

LASER MOLD WELDER

COM-RL-F1500

For Light Molds



Instructions for use of optical fiber die welding machine

catalogue

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Instructions for use of optical fiber die welding machine

The Preface of Chapter 1

1.1 welcome

Thank you for purchasing our optical fiber optic die welding machine. If it is the first time to use this type of product, please read the instructions carefully before installation and use. Please carefully read the [danger], [warning] and [attention] to ensure the safety of you and the surrounding personnel and the correct use of the equipment.

[Danger]: means that if the correct operation is not followed, it may immediately lead to serious personal injury and even endanger life.

[Warning]: means that if not followed, it may lead to serious personal injury and even endanger life.

[Note]: Any incorrect operation may cause personal injury or damage to the equipment.

1.2 company profile

The company Austenco is a professional manufacturing / trading company in the field of Mold Repair and Surface Finishing Technology

With more than 30 years of experience, we supply the best quality products from all over the world to our customers. The COMET-RL-B1500 laser welding machine which we present in this catalogue is a state of the art, full featured and up to date machine which fully complies with today's demands of industrial sector

Instructions for use of optical fiber die welding machine

Overview of Chapter 2 products

2.1 summarize

Laser welding is a new type of welding method, is also one of the important aspects of the application of laser material processing technology, laser welding mainly for thin-wall materials, precision parts of welding, welding process belongs to the heat conduction type, namely the laser radiation heating work piece surface, surface heat through heat conduction, by controlling the width of the laser pulse, energy, peak power and repetition frequency parameters, make the work piece melting, form a specific pool. Can realize spot welding, butt welding, welding, welding, sealing welding, high width, weld width, small, small deformation, small welding speed, weld smooth, beautiful, after welding without processing or simple processing, welding quality is high, no pores, can be accurately control, focus light point, high positioning accuracy, easy to realize automation.

2.2 Main technical features

The laser spot through the fiber becomes more uniform and stable, improving the quality of the weld. The laser beam can be obtained as very small after focusing

Light spot, high power density, and can be accurate positioning, the mold repair is particularly optimized, more targeted, better effect.

Special chiller, can meet the long time, high power welding stability is better;

Gas protection system, make the product is always protected by argon in the welding process, maintain the product quality and improve the welding quality;

3 d boom, help you solve the problem of large mold repair, without moving the mold, the joystick control pan table (200mm 300mm

Automatic translation table) to move. Easy to achieve laser repair large mold, large mold tools, long life and high precision;

Special welding control system, extremely high stability, LCD touch screen is easy to control, easy to learn, easy to understand;

Strong scalability, can be combined with the assembly line, photoelectric detector, pneumatic clamps and other devices for automatic processing;

Instructions for use of optical fiber die welding machine

2.3 Advantages compared with traditional pulse mold welding

1. No consumables (no lamp tube), no maintenance.
2. Less average power consumption (about 5.6 KWH per hour at full power state).
3. A wider range of melting (effective melting: stainless steel 0.1-1.2mm), laser is more stable, do not run light.
4. Equipped with double temperature and double control special water machine, can meet the long time work, high power welding stability is better.
5. The objective is equipped with a water cooling system, which can better protect the objective for a long time.
6. The welding depth is large, the welding is more firm, the welding part can be fully melted, without pores and trachoma, and the repair trace is more beautiful.
7. The laser head can easily rotate 90 degrees, can slide back and forth, convenient to reweld any side.
8. Smaller volume, small floor area, convenient for door-to-door welding business.

Instructions for use of optical fiber die welding machine

2.4 Product model and technical parameters

unit type	RL-F1500W
Maximum laser power	1500W
Laser type	Fiber lasers, a conventional QBH terminal
laser wave length	1080±10 nm
motor pattern	Continuous, pulse
Maximum modulation	25 H z (customizable)
Laser welding depth	3.0 mm (depending material)
Fiber core diameter	50 μm
Optical fiber line length	> 8 m
Divide the way	Precision energy splitting or high-speed time separation
Out of the light mode	QCW/PWM/CW
Aim positioning system	microscope
power rating	5.6 KW
Refrigeration method	Water cooling (double temperature and double control)
Electricity demand	220V±10% 50Hz/40A
Host size / net weight	L 960×W 550×H 680mm / 120 KG
Bench size / net weight	L 610×W 410×H 580mm / 55 KG
Arm size / net weight	L 1600×W 1070×H 1680mm / 120 KG

Instructions for use of optical fiber die welding machine

2.5 Application industry and scope

It is suitable for the repair and welding of precision machine parts, and the welding and processing of various metal structural parts and gold and silver jewelry.

2.6 Requirements for the working environment

Ambient temperature: 10 ~35 deg. Centigrade. If this range is not reached, air conditioning should be .1
; installed for adjustment

Humidity requirements: 10%~70%, no condensation, if not to reach this range, a dehumidifier should be .2
installed;

Power grid fluctuation: <5%, the power supply grid voltage fluctuation of more than 5% in the areas, the .3
automatic voltage stabilization and flow stabilization device should be installed. Power grid grounding
; ground wire should meet the requirements of national standards

Foundation Amplitude: <50um, vibration acceleration: <0.05g. Avoid having large stamping machines .4
and other machine tools nearby;

; Air pressure requirement: 86 kpa-106 kpa .5

There should be no strong electromagnetic signal interference near the installation of the equipment to .6
; avoid the radio transmitting station (or relay station) around

The working space of the equipment should be smoke-free and dust-free, and avoid placing it in a .7
; serious dust environment such as metal polishing and grinding

In some environments, static shielding measures such as installing anti-static floor and grounding of .8
equipment shell should be taken;

When the ambient temperature drops below 0℃, the circulating cooling water in the equipment will .9
freeze and the equipment may be damaged. When the equipment is disabled, the internal circulating
cooling water must be drained and ensured against icing in the equipment during use.

2.7 Overall structure and working principle

Optical fiber die welding machine: it is mainly composed of laser, welding control system, electric lifting
. table, three-dimensional electric boom, laser welding head and cooling system

The laser welding process takes advantage of the excellent directionality and high power density of the laser
beam. The laser beam is focused by the optical system in a very small area, and in a very short time to form
a heat source area with highly concentrated energy, allowing the solder to melt and form a firm solder spot
and weld. Because of its unique controllability: laser pulse width, cycle, peak power and other parameters
.can be changed, it has been successfully used in various types of welding

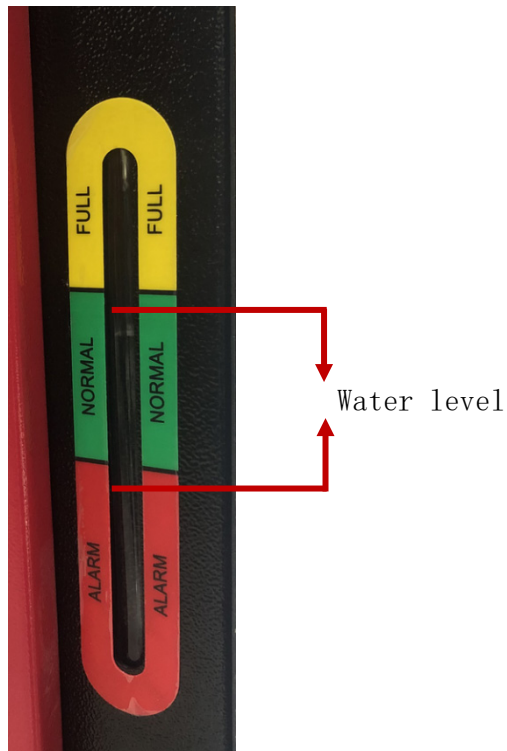
Instructions for use of optical fiber die welding machine

Chapter 3. Equipment operation instructions

3.1 Connecting description and button function



For the water inlet of the chiller, the cooling water must be pure water or distilled water and should be replaced once a month.

