



# Jewelry Laser Welding Machine

## Equipment Operation Manual (V1.1)

### Version history:

Version No.	Update the content	Update time
V1.0	First release	2021-1-10
V1.1	Update the UI function description	2021-5-10

# Pay Attention to

Thank you for using our laser products; The equipment is stable and reliable; It has been used in glasses, mold, jewelry, advertisement and many other welding industries for a long time. If this is your first time to use this type of laser welding machine, please read this manual carefully before switching on the power

The equipment has adopted as comprehensive safety precautions as possible to ensure the personal safety of the users and the safety of the equipment itself. However, the incorrect use, maintenance and system modification of the machine may still cause various damages to the operator or the machine. To prevent the leakage of laser radiation, youerte series laser equipment adopts the design of closed laser light path, which can effectively prevent the leakage of laser radiation. The maintenance and adjustment of the electrical equipment of the machine must be carried out by trained professional technicians who are familiar with all parts of the machine, and special attention should be paid to the following points

1. If a part does not need to be operated during maintenance and adjustment, please do not connect the power supply of the part.
- 2, the machine should be well grounded, and should be regularly checked
- 3, as far as possible with one hand to operate the electrical equipment, in order to prevent the formation of a circuit on the human body.
4. Qualified and well insulated tools should be used when operating on the high voltage circuit

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The company may update the content of the manual at any time due to software or hardware upgrades, and all such updates will be incorporated into the new version of the manual without prior notice

**Please read the following carefully before using!**



## 1. Safety instructions

The use of this laser equipment involves high voltage. In order to prevent electric shock or other dangerous casualties, please read carefully and fully understand the relevant contents of the "safety notice" section before installing, using or repairing this product. In order to ensure that you can correctly and safely use the equipment system, please be sure to comply with the following notes. If the power supply system is not operated in accordance with the

