300W 柜式风冷一体式激光焊接机说明书

属性

激光类型	ＮＤ；ＣＥＹＡＧ 钇铝柘榴石
激光波长	1064mμ
输出功率	300W
脉冲宽度	0. 1~20 ms可调
脉冲重复频率	1~20Hz可调
最大单脉冲功率	130J
最大输入功率	7KW

attribute

Laser type N D; C E Y A G Yttrium aluminum garnet
Laser wavelength 1064m
Output power 300W
Pulse width adjustable from 0.1 to 20 ms
Pulse repetition rate 1-20Hz adjustable
Maximum single pulse power 130J
Maximum input power 7KW

产品概述

在激光作用下，金属表面会发生变化，被迅速加热并传导到金属的深层，当激光功 率的浓度足够大时，表面会发生熔化，部分零件由于浓度高而瞬间汽化，形成熔点

激光焊接与其它焊接工艺相比能实现很多材料的焊接，相比具有优势，焊接构件热变形小，附着质量高。激光焊接的优势在于能实现局部很小范围的加热特性，广泛用干与精密零部件如珠宝、电池、汽车工业、航空工业的一些其它应用等。
MW-DW280激光焊接设备是脉冲焊接方式,焊接中的脉冲能量和脉冲宽度可以调节,脉冲能量影响熔化量.宽度影响熔深.同时通过外光路调节焊点,调节聚焦光斑的 大小.
MW-DW280激光焊接系统是一种新的改进产品.可用干钛、镍铝、不锈钢、金、银、铜、铂等小型金属构件的点焊和缝焊.可对继电器的接触器、计算机软盘驱动器的钢带、打印机的引脚、还可加工伺服电机铁芯、金属管带的缝焊,继电器外壳、 IC 封装、压力装置、心脏起搏器外壳、钽电容、锂电池外壳等的密封焊接.也可用 于小尺寸金属零件的切割和钻孔.

此系统特别适用于珠宝行业.处理过程中不需要特殊的块.被加工件可以用手拿着 ，方便在显微镜和电子CCD观察系统下焊接

Under the action of laser, the metal surface will undergo changes, which are rapidly heated and transmitted to the deep layers of the metal. When the concentration of laser power is large enough, the surface will melt, and some parts will vaporize instantly due to the high concentration, forming a melting point

Compared with other welding processes, laser welding can achieve welding of many materials and has advantages such as small thermal deformation of welded components and high adhesion quality. The advantage of laser welding is that it can achieve localized heating characteristics in a very small range, and is widely used in dry and precision components such as jewelry, batteries, automotive industry, and other applications in the aviation industry.
The MW-DW280 laser welding equipment is a pulse welding method, and the pulse energy and pulse width during welding can be adjusted. The pulse energy affects the melting amount and the width affects the melting depth. At the same time, the welding point is adjusted through the external light path to adjust the size of the focused spot
The MW-DW280 laser welding system is a new and improved product. It can be used for spot welding and seam welding of small metal components such as dry titanium, nickel aluminum, stainless steel, gold, silver, copper, platinum, etc. It can also be used for welding the contacts of relays, steel strips of computer floppy disk drives, printer pins, as well as for processing the iron cores of servo motors and metal tube strips. It can also be used for sealing and welding relay casings, IC packaging, pressure devices, pacemaker casings, tantalum capacitors, lithium battery casings, etc. It can also be used for cutting and drilling small metal parts

This system is particularly suitable for the jewelry industry. No special blocks are required during the processing. The processed parts can be held by hand, making it convenient for welding under microscopes and electronic CCD observation systems

1.系统配置

主要部件	简述
激光晶体	Φ7 * 1 3 0 ND; CEYAG
激光电源	KD-280脉冲电源
冷却系统	风冷式冷凝器散热，流量报警，超温报警
控制系统	单片机
观看系统	10X 显微镜观察系统电子CCD观察系统

1. System configuration

Main component description
Laser crystal Φ 7 * 1 30 ND; CEYAG
Laser power supply KD-280 pulse power supply

Cooling system
Air cooled condenser heat dissipation, flow alarm, over temperature alarm
Control system microcontroller
Observation System 10X Microscope Observation System Electronic CCD Observation System

2.规格

2.1.激光

激光介质:Nd3+:YAG

波长: 1064mμ

泵灯: 脉冲氙灯

脉冲频率: 0~20Hz 可调

脉冲宽度: 0.1~20ms 可调

单脉冲能量: 0~12 0 J

激光功率: 300W

2. Specifications

2.1. Laser
Laser medium: Nd3+: YAG
Wavelength: 1064m
Pump lamp: pulse xenon lamp
Pulse frequency: 0-20Hz adjustable
Pulse width: 0.1-20ms adjustable

