Laser Engraving Machine NC-C1290

User's Operation Manual

☆ Thank you very much for buying laser engraving machine.

☆ In order make sure that your computer laser engraving machine can work steadily for a long period of time, please read this manual carefully, be familiar with and master the operation method and technological requirements of the machine in advance.

☆ If abnormal situation takes place, please turn off the power immediately and consult this manual. If the problem can not be solved, please contact with our company or the local customer service agent to work out a solution.

☆ You can log on the website of our company at anywhere to look up ways of contacting us to consult with the local customer service agencies for information and help.

☆ In order to guarantee the personal safety and machine security, please bear in mind the E Equipment Maintenance and Safety Cautions.

Statement

1. The manufacturer has the right to modify the products without notification to customers in advance.
2. The manufacture only undertakes legal responsibilities for his products sold to customers. The manufacture is not responsible for other losses caused by trouble of the machine.

Hardware

I Function of laser engraving machine

The application scope of laser engraving machine is very wide. Different designs have been used in machines of our company to meet the needs of all use. We believe that the type of machine you've chosen will surely be of great help to your work. The following introductions might provide you information for enlarging the scope of usage and to use laser machine well.

1、Printing and packaging trace: rubber plate laser engraving, laser cutting of paper products, etc…

2、Trade of artwork and gift: bamboo slip laser engraving, wooden book laser carving, redwood laser engraving, double-colored plate engraving, box-shaped artwork laser engraving, chessboard laser carving, etc…

3、 Advertising: organic glass laser engraving (cutting), laser carving of all kinds of boards, double-colored plate laser carving, etc…

4、 Trade of leather clothing: genuine and synthetic leather cutting and surface pattern engraving of different kinds of shoes and leather clothing, pattern engraving of all kinds of clothing and textile, etc…

5、 Trade of model producing: building model laser engraving(cutting),laser engraving(cutting)of aviation and navigation models, laser engraving(cutting)of cartoon figures, industrial model laser engraving(cutting),etc..

II Structure of series Laser Engraving machine

Complete working system is composed of principal machine of laser engraving, laser power supply, laser engraving software, exhaust fan, air pump, submersible pump, water tank, air pipe, calculator, communication cable, etc. Printer, scanner, various kinds of designing software, etc. are equipped according to different machines being set up.

System components

The laser engraving machine of series is made up of five parts: machinery platform, optical system, transmission system, control system, and accessory system.

※ Machinery platform: composed of fittings such as machine cover, guide rail, base frame, reflector mount, etc.

※ Optical system: composed of laser tube, laser power supply, three reflecting mirrors and one focus head.

※ Drive system: composed of three imported balanced straight line guide rails of high accuracy, belt, two step motors and several gears.

※ Control system: composed of high speed DSP control card, two sets of switching power supply and two step motor drivers.

※ Accessory system: composed of circulating cooling water pump, air blowing compressor and smoke suction machine.

III Installation of series laser engraving machine

1、 Dismount of the packing box

After opening the packing box, please check out whether there is any damage on laser tube or

not, Then check up the complete machine to see whether there is any scratch on the surface and the completeness of fittings.

2、 Positioning

The machine should be put in cool and dry places. It should be placed close to earth wire. When the machine has been debugged, please don’t move it again, otherwise the ray path has to be readjusted.

3、 Installation

!)Insert the control card into PCI slot of the computer, tighten the screw, and link the data wire. Insert the softdog and install the operation software as well as softdog driver program.

2)Connect the tube and water circulation pipe with cathode and anode conducting wire, and then put in the laser tube snap ring. Connect the laser power supply with cathode and anode of the laser tube. Insert the data wire.