method specified in this manual, the equipment may be damaged

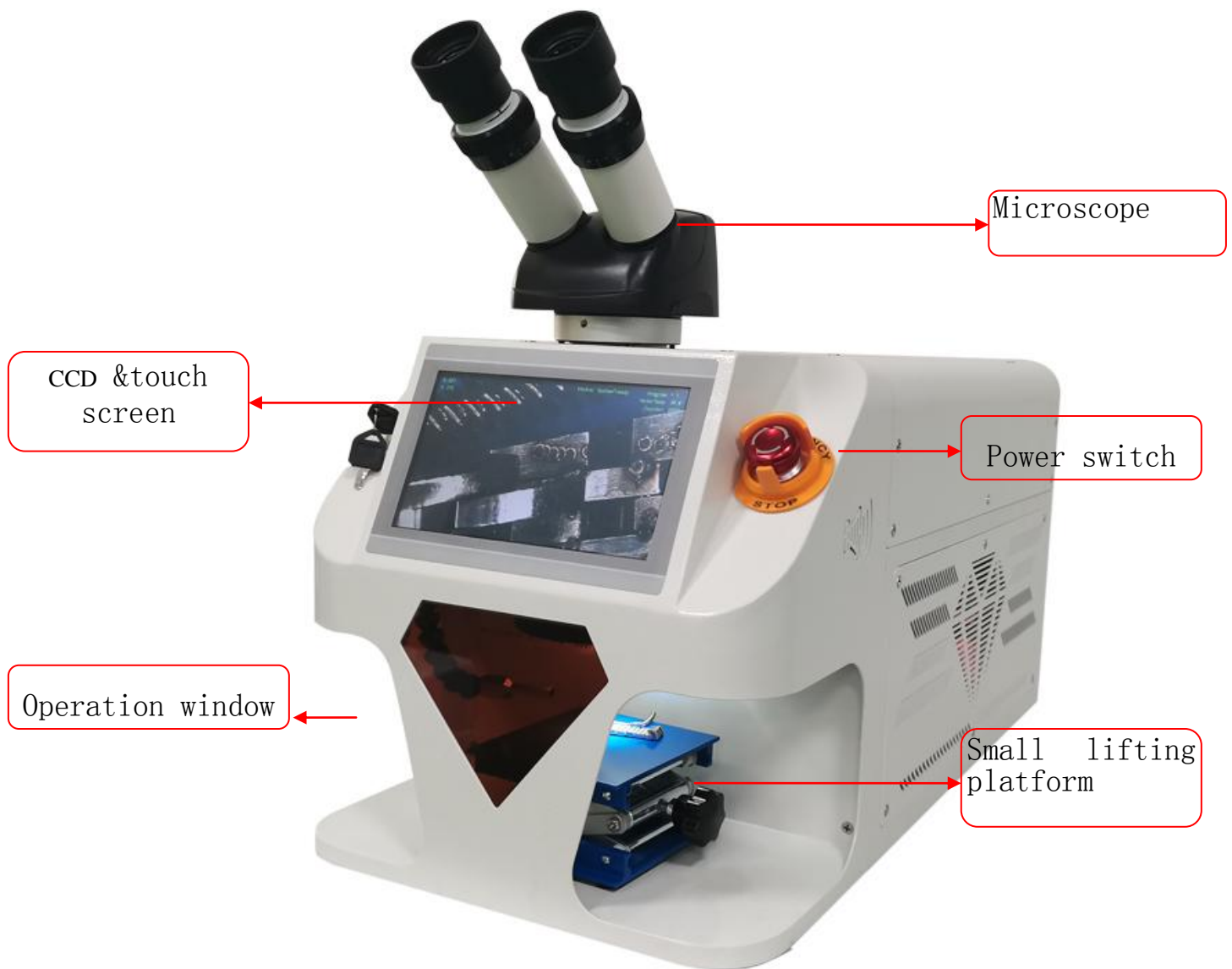
## 2. Pay attention to safety



### **! warning**

1. This equipment is not suitable for use in high temperature and high humidity environment, which may cause short circuit and fire
2. Under working conditions, do not touch the terminal, otherwise electric shock may occur
3. Before use, it must be confirmed to connect the equipment ground wire, so as to avoid device leakage and injury
4. As the power supply system adopts single-phase 220V/50HZ ac power supply, it can generate a high voltage of tens of thousands of volts and output 60-150w power, which belongs to high-voltage and high-power electrical appliances. If you are using this laser for the first time, be sure to pay attention to safety
5. Please supply power according to the rated specification, otherwise it will cause the product to burn out or fire
6. Can not be used in flammable, easy to gun, damp, vibration environment, may cause product damage or fire
7. Before use, make sure that the power supply input contact is firm and the power supply shell must be connected to the earth correctly to ensure that the shell leakage or static electricity can be released quickly to protect the equipment or personal safety

## The machine appearance



(This drawing is for reference only, the appearance of the equipment is subject to the real object)

➤ Configuration List

No.	Item Name	Specification & parameters	ReMark
1	Laser Power Supply	UET	
2	Laser Type	Nd. YAG	
3	Laser waveLength	1064nm	
4	<b>Laser Power</b>	<b>60W/100W/150W</b>	<b>option</b>
5	Pump Soure	Xenon lamp	
6	pulse Width	0.3-5ms/10ms/10ms	
7	Frequency	0-15Hz	
8	Solder Joint Size	0.2-3mm	
9	Positioning way	reticle	
10	Visual system	Microscope&CCD	
11	Max Weld Depth	0.1-0.5mm	
12	Cooling method	Small Chiller (Built-in)	
13	power systems	3KVA/4KVA/5KVA	<b>option</b>
14	Weight	32KG	
15	machine size	540(L) x 290(W) x 290(H) mm	

# Chapter 1: Equipment introduction

## 1、The product description

The miniature laser welding machine is composed of YAG pulse laser, laser power supply, imported optical system, built-in integrated water cooling machine, CCD observation system, etc., table top equipment, small size, light weight, strong function;