Single pulse energy: Laser power:

0-12 0 J
300W

2.2.焊点尺寸:

直径;0.2-3.0mm,可根据需要调整

2.3.光学系统

(1) 光束扩束和聚焦

扩束倍数:2.5X

聚焦焦点120mm

2.2. Solder joint size:

Diameter; 0.2-3.0mm, adjustable as needed

2.3. Optical systems
(1) Beam expansion and focusing

Beam expansion factor: 2.5X
Focus 120mm

.42 冷却系统

冷却系统

采用冷凝器双循环水冷却系统， 由水泵驱动内循环水用于冷却激光器和泵浦灯 .
具有超温，超流控制保护， 内循环水必须是纯净水， 内循环的热量由冷凝器带走
， 由风扇送入空气中

42 Cooling system

Cooling system

Adopting a condenser dual circulation water cooling system, driven by a water pump, the internal circulation water is used to cool the laser and pump lamp. It has over temperature and over flow control protection, and the internal circulation water must be pure water. The heat of the internal circulation is carried away by the condenser Sent into the air by a fan

2.5.对电源的要求

单相,交流220V50HZ

2.5. Requirements for power supply

Single phase, AC 220V 50Hz

.6.2 工作环境

清洁，远离振动源，温度约10°-32° ，湿度低于85%

6.2 Work Environment

Clean, away from vibration sources, with a temperature of about 10 ° -32 ° C and a humidity below 85%

2.7.连续工作时间

可连续工作12小时以上

2.7. Continuous working hours

Can work continuously for more than 12 hours

3.结构及维护说明

该系统由激光器， 电源，光学工作系统，控制箱和冷却系统组成，根据各部分的功能，可分为以下部分

(1) 激光器 (2) 激光电源 (3) 光学系统
(4) 控制系统 (5) 冷却系统

3. Structure and maintenance instructions

The system consists of a laser, power supply, optical working system, control box, and cooling system. According to the functions of each part, it can be divided into the following parts

(1) Laser (2) Laser power supply (3) Optical system
(4) Control system
(5) Cooling System

3.1 结构及维护说明

激光是将电能转化为激光能量的装置,在该系统中,激光器为ND: CEYAG激光器,主要由以下几个部分组成

(1)氙灯(2)激光棒(3)腔(4)光学谐振腔(5)其他配件
氙灯激发激光介质,将电能转化为光能.激光棒将光能转化为激光能量.在该系 统中,泵浦灯为脉冲氙灯,激光介质为Nd: CEYAG棒
在腔内，泵浦灯发出的光聚焦在激光介质上。在我们的系统中，它是封闭的陶瓷腔。
在光学谐振腔中，激光被放大，形成高强度的激光输出。在谐振腔中平行设置两个高损伤阈值的镀膜平面镜。
在激光器工作过程中，只有3%的电能转化为激光能量，其余的电能都转化为热能，分布在泵浦灯、激光棒和腔体中。为了保护激光，这些热量必须被带走。该系统采用循环去离子水冷却泵浦灯、激光棒和腔体。除上述部件外，还有以下其他配件
(1)高压电极。 (2) 绝缘底座， (3)定位支撑， (4)可调式镜面支架， (5)激光支架
。

3.1 Structure and Maintenance Instructions

Laser is a device that converts electrical energy into laser energy. In this system, the laser is an ND: CEYAG laser, mainly composed of the following parts

(1) Xenon lamp (2) laser rod (3) cavity (4) optical resonant cavity (5) other accessories
The xenon lamp excites the laser medium, converting electrical energy into light energy. The laser rod converts light energy into laser energy. In this system, the pump lamp is a pulsed xenon lamp, and the laser medium is an Nd: CEYAG rod
In the cavity, the light emitted by the pump lamp is focused on the laser medium. In our system, it is a closed ceramic cavity.
In an optical resonant cavity, the laser is amplified to form a high-intensity laser output. Two high damage threshold coated planar mirrors are set parallel in the resonant cavity.
During the operation of the laser, only 3% of the electrical energy is converted into laser energy, while the remaining electrical energy is converted into thermal energy Distributed in pump lamps, laser rods, and cavities. To protect the laser, this heat must be taken away. The system uses circulating deionized water to cool the pump lamp, laser rod, and cavity. In addition to the above components, there are also the following other accessories
(1) High voltage electrode. (2) Insulated base, (3) Positioning support, (4) Adjustable mirror bracket, (5) Laser bracket
.