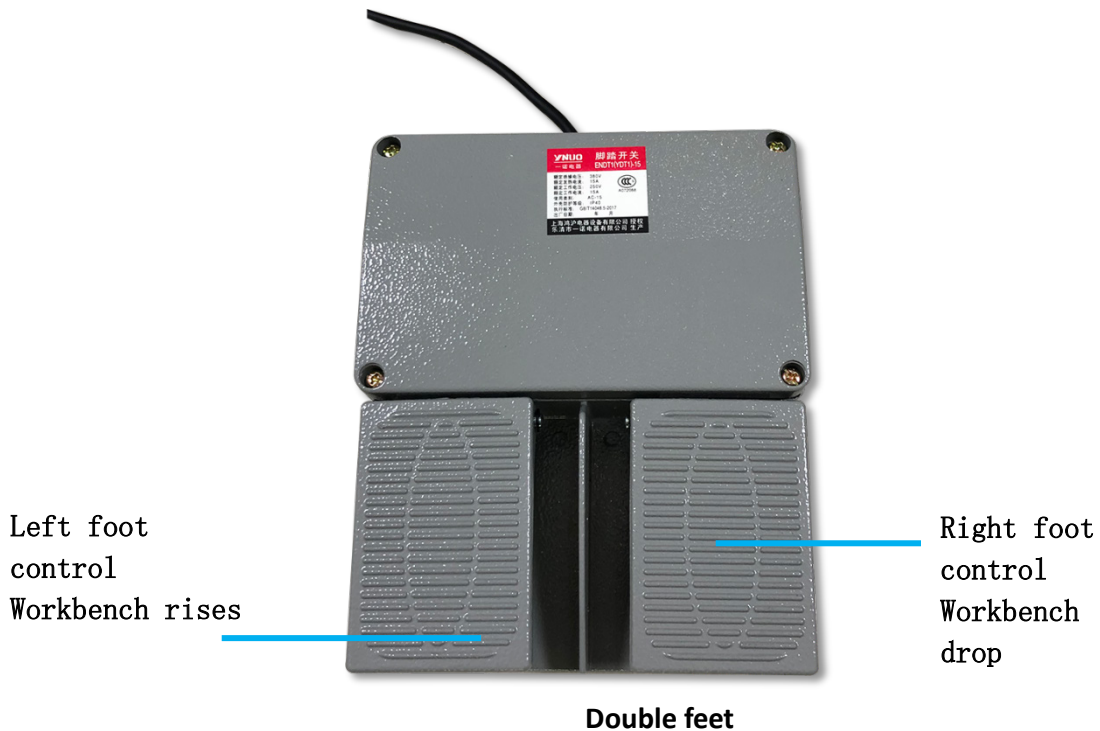


The water level of the water machine is kept in the green area

Instructions for use of optical fiber die welding machine



Connect the pedals
(Control the workbench
lift)



Left foot
control
Workbench rises

Right foot
control
Workbench
drop

Double feet

Instructions for use of optical fiber die welding machine

Connect workbench
signal line

Connect the
workbench

Connect
single

Connect a single pedal



Emergency stop button: use in emergency.

Key switch: machine on / off.

Workbench rise: long press, workbench rise.

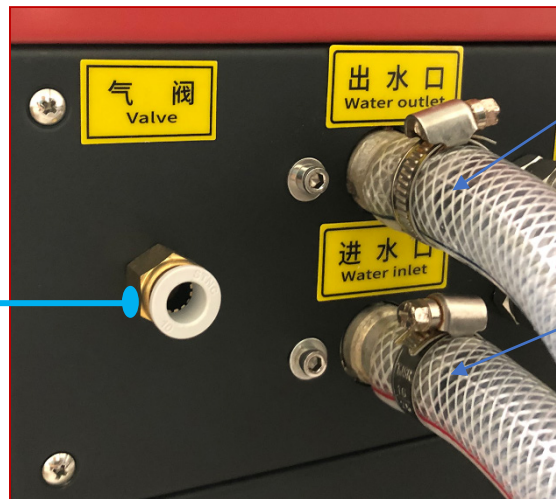
Workbench down: long press, workbench down.

Instructions for use of optical fiber die welding machine



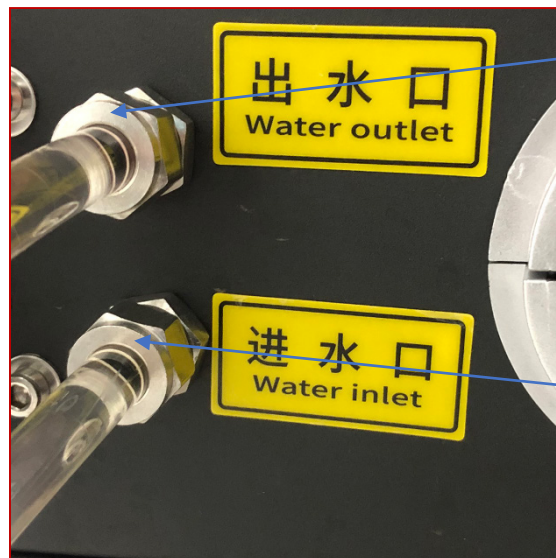
Host cabinet rear panel

Connect the protective gas (argon)



Main cabinet cold water outlet
(Connected to the cold water inlet of the water machine)

Main cabinet cold water inlet
(Connected to the cold water outlet of the water machine)



Main cabinet warm water outlet
(Connected to the warm water inlet of the water machine)

Main cabinet warm water inlet
(Connected to the warm water inlet of the water machine)

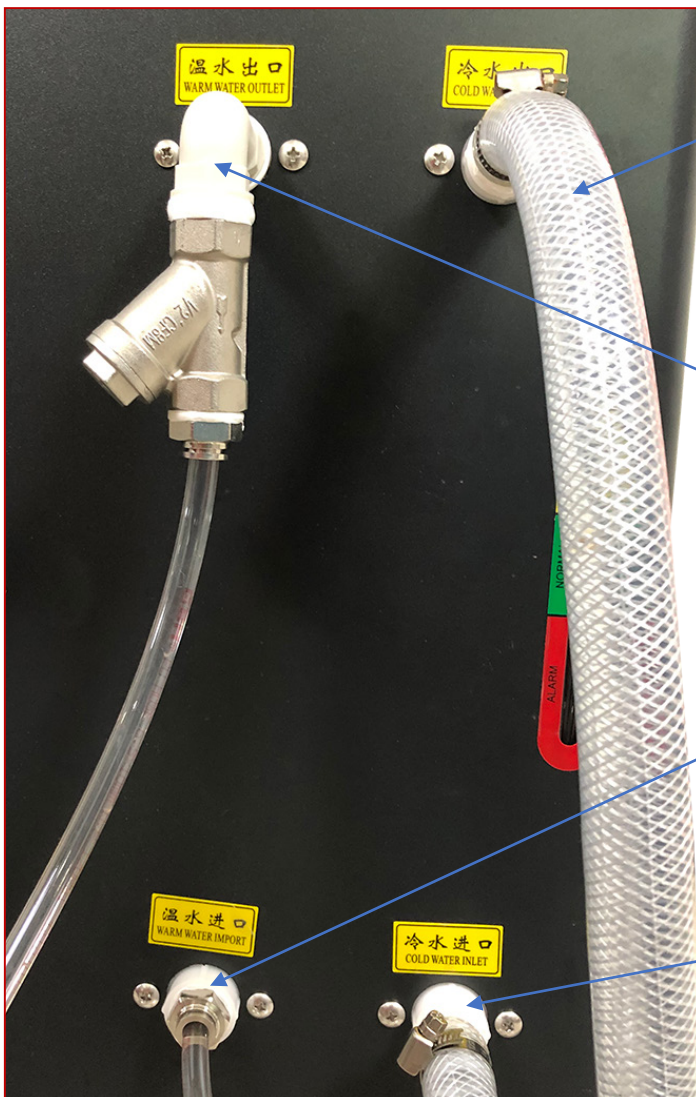
Instructions for use of optical fiber die welding machine



Connect the water pressure signal line to the water machine

Connected to the water machine power line

Connect the 220V power supply



Water machine cold water outlet
(Connected to the cold water inlet of the main cabin)

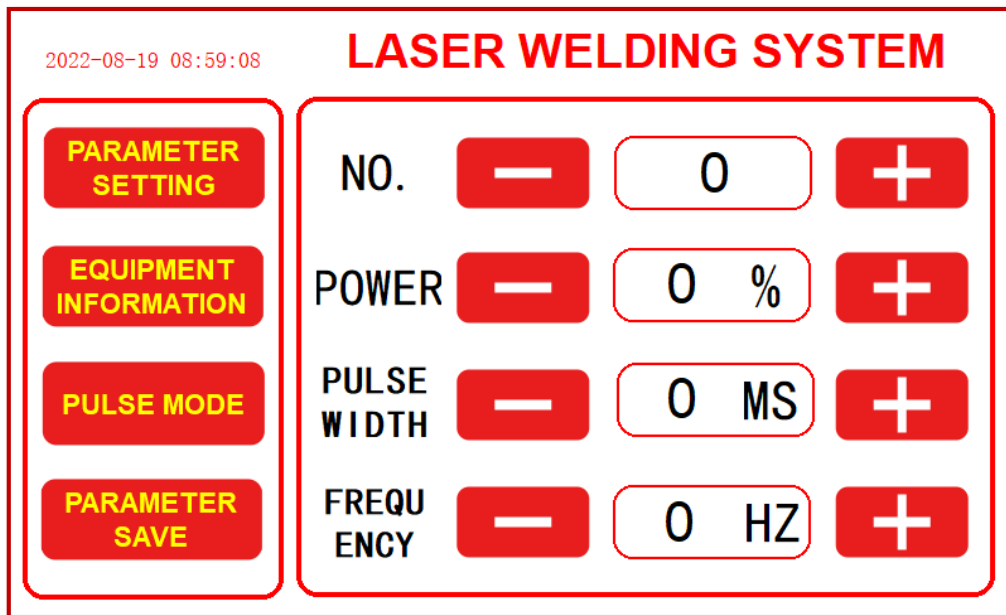
Water machine warm water outlet
(Connected to the warm water inlet of the main cabinet)