Adopts the laser power supply and welding system independently developed by the company, and is equipped with the dual observation mode of HD microscope and CCD camera. It is the first to embed the manual voice function, and the information such as startup and process status can be broadcast by human voice in real time. Is the company's first embedded artificial intelligence product, the company's other series of products will also introduce artificial voice function

### ✚ Equipment advantages:

1. Built-in self-developed laser host, patented technology; Stable and reliable
2. Integrated design, ergonomic design; Beautiful appearance, generous; Small volume, light weight
3. 7 inch TFT true color touch screen, parameter setting and CCD monitor integrated
4. Support 6 languages (international version)- customizable language
5. Electric speed expansion adjustment
6. Imported optical components, the use of the UK imported ceramic condenser cavity, condenser cavity life (8-10 years), xenon lamp life can reach more than 8 million times;
7. Equipped with 100X100X150 manual lifting platform
8. Built-in air cooling system, continuous working ability for several hours, stable working performance of the machine
9. Independently developed laser controller and CCD visual monitoring system
10. Specialized UI and software interface, strong R & D team
11. Artificial speech system; Real-time alarm and prompt;
12. Support irregular software upgrade, support mobile APP connection in the later stage, access to cloud and remote monitoring

### ✚ Application fields:

This series of products for jewelry, hardware, electronic industry design. Mainly used in jewelry, hardware, electronic components, 3C communication, crafts and other industries. They can repair and weld all kinds of metals and alloys, spot weld lines, splicing, embedded troops and other welding; Such as stainless steel, copper, gold, silver, K gold and so on

Necessary welding tools for jewelry processing shops, specialty shops, factories or school scientific research laboratories

### 1.1. Product structure

Main box **Size:** L 54cmx W 29cm x H 29cm.






**Weight:** 32 kg

### 1.2. Technical indicators:

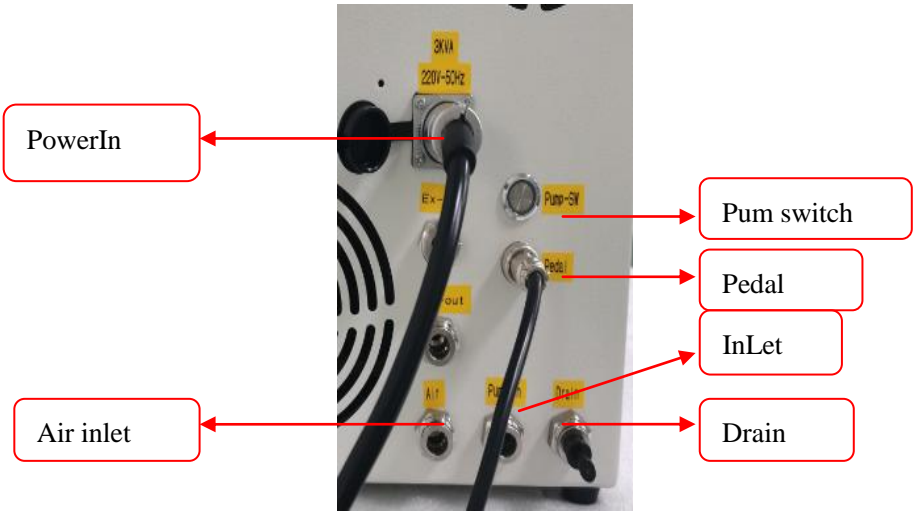
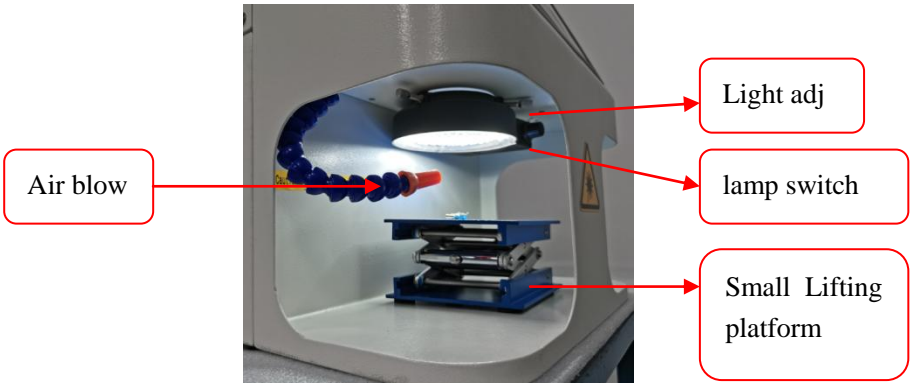
- Working environment requirements: temperature range:  $-20^{\circ}\text{C} \sim 40^{\circ}\text{C}$ ; Humidity 45-75%.
  - Input power requirements: single-phase AC220V/3KVA, 50Hz; Power supply network fluctuation is less than 10%.
  - Equipment cooling system requirements: water cooling, installation location to maintain a ventilated environment
  - Maximum output pulse frequency: 0-15HZ (other frequency ranges can be customized)
  - Maximum output pulse width: 0-10ms
  - Maximum output pulse current: 150A
  - Output power limit: 60W/100W/150W
-