3.1.2.注意事项及保养

激光器系统为光电一体化系统，它非常精确需要由具有专业技术和技能的授权人员进行操作。

A.光学谐振腔

光学谐振腔由两个介质膜组成，两个介质膜严格平行设置在谐振腔中。这两面镜 子调整后不可触摸和移动并保持清洁，否则，镜子的表面可能会被破坏。所以， 激光罩在任何时候都不能移动。当激光功率变低时，首先要检查反射镜的表面是 否被污染。如有污渍，可用镜纸或吸水棉用清洁液(50%无水乙醇和50%花药的混 合液)轻轻擦拭。 然后，检查谐振器的调整

3.1.2. Precautions and maintenance

The laser system is an optoelectronic integrated system, which is very precise and requires authorized personnel with professional skills and expertise to operate.

A. Optical resonant cavity

The optical resonant cavity is composed of two dielectric films, which are strictly parallel in the resonant cavity. These two mirrors should not be touched or moved after adjustment and should be kept clean, otherwise the surface of the mirrors may be damaged. So, the laser cover cannot be moved at any time. When the laser power decreases, the first step is to check whether the surface of the reflector is contaminated. If there are stains, you can use mirror paper or absorbent cotton to gently wipe with cleaning solution (a mixture of 50% anhydrous ethanol and 50% anther). Then, check the adjustment of the resonator

B.冷却系统

激光腔体下面分别接有两根水管，任何一根水管堵塞都可能造成无法弥补的损坏冷却水每个月都要更换新的纯净水

B. Cooling system
There are two water pipes connected to the laser cavity, and any blockage in either pipe may cause irreparable damage. The cooling water needs to be replaced with new purified water every month

C.更换氙灯

脉冲氙灯是消耗部件。使用寿命为8000万次闪光次数。为保证系统的正常工作，当灯具达到使用寿命，激光能量变低时，必须更换灯具。
如果氙灯损坏或提前达到使用寿命(电压上升到500V时无法点燃或没有激光输出)，也需要更换。
在更换氙气灯时，必须注意氙气灯的两端。 (1)关闭系统，关水，排出储能电容中的剩余电荷 ；
(2)卸下灯的电极;
(3)拆下灯顶， 小心取出氙气灯在反射镜旁边，
(4)用棉花和清洁液清洁盖管。 (5)检查氙气灯的尺寸;
(6)插入灯，关闭顶部，安装电极。 (8) 检查漏水情况:
(9)打开主电源，检查放电情况。
(10)使用单脉冲模式检查激光输出功率。如果激光输出功率不能满足要求，则 需要反复调整谐振腔。 (11)关闭激光罩

C. Replace xenon lamp

Pulse xenon lamp is a consumable component. The service life is 80 million flashes. To ensure the normal operation of the system
When the lamp reaches its service life and the laser energy decreases, the lamp must be replaced.
If the xenon lamp is damaged or reaches its service life prematurely (unable to ignite or without laser output when the voltage rises to 500V)
) It also needs to be replaced.
When replacing the xenon lamp, attention must be paid to both ends of the xenon lamp. (1) Turn off the system, turn off the water, and discharge the remaining charge from the energy storage capacitor;
(2) Remove the electrode of the lamp;
(3) Remove the lamp top and carefully remove the xenon lamp next to the reflector,
(4) Clean the cap tube with cotton and cleaning solution. (5) Check the size of the xenon lamp;
(6) Insert the lamp, turn off the top, and install the electrodes. (8) Check for water leakage:
(9) Turn on the main power and check the discharge situation. (10) Use single pulse mode to check the laser output power. If the laser output power cannot meet the requirements, it is necessary to repeatedly adjust the resonant cavity. (11) Close the laser cover

D.ND:CEYAG棒

ND:CEYAG棒是激光器的核心，在安装和使用过程中必须非常小心地处理该棒。连杆两端必须严格保持平行。如果两端表面有脏物，必须先清理房间，然后请专业服务人员处理该棒。拿出NdC E YAG棒，用含有清洗液（：50%无水乙醇和50%乙醚的混合物）的透镜纸清洗。YAG棒损坏的原因可能如下：

a.冷却水流量较低或水管堵塞。导致灯和激光棒过热，使灯和激光棒断裂。

b.YAG棒的末端被坚硬的东西弄伤了。

c.由于表面的脏，薄膜烧坏了。

d.腔体座的强烈和不均匀的应力打破了激光棒。因此，操作者通常不能打开激光盖，也不能接触到YAG杆。如果YAG杆端面有污垢，必须由专业服务人员处理。

D. ND: CEYAG rod
The ND: CEYAG rod is the core of the laser and must be handled very carefully during installation and use. connecting rod
Both ends must be strictly parallel. If there is dirt on the surfaces of both ends, the room must be cleaned first, and then professional service personnel must be consulted

