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# USER'S MANUAL

**Model: 20W Mini**



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## Preface

First of all, thanks for choose and buy our fiber series laser marking machine, your trust is the largest support to us. We will introduce the general situation and basic application of fiber laser marking machine to you from several aspects, the hope all these can help you.



Our aim is constantly to improve and perfect our products, so there maybe exist a little difference between the manual and the machine you are using. If there are changes to be made, we will use the attached way to inform. Any question please contact with the after-sale service department, we will meet your requirements.



Due to the input/output terminals, laser power supply, sound and light power supply, control power supply,etc.are may be charged, you must be careful in use, avoid electrical shock. Pay attention to personal safety!



Optical fiber laser marking machine belong to the fourth class laser products, pls wear protective glasses when using, the technical workers without training are strictly forbidden to open and use the equipment!

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### **Notes**

- ◆ This book contains many help for your safety, economy, important notice of operation. If you follow these tips, not only to avoid dangerous accidents and reduce maintenance costs, reducing down time of examine and repair, also can improve the credibility and the working life of the machine.
- ◆ This manual including induc-trial injury prevention and protection matters for environmental, the user can replenish according to its specific conditions.
- ◆ Instructions shall be stored in the machines for reference;
- ◆ The operator should have the relevant technical training, or be guidance.

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## **Safety requirement**

Improper use can lead to personal injury, so please read the knowledge of the safety about the laser, in order to avoid personal injury, and prevent the damaged of the product or other production connection with. In order to avoid the possibility of danger, this product can only use within a prescribed scope.

1. Do not let the laser directing your eye or others, even if lasers in close condition because there maybe occurred an error.
2. Any irrelevant total reflection and diffuse object is prohibited placed near the equipment, In case of laser directly reflect to the human body or flammable items.
3. Lasers are not toys; do not give to children, mental incompetence, and the people who not know the characteristics of laser to use, in this case, vulnerable to damage.
4. Because this kind of laser is invisible light, so strictly prohibited placed inflammable and explosive items near the laser, in case of deviation lead fires.
5. For invisible laser, we suggest to wear protection glasses when use.
6. The top cover plate must be cover when working, in case of the laser deviating and hurt people.
7. Starting up is prohibition When the voltage instability, Or you must use a voltage stabilizer.
8. Fiber optic equipment should cleaning filter screen of the fan regularly.

We suggest do not long working when ampere meter on the maximum state, lest break down laser power, shorten the life of laser.

9. Cut off the power immediately If malfunction or outbreak of fire.

In a suspicious fault, do not operation. If you suspect the damage is exist, contact us for

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inspection, do not continue to operate.

Do not operation in wet environment.

Do not operation in explosive environment.

Keep the surface cleaning and drying.

Suggest each related works reading this manual.

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## Chapter One Brief introduction

### 1.1. Summarize

Optical fiber laser marking machine is a kind of professional laser marking equipment which integrated light, machine, electricity, independent research and development and production, The key components are imported, our machine with advantage of novel style, unique structure, convenient operation, high frequency modulation, high marking speed and precision, stable performance, widely used in all kinds of metallic and nonmetallic surface for permanent marker.

### 1.2. Main Specifications

Laser wavelength: 1064nm

Laser power: 20w

Modulation frequency: 20KHz-80KHz

Scanning speed:  $\leq 7000$ mm/s

Repeatability precision: 0.001mm

Engraving range: 110 mm \* 110 mm

Marking depth: 0.01- 0.2 mm (Depending on the material)

Marking line width: 0.01-0.2 mm (Depending on the material)

Power supply: AC220V  $\pm 10\%$ , 50 Hz  $\geq 0.8$ KW

Safety: over current protection, over-temperature protection, over-voltage protection

Continuous Working hours  $> 16$  Hours

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## Chapter Two Working principle and structure

### 2.1. Marking principle

\*Through the laser light energy evaporat the material in the surface and show deep material;

\*Through the laser light energy cause the surface substance chemical physical change and "engrave" the needed text pattern;

\*Through the laser light energy burned part of the material, then show the design, text of etching.

### 2.2. Structure Description

Optical fiber laser marking machine mainly made up of the control cabinet, optical fiber laser, marking head, working table, computers, etc.

#### Machine picture



### 2.3 Fiber Laser(Laser Source):



## 2.4 Control section

Front panel of control cabinet:



Details:

### 2.4.1. Emergency button



Emergency stop, press this button.

