LX-30W Fiber Laser Marking Machine

Operation Manual

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Content

Chapter One:Product description

The laser, called the stimulated radiation light amplification,Its high brightness, high directivity and high monochromaticity,and high coherence, is unmatched by other light, laser beam through the focus, the focus of thousands or even tens of thousands of degrees high temperatures, make it possible processing almost all materials.Laser mark is the use of high power density of the focused laser beam in different kinds of material surface permanent mark in the moment

Laser processing compared with traditional mechanical process has the following characteristics:

1) But for a variety of non-metallic materials processing, especially for high hardness, high melting point, brittle materials.

2) Belong to non-contact processing, no damage to the product, no tool wear, tags are of good quality.

3) After through focused laser beam, the focus can be small to a few microns in diameter,so the processing materials consumption is very small, processing small heat affected zone.

4) fast process speed,high efficiency.

5) Can be transferred by computer control, easy to realize automation, can mark Numbers, characters, vector graphics and bitmap graphics, etc.

6) Processing the noise is small,no pollution to the environment .

7) Laser mark different from the traditional printing way, mark trace is not easy to be erased,but forever.

The main purpose and scope of application:

LX-30W laser marking machine is the collection laser,computer,automatic control, precisi on machinery technology as one of the high-tech products. The marking machine adopts the galvanometer scanning way, in a variety of non-metallic materials such as wood,org anic board, rubber, ceramic, marble and other materials to compose the permanent mar king difficult to imitation.

It has wide application : Hardware tool,IC,instrument and apparatus,electronics,machinery et c .

Chapter Two: All the parts of equipment and operating instructions

30Watt fiber laser marking machine structure

Equipment composition

1:Cabinet body

2. Keyboard tray

Put keyboard on it,the mouse can be placed on the cabinet table. Laptop can connect with keyboard and mouse via USB cable.

3:Monitor

4：Control panel

5：Lifting handle

It is used to adjust the rise and fall of the machine , adjust the suitable focal length. Lift travel is 45mm.

6：Scanner head

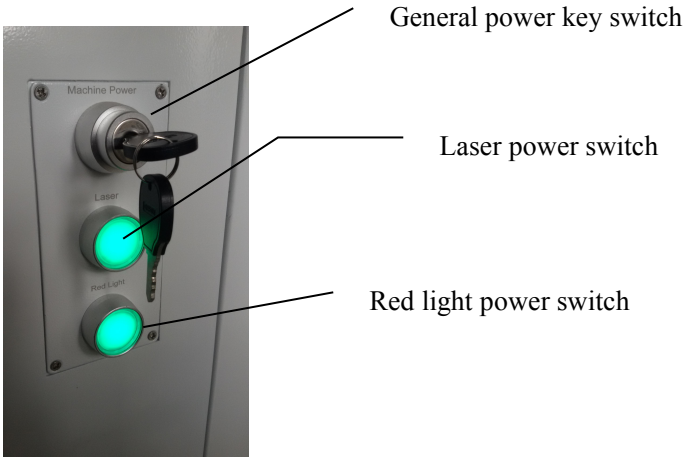
7：Rotary fixture

It work with marking machine when marking on cylinder material (Optional)

8：Two-dimensional stage

Change the center position of material to scanner head , accurate positioning,the adjust range of up and down around is 80*80mm

Machine cabinet composition and operating instructions



Main power supply key switch (Machine power)：

Control machine's electricity , switching on or off . Machine will completely disconnect from power .

Laser power switch (Laser)

Control fiber laser source power

Red light power switch (Red light)

Power on if need positioning, turn off when not in use to increase life .