Water machine warm water inlet
(Connected to the hot water outlet of the main cabinet)

Water machine cold water inlet
(Connected to the cold water outlet of the main cabinet)

Instructions for use of optical fiber die welding machine

3.2 Control version operation



NO.-Procedure: save different parameter settings; modulation range 1-25

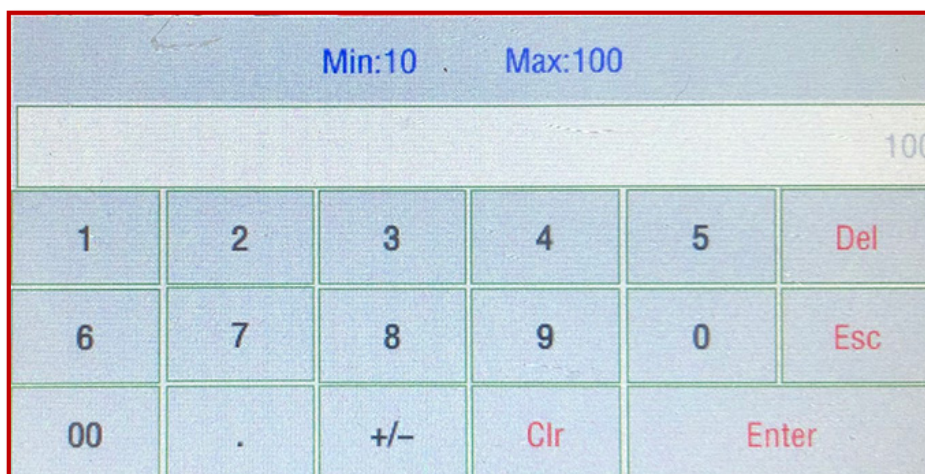
POWER-Power:% laser real-time power; modulation range 10% -100%

PULSE WIDTH-Pulse width: laser single point light duration; modulation range 160m s

FREQUENCY-Frequency: the number of laser light output per second; the modulation range is 125Hz

PARAMETER SAVE-Parameter saving: After the parameter is modified, click this button to save it

When modifying the above parameters, first click on the number of the item that needs to be modified, and the input window will pop up (as shown in the figure below). Directly enter the modified number, and finally click the "Enter" button.



Instructions for use of optical fiber die welding machine

Click the "PARAMETER SETTING" button to enter the parameter setting interface: as shown below

Eye brake setting		Air valve setting	
Eye brake switch	ON	Air valve switch	OFF
Turn on delay	0 MS	Turn on delay	0 MS
Turn off delay	0 MS	Turn off delay	0 MS

Description:
shutter on delay: the time interval from the shutter on to the single-point laser on ;
Shutter off delay: the time interval from the single-point laser off to shutter off;
Air valve on delay: the time from the air valve open to the beginning of laser start;
Air valve off delay: the time interval from the end of laser to the air valve off ;

RETURN

1. Eye brake switch-Eye lock function: open / close the eye brake function;

2. Turn on delay-Gate opening delay: length of eye gate opening delay;

3. Turn off delay-Gate closing delay: length of eye brake closing delay;

4. Air valve setting-Air valve protection function: open / close air valve protection function;

5. Turn on delay-Air valve opening delay: the duration of air valve opening delay;

5. Turn off delay-Air valve closing delay: the time limit of air valve opening delay;

RETURN-Return: Return to the main interface

Click the "EQUIPMENT INFORMATION" button to enter the device information interface: as shown below

Model: Fiber laser mold welding machine

Laser power: 0000 W

Version: GQMJ-20220805

Counting laser times: 0

RETURN

Instructions for use of optical fiber die welding machine

Counting laser times-Accumulated light output times: the number of light output times recorded

Click on the green box area on the left side of the figure above to enter the function key setting interface, as shown in the figure below

Button Sensitivity	0	
Auto Save Delay	0	ON
Limit Value	0	

Restore Defaults

RETURN

Button Sensitivity-Button sensitivity: set the sensitivity of the button;

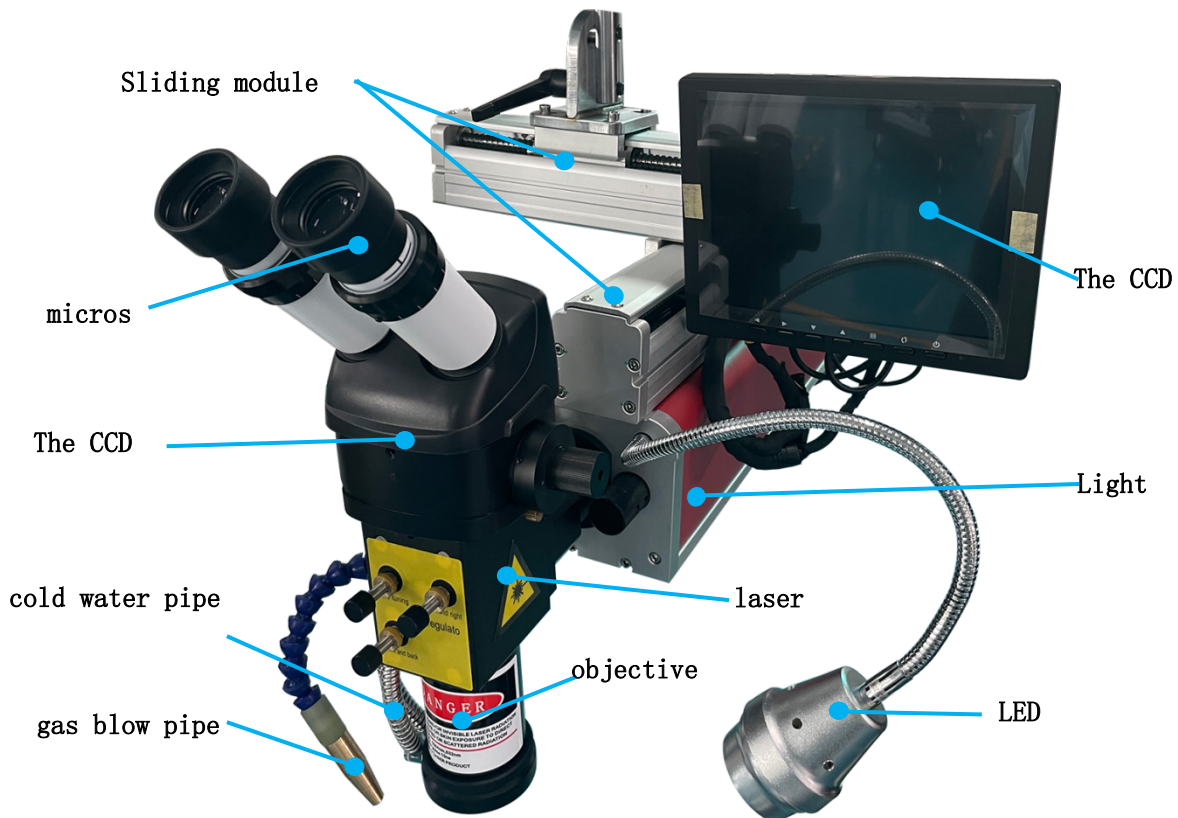
Auto Save Delay-Automatic saving delay: set the time of automatic saving delay;

ON : Auto-save function on / off

Restore Defaults-Restore the default value: All settings return to the initial value

Instructions for use of optical fiber die welding machine

3.3 Laser head welding assembly



Microscope: high definition observation window, high precision welding products. Objective lens: Laser focus.

Laser welding, head: laser conversion assembly, adjust the laser light out position. Blowing air pipe: protect the gas outlet.

Sliding module: drive laser head back and back left (electric). LED lamp: Provide a light source for the microscope.

Optical circuit box: place, optical fiber cable and other power lines. Cold water pipe: objective lens cold water circulation system.

CCD Converter: CCD screen conversion. CCD display: Welding the display window.



Instructions for use of optical fiber die welding machine

CCD Converter fixed button: fixed CCD converter.

