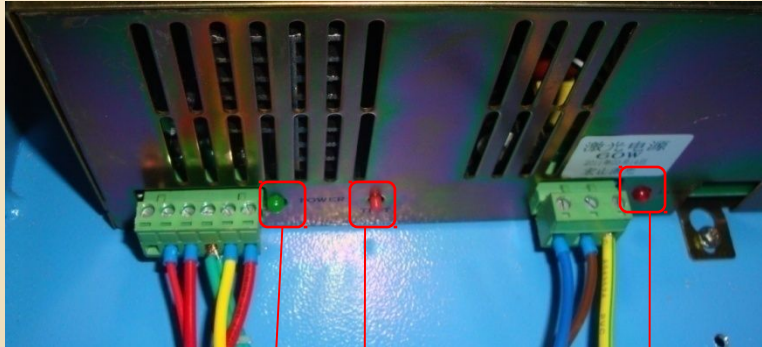
The internal tubes are broken



b. Check if the water circulation is in normal status(check the water inlet of the water tank). Check if there is no water flow or inadequate passage of water and if the water pipe connection is correct. The water outlet of the water tank should be connected to the water inlet of the machine and the water inlet of the water tank connected to the water outlet of the machine, as shown below. If it is water frame, check if the power plug of the water pump is firmly in place. And then clean the water pump and clear out the pipes.



c. If the water circulation is in normal status, check if the laser power indicator lamp is on and if the power fan is running. If problems occur as shown in the pictures below, it indicates that the laser power is damaged and needs to be replaced.



Power indicator lamp

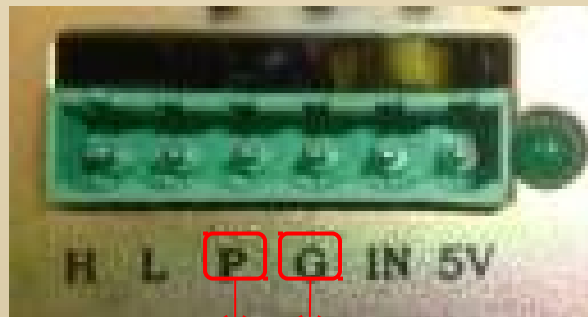
Test button

Laser indicator lamp



Power fan

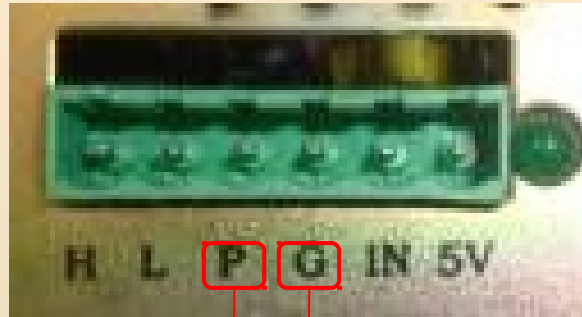
d. If there is still no light after short-circuit of the water protection signal wire, as shown below, it indicates that the motherboard is malfunctioned and needs to be replaced.



Short-circuit of P and G



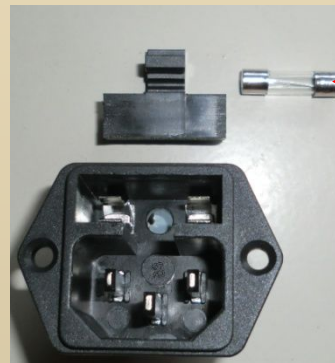
e. If the shorted water protection signal wire has light, as shown below, it indicates that the water protection is damaged and needs to be replaced.



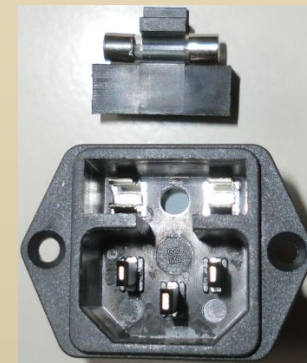
Short-circuit of P and  
G

2. No response after start-up:

1) Check if the control panel has display or if the fluorescent tube is lighted. If not, it indicates there are problems with power supply system or fuse of the main power.



Fuse

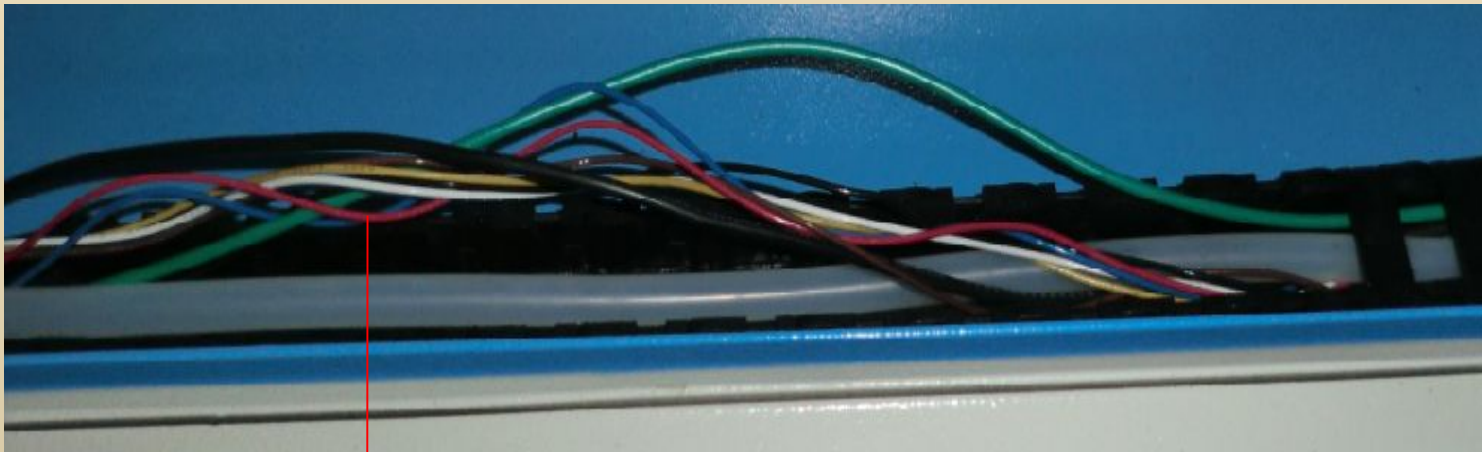


2) Check if the 36V and 24V switching power supply has output. If not, as shown below, it indicates that the switching power supply is damaged and needs to be replaced.



Power Supply Indicator Lamp

If nothing wrong with the above mentioned items, check if the motor wires are damaged or broken. If the wires are damaged, as shown below, they should be replaced accordingly.



Wires of the motor

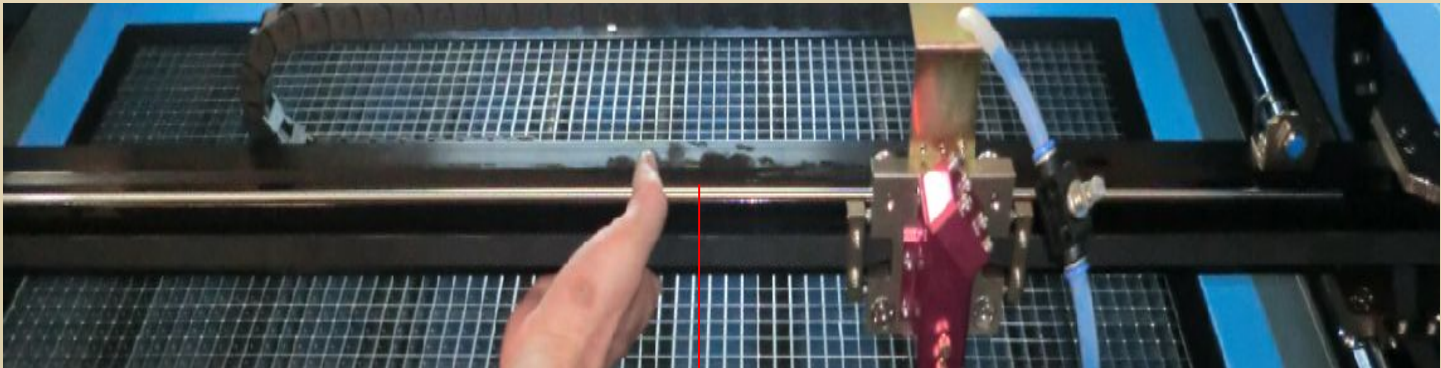


3) If nothing wrong with the above mentioned items, check if the driver is ok. If the red lamp is on, as shown below, it indicates that the driver is damaged and has to be replaced.

Driver running  
indicator lamp



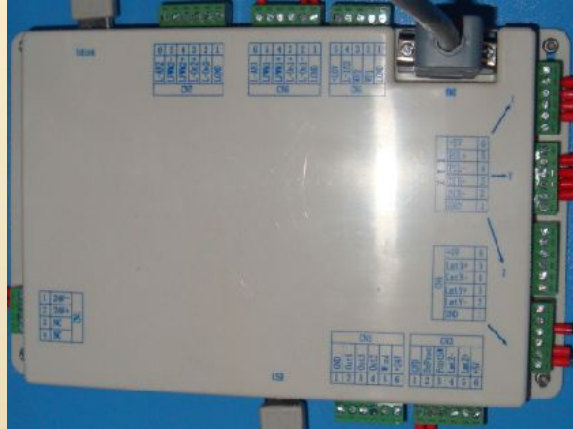
4) If nothing wrong with the above mentioned items, gently push the laser head and the crossbeam by your hands during the running status. If they are moved, as shown below, it indicates that the motor shaft is broken and the motor has to be replaced accordingly.



Crossbeam of the Guide Rail



5. If there is still no response after above inspection, as shown below, it indicates that the motherboard is malfunctioned and has to be replaced.



### 3. Cutting difficulty or insufficient engraving depth

1) Check the working power, speed, and water temperature. If the speed is too fast, the power is too small, and the water temperature is too high, it is necessary to increase the power, reduce the speed, and exchange the water. The temperature shown below is normal. If the temperature is over  $38^{\circ}\text{C}$ , the water has to be exchanged.

Temperature Indicator Lamp

Alarm Indicator Lamp

Normal Status Lamp



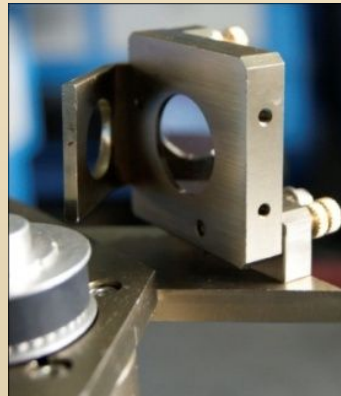
CW3000 water  
tank



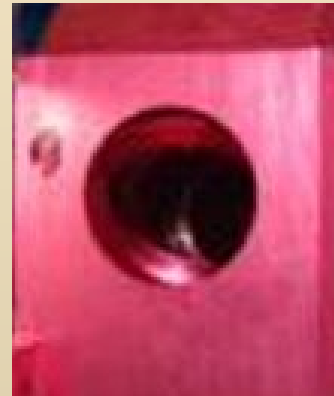
2 ) Check if the following reflectors and focusing lens are dirty or damaged. If dirty, clean with the cotton swab dipped with alcohol. Besides, check if the optical path is deviated. If so, it is necessary to adjust the optical path. Refer to the chapter of Maintenance for detailed adjusting steps.