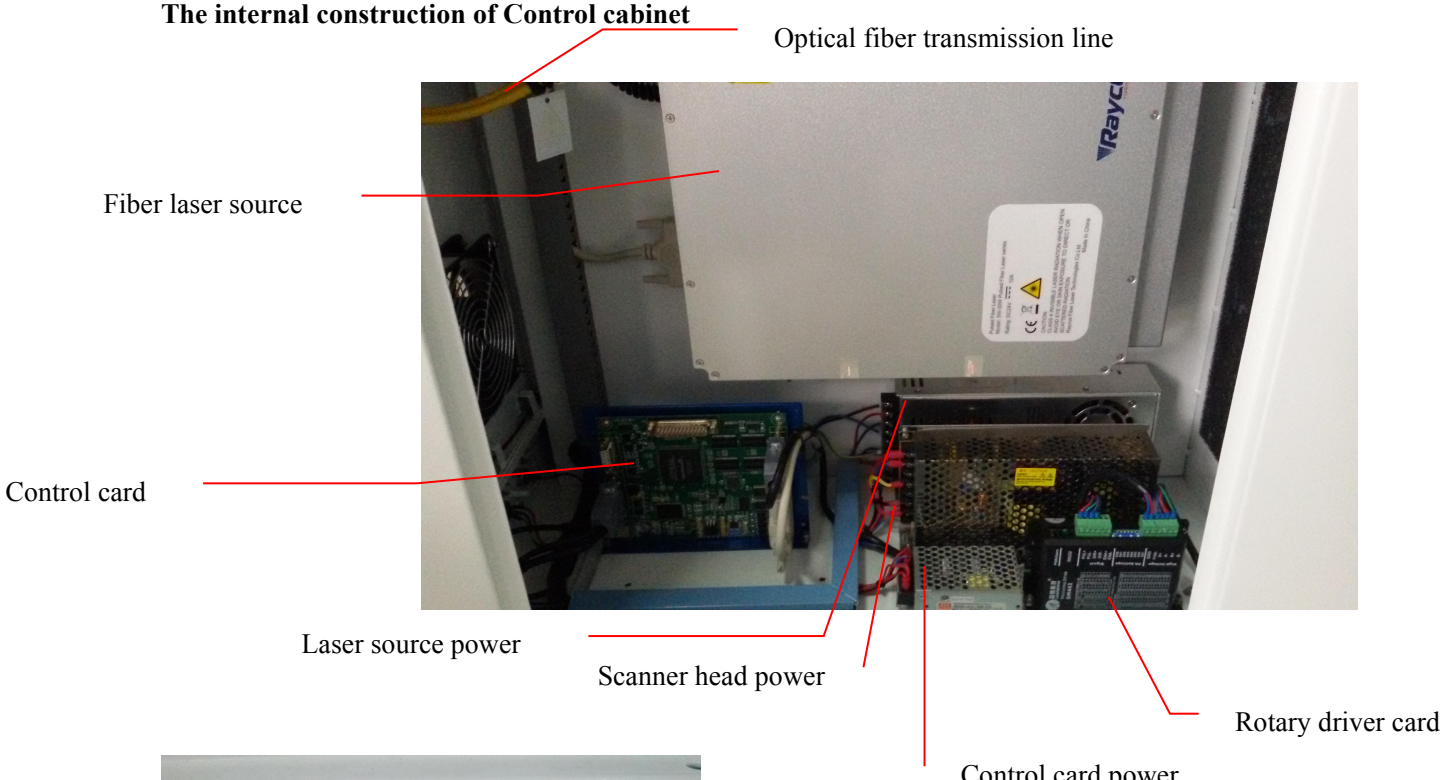
Machine power sequence

Turn on key power switch--Turn on the computer--Turn on laser power-- Turn on Red light power if need --Open EzCad software .

Shutdown sequence

Finish EzCad software--Turn off Red light power--Turn off laser power--Turn off the computer--Turn off key switch .

The internal construction of Control cabinet



Fiber laser source

Laser source main component

Control card

Control laser and scanner head through computer

Fiber laser source power

Provide voltage and control signals to fiber laser source .

Scanner head power

Provide direct current supply to scanner head .

Control card power

Provide direct current supply to control card .

Fiber transmission cable

Note : The bending radius of Optical fiber transmission line can't be too small,so as to avoid damage .