It should be a stick. Take out the NdC E YAG rod and clean it with lens paper containing a mixture of 50% anhydrous ethanol and 50% ether. The possible causes of YAG rod damage are as follows:
a. Low cooling water flow or blocked water pipes. Causing overheating of the lamp and laser rod, causing them to break.

b. The end of the YAG stick was injured by a hard object.
c. Due to the dirt on the surface, the film burned out.
d. The strong and uneven stress on the cavity seat broke the laser rod. Therefore, operators usually cannot open the laser cover or come into contact with the YAG rod. If there is dirt on the end face of the YAG rod, it must be handled by professional service personnel.

E.空腔的维护

该空腔是由陶瓷制成的，其反射率很高。它不需要做维护。所以分开是不允许的。

E. Maintenance of cavities
The cavity is made of ceramics and has a high reflectivity. It does not require maintenance. So separation is not allowed

F.对高电压的保护

要启动激光，氙气灯施加三个电压。它们为触发电压：约15~20 kV；预点火电压：约1.7 kV~2kV，电弧放电电压：约500~ 1900电压。它必须与周围的部件保持至少15毫米的距离。在操作过程中，绝缘板必须保持清洁和干燥，以防止高压短路。

F. Protection against high voltage
To start the laser, a xenon lamp is applied with three voltages. They are trigger voltages: approximately 15-20 kV; Pre ignition voltage: approximately

1.7 kV~2kV, arc discharge voltage: approximately 500~1900 voltage. It must maintain a distance of at least 15 millimeters from the surrounding components. During operation, the insulation board must be kept clean and dry to prevent high-voltage short circuits.

3.2激光电源

该系统可通过操作面板和操作摇杆进行控制。

3.2 Laser power supply
The system can be controlled through the operation panel and joystick.

.2.1.3规格

本系统中的激光电源为脉冲模式电源。IGBT由L-C谐振充电和储能电路提供。控制电路有两个单片机作为核心。因此，可以很方便地调整输出功率和可重复性。电源可以独立调节或与控制系统一起调节。本系统有多联锁保护，在紧急情况下关闭主电源。

2.1.1.3 Specifications
The laser power supply in this system is a pulse mode power supply. IGBT is provided by L-C resonant charging and energy storage circuits. The control circuit has two microcontrollers as the core. Therefore, it is easy to adjust the output power and repeatability. The power supply can be adjusted independently or together with the control system. This system has multiple interlocking protections to turn off the main power supply in emergency situations.

3.2.2.电气电路的说明

该电路由以下几个部分组成：

主电路：包括充电电路、储能电路、放电回路和预点火电路。

控制电路：包括电气控制电路、微机控制电路和各类保护电路。

A.升压/整流电路

通过上升单相电压，电压升/整流电路将220 ACV转换为620 DCV，为充电电路供电。

B.充电电路

该充电电路由一个电压双倍器电路组成。这种电路可以提高充电的可重复性。

C.放电回路

放电电路回路由SCR控制。在放电期间，必须关闭放电IGBT功率晶体管。储能电路充电后，充电IGBT功率晶体管关闭，等待一段时间的延迟，放电IGBT功率晶体管接通放电。当储能电容器放电完成后，放电的IGBT功率晶体管将自动关闭。

D.预点火和触发电路

它包括降压变压器、高压整流器、滤波器、电流继电器、高压脉冲变压器和高压触发电路。

脉冲氙气灯在预点火过程中在光环放电中工作，具有负电阻的特性。为了保持氙气灯在电弧放电后的光环放电，预点火电路必须具有恒流的特性。所以预点火电路必须具有很高的极限电阻。该激光器的触发模式由50Hz脉冲自动触发。当预点火电路工作时，高压脉冲变压器产生15000V~20000V的高压。当预点火开始时，触发电路会自动并立即关闭。

E.控制电路

控制电路包括操作电路和微机控制电路。操作电路控制水泵、预点火电路、主电源、控制电路的电源和联锁保护，通过

如按钮、接触器、继电器等部件。微机控制电路集成在一个PCB中。

G.保护电路

a)预点火切断保护电路

当预点火电路关闭时，预点火关闭保护电路进入功能，并发出故障信号。

b)水流联锁

当冷却系统中水流不足时，水流继电器中断并关闭预点火电路和主电源，从而使系统停止。

3.2.2. Description of electrical circuits

The circuit consists of the following parts:

Main circuit: including charging circuit, energy storage circuit, discharge circuit, and pre ignition circuit.