## Chapter 2: main components of the equipment

### 2.1: Component Description

Component Items	Description
	<ul style="list-style-type: none"> <li>● Touch&amp;CCD screen, user parameter adjustment interface, all welding parameters are set and adjusted on this screen</li> </ul>
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Laser power switch</p> </div> <div style="text-align: center;">  <p>Emergency switch</p> </div> </div>	<ul style="list-style-type: none"> <li>● The power switch             <ol style="list-style-type: none"> <li>1. Emergency stop switch, main power switch;</li> <li>2. Laser power switch – turn on the power of the laser host</li> </ol> </li> </ul>
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>microscopic</p> </div> <div style="text-align: center;">  <p>CCD Screen</p> </div> </div>	<ul style="list-style-type: none"> <li>● Observation system             <ol style="list-style-type: none"> <li>1: Microscopic observation</li> <li>2: The CCD observation</li> </ol>             Dual observation system           </li> </ul>



 <p>PowerIn</p> <p>Air inlet</p> <p>Pum switch</p> <p>Pedal</p> <p>InLet</p> <p>Drain</p>	<ul style="list-style-type: none"> <li>● Back connector <ul style="list-style-type: none"> <li>-Power input: 220V</li> <li>Pumping switch: the water inlet is connected with the 10MM water pipe, the water pipe is put into the water, press the pumping switch, start pumping, and automatically stop pumping when full 2:</li> </ul> </li> </ul>
 <p>Air blow</p> <p>Light adj</p> <p>lamp switch</p> <p>Small Lifting platform</p>	<ul style="list-style-type: none"> <li>● Work window: <ul style="list-style-type: none"> <li>- The brightness of the desk lamp can be adjusted by twisting</li> <li>-Lifting platform: adjust the height of the working face</li> </ul> </li> </ul>

## 2.2: Machine on/off process

### ➤ Power on steps:

Turn on the main power switch → turn on the laser power → power on



### ➤ Power off Steps:

Power off → turn on the laser power → Turn on the main power switch



◆ Notes for switching machine:

The operation must be carried out according to the switch step, otherwise the equipment is easy to be damaged; During normal use, please do not directly turn off the main power switch, because the laser has been turned on, the laser water cooling system is working; After the water tank stops, because laser xenon lamp has high heat, will easily damage the laser lamp rod;

# Chapter 3: Operation instructions

## 3.1、Monitoring Interface



➤ **Description:** If the user wants to modify or set the system parameters, he can set them by pressing the button on the right side of the main interface and entering each sub-window (finger touching the button). Parameters such as welding power are adjusted here



>Power button: on/off the laser power



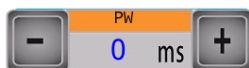
Setting

>Parameter modification: enter parameter setting page, modify and adjust laser parameters