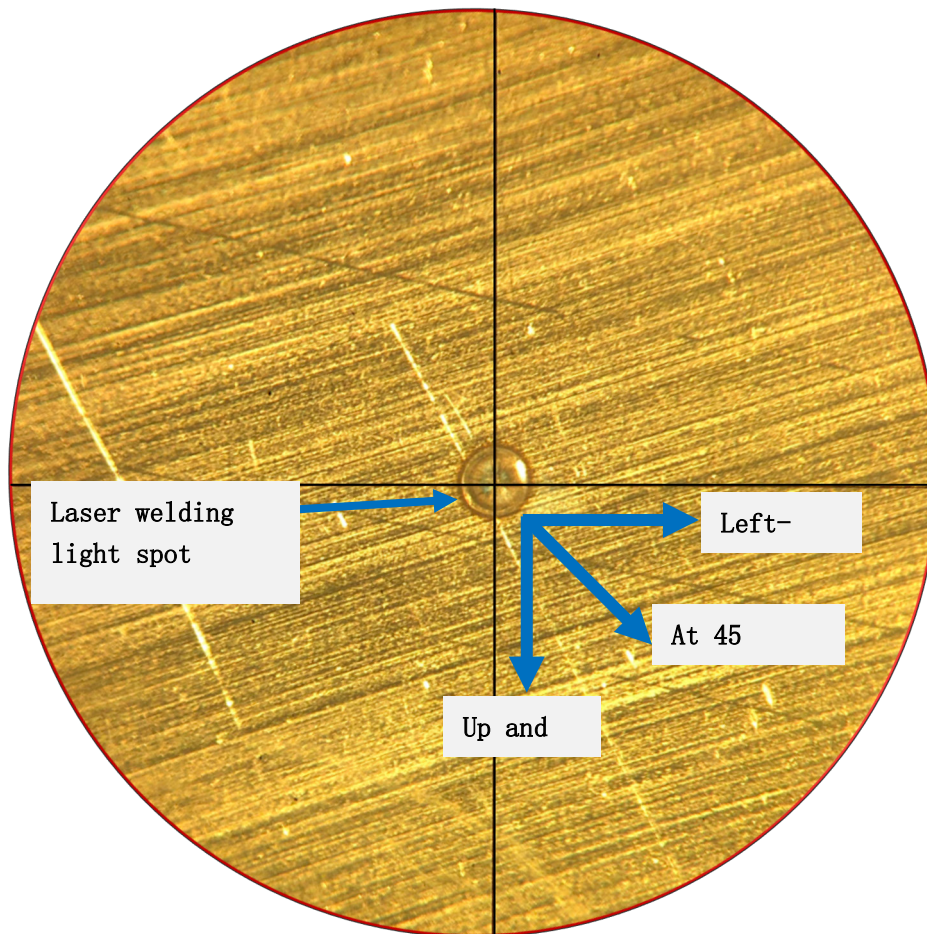
Focus adjustment button: adjust the distance of the focus (i. e. adjust the firepower of the laser)

Left and right adjustment button: adjust the laser spot to move from left to right.

Up and down adjustment button: adjust the laser spot movement up and down.

Micro adjustment button: adjust the laser spot slightly 45 degrees, Angle movement.

Example graphs



Before each welding product, adjust the "laser weld head" to the clearest state of the microscope, and then place the spot

Adjust to the center of the cross center (shown above), and finally adjust the focus distance (i. e., the strength of the laser power).

Instructions for use of optical fiber die welding machine

3.5 Electric lifting work table

1. Table flashlight integrated, electric up and down.
2. Sliding hand wheel 1 console movement left and right, and electric control cannot be used at the same time;
Move lip wheel 2 console in front and rear, not used at the same time with the electric control.

Maximum Load: 50 Kg



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Handle control box

UP: control the "beam" to move up, long press and touch.

DOWN: Control the "beam" to move down, long press and touch.

Speed change button: press the state, drive the shaft to move slowly; bounce on the state, drive the shaft to move quickly.

Joystick: left and right, the table left and right; up and down, in front of the table.

3. The bottom of the table is equipped with a brake device (Figure 2 and Figure 3). Just tighten the screws.

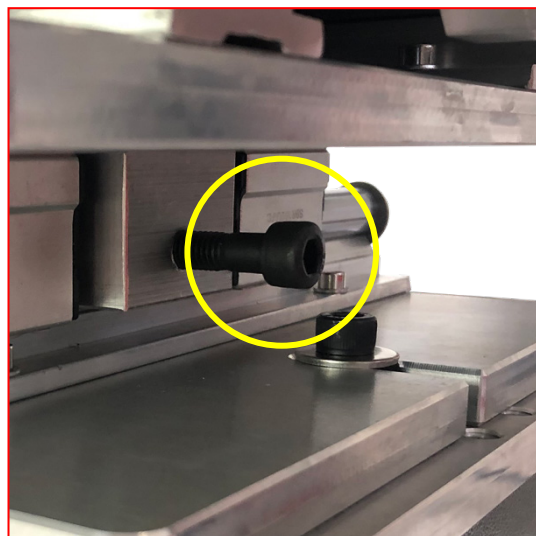


Figure 2, Figure 3

Instructions for use of optical fiber die welding machine

Chapter 4. Main components

4.1 Fiber-optic laser

1. Safety guidelines

High-power fiber lasers can produce lasers enough to cause unrecoverable damage to the eyes and the body, laser output

Can easily ignite clothing, volatile material, burn the skin to wait. To ensure the safety of the users, the following advice please be sure

Fine reading:

- Do not disassemble the laser because there are no product parts or accessories available to the user. All maintenance or repair work can only be done by

Our professional personnel;

- To the position of the warning notices, need to be vigilant, careful operation;
- When operating the laser system, prohibit without safety training from entering the relevant area;
- Avoid operating lasers in a dark environment;
- In the laser operation area, prohibit placing flammable and explosive volatile products such as gasoline and alcohol, and ensure that the operation area is well ventilated;

- Ensure AC power with reliable grounding and over current protection. Make sure the laser is reliable when using it

Ground, in order to avoid possible personal injuries;

- Before accessing the AC power supply, ensure that the power supply is connected correctly. If the power supply is connected wrongly, the laser will be damaged;
- Carefully check whether the input cable, water pipe, output fiber armored cable of the laser are intact and whether the signal control connector is not

Plug in place, confirm that everything is correct before the power on the laser, damaged accessories and wrong operation will cause the laser can not

Damage to repair;

- Avoid the eyes and skin contact the radiation directly emitted or scattered by the laser output end, and ensure the whole operation of the machine

Wear laser safety glasses and strictly watch laser output head; laser wavelength is 1080nm and laser device is installed

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The full grade is class Class 4 products, and it is recommended to use laser protection glasses with protection of 1080nm band and protection grade OD 5.

2. Description and precautions of safety glasses:

Laser protection goggles is a special glass that can prevent or reduce laser damage to the human eye.

When selecting the protective mirror, according to the maximum output power (or energy) of the laser used, optical density (OD: the larger the OD value, exciting

The stronger the protection ability of light protection glasses), visible light transmittance (visible light transmittance: value less than 20%, laser protection glasses

Need to be used in a well-lit environment) to select.

3. Product characteristics

Compared with conventional lasers, they have higher photoelectric conversion efficiency and lower power consumption and higher beam quality. The fiber laser is compact and ready for use. Due to its flexible laser output mode, it can easily integrate with the system equipment.

main features:

Excellent beam quality, high reliability, high sealability

High power stability power continuous adjustable, fast switching response

Maintenance-free operation with high electro-optical conversion efficiency

High anti-reverse performance high modulation frequency, waveform editable

Panel description

name	function declaration
AC 220V (1000X-1500X) (G5)	200-240VAC AC power switch
POWER (1000X-1500X) (G5)	200-240VAC AC power supply input
ETHERNET	Ethernet interface
CTRL	External control interface
RS232	RS232 Interface
ACTIVE/ALARM	Normal operating status (green light) / abnormal alarm status indicator (red light) (standby, no laser output, traffic lights flashing alternately)
WATER IN	Laser water-cooling water inlet
WATER OUT	Laser water cooling outlet
OPTICAL OUTPUT	Laser output port

Instructions for use of optical fiber die welding machine

4. Optical characteristic parameter table

序号	特性参数	测试条件	最小值	典型值	最大值	单位
1	工作模式	连续 / 脉冲				
2	偏振态	随机				
3	输出功率 MFSC-1000X(G5)	100% 连续		1000		W
	输出功率 MFSC-1500X(G5)	100% 连续		1500		
4	功率调节范围		10		100	%
5	中心波长	100% 连续	1070	1080	1090	nm
6	光谱带宽 (3dB)	100% 连续		3	5	nm
7	短时功率稳定性	100% 连续 >1h		±1	±1.5	%
8	长时功率稳定性	100% 连续 >24h		±2	±3	%
9	光束质量 BPP	50um-QBH 输出			1.5	mm x mrad
10	激光开启时间	10% → 90% 输出		50	100	μs
11	激光关闭时间	90% → 10% 输出		50	100	μs
12	调制频率	100% 输出			20	KHz
13	指示红光功率	100% 输出	200			μW
14	光纤线缆长度 MFSC-1000X(G5)		10			m
	光纤线缆长度 MFSC-1500X(G5)		10			
15	输出光纤芯径		50			μm
16	光纤线缆弯曲半径		200			mm
17	输出方式	标准 QBH (LOC)				