Control circuits: including electrical control circuits, microcomputer control circuits, and various protection circuits.

A. Boost/rectifier circuit

By increasing the single-phase voltage, the voltage rise/rectification circuit converts 220 ACV to 620 DCV to supply power to the charging circuit.

B. Charging circuit

The charging circuit consists of a voltage doubler circuit. This circuit can improve the repeatability of charging.

C. Discharge circuit

The discharge circuit is controlled by SCR. During discharge, the discharge IGBT power transistor must be turned off. After charging the energy storage circuit

Turn off the charging IGBT power transistor, wait for a period of delay, and then turn on the discharging IGBT power transistor. After the discharge of the energy storage capacitor is completed, the discharged IGBT power transistor will automatically turn off.

D. Pre ignition and trigger circuit

It includes step-down transformers, high-voltage rectifiers, filters, current relays, high-voltage pulse transformers, and high-voltage trigger circuits

.

Pulse xenon lamps operate during pre ignition during halo discharge and exhibit negative resistance characteristics. In order to maintain the halo discharge of xenon lamps after

arc discharge, the pre ignition circuit must have constant current characteristics. So the pre ignition circuit must have a high limit resistance. The triggering mode of the laser is automatically triggered by a 50Hz pulse. When the pre ignition circuit is in operation, the high-voltage pulse transformer generates a high voltage of 15000V~20000V. When the pre ignition starts, the triggering circuit will automatically and immediately shut down.

E. Control circuit
The control circuit includes operation circuit and microcomputer control circuit. Operate the circuit to control the water pump, pre ignition circuit, main power supply, control circuit power supply, and interlock protection, through

Components such as buttons, contactors, relays, etc. The microcomputer control circuit is integrated into a PCB.

G. Protection circuit
a) Pre ignition cut-off protection circuit
When the pre ignition circuit is turned off, the pre ignition shutdown protection circuit enters the function and sends a fault signal.
b) Water flow interlocking
When there is insufficient water flow in the cooling system, the water flow relay interrupts and turns off the pre ignition circuit and main power supply, causing the system to stop.

.33光学系统

3.3.1 电子CCD观察

该功能可在显示屏幕上面清晰的观察焊接部件

. 33 Optical System
3.3.1 Electronic CCD observation

This function allows for clear observation of welded components on the display screen

3.3.2 Laser光束扩展器和聚焦系统

为了保证在聚焦过程中激光焊点始终在视图中心，激光束必须与显微镜的光束路径同轴。在该系统中，激光束和显微镜的光路具有相同的物体透镜。焦点的偏移量由上下键进行调整。根据焊接工艺技术，通过实验确定了焦点的偏移量。

.3.33焊点指示

μ由于YAG激光是1.064m的不可见红外线，在眼中有一个交叉，其交点与激光光点一致，表示激光的位置。因此，激光束可以对准焊接件上的焊接位置。

.3.43.对光学系统的注意事项

（1）禁止用手和一些坚硬的东西来接触光学系统的表面。也禁止口吹光学。如果光学系统被染色，它可以用特殊的吹制球吹制，或用长纤维吸水性棉球或透镜纸清洗。

(2)通常，不要拆卸光学系统，防止损坏和灰尘。

(2) 小心移动保护气体的管，不要碰保护玻璃。更换保护玻璃前，先小心取下物体镜头和压环。

3.3.2 Laser beam expander and focusing system
To ensure that the laser solder joint is always in the center of the view during the focusing process, the laser beam must be coaxial with the beam path of the microscope. In this system, the laser beam and the optical path of the microscope have the same object lens. The offset of the focus is adjusted by the up and down keys. According to the welding process technology, the offset of the focus was determined through experiments.

Welding point indication
Due to the fact that YAG laser is an invisible infrared radiation of 1.064m, there is a cross in the eye, and its intersection point is consistent with the laser spot, represents the position of the laser. Therefore, the laser beam can be aligned with the welding position on the welded part.

Precautions for optical systems
(1) Do not use hands or hard objects to come into contact with the surface of the optical system. Optical blowing is also prohibited. If the optical system is stained, it can be blown with a special blowing ball, or cleaned with a long fiber absorbent cotton ball or lens paper. (2) Usually, do not disassemble the optical system to prevent damage and dust.

(3) Be careful when moving the protective gas tube and do not touch the protective glass. Before replacing the protective glass, carefully remove the object lens and pressure ring.