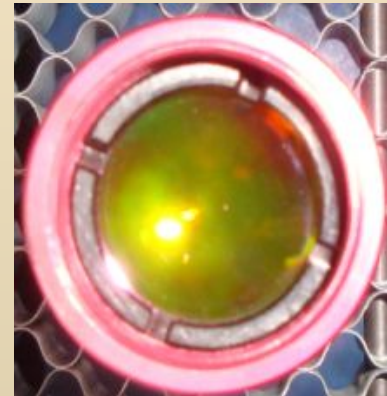
No.1 Reflector



No.2 Reflector

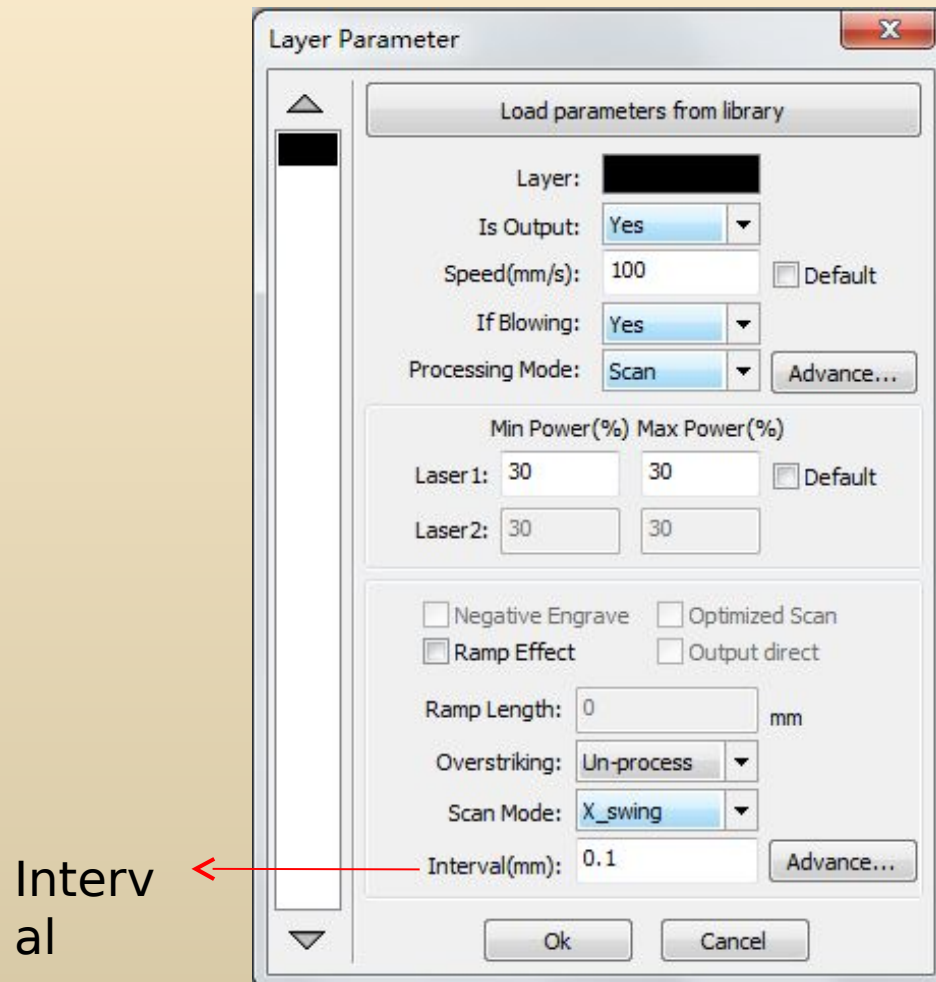


No.3 Reflector

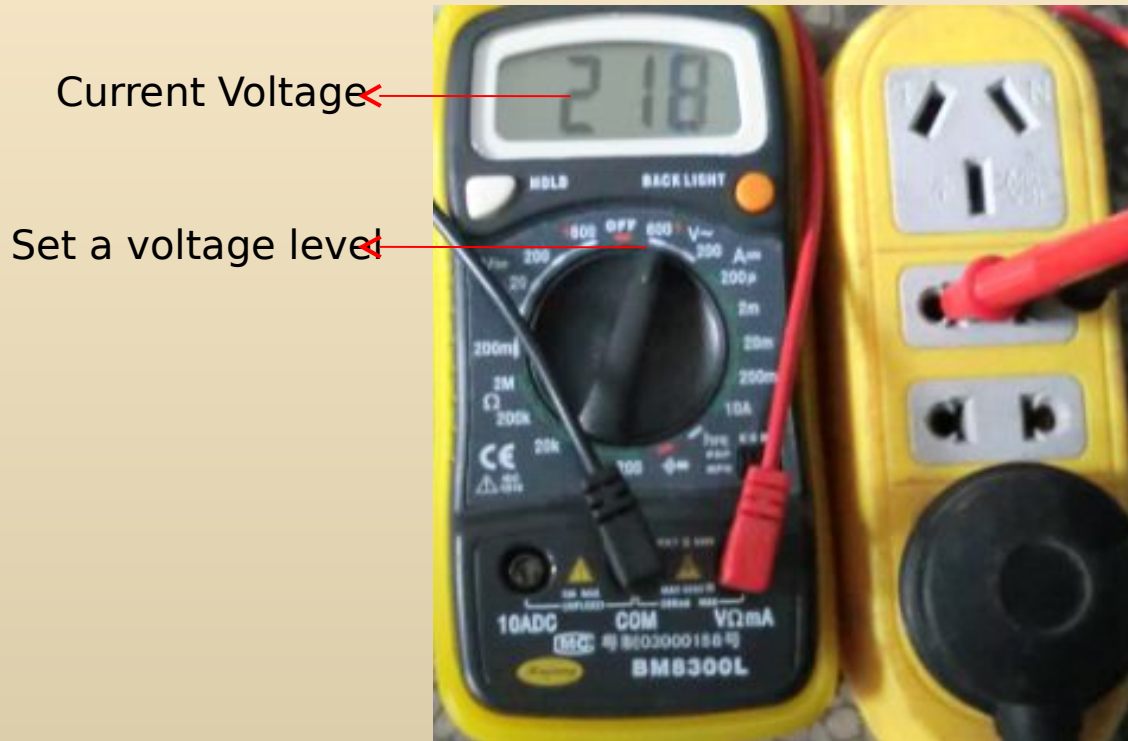


Focusing Lens

3) If nothing wrong with the above mentioned items, check if the engraving depth is normal. If not, as shown below, it can reduce the value of interval (default value is 0.1) on the basis of the actual situation and customer's requirement.



4) If nothing wrong with the above mentioned items, check if the supply voltage is stable and not less than AC 200V by using a multimeter. The reading number in the following picture is normal. If the voltage is less than AC 200V, it requires the user to use voltage stabilizer.



5) If nothing wrong with the above mentioned items, and the insufficient cutting and unstable engraving still exist, and the current value of the ammeter is only about 5-10mA, as shown in the picture below, it indicates that the laser power has been damaged and needs to be replaced.

The current is less than 5mA ←

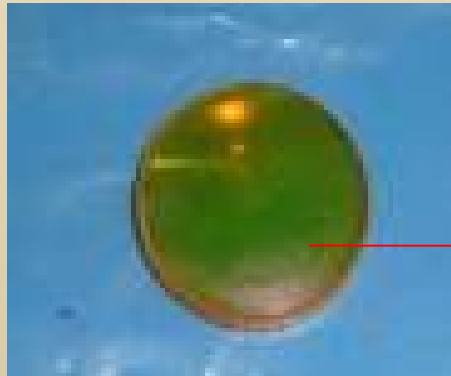


6) If nothing wrong with the above mentioned items, and the insufficient cutting and unstable engraving still exist, and the current value of the ammeter is in the range between 20 and 25mA, as shown in the picture below, it indicates that the laser tube has been aged and has to be replaced.



4. Sometimes the machine has light and sometimes hasn't

1) Check if the lens is dirty or broken. If so, as shown below, the lens should be cleaned or replaced.

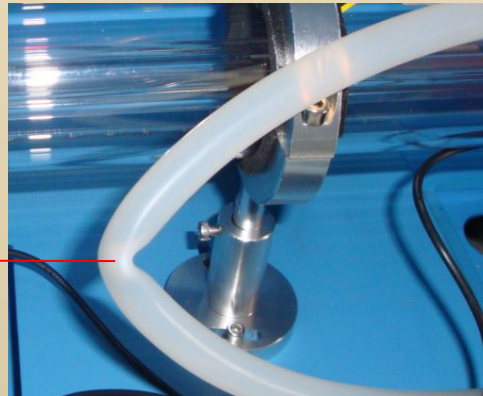


2) Check if the optical path deviates. If so, as shown below, the optical path should be adjusted.



→ Deviate to the right

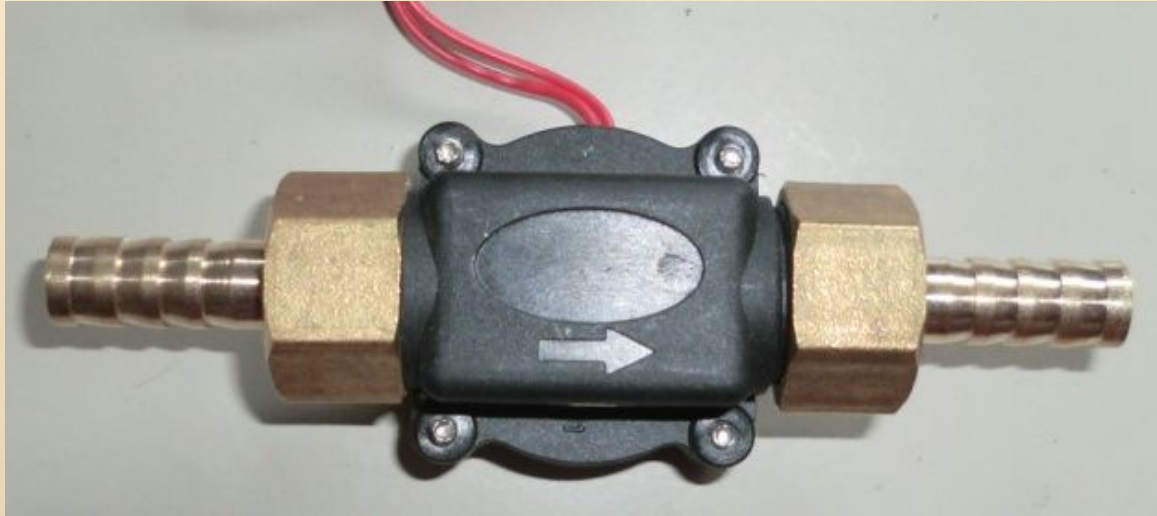
3) If above mentioned items are normal, check if the water circulation is normal. If the water flows discontinuously, as shown below, the user has to clean or replace the water pump and clear out the water pipe.



The water pipe is bent ←



4) If the water circulation is normal, it is likely the malfunction of the water protection, as shown below. In this case, the water protection should be replaced (only for the customers using the water framework).

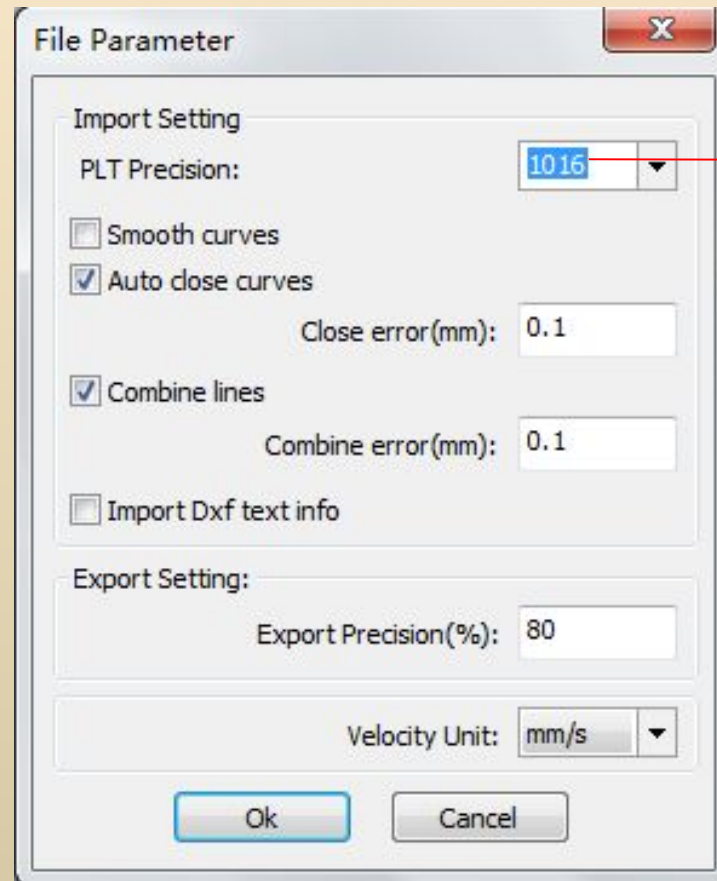


Water protection

5) If problems still exist, it may be the problems related to the motherboard, laser power, or laser tube. It has to find out the real reason by using the displacement method.

## 5. Incorrect graphic output dimension

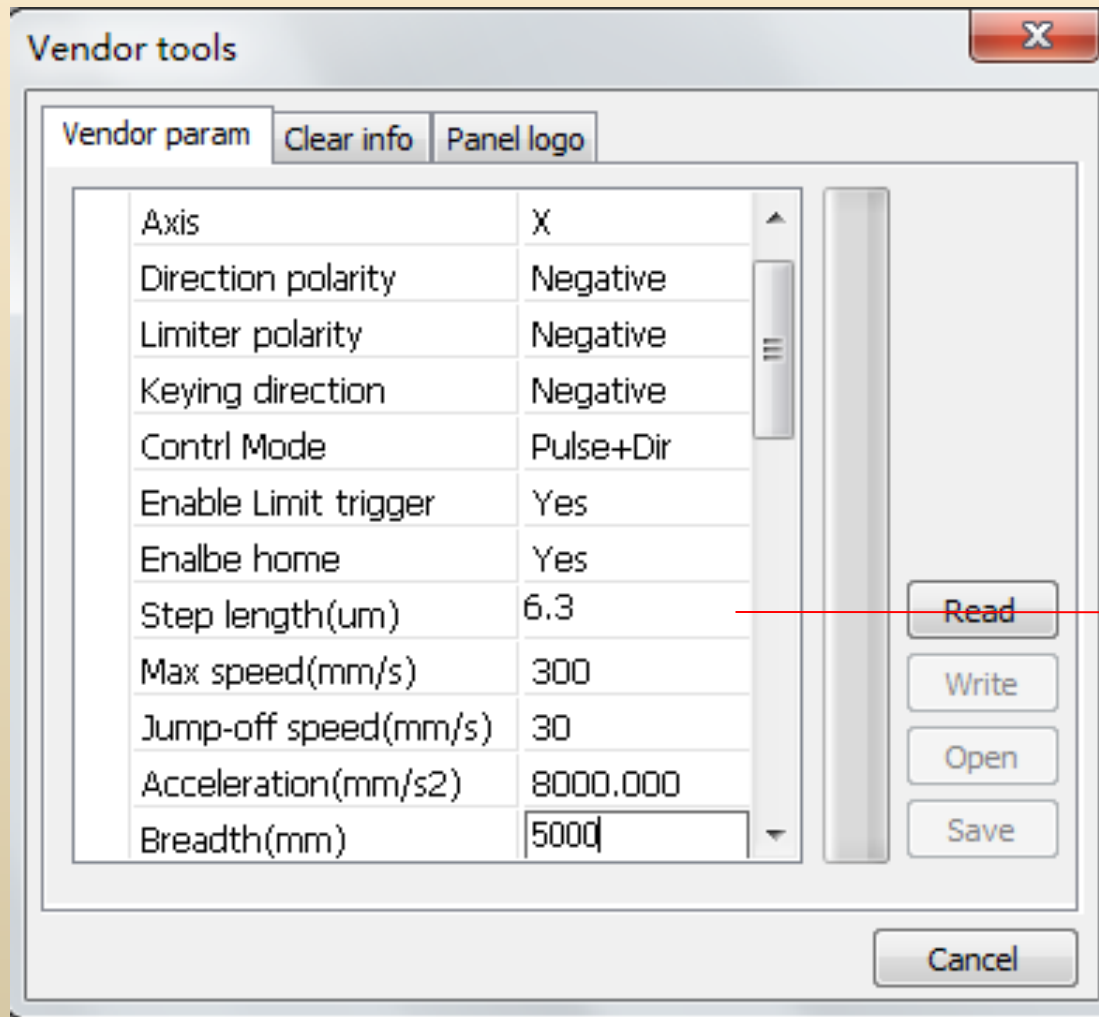
1) If the graphs are output with PLT format in CorelDraw, make sure that the unit of the graph plotter is set as 1016 , the output precision of the curve is set as 80, and PLT precision in Hongsan Laser Software is also set as 1016. If not, change the unit of the graph plotter to 1016. The following picture indicates the correct setting.