Pedal switch interface

External pedal switch, control marking output

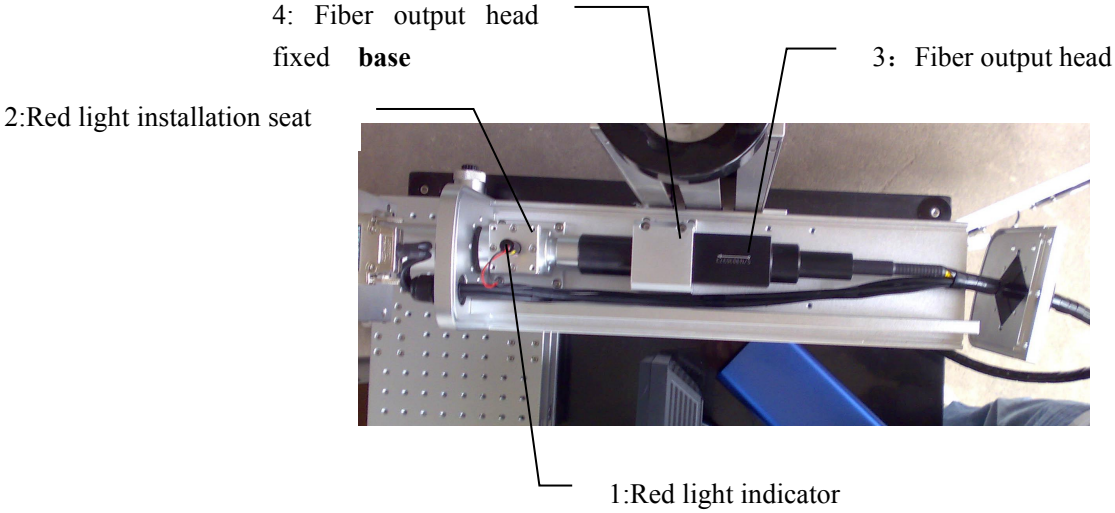
220V power entrance

Input AC 220V±10% 50/60Hz Voltage

Rotary fixture connect entrance

Note : The machine should be power off before connecting or disconnecting the rotary fixture !

Machine internal structure and function introduction of each parts



Machine frame constitute

1： Red light indicator

The red light with 650nm wavelength ,which can be seen,is used to indicate and positioning .The visible light will pass though all frame internal optical element and reach scanner head .

2： Red light installation base

It is used to fix and adjust the angle of red light .There is a red light reflector which installed with 45 degree angle.It can get through 1064nm laser, reflect 650nm red light, then make the red light coincide with laser .

3：Fiber output head

The fiber output head match with laser source,output laser beam with 8mm diameter directly which is suitable for scanner head .

4：Fiber output head fixed base

Be used to fix fiber output head.After fixation ,the fiber laser beam will align with the light hole positive center of the scanner head.

Chapter Three:Machine installation and adjustment

1：The installation of equipment parts

LX-30W laser marking machine installation is very simple, the equipment rear all adopt t he standard connectors to connect, the connector specification is different, to avoid the possibility of wrong. Equipment should be used in clean indoor, main body it doesn't m atter to the wall, at least 0.5 m distance, the aim is to ensure that components of the cooling equipment

2：The first electric test equipment

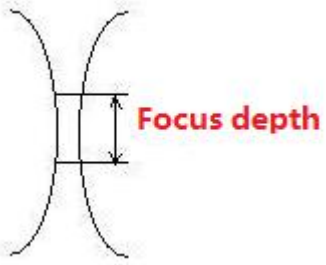
According to the boot sequence: open the key switch--open the computer--open the lase r power switch--turn on red light switch (open when necessary)--open the Ezcad softwar e

After open the software interface, enter a character or rectangular, put a metal namepl ate or other materials , adjust well the correct focal length (the distance from the lowe r edgeof the lens to the surface of a material of vibration), software to adjust good ma rking speed and laser power, marking the output, then should laser materials appeared.

3：Equipment operation technology and skills

The effects of focus position

After focusing the laser beam as shown in the figure below, should mark parts surface is located in the depth of focus range (about 1 mm ~ 2 mm).



The highest when the laser power density ,laser etching effect is best, we usually adjust the lifting platform to observe the laser brightness and sound of the laser marking on the materials to identify whether the work piece surface within the scope of the depth of focus. Sometimes it can achieve special marking effect by positive defocus and negati ve defocus.

The influence of laser frequency and pulse width

In certain cases, the output power can be laser frequency and pulse width to improve by reducing peak power, average power reduction). Laser peak power is high, easy to form "sculpture" effect on the surface; Also, by increasing the frequency and pulse width can reduce peak power (average power increase). Laser mean power is high, easy to form the ablation effect on the work piece surface .The working frequency range of laser source is 20-80KHz .

The galvanometer scanning,and the effects of parameters on the software

software set parameters on the marking effect has great influence, parameter setting is unreasonable, will appear at the end of the tag text pen or pen overweight or turn pen, pen overweight or leakage into arc, graphics, the phenomenon such as high speed filling filling part beyond the border. Please see instruction software parameter adjustment

Chapter Four:Equipment maintenance and breakdown maintenance

1：Equipment maintenance and matters needing attention

Fiber laser marking machine has the feature of stable working, long lifespan . The cooling system of laser source is air cooling . It is maintenance-free . Users should operate strictly according to manual,maintain with right way to reduce the incidence of failure .

Equipment maintenance mainly has the following points:

1). Pay attention to the optical fiber transmission line at the back of the rack .Do not bend with acute angle, or it will damage easily .

2). Equipment should be used in clean indoor air, best at room temperature in 22 to 25 degrees

3). Do not keep machine body close to the wall,at least 0.5 m distance, the aim is to ensure heat dissipation of machine.