Instructions for use of optical fiber die welding machine

General characteristic parameter table

序号	特性参数	测试条件	最小值	典型值	最大值	单位
1	工作电压 MFSC-1000X(G5)		200	220	240	VAC
	工作电压 MFSC-1500X(G5)		200	220	240	
2	输入功率 MFSC-1000X(G5)	100% 输出			3.4	KW
	输入功率 MFSC-1500X(G5)	100% 输出			5.0	
3	工作环境温度		10		40	°C
4	工作环境相对湿度		10		85	%
5	冷却方式	水冷				
6	存贮温度		-10		60	°C
7	整机尺寸	482.6*478*128 (W*D*H) (不含把手)				mm
8	整机重 量 MFSC-1000X(G5)	25±2				kg
	整机重 量 MFSC-1500X(G5)	28±2				

Water cooling conditions

序号	特性	参数		单位
1	冷却方式	水冷		□
2	环境温度	≥ 30	< 30	°C
	冷水机设定温度	夏天 26	冬天 22	°C
3	水压	≥ 3		bar
4	MFSC-1000X(G5) 水流量要求	10		L/min
	MFSC-1500X(G5) 水流量要求	15		
5	MFSC-1000X(G5) 冷水机额定制冷量要求	2.5		kw
	MFSC-1500X(G5) 冷水机额定制冷量要求	3.5		

pay attention to:

☐ The chiller shall meet the cooling capacity required in the above table under the working condition of the ring temperature of 40☐ and the outlet temperature of 26☐;

☐ The water pressure recommended above if Δp 0.5bar of the main road exceeds this value, the water pressure of the main circuit shall be increased accordingly;

Instructions for use of optical fiber die welding machine

☐ The cooling water and filter element need to be replaced once a month; it should be cold before winter (in the low temperature environment of 0☐ and below)

But the water is replaced with appropriate antifreeze (such as ethylene glycol antifreeze, it is forbidden to add excessive, antifreeze thermal conductivity is low, over

Quantity addition is easy to cause poor heat dissipation). After the end of winter, the antifreeze should be replaced with distilled water and the filter element to restore one

Monthly maintenance frequency.

5. QBH under water-cooled conditions

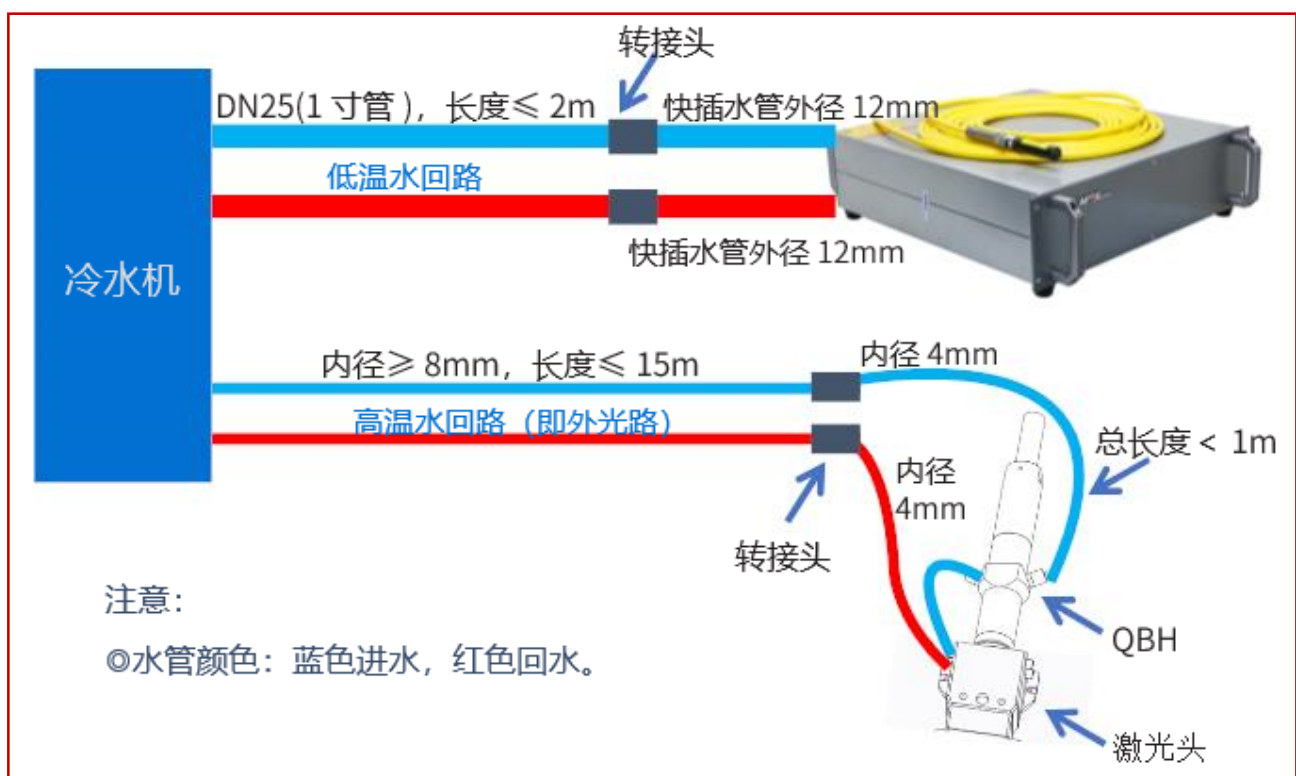
cooling-down method	Water pipe size requirements	Water flow rate (L/min)	water gage (bar)	Cooling water temperature is (☐)
Hydro cooling	6*4 mm	≥2	≥3	28-30

pay attention to:

Outer optical pipeline inner diameter 8mm, length 15m;

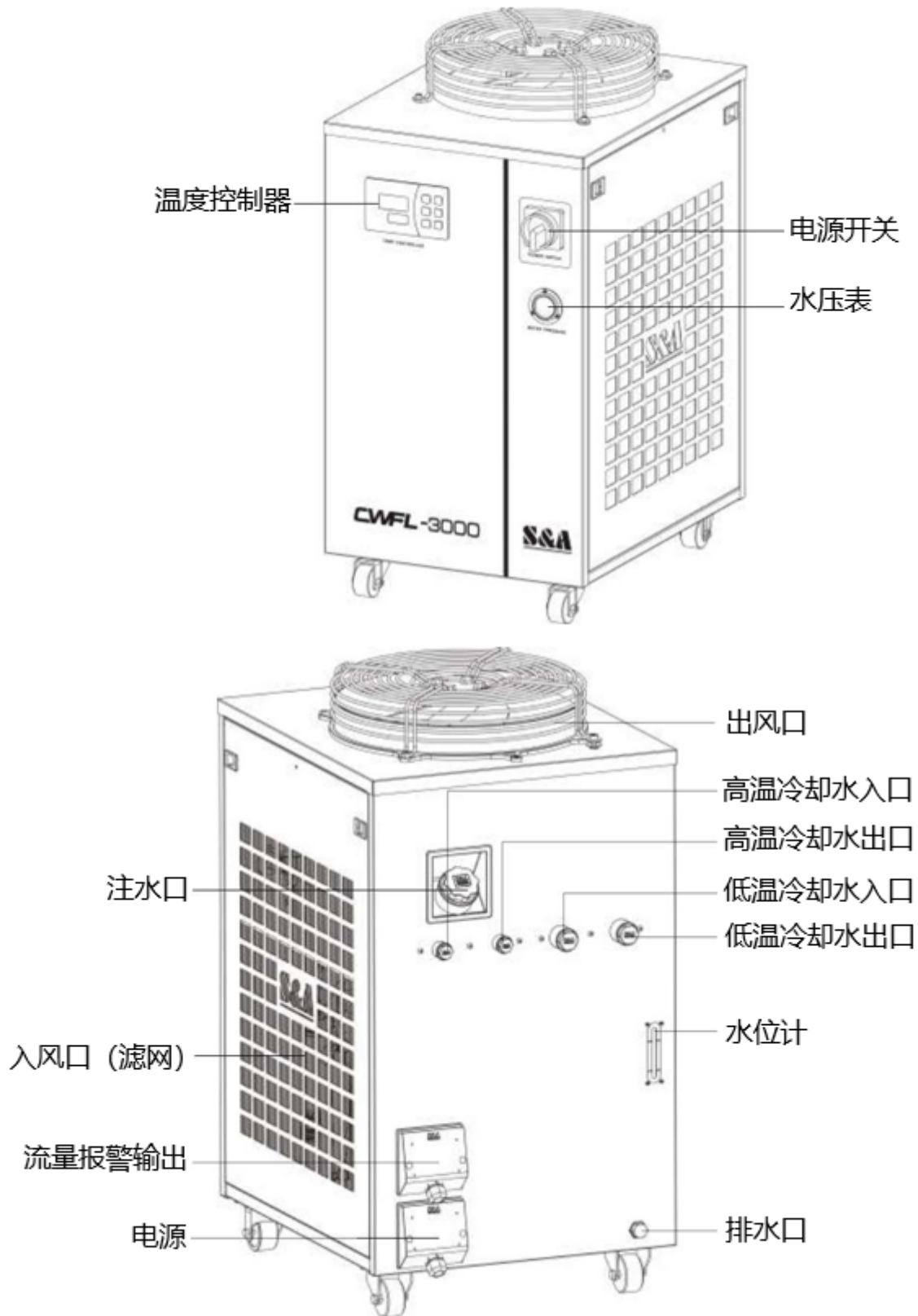
The length of the Φ 6 pipe connecting the QBH after switching from the external light road is 1m;