.43冷却系统

3.4.1Construction

冷却系统是激光器系统的主要组成部分。它由换热交换器、磁性泵、过滤器、水箱、水流开关、温度接触器、ABS软管和阀门组成，形成一个封闭的循环水系统。

. 43 Cooling System 3.4.1 Construction
The cooling system is the main component of the laser system. It consists of a heat exchanger, magnetic pump, filter, water tank, water flow switch, temperature contactor, ABS hose, and valve, forming a closed circulating water system.

.4.23.冷却的原理

水箱内的去离子水由磁性泵泵送，以冷却YAG杆、脉冲灯、两个电极。加热后的去离子水通过热交换器并返回到水箱中。去离子水的电阻率必须高于0.5米-厘米 Ω当去离子水变脏或其电阻率变高时，氙气灯可能不能被点燃，激光腔和玻璃管可能被染色。在这种情况下，去离子水必须立即更换。（激光系统连续运行时，每周更换一次去离子水）

4.23. Principle of cooling

The deionized water in the water tank is pumped by a magnetic pump to cool the YAG rod, pulse lamp, and two electrodes. The heated deionized water flows through the heat exchanger and returns to the water tank. The resistivity of deionized water must be higher than 0.5 meters to centimeters. When the deionized water becomes dirty or its resistivity increases, the xenon lamp may not be able to be ignited, and the laser cavity and glass tube may be stained. In this situation

Deionized water must be replaced immediately. (During continuous operation of the laser system, replace the deionized water once a week.)

4.安装

4.1安装条件

由于激光焊机设备采用精密光学部件，安装正确后运行良好。

项目	安装条件	备注：
温度	15-35C	没有下降
湿度	30-80%	
粉尘	小于0.20mg/m3	
油雾	不允许	
电源	1 .单相交流电50Hz/60HZ≥32A 2 .电压在± 10%以内	组装电台哪个供应总功率提供
冷却水	使用蒸馏水，推荐使用去离子水	一体机15L

4. Installation

4.1 Installation conditions

Due to the use of precision optical components in laser welding equipment, it operates well after proper installation.

Notes on project installation conditions:
The temperature has not decreased by 15-35 ° C
Humidity 30-80%
Dust less than 0.20mg/m3
Oil mist not allowed

Power supply
1. Single phase AC 50Hz/60Hz ≥ 32A
2. Assembly with voltage within ± 10%
radio station
Which supply total power
provide

Distilled water is recommended for cooling water

Using deionized water
Integrated machine 15L

5.操作手册

.1.5.控制面板的说明

注意：在任何尝试操作此激光焊接系统之前，必须仔细阅读此说明，以防止错误的操作。

5.1.1电源启动

长途运输后，应按以下步骤重新检查：

(1)印刷板是否松动。
(2)该设备是否有关闭标志。
(3)电线是否松动。
(4)接线连接是否正确，包括电源线、电源箱等。

所有附件都正确，您应打开空气开关，打开接通电源，并连接电源控制电路。然后，注水系统启动。（图1）水箱注入完毕后，检测并显示在触摸屏上。最后，触摸屏开始工作，电源系统开始自检。检测到水保护系统和充放电系统。如果有任何异常信息，触摸屏就会显示异常信息

5. Operation manual
1.5. Description of Control Panel

Attention: Before attempting to operate this laser welding system, it is necessary to carefully read this instruction to prevent incorrect operations.
5.1.1 Power startup
After long-distance transportation, the following steps should be followed to recheck:
(1) Is the printing board loose.
(2) Does the device have a shutdown flag.
(3) Are the wires loose. (4) Check if the wiring connections are correct, including the power cord, power box, etc.
All attachments are correct. You should turn on the air switch and turn it on Connect the power supply and connect the power control circuit. Then, the water injection system starts. After the water tank is filled, it is detected and displayed on the touch screen. Finally, the touch screen starts working and the power system starts self checking. Detected water protection system and charging and discharging system. If there is any abnormal information, the touch screen will display the abnormal information


钢质材料
功率%
10
脉宽ms
1
频率 Hz
1
光斑调整
1.8
设置
状态：待机状态
2023-02-02 19:05:20
钢质材料
K金铂金
铜质材料
银质材料
自定材料
水温：26 C
出光点数
16274
OFF

图1 主窗口

图2主窗口

自检完成后，点击屏幕ON启动按钮，启动激光电源。大约40秒后，电压充到500V接触器被吸合。大约5秒后，点火电路开始工作，高压氙灯的照明预燃开始运行。大约2秒后，发出短蜂鸣声，然后激光电源成功启动。