Notice: the ray outlet hole of laser tube should be placed towards the first reflecting mirror. Rubber pad have to be put in the laser tube close to snap ring. Silicon rubber should be painted on the anode and high pressure connection thus to avoid fire sparks caused by high pressure. Before welding conducting lines on cathode and anode, please polish off the oxide layer on each end of the line slightly by using sand paper.3

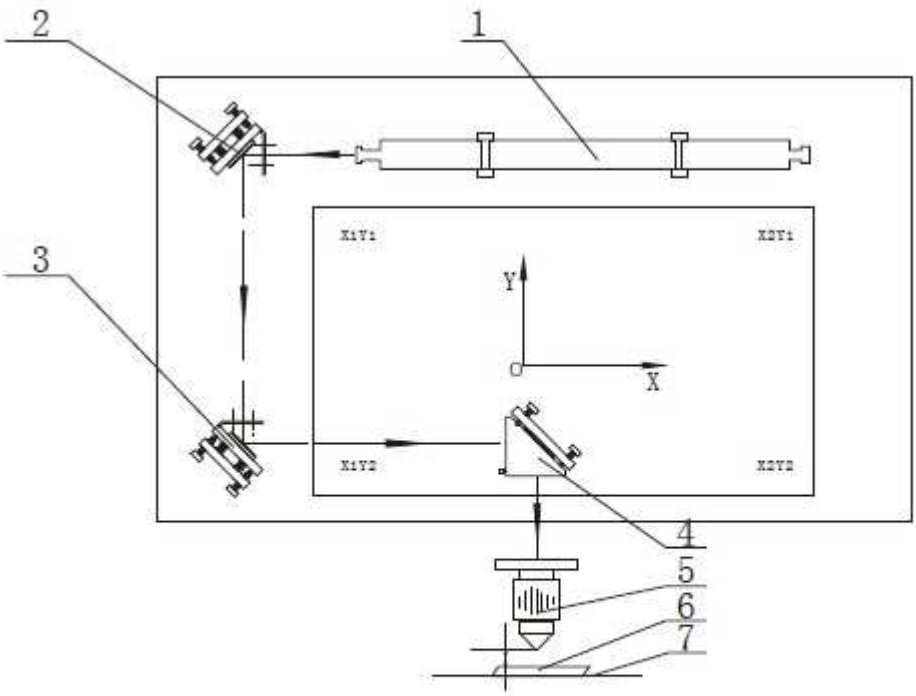
3)Fill the water tank with purified water, connect it with pump and air pump, and link the water outlet pipe and air inlet pipe. After several minutes of water circulation, please check out whether there is any bubble in the laser tube. If there is, please turn over the tube to push the bubble out.

4)Embed a copper conductor with the minimum diameter of 2mm into the earth(the minimum depth is 1M). Then connect the other end of the conductor with laser power supply. Notice: it must be grounded strictly!!!

5)Connect the principal machine and blower fan with power supply, and then start the machine.

Ⅳ **Structure and adjusting method of ray path**

1、 Structure of the optical components



1. Laser tube 2. The first reflecting lens 3. The second reflecting lens
4. The third reflecting lens 5. Focusing lens 6. Object being processed
7. Working platform

Ray path is ray guide system. Laser engraving machine of series has adopted flying-optical system. The complete system is made up of laser tube, three reflecting mirrors, condensing lens and relevant adjusting devices. These are the main parts of the machine.

Ray path has close relationship with the effect of engraving and cutting. Therefore please be patient and careful when adjusting the ray path.

2、 Ray path adjusting

(1) Reflecting mirror adjusting

Stick a piece of paper on ray inlet hole of laser head; then move the laser head to upper left corner of the machine. Press “ray testing” button and make a dot. Then move the head to the lower left corner of the machine to make another dot. Using adjusting screw of the first reflecting mirror to make these two dots totally matched together, thus fix the ray path Y. Then turn to ray path X. Move the laser head to the left of crossbeam. Press “ray testing” button to make a dot. Then move it to the right to make another dot. Using adjusting screw of the second reflecting mirror to make these two dots totally matched together.

（2）Laser tube adjusting

Though in the above step, flying-optical path has been fixed, the laser ray may not be in the center of ray inlet hole. The next step is to adjust the position of laser tube to make the laser ray in

the center of the hole. Then check up the ray position in the hole. If the ray locates in upper part, the laser tube should be moved downward. If the ray locates in lower part, the laser tube should be moved upward. The ray locates in the front; the tube should be moved backward, the ray locates in the back; the tube should be moved forward. During this process, the tube must be moved slowly and carefully. Don't operate it in haste.

(2) Ray verticality adjusting

Put a piece of acryl on the working platform. Press "test light" button to see whether the pierced acryl is vertical or not. If it is not vertical, adjust the mirror cover of the third reflecting mirror to make the ray vertical. Ray verticality adjusting is to adjust the ray position on condensing lens. Only the ray is in the center of condensing lens, can the it be straight and strong.