→ Unit of Graphic Plotter



2) Check if the step length of the motor is correct. The picture below is the modification interface. The step length of T-series motor should be changed to 6.3 and that of Z-series motor 4.8.



The 'Vendor tools' dialog box contains a table of motor parameters. The 'Step length(um)' field is currently set to 6.3. A red arrow points from this field to the 'Read' button, indicating the action to be taken.

Vendor param	
Axis	X
Direction polarity	Negative
Limiter polarity	Negative
Keying direction	Negative
Contrl Mode	Pulse+Dir
Enable Limit trigger	Yes
Enalbe home	Yes
Step length(um)	6.3
Max speed(mm/s)	300
Jump-off speed(mm/s)	30
Acceleration(mm/s <sup>2</sup> )	8000.000
Breadth(mm)	5000

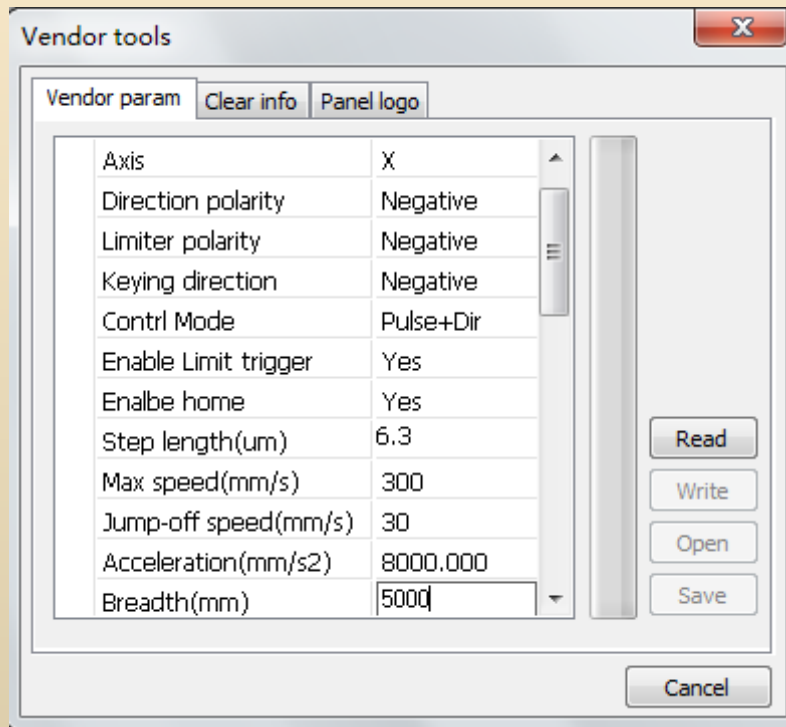
Buttons: Read, Write, Open, Save, Cancel

Step length  
of the motor



## 6. Abnormal phenomenon during resetting the machine

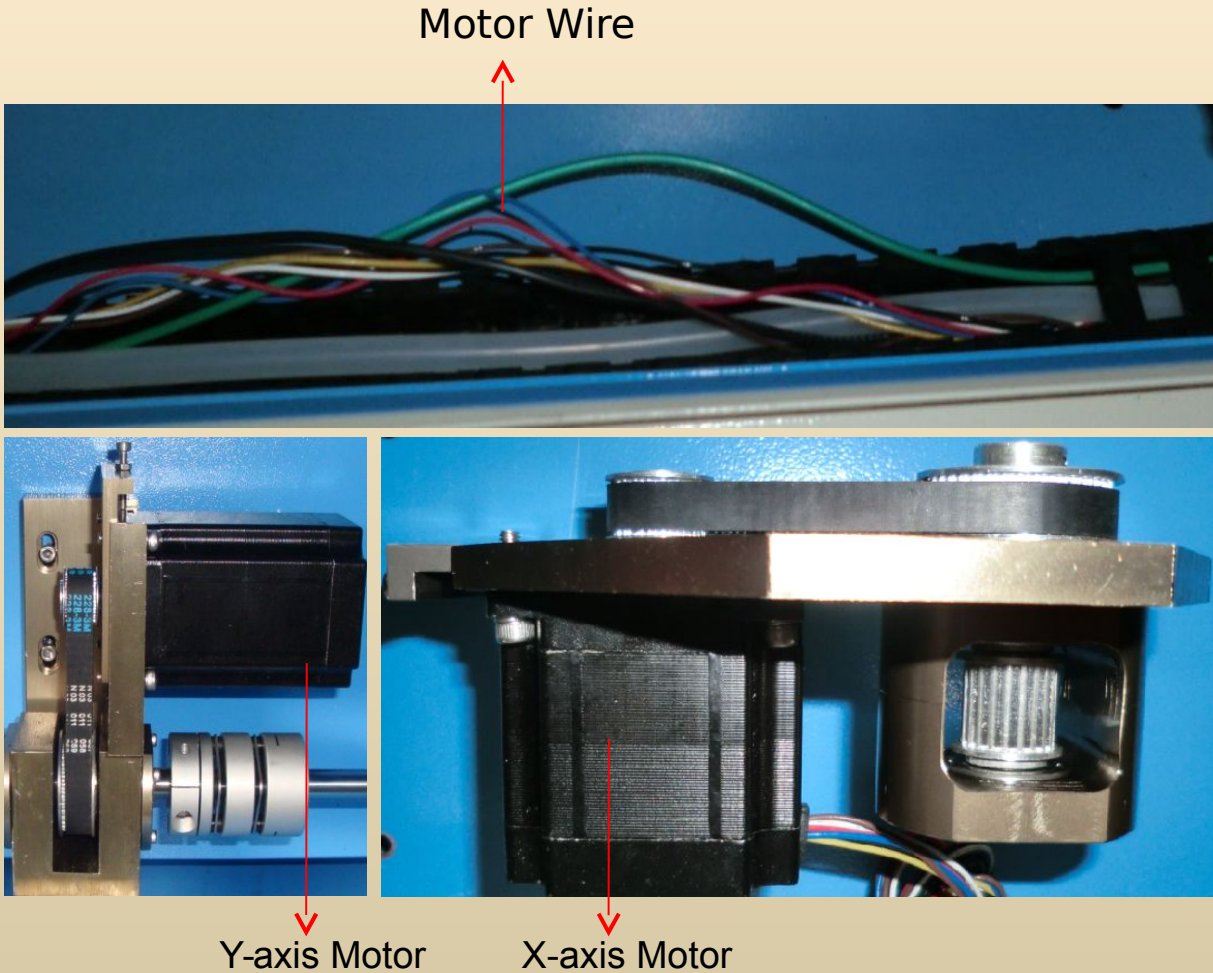
1) When the machine is reset, the direction is correct, however, the X-axis or Y-axis cannot stop when they reach the apex. Firstly, check the parameters of the motherboard. If correct, check the motherboard or the sensor by using the displacement method.



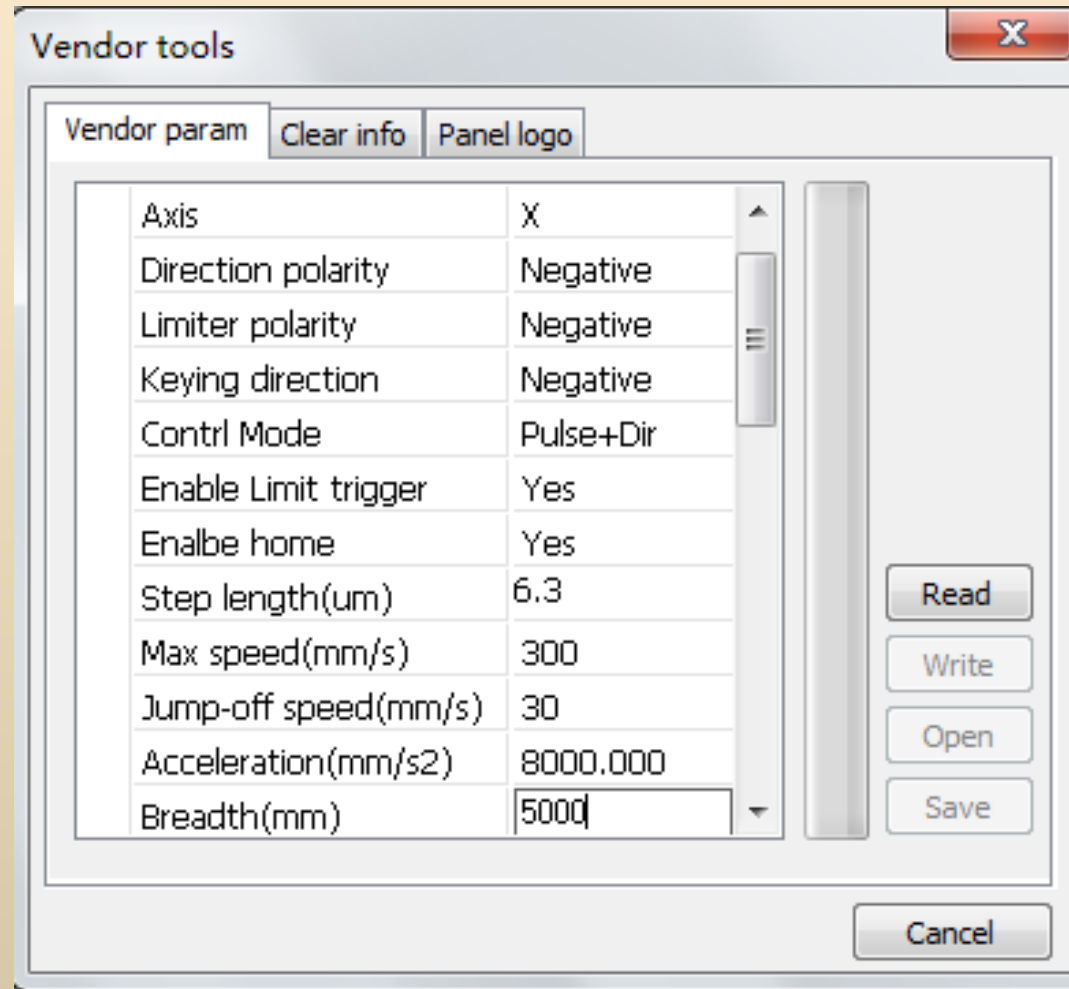
Sensor



2) The crossbeam resets normally but the X-axis cannot move. In this case, it is likely the problem of motor wire broken or motor shaft broken. Therefore, the motor wire or small motor has to be replaced.



3) During resetting, X-axis and Y-axis moves in opposite directions and hit the side. In this case, check if the parameters of the motherboard are correctly set. If not, stop the machine and modify the parameters.