4). There will be some dust When processing material , because material surface is vaporised by laser. And the dust will pollute the lens. Then users can put a small fan to avoid the pollution of lens .

5). It can be scrubbed gently by lens paper or ethanol if the lens is dirty. Please pay more attention about the operating environment, avoid the scrub times of lens as possible .

6). Open the cover plate at machine's left and right side regular. Clean up the air inlet, and open the back cover plate of the machine regular .Clean up the fan of back plate to improve machine's cooling effect .

2:Breakdown maintenance processing

abnormal phenomenon	Reason analysis	Processing method
Machine can't be powered on (The machine is not power on after opening the key switch and level switch)	1.Machine power cable poor contact. 2.Blown fuse or the emergency stop switch is in the wrong state	1.Reconnect the power cable,check power outlet . 2.Check blown and urgent stop switch state
Frequent power ou tages when equip ment normal use	Power cable or outlet poor contact.	Reconnect the power cable,check power outlet
Without laser output	1.Inappropriate parameter setting 2：Machine is breakdown.	Check software parameter,and check if laser source type is right or not .Or re-install the software .
Laser energy is weak	1.The lens is dirty 2.The focal length is wrong.	1.Wipe with cotton ball dipped in ethanol 2：Adjust the table height to the correct focal length
Computer control has but only one laser point or only a horizontal line or vertical line only, not form the text	The galvanometer is not powered or damage	Check the 25 core socket back of scanner head to see whether it is bad connect .And re-connect again. To contact factory after-sale if it still not work .
There is no red light indicate.	1.The red light is old and damage 2.The power supply of red light is damage	1.Change red light head 2.Check red light head whether there is 5V dc voltage supply .
When operate the software,there is reminder that the control card can not be found or software dog can't be found and	1.The USB cable of marking software control card poor contact .The driver of marking software control card is installed with wrong way. 2.The USB software dog	1.Re-plug . 2.Re-install control card driver,check the device manager and observe whether there is marking card choice (LMC) 3.Change USB port,re-install software dog driver program.

software will operate with demo mode .	plugging at the back of computer host is firmly connected or the diver is installed with wrong way .	