Ⅴ Operation panel

Function of keys and buttons

 Move left  Move right  Move forward  Move backward

Start: Press this button, the machine begins to work..

Edge: Outer frame of the object being engraved

Test: Press this button, the laser tube begins to give out light.

Stop: Press this button when the engraving machine is working, the machine will stop working and return back to the original point.

Reset: Press this button, the laser head will return back to the upper right corner of the machine.

Pause: Make a pause of the working machine. Press the start button, it will start to work again.

The function of the operation panel is the same as computer.

Attention: The operation panel of the machine can work only when the software is open..

Ⅵ Basic operation procedure

1、 Starting up

1) Start the water pump and air pump; let the water in laser tube circulate for 3 minutes.
2) Turn on the power of principal machine
3) Turn on the power of blower fan
4) Turn on the laser power, and press “ray testing” button to see if there is ray
5) Start the controlling software, make sure that left and right optical head can move.
6) Put work pieces in position, and fix up the focal length (the length see Figure 4).
7) Operate the transmission file in the computer to start carving.

2、 Shut down

Turn off the laser power, principal machine, blower fan, water pump and air pump in turn.

Ⅶ **Cautions and maintenance**

1、 Safety caution

1) It is forbidden to start the machine without grounding. The ground wire of laser power must be connected with the earth. It can not be connected on facilities such as doors, windows, water pipes, and so on. The wire should be pulled to the putdoor ground.
2) Check the submersible pump to see if it can let the water outer each time after starting the machine. It is forbidden to start the machine up when water can not come out from the pump.
3) Operators can not leave the machine when it is working so as to avoid unnecessary loss.
4) Water container should be a bit larger to, make sure that there is 20 kilogram water in circulation. The water temperature should be about 20°C. If the temperature is too high, the water should be changed. It is better to use purified water so that here isn’t any contaminant. Circulating water should be changed regularly (every three days).

5) Because there is laser and high-pressure in the machine, non-professional works should not disassembel the machine without authorization.
6) Reflecting mirror and condensing lens should be wiped with special camera lens paper or medical-use cotton wetted by mixture of alcohol and ether.(proportion of ether and alcohol should be 1:1) Cleansing of mirrors and lens should be done once a week. It is required that the grounding of all parts of the machine and user's computer should be safe to avoid damage of machine and injuries caused by static electricity.
7) Blower fan must be turn3ed on while carving, so as to avoid pollutions on mirror and lens. It is forbidden to put any flammable and explosive articles close to the equipment so as to avoid fire.
8) Any irrelevant total reflection or diffuse reflection objects can not be placed in the equipment to prevent the laser from reflecting on human body or flammable articles directly.
9) The water in laser tube should be drawn off in winter, in order to avoid frost cracking of the tube.
10) When the machine is working, operators should examine the working conditions(such as whether the laser ray has been blocked from shining on the paper used for crispening by the air coming from the air pump, unusual noise, temperature of circulating water, etc.) at any moment.
11) The crossbeam and larry can not be pulled by hand. The machine should be put in places where there is no interfere and harmful effect of pollution, strong electricity, strong magnetism, and so on.
12) When the voltage is not stable, please don't start the machine. It is suggested to use voltage regulator.
13) People who have no been trained should not sue the machine.
14) Don't strike the keys and buttons strongly. Please press it lightly to avoid damages of those keys and buttons.
15) In case there is damage or fire, please turn off the power at once.
16) Don't start the machine when there is thunder or lighting.

Users should follow all the above mentioned regulations carefully. Otherwise the manufacturer will not take responsibility for any trouble of the machine or physical injuries.

2、 Maintenance

1) It is forbidden to use circulating water of poor quality, because it may affect the laser power seriously and shorten the service life of laser tube. The manufacturer is not responsible for repairs and maintenance of damages of the tube caused by the using of poor-qualified water. It is suggested to use purified water.

The minimum amount of cooling water should be 30L. Make sure that the water can submerge the submersible pump.

2) Water temperature should be examined at all times during the working process. Once the water turns to be warm, please change it right away (the right way of changing the water is to get out of some hot water and fill in cold water).
3) If there is any particular requirements, the ray intensity shouldn't be more than 20MA, thus to avoid the tube becoming aged quickly.