The QBH is connected to the cutting head in series;



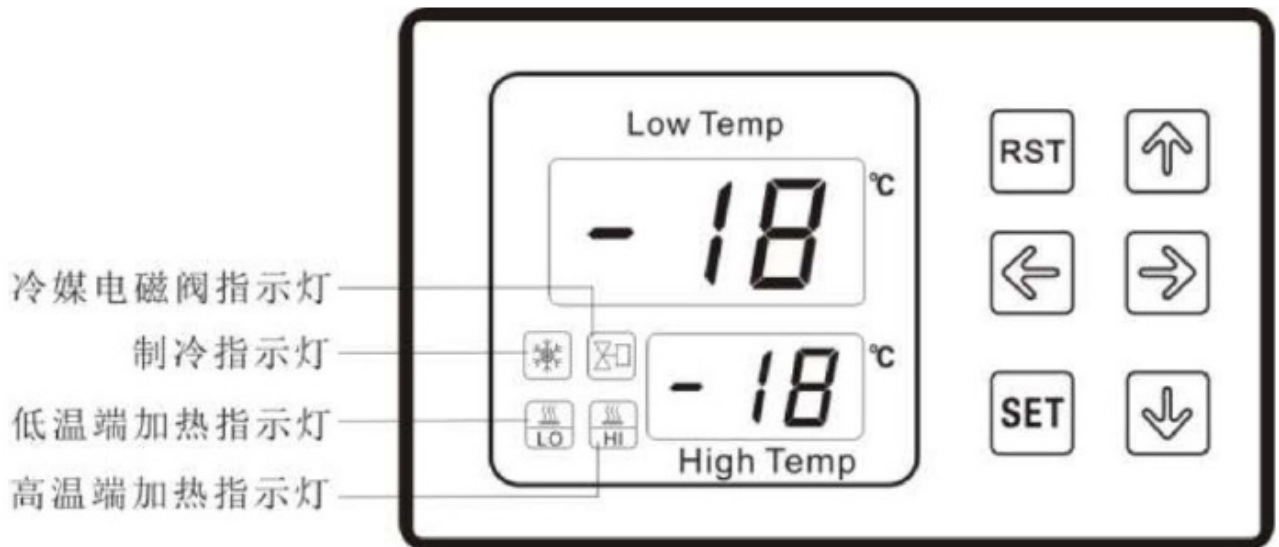
Instructions for use of optical fiber die welding machine

4.2 Water Chiller



Instructions for use of optical fiber die welding machine

1. Introduction of the temperature controller panel



2. The thermostat operating state indicator lamp

Refrigeration indicator: during refrigeration, the refrigeration lamp is on; the constant temperature refrigeration lamp is off and flashes during the delay.

Cooling solenoid valve indicator: light on; off when off.

Low temperature end heating indicator: on and off when off.

Heat indicator at high temperature end: on and off when off.

3. Quick adjustment: press the "SET" key to set the low temperature temperature, and the low temperature window displays F0 (intelligent mode displays F1)

Flash the current value, press "" or "" "to change the value and remember, and press" SET"

Set the high temperature temperature, the low temperature window displays F4 (intelligent mode display F5) flashes the current value,

Press key or key to change value and remember; press RST to save and exit.

4. Press the "" button to enter the status display menu:

T 1, showing the room-temperature probe temperature;

T 2, showing the low temperature terminal flow (unit L/min, resolution 0.1);

T 3, showing the high temperature terminal flow (unit L/min, resolution 0.1);

Instructions for use of optical fiber die welding machine

5. When the first power is powered on, press the "" button to cancel the delay time and connect the compressor.

6. User parameter setting (only F0~F16 parameters can be set): up and down key change, store the value, left and right key change

Project, while holding "SET", "" for six seconds, enter the parameter setting, the lower window shows PAS, on Window shows 99; press ", ""to change the password (08) and press SET if the password is correct

Window shows F0, can modify parameters; if password is wrong, return temperature display. If there is no key to press within 20 seconds,

The controller also automatically exits the parameter setting state; press the RST key to save and exit.

7. Restore the factory setting: press the "" and "" key for three seconds and then display "rE", including the manufacturer and user

The number returns to the factory value, after repeated seconds, the return temperature display.

8. Parameter setting table

parameter	function	Set the scope	Factory value	explain	
F 0	Set temperature at low temperature	-20~40℃	25℃	low temperature system set up menu	
F 1	Temperature difference coefficient	-15~5	-0.2		
F 2	Refrigeration back to difference	0~3℃.1	0℃.8		
F 3	control method	00~01	00		01= smart mode 00= constant temperature mode
F 4	Set the temperature at high temperature	-20~40℃	30℃	high temperature system set up	
F 5	Temperature difference coefficient	-15~5	-0.2		

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F 6	Refrigeration back to difference	0~3 ^② .1	0.8	menu	
F 7	control method	00~01	1		01= smart mode 00= constant temperature mode
F 8	High water temperature alarm	1~60 ^②	10 ^②	height The temperature system altogether need	
F 9	Ultra low water temperature alarm	1~20 ^②	15 ^②		
F 10	Ultra high alarm at room temperature	40~50 ^②	45 ^②		
F 11	Smart mode sets the maximum water temperature	F 12~40 ^②	30 ^②		
F 12	Smart mode sets the minimum water temperature	1 ^② ~F11	20 ^②		Intelligent mode is effective
F 13	password	00~99	08		00= Cancel the password function
F 14	Low-temperature terminal flow alarm	0~20	2L/min		
F 15	Flow alarm at the high-temperature end	0~20	0.5L/min		
F 16	mailing address	1~247	1		

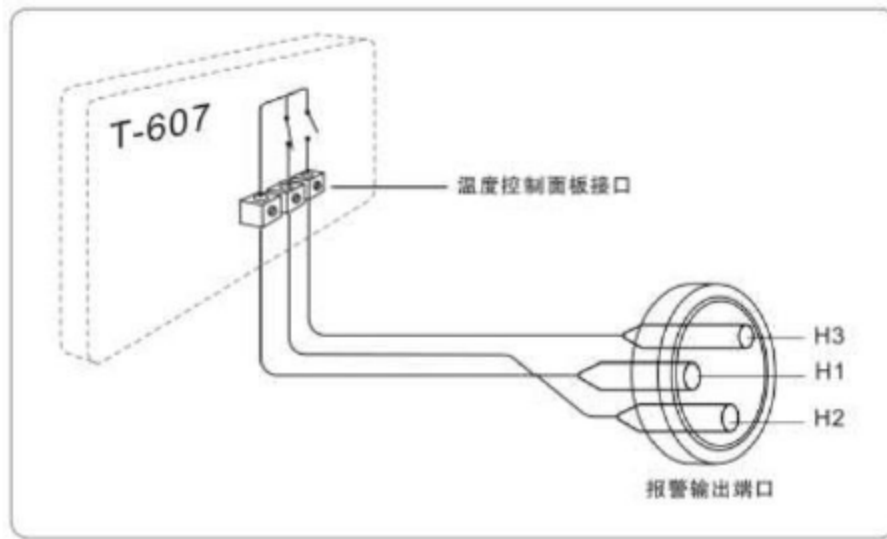
9 Alarm and output ports

In order to ensure that when the cooling machine appears abnormal situation does not affect the safety of the equipment, CWFL-3000 double temperature sheet

Pump series chiller is equipped with alarm protection function.

Instructions for use of optical fiber die welding machine

Flow alarm output terminal and wiring diagram:



10. Alarm cause and working status table

系统指示 工作状态	报警代码	蜂鸣器	输出端口 H1、H2	输出端口 H1、H3
循环水泵正常工作			断路	导通
室温超高	E1	发声	断路	导通
低温端水温超高	E2	发声	导通	断路
低温端水温超低	E3	发声	导通	断路
高温端水温超高	E4	发声	导通	断路
高温端水温超低	E5	发声	导通	断路
室温探头故障 (恒温无效)	E6	发声	导通	断路
低温端探头故障	E7	发声	导通	断路
高温端探头故障	E8	发声	导通	断路
外部输入1报警	E9	发声	导通	断路
外部输入2报警	E10	发声	导通	断路
低温端流量报警	E11	发声	导通	断路
高温端流量报警	E12	发声	导通	断路
冷水机供电中断			导通	断路

Note: A set of normally open and closed contact contacts in the alarm output port connector. The operating current is less than 3A and the working voltage is less than 300V.