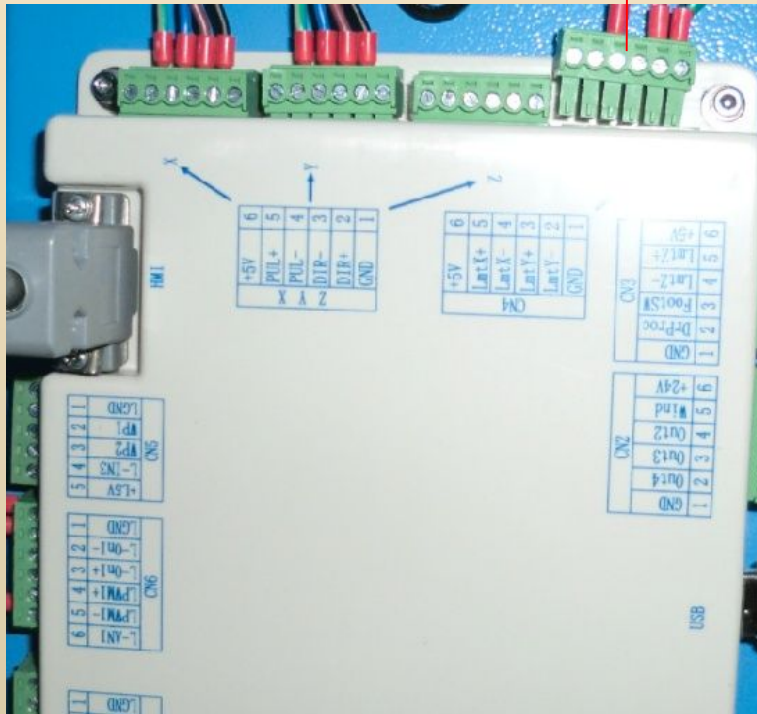
The screenshot shows a software window titled "Vendor tools" with a standard Windows-style title bar (minimize, maximize, close buttons). Inside the window, there are three tabs: "Vendor param" (selected), "Clear info", and "Panel logo". Below the tabs is a table of parameters for the X-axis. The table has two columns: the parameter name and its current value. To the right of the table is a vertical scrollbar. To the right of the scrollbar are four buttons: "Read", "Write", "Open", and "Save". At the bottom right of the window is a "Cancel" button.

Axis	X
Direction polarity	Negative
Limiter polarity	Negative
Keying direction	Negative
Contrl Mode	Pulse+Dir
Enable Limit trigger	Yes
Enalbe home	Yes
Step length(um)	6.3
Max speed(mm/s)	300
Jump-off speed(mm/s)	30
Acceleration(mm/s <sup>2</sup> )	8000.000
Breadth(mm)	5000



4) During resetting, the control panel has display but the X-axis and Y-axis do not move. If the sensor terminal of the motherboard is unplugged, the machine begins moving. In this case, the sensor has to be replaced to solve the problem.

## Unplug the Sensor Terminal

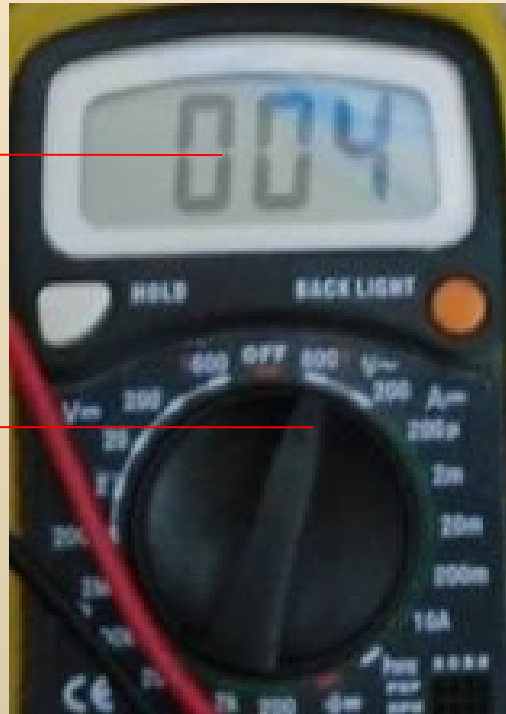


7. Engraving is suspended, omitted, or in disorder

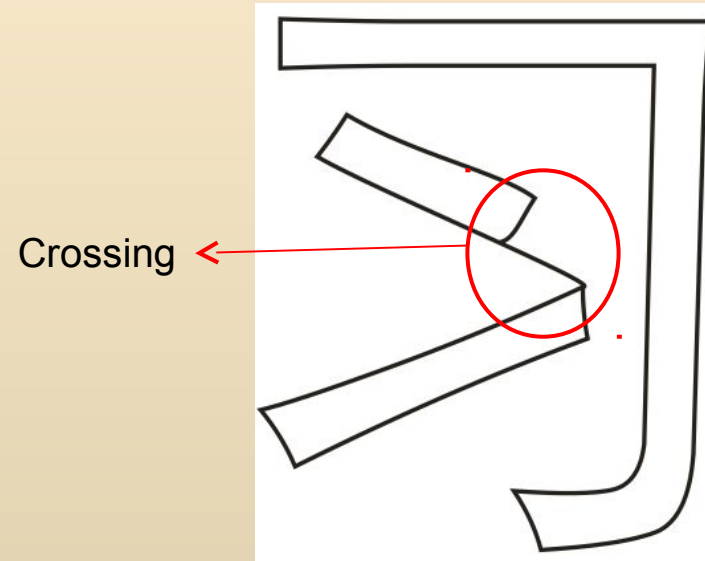
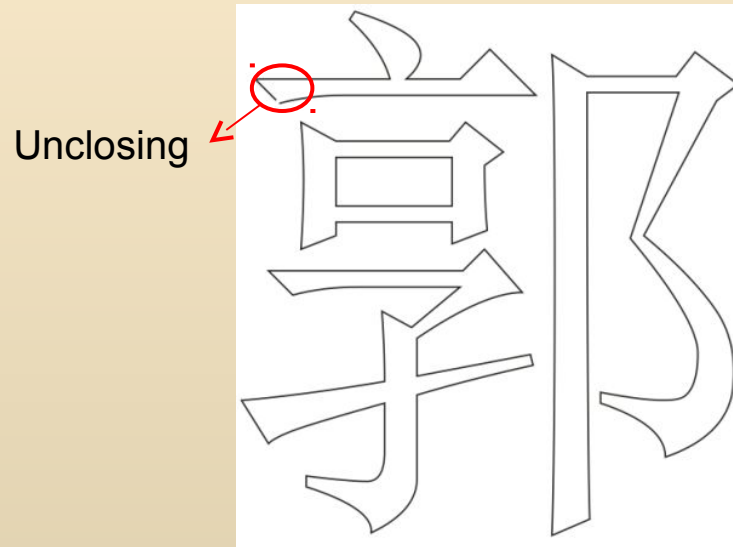
1) Check the grounding status and measure the voltage to earth, which should not be more than 5V, to see if the grounding wire reaches the standard. If the voltage is more than 5V, the grounding wire should be re-connected to reach the relevant standard.

The value is less than 5V ←

Voltage Level ←



2) Check if the original graph has problems, such as crossing, unclosing, too many repeated lines, and so on. These faults have to be corrected.



3) If only one graph has problem and others don't have, it's the graphic data processing fault and the effect drawing should be made again.

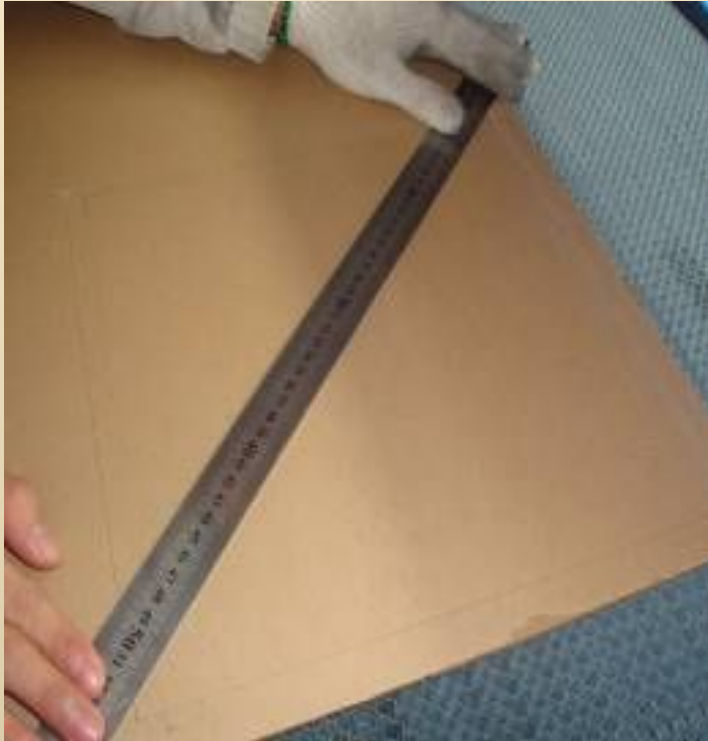
4) Check if there is virus in the computer. If any, kill the virus or re-install the operating system.

5) If the problems still exist, they may be caused by the malfunction of the USB port or motherboard.



## 8. Cutting is unclosed

1) Check if the deviation of the length of the two diagonal lines is within 0.3mm. If not, loosen the screw on the shaft coupling and move one side to make the deviation within 0.3mm.



2) Check if the belt tension or the Y-axis belt tension is proper and if the belt tension on both sides is equal. Adjust the belt tension to make tension on both sides equal.



Move the laser head to the left or right to check the belt tension

3) Check if there is any clearance in the shaft coupling of the Y-axis. If any, replace the shaft coupling.



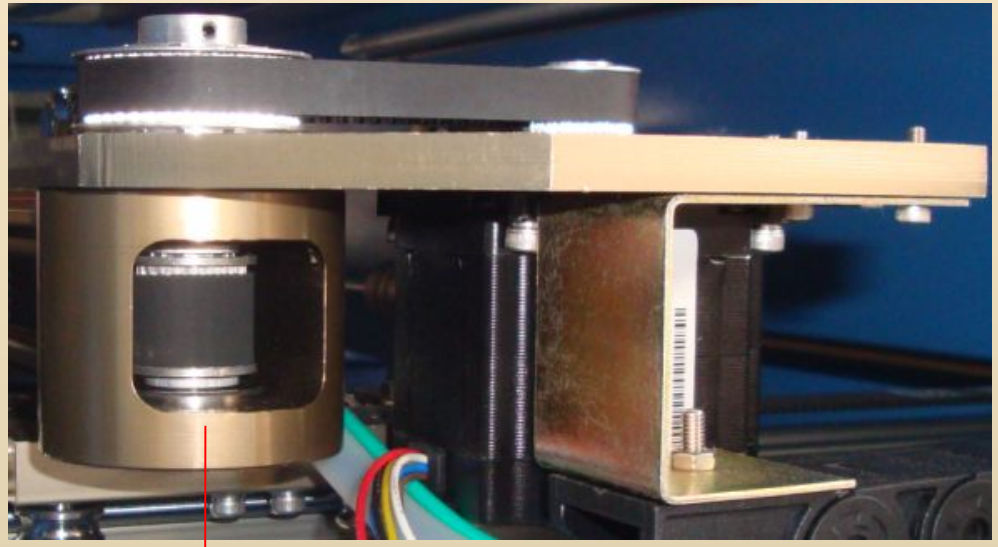
Rotate the shaft coupling to check if there is any clearance



4) Check if there is any abnormal sound, abrasion, and eccentricity on the synchronizing wheel and reduction gearbox.

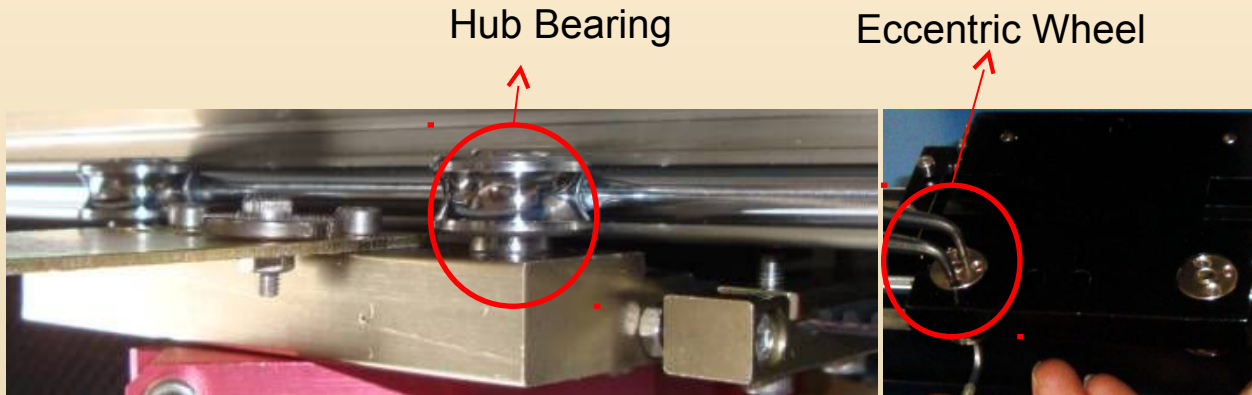


Synchronizing Wheel



Reduction Gearbox

5) Check if the tension between the hub bearing and the guide rail is proper. If not, adjust the eccentric wheel.



6) Move the laser head to check if the synchronous belt is loosened. Tighten the endless belt or the synchronous belt on the drive shaft.



Check the Belt Tension



7) Check if the left and right guide rail is paralleled. Loosen the fixing screw between the right guide rail and the guide rail gasket, position the crossbeam to the mechanical origin, tighten the screw, push the crossbeam to the outmost position, and then tighten the fixing bolt.



Fixing Screw

8) If above mentioned items are normal, check the mechanical rotating parts, such as bearing, synchronous wheel, and belt, to see if they are wore out or if there are any foreign objects on the belt. If any, replace the relevant parts.



Synchronous Whell



Belt



Bearing



## 9. Dislocation of engraving or cutting

1) For any graphs, too fast working speed will cause dislocation. The default speed is 100. As for graphs with diameter of less than 2mm, the speed should not be more than 25mm/s; as for graphs with diameter between 2mm and 3mm, the speed should not be more than 35mm. Other speed can be calculated by this way. The maximum speed of the machine is 300mm/s.