警告：系统正常启动需要分钟，在启动过程中不要对触摸屏进行任 何操作。

屏幕页面按钮介绍;
1.钢质材料 2.K金铂金 3.钢质材料 4.银质材料 5.自定材料系统可同时保存5组焊接材料参数 用户可通过相对应的产品材料焊接调至合适的功率.脉宽.频率 光斑调整进行保存

(功率%)=脉冲能量影响融化量
(脉宽ms)=宽度影响熔深
（频率HZ)=指出光的快慢 数值越大出光速度越快
（光斑调整）=指焊接出来的光斑焊点的大小 0.1是最小光斑数值往上加则焊点越大如果遇到数值与焊点光斑相差较大需手动校准,屏幕看到最清晰的时候将光斑大小值设置为0手动扭电机如图3.5 左右扭边出光变扭，扭到光斑最小点为止
（箭头按钮)=焊斑十字线小范围偏离焊斑可通过箭头按钮上下左右调至焊斑中心如果大范围偏离需用2.5号的六角扳手调节如图 调上下，下面孔

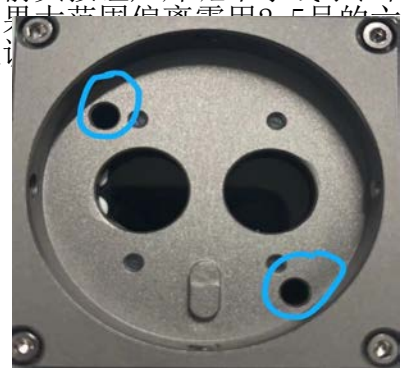

图3

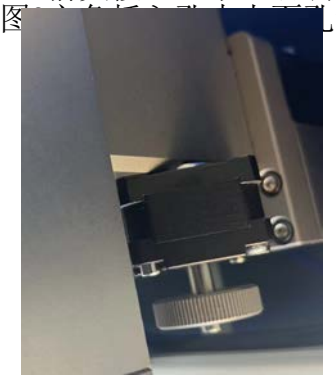

图3.5

（时间图标）=图标处长按5s可修改年月日
（出光点数)=记录脉冲氙灯出了多少次光更换新的氙灯需要在设置里面出光点数处点换灯清零
（设置）=密码150135 可进入设置页面如图4 气阀的开关延时和换灯清零和语言的设置

图4

显微镜安装调试

将显微镜安装在图3的座子上四边的螺丝扭紧把显微镜固定住
屏幕上面看到焊接的产品清晰而显微镜看上去是模糊的这个时候就需要调节如图5标注的黑色调节圈左右都可扭把焦距扭至显微镜能清晰看到产品即可

显微镜十字不在光斑中心如图6需要调节显示屏后面2个黑色调节杆如图7边出激光边观察焊点朝哪个方向移动黑色调节杆1个是调上下1个是调左右将焊斑调至显微镜十字线中心

图5

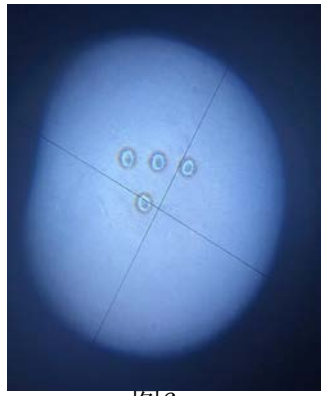

图6

图7

操作空间面板

1. 黑色摇杆控制屏幕光标 黄色光标移动可加减参数值
2. 蓝色气阀管 保护气体的输出
3. 环型灯上面黑色调节小按钮可调节灯的亮度
4. 射灯用于照明
5. 红色急停开关用于设备故障紧急关机