### 2.4.2. Laser&Rotary button





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Control laser power supply and Rotary axis.

### 2.4.3.Scanner&Red spot



Control laser scanner and red spot, noted: laser scanner also called laser galvo head.

### 2.5 Back Panel of the Control system



Details:

#### 2.5.1 USB port (Connect with PC)



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### 2.5.2 Axis (connecting rotary Tooling)



Connect with axis line

### 2.5.3 Foot switch



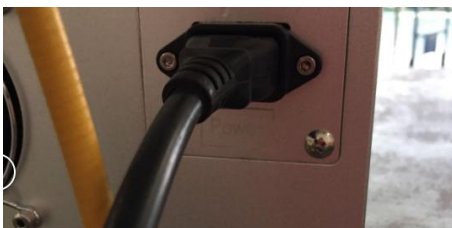
Connect with foot switch line.

### 2.5.4 Fuse



Protection, in case the wrong line

### 2.5.5 Main power port



### 2.5.6 Internal structure of the laser

Structure diagram of laser



## **Chapter Three Installation requirements & operating instructions**

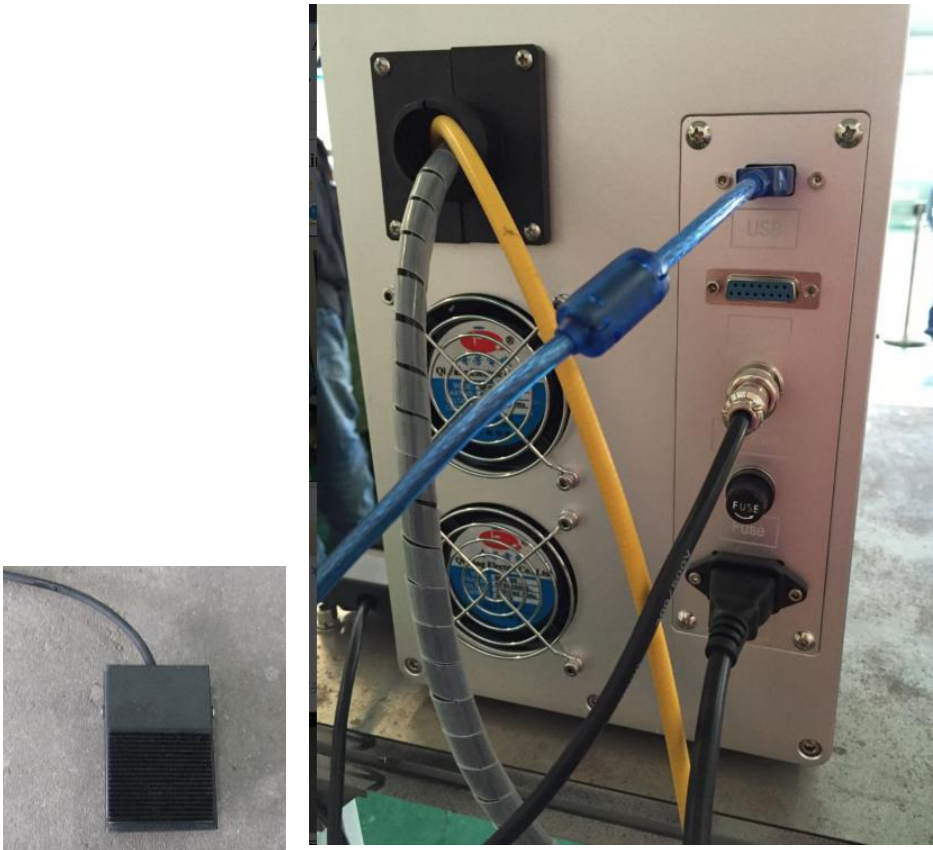
### **3.1 .1 Equipment installation requirements**

Laser marking machine as possible as used in the environment of clean, 10 °C-35 °C, and keep the optical device dry, clean. Usually need a separate closed workshop, to assure indoor constant temperature, the ground need floor lacquer or ceramic tile, installation of air conditioner.

The customer shall provide the support of at least 1000 W power single-phase ac power supply, the main power cord of our equipment should be installed in an air switch to do protection.

The customer provides the main power supply must be with ground, it is strictly prohibited virtual connection!

### **3.1.2 The wiring diagram of outside**



### 3.1.3 USB line



USB line, connect the control cabinet and computer, as in the above pictures.