Working Speed ←

Load parameters from library

Layer:

Is Output:

Yes

▼

Speed(mm/s):

100

☐ Default

If Blowing:

Yes

▼

Processing Mode:

Cut

▼

Advance...

Min Power(%)

Max Power(%)

Laser 1:

30

30

☐ Default

Laser 2:

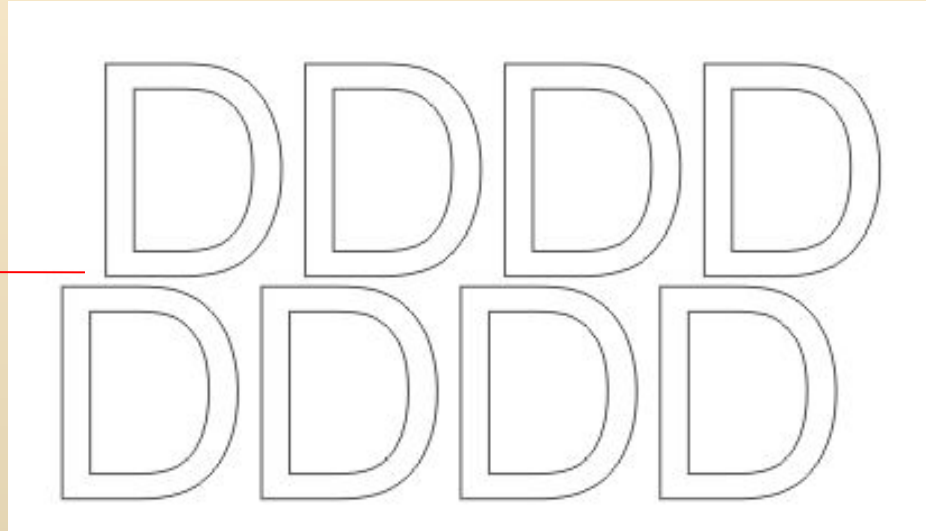
30

30



2) Enlarge the original graph in the output software to see if there is any dislocation. If any, correct the dislocation.

Dislocation



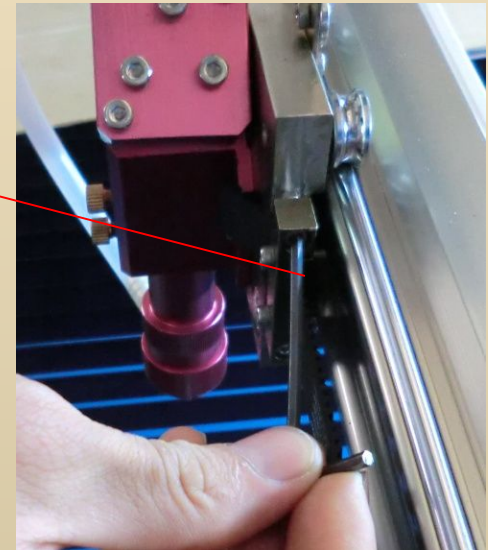
3) Make another template to see if other graphs have the same problem. If other graphs are normal, it indicates that only this graph has data faults. Make a new effect drawing.



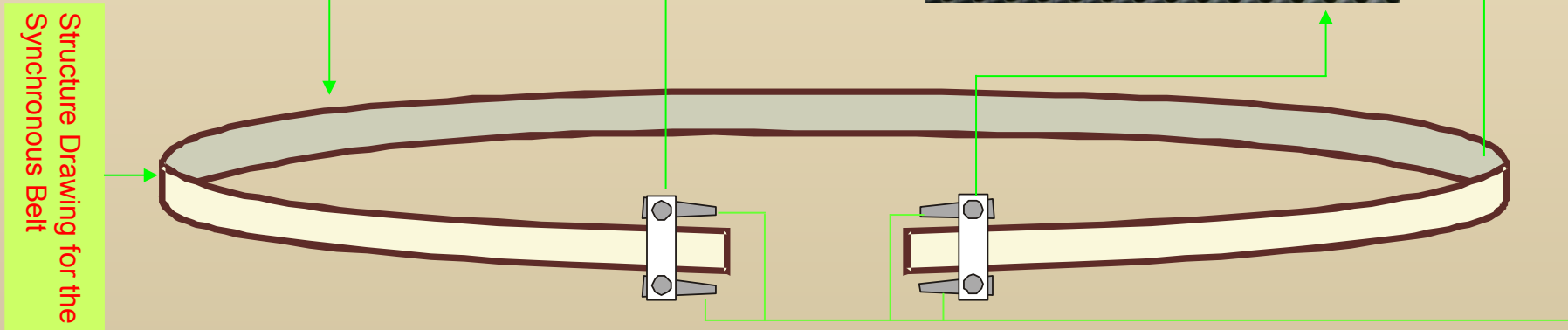
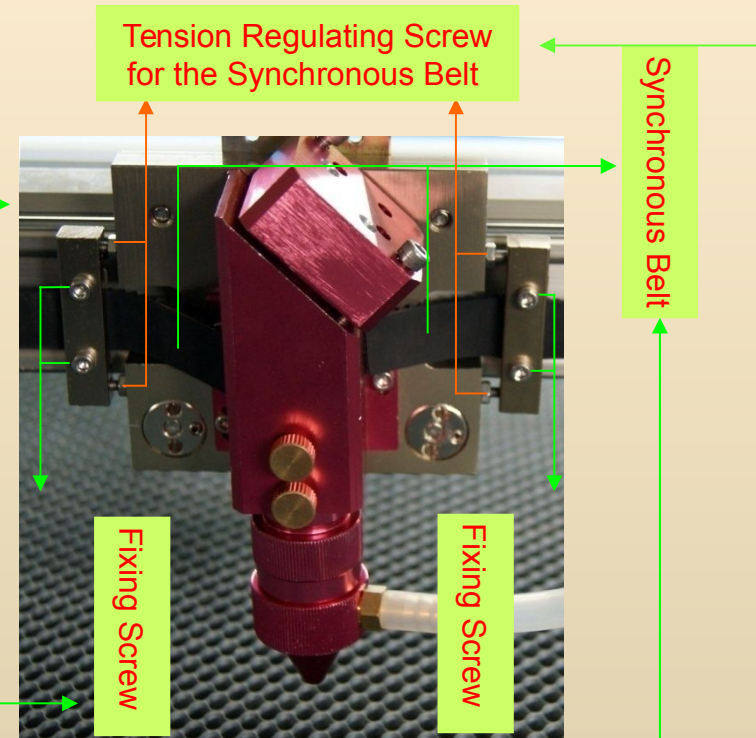
4) Check if the belt is too loose and if the belt tension of both sides is equal. Adjust the belt tension.



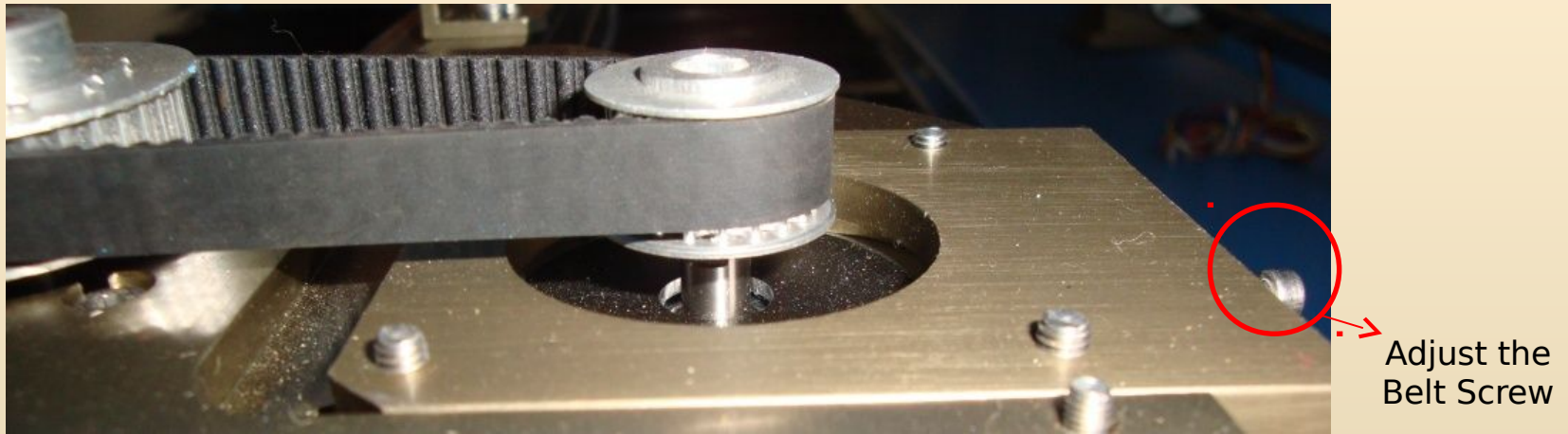
Adjust the  
Belt Tension



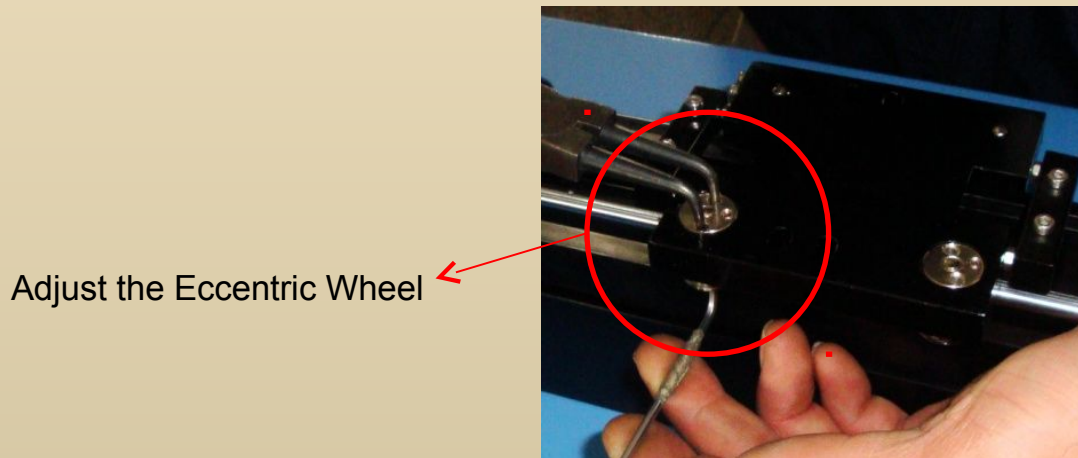
Tighten the tension regulating screw for synchronous belt to adjust belt tension.



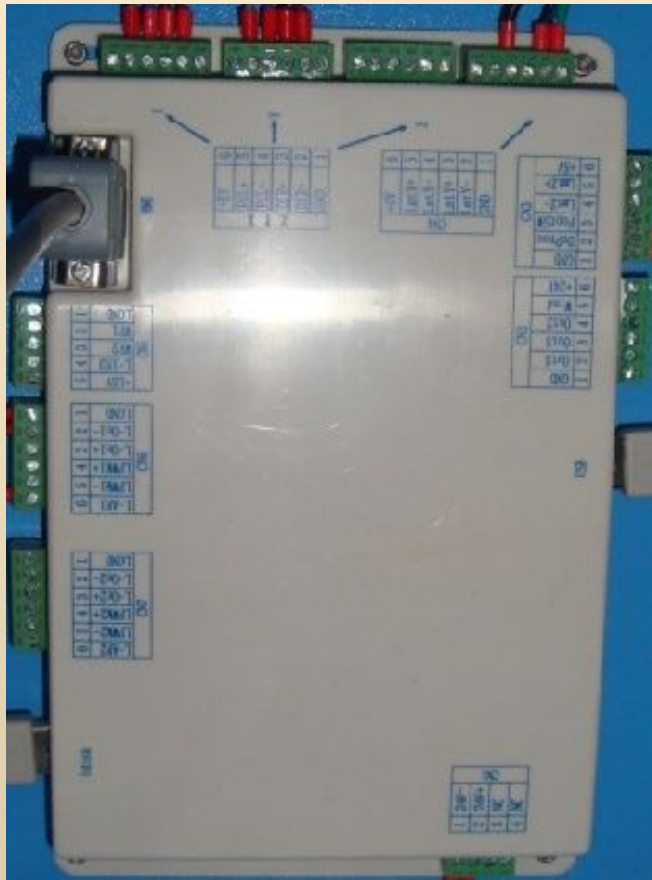
5) Check if the endless belt is too loose. Tighten it.