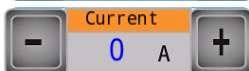


System

>System Settings: Enter the System Settings page and set the system parameters



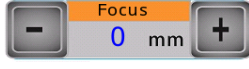
>Pulse width adjustment: step length 0.1ms



>Current adjustment: step size 1A



>Frequency adjustment: step length 1Hz



>Spot adjustment: step size 0.1mm



>CCD crosshead position adjustment: left and right, up and down adjustment

Program: 0

>Program: Displays the current program number

WaterTemp: 0

Water temperature: Display the current water tank temperature, water temperature

Counter: 0

Counter: laser counter (can be reset in the system page)

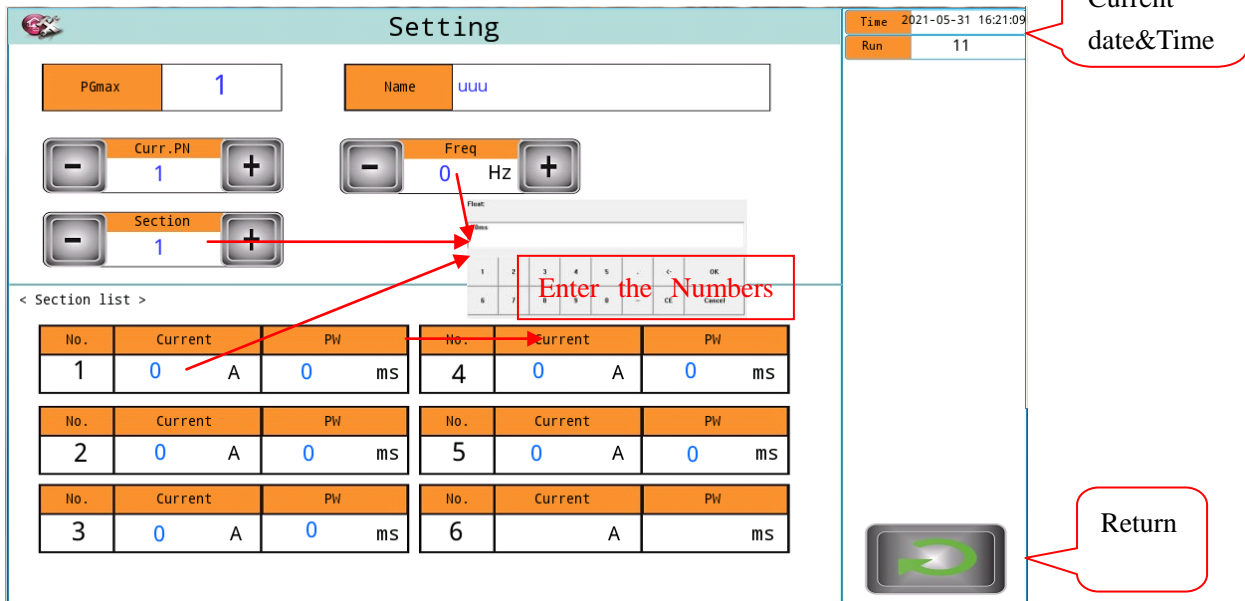
Status: System error' >Status: Display the current status of the system