Instructions for use of optical fiber die welding machine

11. Simple fault handling

故障现象	故障原因	处理方法
开机不通电	电源线接触不好	检查电源接口，电源线插头是否接插到位，接触良好
	保险管熔断	打开机器内部的电箱盖，检查保险管，必要时换上备用保险管，并检查电源电压是否稳定，检查电源接口，电源线是否接触良好
流量报警、用水管直接连接出水口、入水口没有水流	储水箱水位过低	检查水位计显示窗，加水到水位显示的绿色区域；并检查水循环管路有无漏水
连接设备使用时流量报警、但用水管直接连接出水口、入水口时有水流，不报警	水循环管路有堵塞或水管折弯变形	检查水循环管路
水温超高报警 (温控器面板显示 E2)	防尘网堵塞，散热不良	定期拆下防尘网清洗
	出风口或入风口通风不良	保证出风口、入风口通风顺畅
	电压严重偏低或者不稳定	改善供电线路或使用稳压器
	温控器参数设置不当	重新设定控制参数或恢复出厂设置
	冷却机频繁开关机	保证冷水机有足够的制冷时间(五分钟以上)
室温超高报警 (温控器面板显示 E1)	热负荷超标	降低热负荷，或选用更大制冷量的机型
	冷水机使用环境温度偏高	改善通风，保证冷水机运行环境在 40 度以下
冷凝水凝结现象严重	水温低于环境温度较多，湿度大	调高水温或给管路保温
换水时排水口排水缓慢	注水口没有打开	打开注水口

Instructions for use of optical fiber die welding machine

Chapter 5. Safety instructions and precautions

5.1 Safety

warning signs and instructions

Please read the safety signs on the equipment carefully and use the equipment correctly to avoid accidents and faults.



Laser radiation warning identification



class 4 laser

product

Beware of

electric shock warning signs



Hazard warning sign



Hazard

warning sign

5.2 Warning for

security management

- a. Please designate the personnel with sufficient knowledge and experience of laser and laser device as the equipment administrator. The equipment administrator shall manage the equipment boot key, educate safety knowledge and direct the production process.
- b. It is forbidden for non-professionals to disassemble, repair or transform the equipment by themselves. Please be responsible for the consequences of electric shock or fire caused by the above reasons.
- c. Operators should wear work clothes when using the equipment. Please use protective gloves, long sleeve clothes, leather aprons, if sparks touch the skin.

Instructions for use of optical fiber die welding machine

d. Equipment shall be installed in a horizontal unting site. Falling or falling from the installation site will cause damage or failure of the equipment.

e. Please maintain the machine regularly.

5.3 Laser safety notice

The optical fiber die welding machine adopts the closed laser light path design, which can effectively prevent the leakage of laser radiation. Note the following items when operating the laser welding machine:

a. Do not gaze at or contact the laser beam. Eyes and skin do not contact the laser or diffuse laser output by the device, otherwise it may cause blindness or burns.

b. During the normal operation of the laser, no parts and articles shall be added inside the welding machine.

This welding system shall not be used when the sealing cover is open.

c. Please use the laser protection glasses. Use the equipment. Blindness can also occur when the laser goes directly into the human eye.

d. When maintenance output laser, do not touch the parts unrelated to maintenance, and please use high temperature resistant light absorber, diffbody as baffle to prevent laser leakage.

e. The workpiece is still at high temperature after the laser processing or termination, do not touch the workpiece immediately.

f. The laser protection device used is required to protect against laser radiation at a wavelength of 1064um.

g. The processing of processing waste shall comply with the requirements of local regulations.

5.4 electrical safety

a. Please use the specified wire, cable, if the use of insufficient capacity wire, cable, or connection method is not correct, will cause a fire or electric shock.

b. Do not damage the power supply wires and cables. Do not step, screw, or pull the cable. Cable damage can cause electric shock, short circuit, and fire.

c. The fiber may be damaged or unusable when bending less than the limit bending radius.

d. Please carefully operate switches, buttons and so on one by one in order to avoid equipment failure caused by switching multiple switches at the same time.

e. Do not short-circuit or ground the output lead of the laser power supply.

f. When changing the laser xenon lamp, we must cut off the power supply of the welding machine.

Instructions for use of optical fiber die welding machine

- g. Please turn off the power supply for burnt odor, abnormal sound, abnormal heat, smoke and other abnormal phenomena to stop operation, and immediately contact the company, otherwise there is electric shock, fire and other danger.
- h. Electrical safety operation regulations shall be followed when operating the equipment.

5.5 fire safety

- a. It is forbidden to pile up inflammable and explosives and sundries around the machine. Sparks splash out during welding, and a fire will occur in combustible materials.
- b. Do not place inflammable and explosive materials on optical roads or where the laser beam may shine. If the laser beam is exposed to the flammable and explosive material, it may cause a fire or explosion.
- c. Do not cover blankets, cloth and other textiles on the equipment in use to avoid fire caused by equipment heating.
- d. Please provide a carbon dioxide fire extinguisher. Please place the fire extinguishers in the place where the equipment is installed, just in case.

Chapter 6. Installation requirements

6.1 OOBA

- a. Open the equipment box (keep the original box), visually inspect the appearance of the machine and check for collision damage in transportation.
- b. After unpacking, check whether the random accessories of the equipment are complete according to the delivery packing list.
- c. If any transportation damage phenomenon or random accessories are missing, please contact our company immediately.

Instructions for use of optical fiber die welding machine

6.2 Environmental requirements for the installation

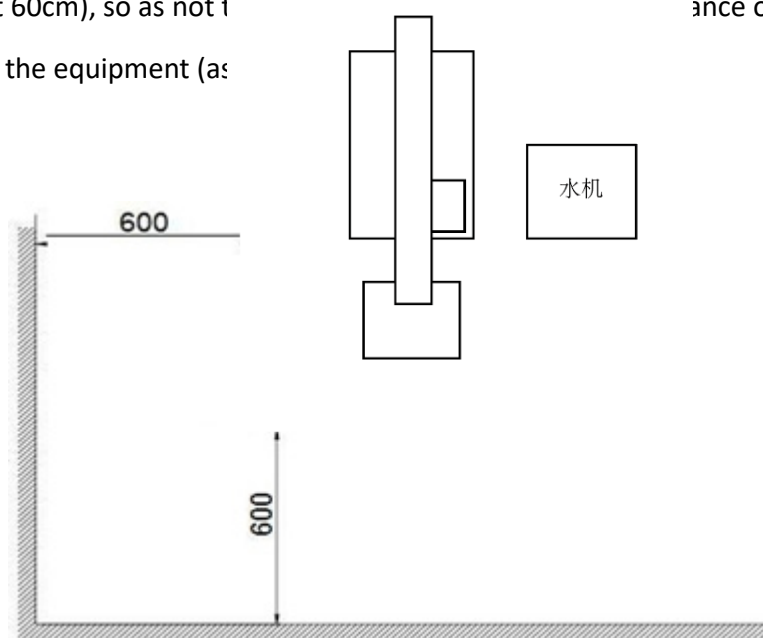
temperature	10 °C-35 °C
humidity	10%-70%
Power grid fluctuations	< ±5%
Grid ground line	Meet the national standard requirements of the machine room
cooling water	Deionized water or pure distilled water and remain clean

6.3 Method of installation and fixing

Step 1: choose a solid and flat site as the installation site;

Step 2: There are vents in the front, rear, left and right side of the optical fiber continuous welding machine.