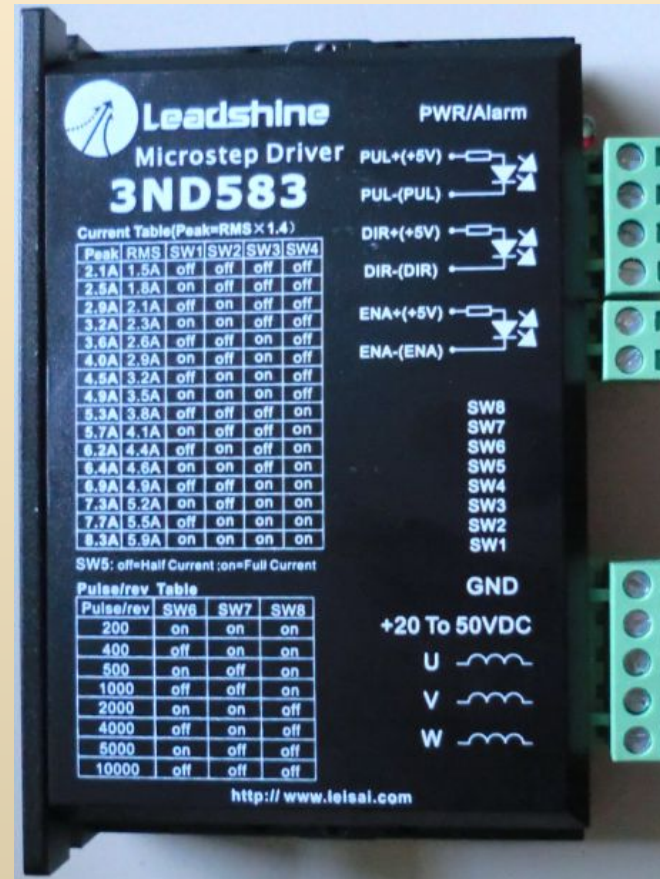
6) Check if there is clearance between the motor and the synchronous wheel. Tighten the synchronous wheel.



7) Motherboard or driver is malfunctioned. Replace the motherboard or the driver.



Motherboard



3-phase Driver



## 10. Serrated edge occurs during engraving or cutting process

1) The working speed is too fast. Reduce the speed to solve the problem. The maximum speed of the machine is 300mm/s and the system default speed is 100mm/s.

Working Speed ←

A screenshot of a software parameter dialog box. At the top is a button labeled "Load parameters from library". Below it, the "Layer:" field is a black rectangle. The "Is Output:" dropdown is set to "Yes". The "Speed(mm/s):" field is set to "100", with a "Default" checkbox to its right. The "If Blowing:" dropdown is set to "Yes". The "Processing Mode:" dropdown is set to "Cut", with an "Advance..." button to its right. At the bottom, there are two rows for "Min Power(%)" and "Max Power(%)", each with a "Default" checkbox. The "Laser1:" and "Laser2:" fields are both set to "30".

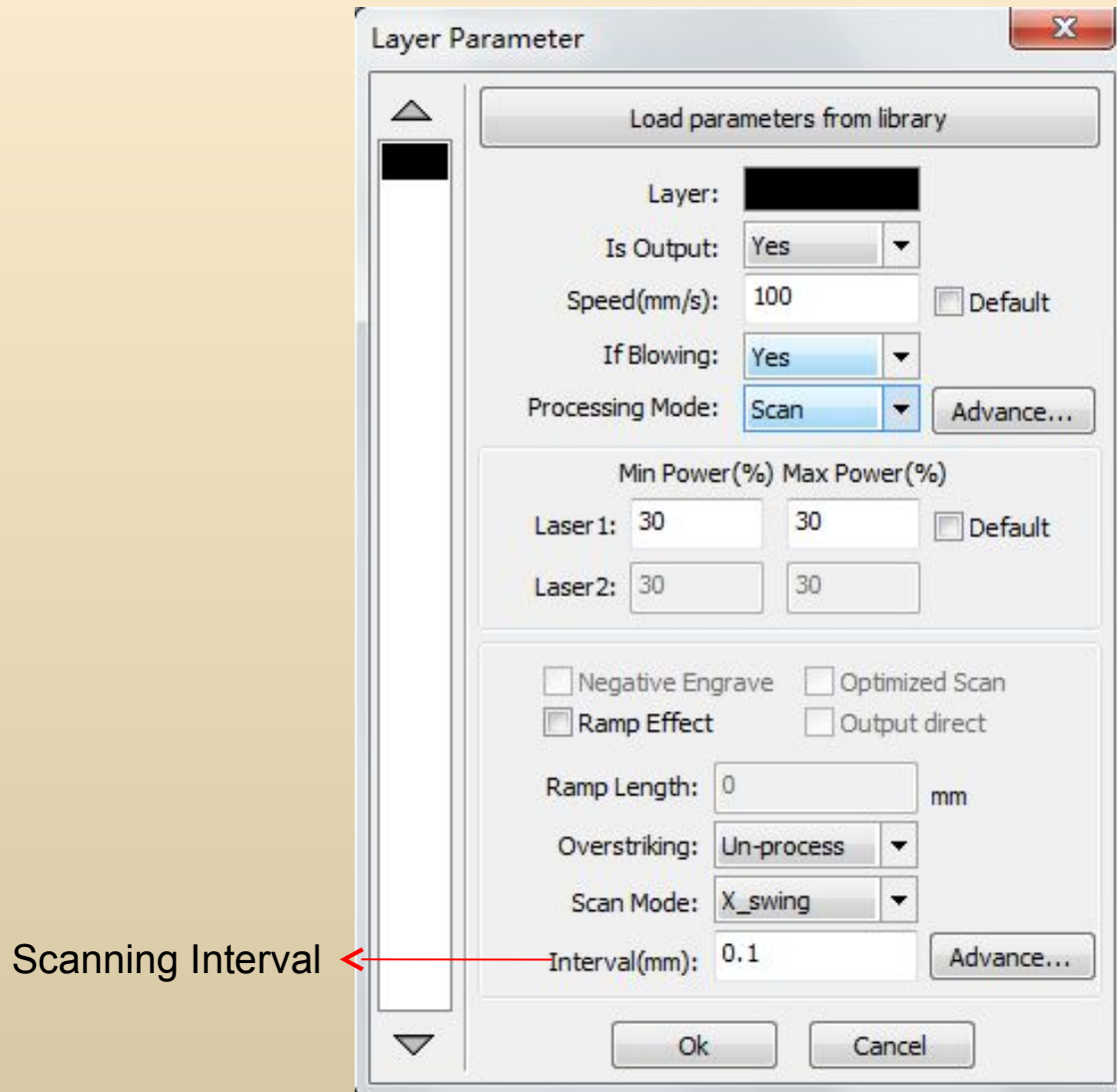
2) If the graph is output in the BMP format, check the graph resolution. Given the precondition that the graph dimensions have no faults, increase the resolution as much as possible.

Resolution ←

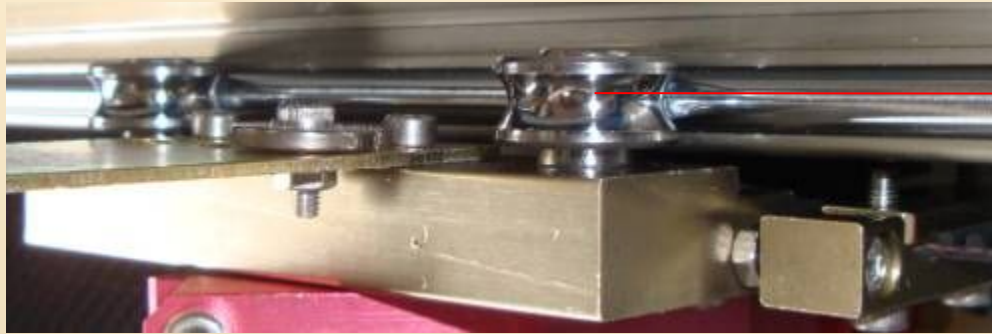
A screenshot of a software parameter dialog box. The top section shows "Width: 699 Pixels", "Height: 699 Pixels", "H Resolution: 96 Pixels/inch", and "V Resolution: 96 Pixels/inch". Below this, there are sliders for "Brightness: 0.0%" and "Contrast: 0.0%", each with a "Zero" button. There is a checkbox for "Invert color" which is unchecked, and a checkbox for "Set output resolution" which is checked. At the bottom, the "Resolution(pixels/inch)" field is set to "96".



3) As for engraving, check if the scanning interval is too large. Reduce the scanning interval. The system default value is 0.1.



4) Check if there is any clearance caused by abrasion in the hub bearing of X-axis and Y-axis. If any, replace the hub bearing.

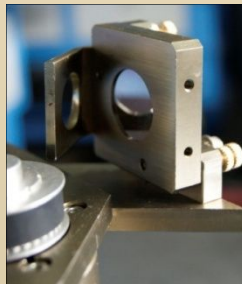


Hub Bearing

5) Check if the 4 pieces of lens are broken or loosen. In particular, check if the reflectors and focusing lens over the laser head are firmly mounted. Tighten the loosened lens and replace the broken lens.



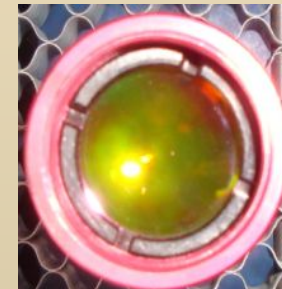
No.1  
Reflector



No.2  
Reflector



No.3  
Reflector



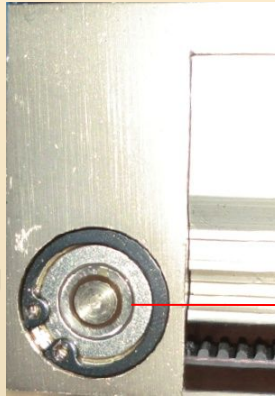
Focusing  
Lens



6) Check if there is any abrasion on the bearing of the driving parts. Replace the worn bearing.



Bearing



Bearing



Bearing

11. Online Failure (or no response under continuous transmitting)

1) Check if the grounding status and grounding wire connection reach the relevant standards. The static interference may influence the data transmission. Reconnect the grounding wire to meet the required standards.

2) Check if the various USB data lines are firmly plugged in the ports. If not, plug the connectors firmly in their positions or replace the data line if necessary.

U-disk Port



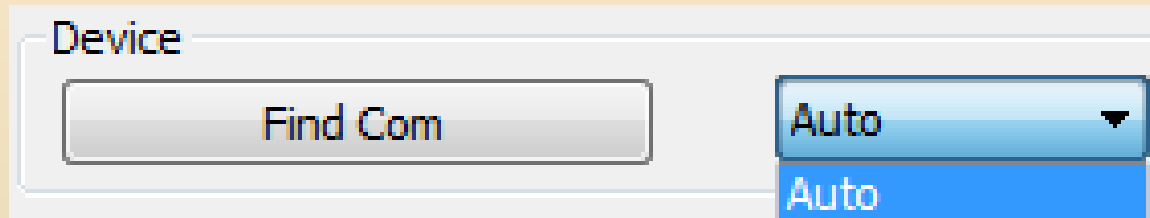
PC Port



3) Check if the USB driver is correctly installed and if the USB serial port (COM3) or Com4 port are available in the System Device Manager. If necessary, reinstall the USB driver. If serial port cannot be seen, as shown in the following picture, it has to install the USB driver.



4) Check if the output port in the Hongsan Laser Software is the same as the port generated in the computer. If not, modify the output port setting in the Hongsan Laser Software. If one computer connects one machine, it sets “Auto”, while if one computer connects many machines, the ports of various machines should be set in the place indicated in the following picture. (The following picture indicates the situation that one computer connects one machine.



5) Check if the USB port of PC has problems by using other USB devices. If any, replace the USB port or use other computers.



6) If all of above mentioned items are ok while the problem still exists, replace the motherboard.

## 12. Bad engraving effect (lines are thick)

1. Check if the focal length is correct, especially after the lens are cleaned or replaced. Pay attention to the direction of the focusing lens. Adjust the correct installation direction and focal length of the focusing lens.



3) Check if the 4 pieces of lens are broken or dirty. Too dirty or broken lens will scatter the laser beam. Replace or clean the lens.



Reflector



Focusing Lens

4) Check the quality of the light spots, which come out of the light exit of the laser tube. If it appears un-round spot, double spots, or hollow core spot, check if the bearing point and the direction of the laser tube are proper. And then check the laser tube, adjust the bearing point and the direction, and replace the laser tube.



Un-round



Hollow Core



Double Spots



13. There are sparks at the light exit of the laser head.

1) If the rubber plate or acrylic plate contains impurities, the sparks may appear. It has no negative influence and does not need to be treated. It is suggested that the user use the high quality rubber plate or acrylic plate.



→ Cutting Effect of the Imported Acrylic Material

2) Check the air hose for the laser head to see if there is strong air flow. The air hose is long and easy to be bent, blocked、 or worn. If necessary, clean or replace the air hose.



→ Air hose

3) Check if the air pump itself has problems. If the gas output is not enough or the air pump is malfunctioned, replace the air pump.