X: 512

>X/Y: Displays the current coordinate value of the reticle position

Y: 300

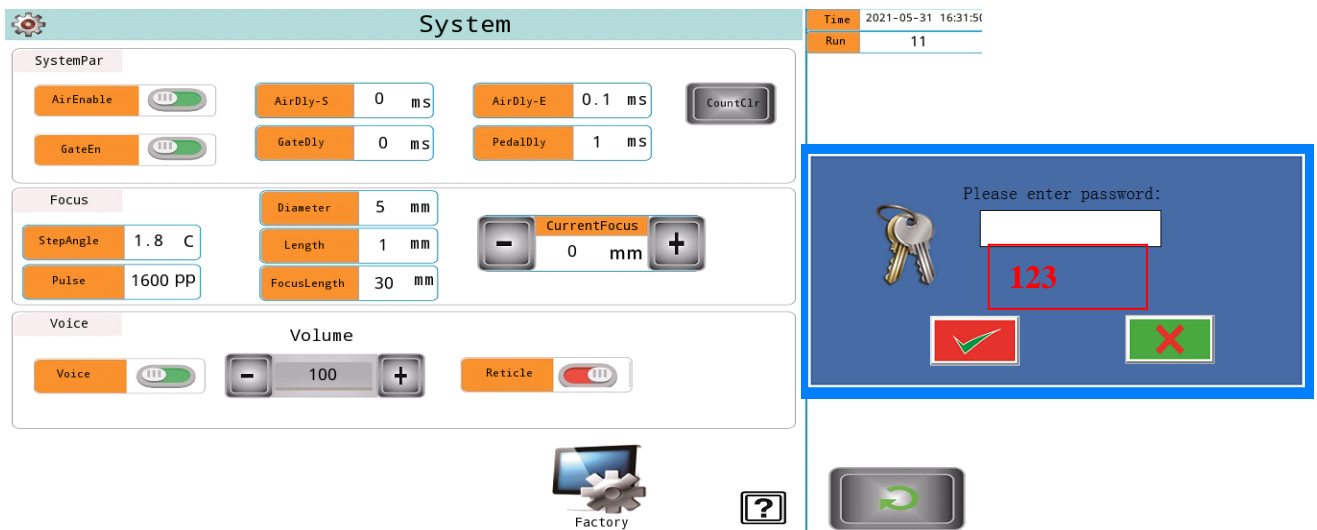
### 3.2、Parameter Setting Interface



#### ● Description:


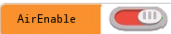

- **PGmax:** Total number of programs: Set range :5;
- **Curr. PN:** Current program, The program group number that is being edited. This program number is the current active program.
- **Name:** The name corresponding to the current program group, entered via the alphabetic keyboard
- **segment:** The maximum number of segments in the current program group; range: 1;
- **Freq:** Current program group frequency value parameter, range :0-- 15Hz (Note: 0Hz is single point mode, other frequency range can be customized)
- **Current:** Current parameter of program group, range :1--200A; (Subject to actual conditions)
- **PW:** current program group pulse width parameter, range :0.5--10ms;

### 3.3: System Interface

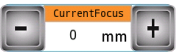


Description:


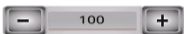

>> system parameter bar:

- **CountClr**: Touch and click this key to reset the light counter 
- **AirEnable**: prohibit/allow air valve function; Delay of air valve: the time value of opening air valve in advance is ms:1-600ms; 
- **GateEn**: Disallow/allow light brake function; Light brake delay: the time of opening the light brake in advance is ms:1-500ms; 
- **AirDly-S**: Delay time before blowing; 1-500ms;
- **AirDly-E**: Delay time before and after blowing; 1-500ms;
- **PedalDly**: Delay time when the foot is closed :1000ms

>> spot parameter bar:

- **StepAngle**: Touch and click this box to set according to the actual stepper motor and driver parameters, generally 1.8 degrees, etc
- **Pulse**: set the subdivision value according to the actual stepper motor driver
- **Diameter**: diameter of screw driven by stepping motor; The unit of mm
- **Length**: The total length of screw. After this value is set, overpunching is prevented
- **FocusLength**: This setting value is, is the length of single adjustment, namely, the unit length of adjustment. Press add/subtract key or rocker to adjust
- **CurrentFocus**: Set the length to be adjusted. When this value changes, the system will automatically adjust and the motor will automatically run to the set length 

>> voice setting bar:

- **Voice**: Turn on and off the voice function 
- **Volume**: Adjust voice volume 1-100% 
- **Reticle**: CCD reticle display mode, large and small mode load switch 