4) Water tank, water pump and water inlet rubber tube should be cleaned once every four days.
5) Lens and mirrors should be cleaned once every day before starting the machine (Notice: not at the time of being off duty).
6) Please clean the reflecting mirror carefully when it is on the machine, otherwise, the ray path must be re-adjusted!
7) When cleaning the third reflecting mirror and condensing lens, then must be removed from the machine. After that, the mirror and lens should be fixed firmly but not too tightly for fear of breaking up.
8) Please pay attention to the focal length before starting the machine every time. If the length is not accurate, it will greatly affect the carving effects.
9) Please clean the working platform every time after working. Don't make the dust fly upwards.
10) Please clean the machine after working every dy. When doing this, the crossbeam and larry can be pulled lightly and carefully in the condition that the power is turned off. Don't pull them strongly.
11) Guide rails should be cleaned, and lubricant should be added onto the rail every two weeks.
12) The outer equipments (blower fan, air pump, etc.) should be cleaned once every two weeks.

Ⅷ Problems and Solutions

Problem	Cause	Solution
No rays	Laser power supply is broken	Replace it with a new power supply
	Data wire of the laser power supply is broken	Replace it with a new wire
	No TTL control signal	Check control signal
The object can not be fully cut	Laser tube is old	Replace it with a new one
	Condensing lens is polluted	Clean the lens
	Reflecting mirror is polluted	Clean the mirror

	Ray path is not right	Adjust the path
There are two slitting	The ray is not in the center of condensing lens. It is reflected when shining on metals	Adjust the third reflecting mirror
Square becomes parallelogram when cutting	Guide rail X and rail Y are not straight	Adjust rail X and rail Y

Ⅸ Technical parameters

Technical parameter

Item	1290
Size of the principle machine (length x width x height)	1800x1400 x1200 mm
Maximum carving range each time	1200mm x 900mm
Weight	250KG
Cutting Speed	0-600mm/s
Speed control	0-100% no segment control
Laser tube cooling	Water cooling
Machinery resolution	0.025mm
Minimum size of shaped character	Chinese character 2mm, English 1mm
Repetitional precision	±0.01mm
Power supply	220V±10% 50HZ or 110V±10% 60HZ

Total power	1200W
Format of inages	PLT、DXF、BMP、JPG、GIF、PGN、TIF
Driving	Step motor, subdivision driving
Laser power	80W
Temperature of operating environment	0℃-45℃
Humidity of operating environment	5%-95%

X Accessories

Complete machine	1set
Air pipe	1pc
Blower fan	1pc
Submersible pump and Air adjusting valve	1set
Air pump	1set
Rubber pipe	1pc
Communication cable	1pc

Power card	1pc
User’s manual	1pc
Software of scribing	1set
Control card	1pc
Laser power supply	1pc
Control line of laser power supply	1pc
Laser tube	1pc

Ⅺ Regulations of repair guarantee

We are responsible for the repair of complete machine for one year. Guarantee period for repair of laser tube (we are not responsible for blowing out of laser tube caused by high water temperature and frost cracking caused by low water temperature) and optical glass is three months, and that of outer equipment(blower fan, air pump, water pump) is half a year.

Regulations of repair guarantee

1、 Within the guarantee period, our company will provide service for problems that appear in normal using conditions for free.

2、 Certain amount of maintenance fees will be charged by the company when the guarantee period is over,

3、 Our company will not provide maintenance and repair for free in circumstances that the sealing paper is damaged caused by disassembly of the machine without authorization, the machine is not used in correct way, problems caused by calamities of nature and calamities imposed by other people, or the customer can not show us the repair guarantee certificate of the product.

4、 It is very important to keep the serial number of the product given by the manufacturer when the product leaves factory. Only when information contained in it has been confirmed, can customers enjoy after-sale service provided by our product without

notification to customers in advance.

5、The manufacturer has the right to modify specifications of the product without notification to customers in advance.

6、The manufacturer only undertakes legal responsibilities for his products sold to customers, but is not responsibility. The manufacturer will not take any compensation responsibility for loss of commercial profits, service interruption or any other monetary loss caused by the use or abnormal use of the product.

7、This certificate will be valid only after being a=stamped by distributor. It will be invalid if altered.