Air Pump ←



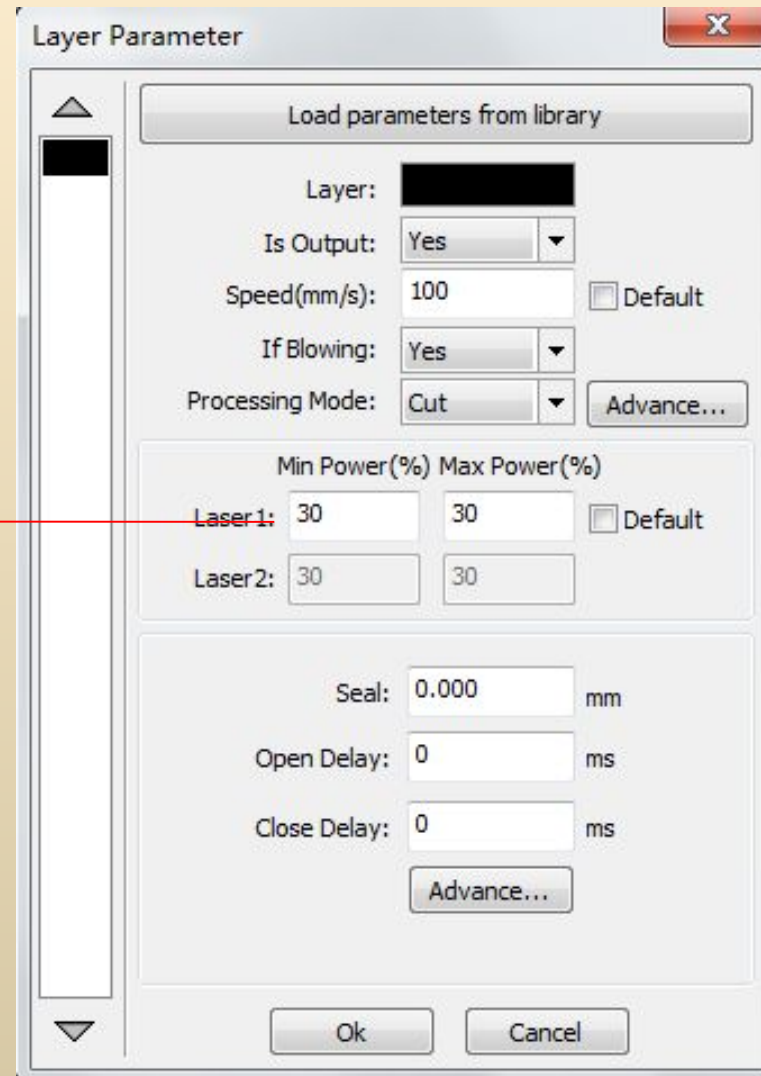
4) Focusing length is improper. Readjust the focusing length.

8mm ←



5) Check if the working power of the laser is excessive. Adjust it to a proper value.

Change the Value  
of the Power



The screenshot shows a 'Layer Parameter' dialog box. On the left is a vertical list of layers, with the top layer selected. A red arrow points from the text 'Change the Value of the Power' to the 'Laser 1' power field. The dialog contains the following settings:

- Load parameters from library: [button]
- Layer: [dropdown menu]
- Is Output: Yes [dropdown menu]
- Speed(mm/s): 100 [text field] [checkbox] Default
- If Blowing: Yes [dropdown menu]
- Processing Mode: Cut [dropdown menu] [button] Advance...
- Min Power(%) Max Power(%)
  - Laser 1: 30 [text field] 30 [text field] [checkbox] Default
  - Laser 2: 30 [text field] 30 [text field]
- Seal: 0.000 [text field] mm
- Open Delay: 0 [text field] ms
- Close Delay: 0 [text field] ms
- [button] Advance...
- [button] Ok [button] Cancel



14. The temperature of the circulating water rises too fast.

1) Too strong working power. Under the premise of enough cutting depth, the light intensity should be reduced as much as possible.

Change the value  
of the power

Layer Parameter

Load parameters from library

Layer: [Black]

Is Output: Yes

Speed(mm/s): 100 ☐ Default

If Blowing: Yes

Processing Mode: Cut

Min Power(%) Max Power(%)

Laser 1: 30 30 ☐ Default

Laser 2: 30 30

Seal: 0.000 mm

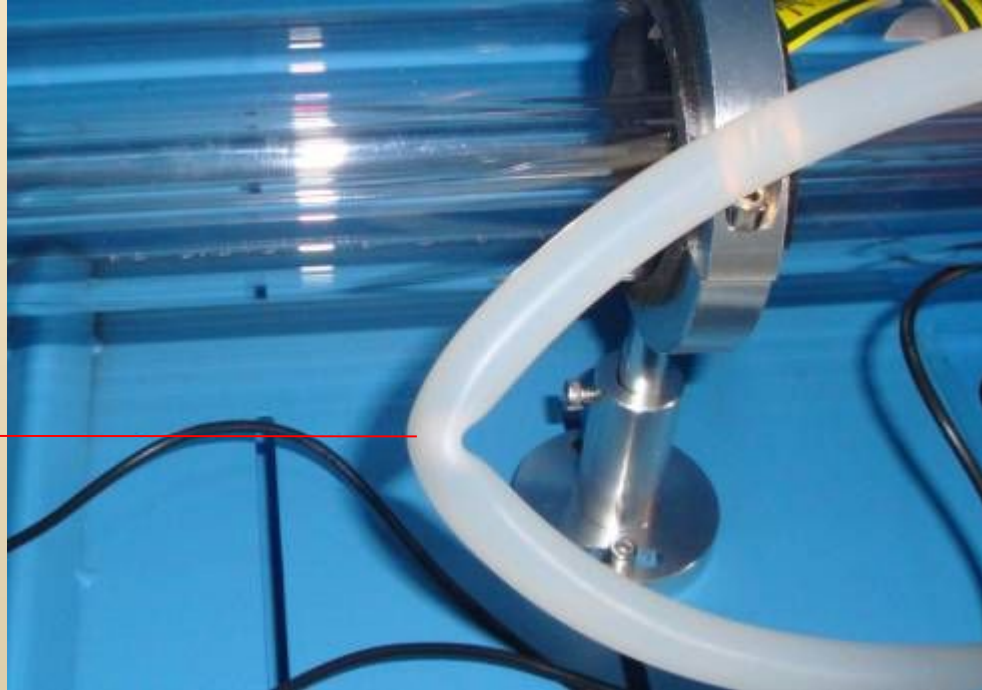
Open Delay: 0 ms

Close Delay: 0 ms



- 2) Working time is too long. The user has to stop the machine for 5 minutes after every 3 hours continuous running.
- 3) Check if the back flow of the water outlet hose is in normal status and if the emulsion tube in the laser machine is bent. Straighten the water hose.

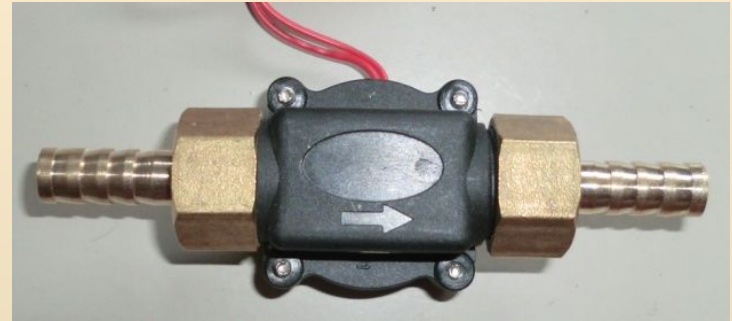
Water  
hose is  
bent



4) Check if the water pump or the inlet/outlet water pipes are too dirty and if the water protection is blocked. Clean the water pump and the water pipes, and replace the water protection.



Connector at the Water Inlet    Connector at the Water Outlet



Water Protection

5) Check if the water output volume and water pressure of the submersible pump are normal. If the water volume is insufficient, replace the water pump or water tank.



Submersible Pump



Water Tank



## 15. The water tank gives alarms

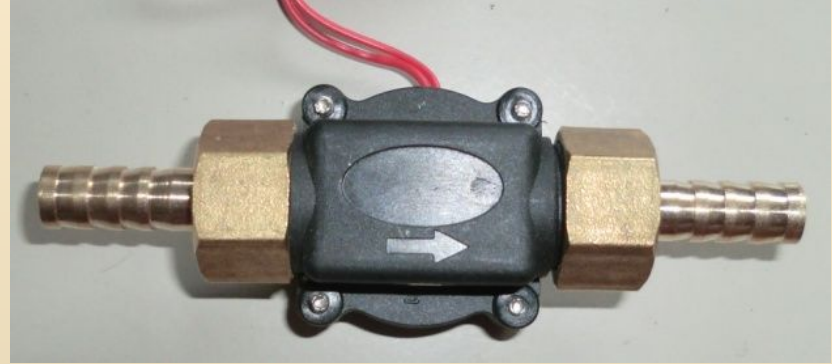
1) Check the power supply system. Low voltage may cause the alarming of the water tank. If necessary, the voltage stabilizer can be used to keep the normal voltage.



CW3000 Water Tank

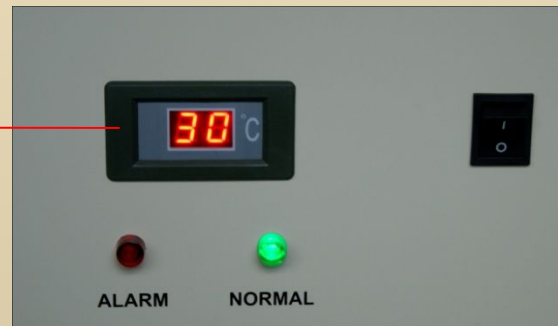
- 2) Check if the water inside the water tank is sufficient. If the water level is too low, the water tank will alarm. Fill in the purified water.
- 3) Check if the water hose is blocked or bent and if the water protection is blocked. Clean or straighten the water pipe and the water protection.

Water hose  
is bent



- 4) Check if the water temperature is too high. If the water temperature exceeds the limit, alarm will be triggered. Exchange water or shut down the machine for half an hour and then continue engraving.

Normal Temperature



- 5) Check if the water pump in the water tank works properly. If there is no water or insufficient water flow, replace the water tank.



16. After start-up, no display on the screen and no response by pressing the keys

1) Restart the machine and check if the crossbeam and laser head can correctly reset. If no response, replace the control panel.



Control Panel

2) If the start-up and reset are normal, press the direction keys and function keys to see if they are normal. If the functions of these keys are normal, replace the control panel.

3) If the keys have no response, replace the control panel.

4) If It displays normally after replacing the control block but the keys still have no response, replace the control panel.



17. The voltage is unstable or out of control

1) The motherboard or the laser power supply may have problems. Replace the motherboard or the laser power supply.



Motherboard



Laser Power Supply



2) Measure the supply voltage by the multimeter to see if it is stable. If not, power supply stabilizer should be used.

Reading is too small

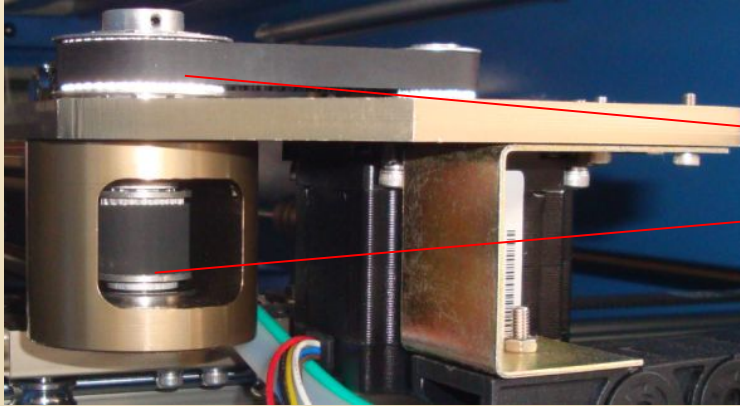


If the voltage fluctuates, use stabilizer

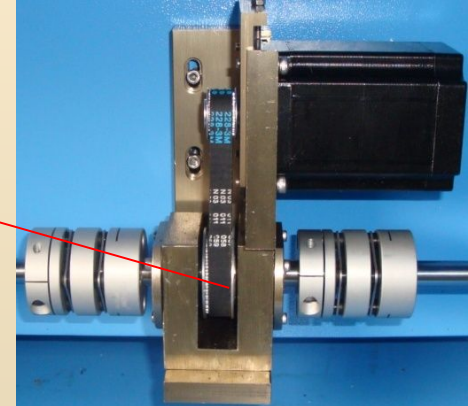


18. After start-up, the X-axis or Y-axis vibrate.

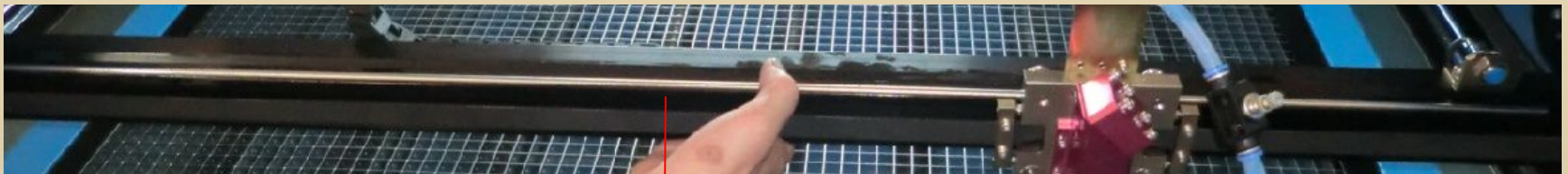
1) Shut down the machine, move the X-axis and Y-axis by hand. If there is distinct resistance, check if any foreign objects stuck at the driving parts of the X-axis or Y-axis. Clean the foreign objects.