**Factory Settings:** Manufacturer factory Settings, common users are forbidden to use



The system Version information

### 3.4、Factory settings

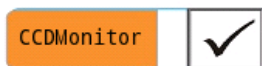
Description:

>> setting parameter bar:

- Model: the device model is not optional
- Light mode: not optional
- Water change time: prompt the user to change the time length setting, 1-9999 hours

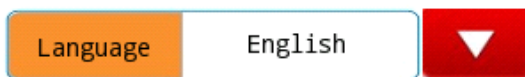
>> password setting bar

- System password: the password to enter the system setting interface
- Factory password: password to enter the factory setting interface
- CCDMonitor: with or without CCD monitor mode selection



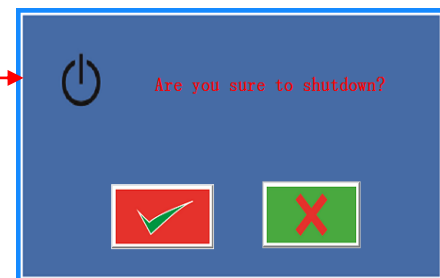
>> language selection bar

- languages switch: Select and switch the languages of different countries. At present, it supports 6 languages and can be customized



!!!! Note: Please remember this password after setting, otherwise you need to contact the manufacturer screen to clear the password

### 3.5、:Power On/Off



- Description:

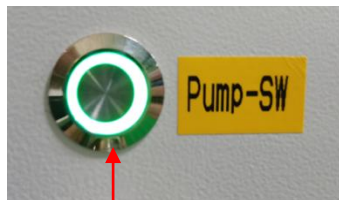
When you need to turn off the machine, you should first turn off the machine from the software, touch and click the "POWER OFF", pop up the shutdown confirmation window, and then press "OK" button, the delay of about 20 seconds, the startup state of "shutdown" immediately becomes "boot; Then turn off the external current (note: "power on" is not displayed in the startup state, please do not turn off the external main switch immediately).



**Warning:** do not turn these switches off immediately

## Chapter 4: Precautions and daily maintenance

### 4.1、The tank must be filled with water before use !!!



Pumping switch



Put the inlet pipe into the water (connect the 10MM water pipe)

**!! Tip: The pump will stop working automatically after filling with water.**

### 4.2. The water tank should be replaced regularly once every three months



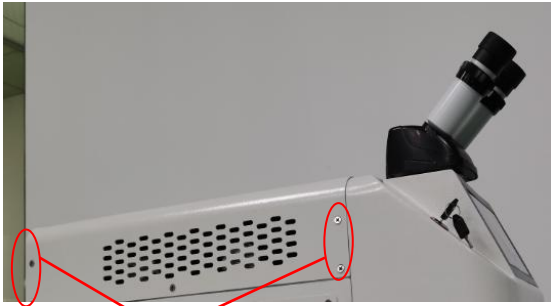
Drainage/Outlet (gently inserted)

**! Tip: after draining the sewage, to seal well, otherwise it will leak**

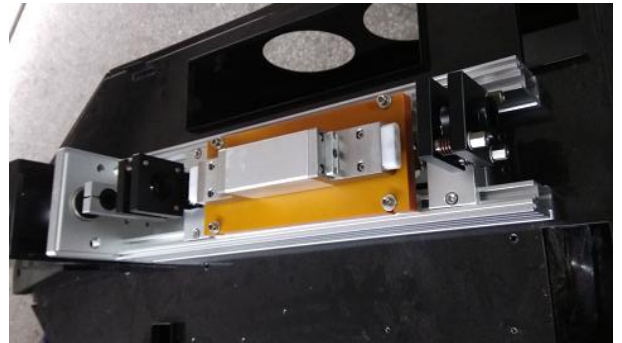
4. 3、 The laser xenon lamp tube belongs to the wastage product, not regularly replaced, generally replaced once a year, in order to ensure sufficient laser energy

- Xenon lamp replacement steps:

Step 1: open the cavity shell of the laser host and find the laser cavity



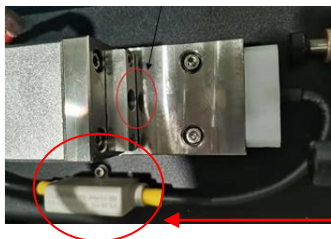
Remove the Laser cavity shell



The laser cavity

Step 2: unscrew both sides of xenon lamp

(note that xenon lamp is a glass shell, which is brittle and easy to damage)



Lamp set



Hand twist here and remove

Step 3: install the xenon lamp carefully and tighten it

(!!! Note that xenon lamp has a glass case, which is brittle and easy to damage.



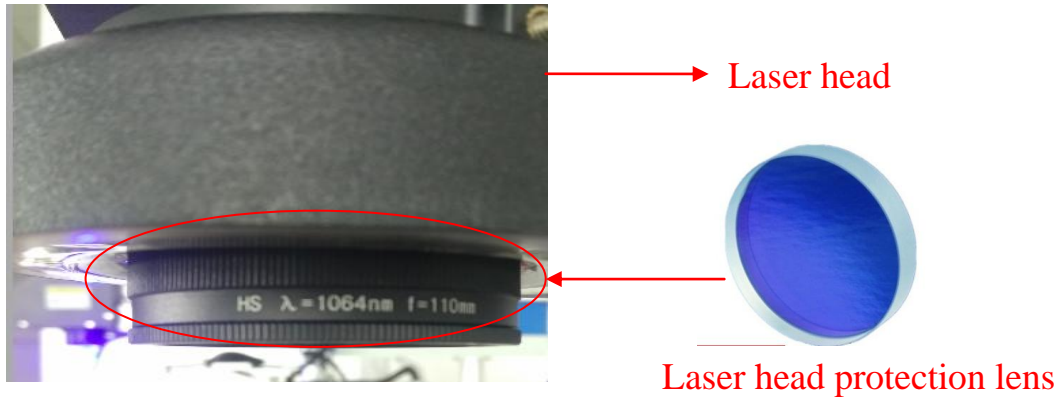
Step 4: install the cavity shell

Restart the machine and turn on the laser. If the light is normal, the xenon lamp will be updated. If there is any abnormality after the machine



is restarted, please check again whether there is any problem in replacing the xenon lamp

4.4、 Laser head protection lens, not regular replacement, use process, if the laser power becomes weak, it is necessary to replace



Unscrew it by hand and replace with a new lens

4.5. Operators should wear laser protective glasses (medium black) to prevent long working hours that may affect their eyes



## Chapter 5: system alarm instructions and solutions

When the power supply system fails, the system will display the fault information on the screen, accompanied by the alarm sound of "di" for 5 times. At this time, the system can only respond to the shutdown action.

No.	Alarm code	alarm information	The cause of the problem	The solution
1	001	WaterP Fail	Water tank insufficient	Check whether water level switch is abnormal
2	002	LEM Fail!	LEM abnormal during lighting	Check the LEM for good condition; The lamp tube is damaged and replaceable
3	003	LEM Error!	the LEM loop detects an anomaly	Check lamp wiring or LEM for damage
4	004	Ignition Fail	Ignition panel failed to light	Check whether the ignition plate is damaged and whether the lamp tube wiring is correct
5	005	Water OT!	Tank temperature is too high	Check the tank to see if there is too little water
6	006	OL1!	There is too little water in the tank/or the water level switch is abnormal	Fill the tank with water or check the water level switch
7	007	IGBT OVT!	IGBT temperature overalarm	Check the IGBT or IGBT AC220V fan
8	008	OL2!	The power adjustment is small, or the hardware is damaged	adjustment par or Check hardware
9	009	Water Low Err!		
10	010	T2 Temp OTP!	The T2 temperature is too high	Detect T2 temperature, or T2 set value
...	015	mark		
99	888	System running normally	No trouble, the system is running normally	