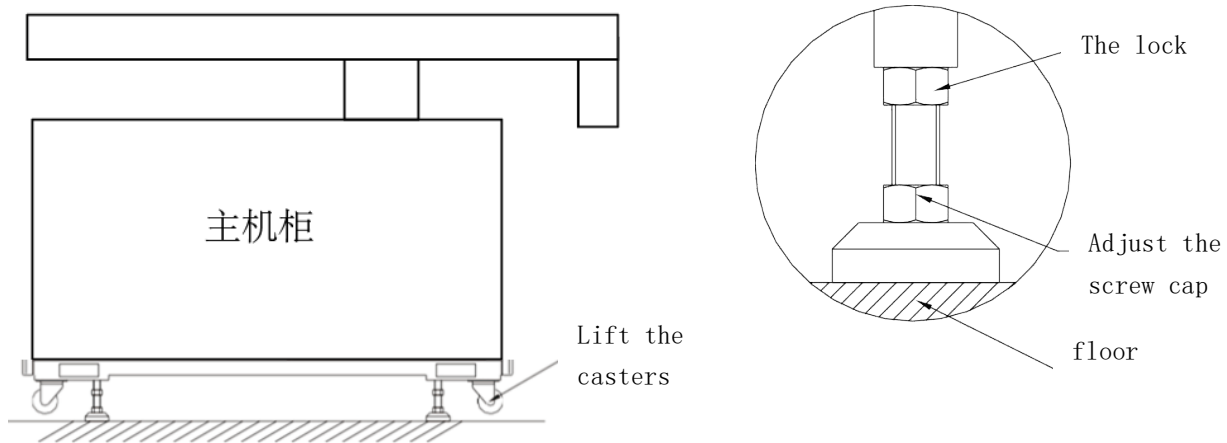
When installing the host cabinet, ensure that the host cabinet has a certain spacing from the wall (the spacing is about 60cm), so as not to affect the maintenance of the equipment and the performance of the equipment (as



Schematic diagram of the machine installation position (top view)

Instructions for use of optical fiber die welding machine

Step 3: Lift the adjusting nut on the four cups on the support foot of the main engine cabinet, and repeatedly adjust the basic level of the cabinet; (as shown in the right figure below)



Step 4: After adjustment, rotate the lock nut on the cup to lock the cup;

6.4 Installation precautions

a . Please use it in a surrounding place without sharp temperature changes. Also, please avoid using the installation in the following places:

Garbage, dust, oil fog more places;

Places with wet ground and water;

More than the vibration and impact;

Places that can reach drugs and inflammable and explosive materials;

Place near the high-frequency interference source;

Easy place;

In environments with high concentrations of CO₂, NO_x, SO_x, etc.

b. The equipment must be installed in a fixed level without tilt place, the device tilt or dumping will cause failure.

Instructions for use of optical fiber die welding machine

Chapter 7: Shipment and Storage

7.1 Precautions for shipment

While moving and shipping equipment, note the following to avoid equipment damage or personnel injury:

- a. Strictly observe the safety operation specifications, shipping staff must wear helmets, gloves and safety shoes.
- b. During shipment, completely pack up the foot glasses and remove the external connections and accessories and put them away.
- c. Mobile, shipping process should avoid too much action, too hard. Do not deflect or reverse the equipment.
- d. For long-distance transportation or long-term storage, the equipment should be packaged in strict accordance with the packaging requirements.
- e. During long-distance transportation, it shall not be installed in open cabins and vehicles, and shall not be stored in an open-air warehouse. It is not allowed to be shipped together with inflammable, explosive and corrosive articles to avoid dampness or mechanical damage from rain, snow or other liquids.

7.2 Precautions for handling and storage equipment

In the process of moving and handling the equipment, the following matters should be paid attention to to avoid personnel injury or equipment damage caused by accidents.

- a. The porters must wear helmets, gloves, wear safety shoes, and follow the safety operation specifications.
- b. Before moving the device, the four feet of the device must be completely closed, the external cables and subsystems of the device must be removed, and all the Windows must be closed.
- c. The road surface through which the movement process passes must be smooth and smooth.
- d. When moving the equipment, you should avoid excessive action and excessive force, and the moving speed should be less than 0.5 m/s.
- e. Do not deflect and reverse the equipment.
- f. When handling with a forklift, adjust the position of the two feet of the forklift and not touch the cup of the equipment. The end point of the forklift support foot shall be completely inserted into the bottom of

Instructions for use of optical fiber die welding machine

the equipment. The semi-insertion state is prohibited to prevent the equipment from falling down. The equipment should be tied to the forklift for long distances.

g. When lifting the equipment by a crane, tie the equipment with a strap, and the strap shall be placed between the caster and the foot cup. Do not tie it to the goblet so as not to break it. During the lifting process, the balance of the equipment should be maintained to prevent the equipment from slipping down and breaking down.

h. It is easy to damage the equipment when it is used to lift the equipment. It is suggested that the equipment should be packed in packing boxes before handling and lifting.

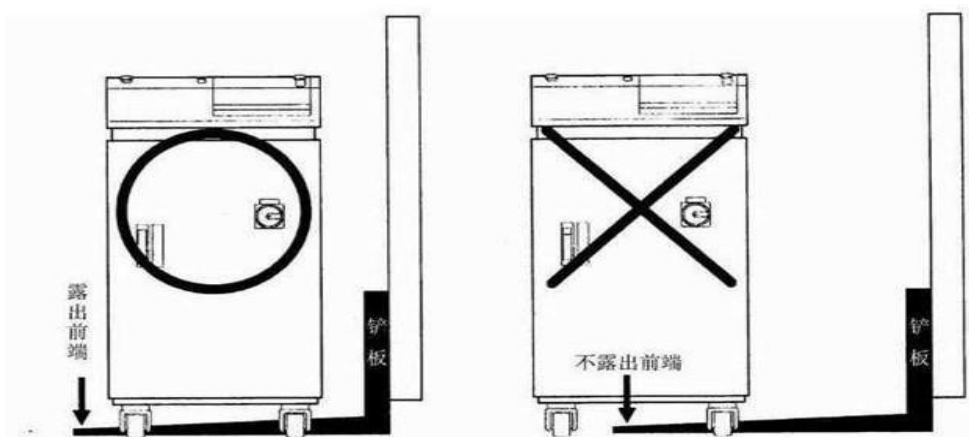
i. After the equipment is loaded into the box, cushions, sponge, rubber and other objects should be filled between the equipment and the box wall to avoid scraping the surface.

j. When bundling the bare machine, soft cushions should be added where the strap and the equipment contact.

k. When transporting the equipment by automobile, the box should be bound firmly to avoid equipment damage caused by vibration. Box body and carriage

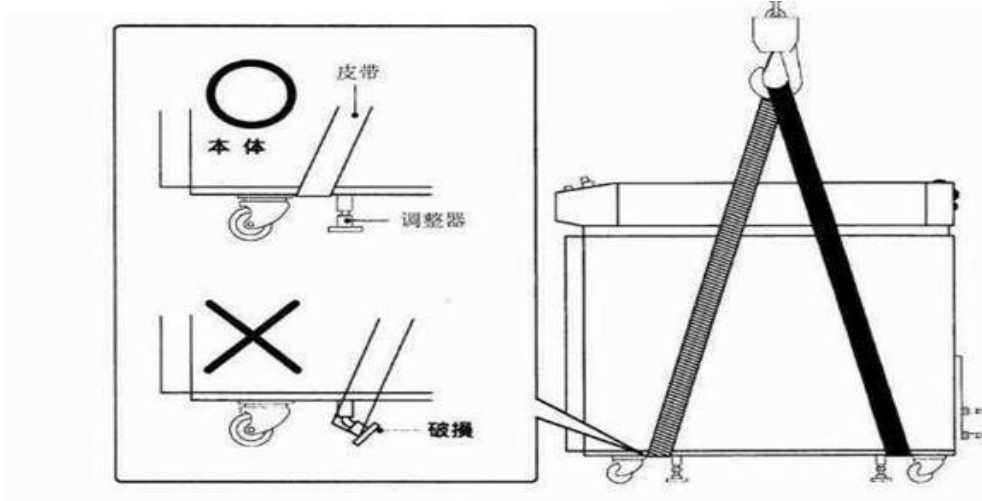
Fill in with cushions of the appropriate thickness.

l. The laser light path may deviate in the process of movement and handling. The light path should be checked before using the equipment, and the light path should be adjusted again when necessary.



Above is a diagram of a forklift truck.

Instructions for use of optical fiber die welding machine



The figure above is a schematic diagram of the transportation by using a crane.

Storage Equipment The following should be noted during storage:

- a. Before the storage of the equipment, several subsystems of the equipment should be split, the cooling water in the chiller should be emptied, and then the appearance of each subsystem should be cleaned, and then each subsystem should be packed and put back into its original packing box.
- b. The ambient temperature of the equipment is 5-45°C, and the relative air humidity is 20-80%.
- c. All kinds of harmful gases, inflammable, explosive items or corrosive items shall not be stored at the same time.
- d. There shall be no strong mechanical vibration, shock and strong electromagnetic field at or near the storage site.
- e. The storage area should be kept away from the dusty environment to reduce polluting optical devices in the equipment.

Instructions for use of optical fiber die welding machine

Questions:

- Language. Is the control Panel and the software in English?
- Which part of the machine is the 3D boom and how does it work for large mold repair?
- Aim Positioning system CCD + Microscope (in the catalogue only microscope is stated).

- What is the **Air pressure requirement**: 86 kpa-106 kpa for?



- Weld width
- Can the machine (Laser and xyz table) be controlled by computer? for welding parts in high quantities.
- What is eye break function?
- Is the "Air valve" for the protective gas (argon)?
- Safety glasses suitable for the wave length?