### 3.1.4 Foot switch

connect the foot switch port



### 3.1.5 Main power line

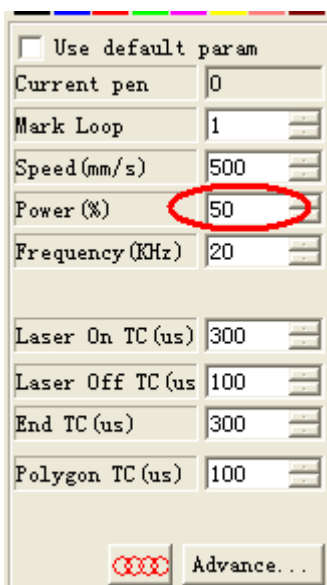


## 3.2 Operation process instructions

### 3.2.1 Starting up order

- ① Open the air switch and remove the cover of the lens
- ② Open Computer and software input the content which you want to mark.
- ③ Open laser and Rotary switch
- ④ Open scanner & Red spot switch
- ⑤ Adjust laser output percent.

Note: According your need adjust the power; Do not use full power work for long time!



Adjust current

Frequency adjustment range 20-80 KHZ, generally considering to 20 KHZ.

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⑥ Adjust the focal length for marking

**\*How to find the focus length of the laser.**



When use the lens (marking size:110\*110mm)

Adjust the height of the lifting worktable, keep the distance as the following picture, the distance about 195mm, this distance we called focus length, when the laser on the focus, the laser light is the strongest. Then start marking, you can have a try, change the distance (up and down), you will see different marker.

### 3.2.2 Equipment shutdown order

- ① Close laser switch
- ② Close scanner&spot switch
- ③ Close software
- ④ Shut down computer
- ⑤ Shut down air switch

**Please note: close laser power supply waiting in at least 20 second, then shut off the air switch.**

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## 5.1 Daily operation caution

1. Avoid eye direct sight the laser light
2. Using laser in controlled range, and add warnings.
3. Do not use without permission, only can be operated by professional trained person
4. Laser beam path around closed as far as possible, in case the laser were leaked
5. Must check if the fan is working correctly after starting up.
6. Use professional paper to wipe clean lens, after wiping pls wait the alcohol completely volatile before installation.
7. It is strictly prohibited to place any irrelevant total reflection or diffuse object around the equipment, in case of laser reflection to the human body or flammable items.
8. In working process, someone must wait on duty, especially high power cut or carving organic ingredients higher material, in order to avoid the exception or fire. Do not operation without training, or Violations operation, thus any damage we will not assume responsibility.
9. Because this kind of laser is invisible light, pay attention to safety when working, equipment are strictly prohibited placed near inflammable, explosive items, in case of laser deviation of fires.
10. When the machine working or debugging light path, please be sure to pay attention not to let any part of the body into the transfer area of light path, so as to avoid the damage. Wear protective glasses when adjust the light path, and adjust the smaller current, in order to avoid of laser deviation of fires.
11. The power supply voltage: voltage fluctuations will lead to unstable equipment, high voltage power supply can cause permanent damage to the device. To avoid the damage of

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equipment and electric circuit cause by voltage fluctuation ,and ensure the stability of the machine we suggest users to install a voltage stabilizer at least 5000 W. Especially the user whose voltage is quite unstable be sure to install regulator.

12.Pls cut off the power supply immediately if the machine malfunctions or fire.

13.When relative humidity of environment more than 80%, do not work, otherwise it will affect the lifetime of the machinery, or damage electronic circuit.

14.When thunder and lightning do not work

The user must strictly abide by the above rules, otherwise any injury or damage, the manufacturer shall not be responsible.

## **5.2maintaining**

### Optical lens clean

Because of working environment, optical lens may have pollution after use a period of time, if not timely maintenance, the dust will corrode lens coating, the lens that coating damage can't reflected light and through laser, oppositely it will absorb laser heat, affecting marking effect, and easy to cause crack lens. When cleaning the lens use lens paper or absorbent cotton put in medical alcohol rotary cleaning along the central to the brink of the lens, note: not with coarse material wipe or touch lenses.

1.Lens should wipe gently, do not damage the coating surface.

2. To prevent the decline,wipe process should be gentle

3.Wipe lens, do not wipe back and forth, do not brush with rough materials, because the lens with a metal film, the film will lead to a damage of laser energy attenuation.

4.With absorbent cotton wipe can only can be used for one time. The cotton should be



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clean, stay on the alcohol completely volatile before starting up.