Chapter Five:Technical parameters

Input power supply：

Input voltage：AC220V±20V

Frequency：50/60Hz

Power Input：0.5kVA

Laser output：

Wavelength：1064nm

Laser power：30W

Instability：＜±2%

Laser frequency：20-80KHz

Pulse width：70-90ns

Single pulse energy：0.5mJ

Marking area ：110mm×110mm （Optional ）

Scanning speed：（0～7000）mm/s

Marking line depth：（0.01～0.6）mm （Subjected to material）

Marking line width：（0.01-0.1） mm （Subjected to material）

Mechanical structure ：

XY table travel： 80mm×80mm

Lifting height of lifting platform ： 450mm

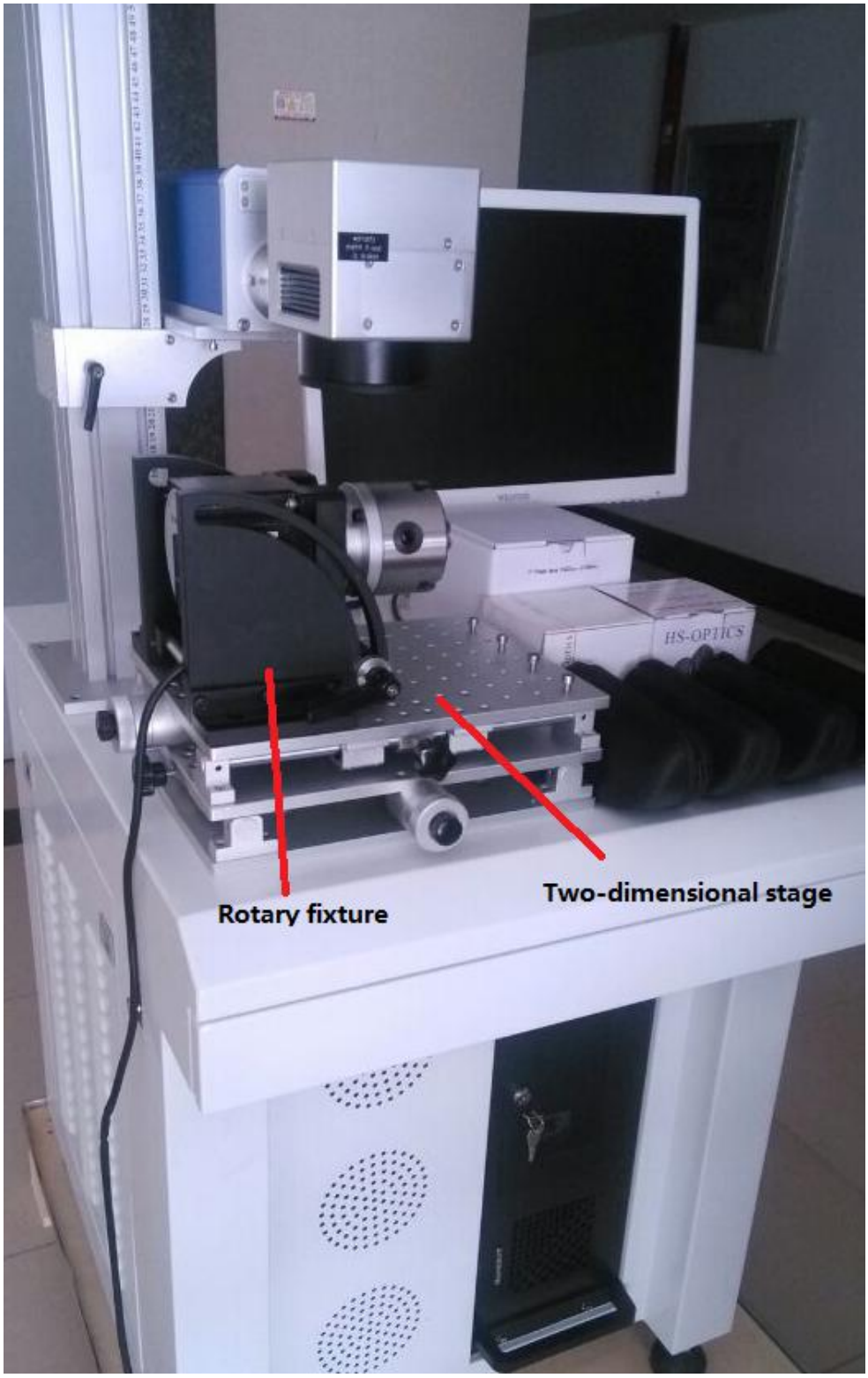
Cooling ：

Cooling system：Air cooling

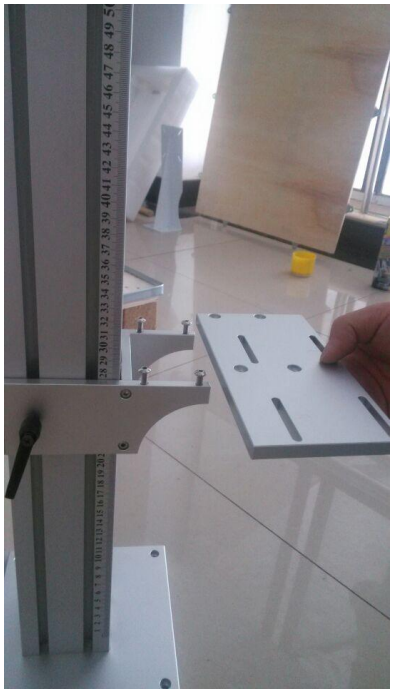
Continuous working hours ：≥12h .

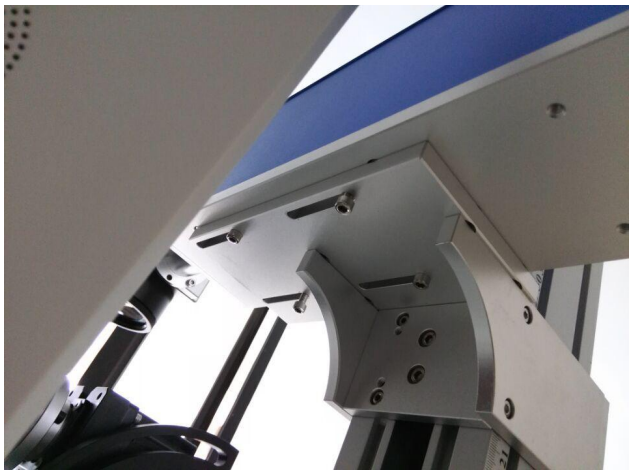
Considerations when installing :

Whole machine picture



Install the panel on the lifting platform to place the rack





Computer installation on the machine cabinet

Lifting platform install on equipment cabinet

Take off the cover of lens before using

Note : Uninstall the two-dimensional stage as below picture

before installing 300*300mm lens (other marking area lens is no need to uninstall)