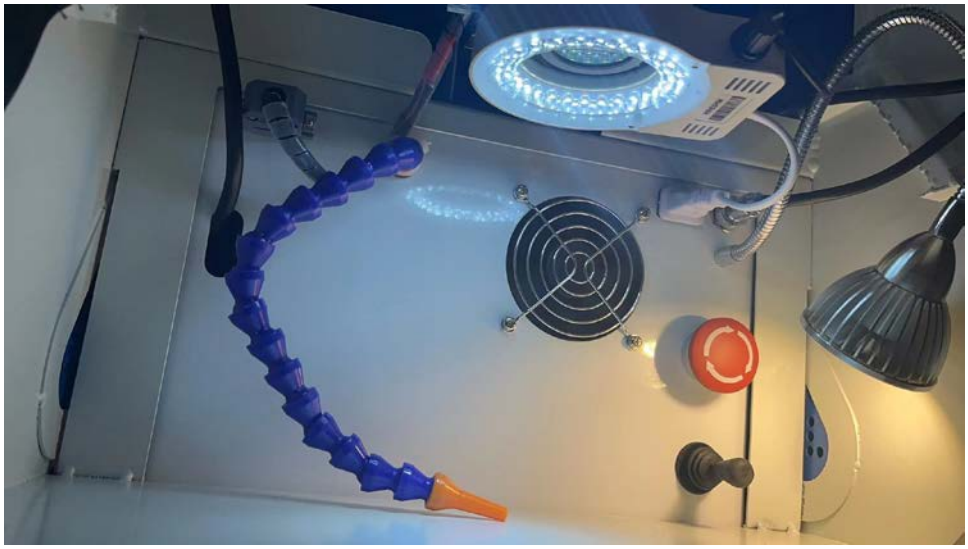

图 8

电源后面板

接氩气，和脚踏需要把后面门板打开从右下角开口接入图9

图9

1.设备需要每月换一次纯净水.
2.冷凝器制冷部分每15天用气枪把里面灰尘吹走
3.放水开关，在水箱的底部

Figure 1 Main Window

Figure 2 Main Window
After the self check is completed, click the ON start button on the screen to start the laser power supply. After about 40 seconds, the voltage was charged to 500V and the contactor was pulled in. About 5 seconds later, the ignition circuit begins to work, and the pre ignition of the high-voltage xenon lamp illumination begins to operate. After about 2 seconds, a short beep will sound and the laser power will be successfully turned on.
Warning: It takes about 1 minute for the system to start normally. Do not operate the touch screen during the startup process.

Introduction to screen page buttons;
1. Steel material 2. K-gold platinum 3. Steel material 4. Silver material 5. Customized material system can simultaneously save 5 sets of welding material parameters. Users can adjust the corresponding product material welding to the appropriate power, pulse width, and frequency spot for saving
(Power%)=Pulse energy affects melting amount
(Pulse width ms)=Width affects melting depth
(Frequency HZ)=indicates that the higher the speed of light, the faster the light output speed
(Spot adjustment)=Refers to the size of the welded spot welding point. 0.1 is the minimum spot value added upwards, resulting in a larger spot. If there is a significant difference between the value and the spot welding point spot, manual calibration is required. When the screen is the clearest, set the spot size value to 0. Manually twist the motor as shown in Figure 3.5, twist the left and right sides to twist the light until it reaches the minimum spot welding point
(Arrow button)=If the cross line of the welding spot deviates from the welding spot in a small range, it can be adjusted up, down, left, and right through the arrow button to the center of the welding spot. If there is a large deviation, it needs to be adjusted with a No. 2.5 hex wrench, as shown in Figure 3. Insert the hexagon into the hole, adjust the upper hole up and down, and the lower hole left and right
thirteen
Figure 3 Figure 3.5

(Time icon)=The icon director can modify the year, month, and day by pressing 5 seconds
(Number of light output points)=Record how many times the pulse xenon lamp has emitted

light. To replace a new xenon lamp, click on the light output point in the settings to reset the lamp to zero
(Settings)=Password 150135 can enter the settings page as shown in Figure 4, including the delay of opening and closing the air valve, resetting the light, and setting the language

Figure 4
Microscope installation and debugging
Install the microscope on the seat shown in Figure 3 and tighten the screws on all four sides to secure the microscope in place
When the welded product appears clear on the screen while the microscope appears blurry, it is necessary to adjust the black adjustment circle marked in Figure 5, which can be twisted left and right. Twist the focal length until the microscope can clearly see the product

The microscope cross is not at the center of the light spot, as shown in Figure 6. Two black adjustment rods need to be adjusted at the back of the display screen, as shown in Figure 7. While emitting the laser, observe which direction the solder joint is moving. The black color knob is adjusted up and down, and the left and right are adjusted to bring the solder spot to the center of the microscope cross

Figure 5, Figure 6, Figure 7

Operating space panel
1. The black joystick controls the screen, and the yellow cursor moves to add or subtract parameter values
2. Output of protective gas from blue gas valve tube
3. The black adjustment button on the circular light can adjust the brightness of the light
4. Spotlights are used for illumination
5. The red emergency stop switch is used for equipment failure and emergency shutdown

Figure 8 Power Rear Panel
Connect the argon gas and the foot pedal, and open the rear door panel from the bottom right corner opening to connect to Figure 9
Figure 9

1. The equipment needs to be replaced with purified water once a month
2. Use an air gun every 15 days to blow away the dust inside the refrigeration section of the condenser
3. Drain switch, located at the bottom of the water tank