Check points



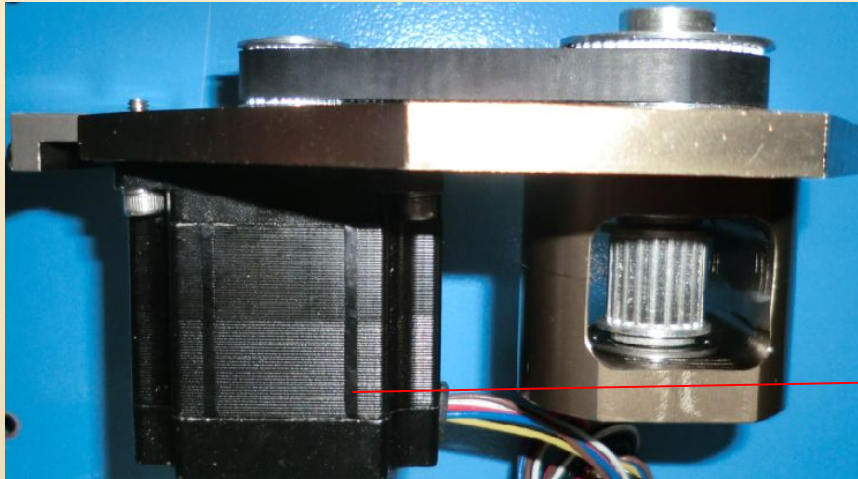
2) Check if the synchronous belt and the air hose of the laser head stuck and if the crossbeam deviates too much. Adjust the crossbeam and belt and straighten the air hose.



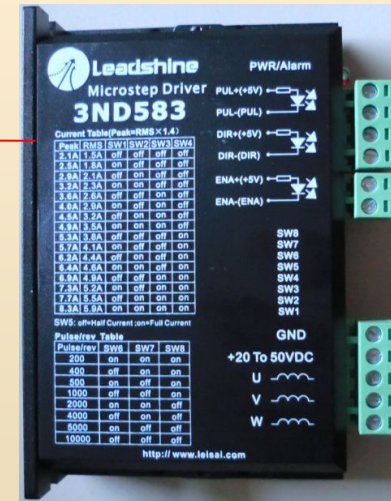
Guide Rail of the Crossbeam



3) Check if the motor and the driver have problems. If necessary, replace the motor or the driver.

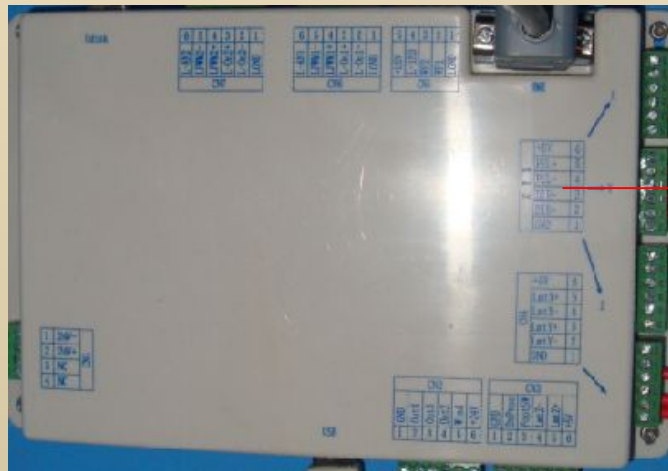


driver



Motor

4) If the problems still exist, replace the motherboard.



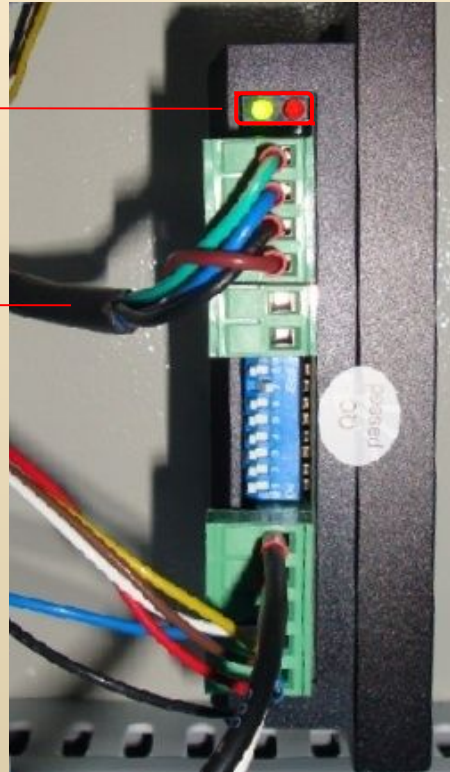
Motherboard



3) Check if the signal wire or the power supply is damaged. Replace the signal wire or the power supply.

Driver Indicator Lamp

Signal wire



Motor Driver



Power Indicator Lamp

36v Power Supply



19. Machine has no response to the data transmitted from the computer.

1) Check if the start-up and reset are normal. If not, solve the problem according to the above step 6.

2) Both the reset operation and data transmission are normal, but the machine does not work. It's the malfunction of the motherboard. Replace the motherboard.

3) Check if the grounding is in good condition. Make sure that the grounding meets the relevant requirement.



→ Grounding Wire

Voltage Level ←



The value is  
less than 5 ←

4) Check if the USB driver is correctly installed and if the virtual serial port is correctly generated. Uninstall and then re-install the USB driver.

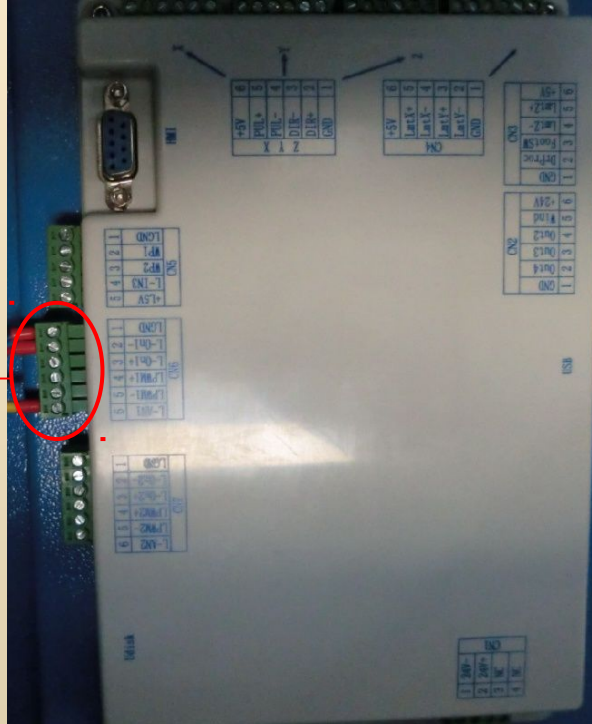
5) Check if the setting of the output port is the same as that of the generated virtual serial port. Make sure that the output port is the same as the generated port.

6) If the problem still exists, try the method mentioned in the trouble shooting '11. Serial Port Failure'.



20. Laser keeps on after machine start-up.

1) Unplug the signal wire controlling the laser power supply from the motherboard, and then restart the machine. If the laser is still on, it indicates that the laser power supply is malfunctioned and needs to be replaced.



Motherboard



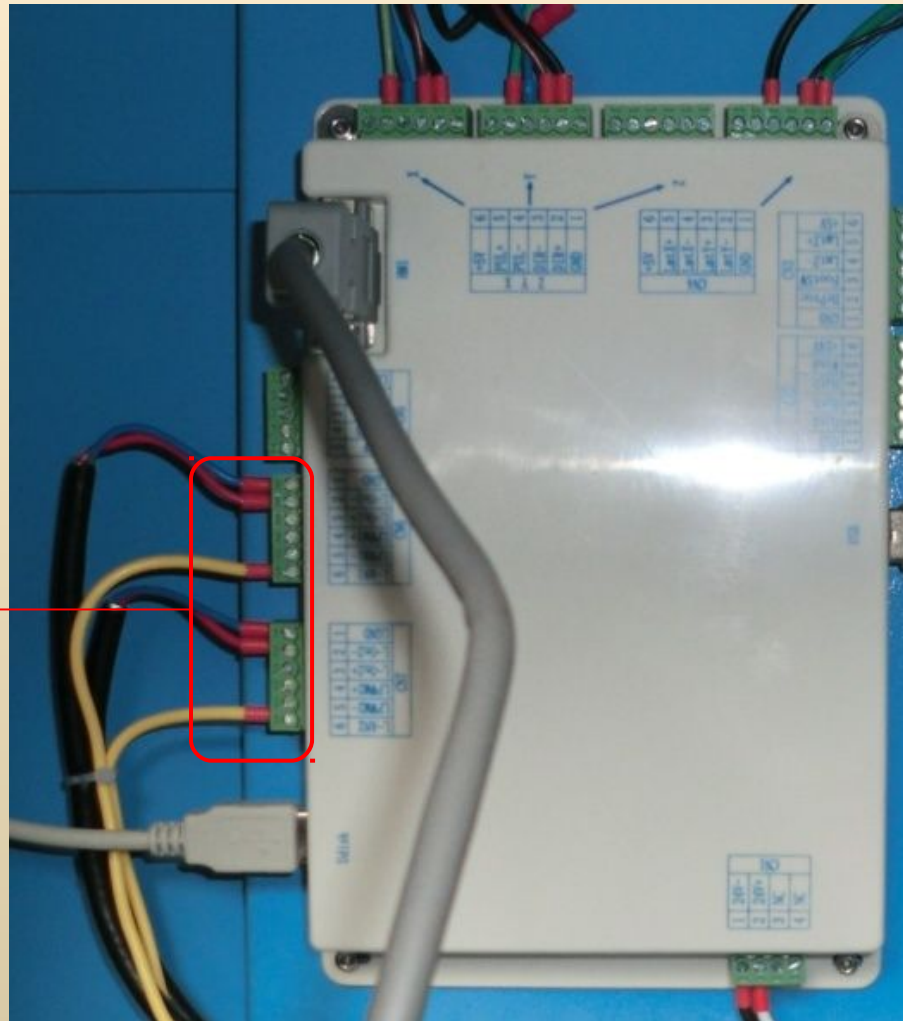
Laser Power Supply

2) Unplug the signal wire controlling the laser power supply from the motherboard. If there is no laser after start-up, replace the motherboard or the button panel.



3) Check if the signal wire is damaged. Replace the signal wire.

Laser Power  
Signal Wire



## 21. High tension spark during operation

1) Firstly, determine the location of the high tension spark. If it is at the joints between the laser tube and the laser power supply, check if it is firmly connected or if the joint is too close to the metal. Make firm connection and put the high tension end far away from the metal surface of the case.



Low tension end of the laser tube

2) Check if there is any poor welding on the high tension joints and make sure the clip is well welded.

High Tension End 



3) If the spark is inside the laser power supply, replace the laser power supply.



➤ Check if there is any spark inside the power supply.

4) There is spark at the high tension end of the laser tube. If the spark still exists after replacing the laser power supply, replace the laser tube.



High tension end of the laser tube

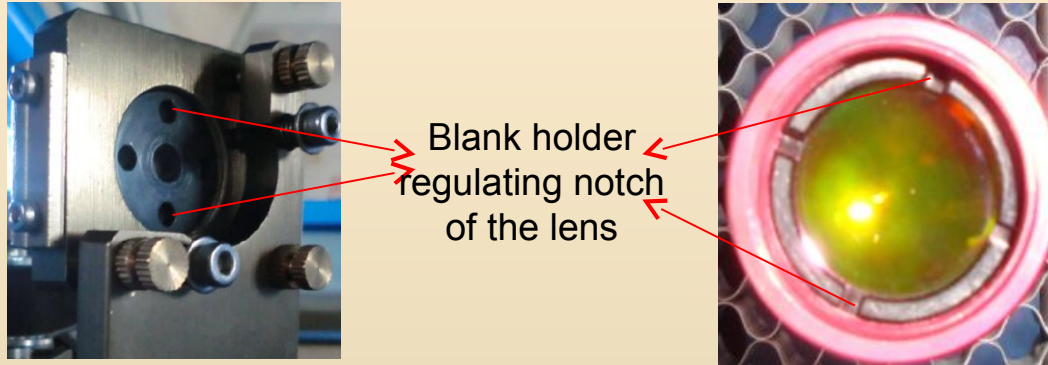


Low tension end of the laser tube

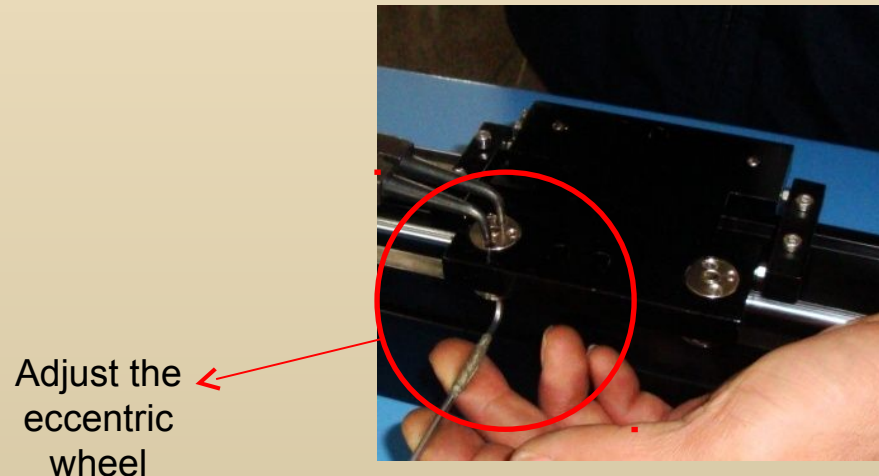


## 22. Cutting lines are wavy.

1) Check if the reflector or the focusing lens is firmly in place. Fix the reflector or the focusing lens and adjust the optical path.



2) Check if the laser head is loosened, tighten the eccentric wheel on the laser head.



3) Mechanical parts has problems. Check and repair it.

# Thanks for Watching!

