

# CW Fiber Laser welding Series



# User Manual

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## **1. Instruction**

### **1.1 Instruction**

This Manual mainly includes product overview and operation instructions. Please read carefully and use CW fiber laser welding machine accordingly.

### **1.2 Safety**

In the process of laser welding, attention should be paid to safety and proper wearing of laser protective goggles to avoid laser irradiation of eyes and skin.

The machine should be locked by pressing the button “lock” on the panel when operator going away and leave the machine alone and when laser welding process will go on after a while.

## **2 Product checklist**

Laser welding machine\*1set;

Laser protective goggles\*1pieces;

Laser welding head protective lens\* 2pieces ;

Fiber wire protective black cap\*1piece;

Nozzle of different type\*2pieces ;

### 3. Product Overview



#### 3.1 Product Category

A new high-power handheld fiber laser welding machine has overturned the working mode of the previous laser welding machine, which is flexible and convenient to handle and making a long welding distance possible. Handheld CW laser welding machine have been taking place of previously fixed beam path part welding machine. Handheld laser welding mode not only makes the welding of molds, advertising, kitchen utensils, doors and windows products easier, but also makes laser welding possible in outdoor operation possible. It indicates that the remaining market of traditional welding such as electric welding and argon arc welding will be taken place in the near future.

### 3.2 Product appearance



### 3.3 Product details



→ **Touch display screen**

→ **Laser source**

→ **Water chiller**

### 3.4 Technical parameters

Module	DPX-W1000/W1500/W2000
Power	1000W/1500W/2000W
Power adjustment range	10-100%
Center wavelength	1080nm
Laser output mode	CW with pulse mode intergrated
Handheld laser welding	Straight, wobble mode optional
Long-term power stability	±1%
Modulation frequency	20 KHZ
Red light power	0.5-1mw
Beam quality	<1.3
Switching light time	20us
Spot diameter	QCS 3±0.5/RFL-QCS 5.5±0.5
Fiber core diameter	50μm
Maximum welding gap	1mm
Fiber length	10m or customized
Cooling	Water cooling
Chiller type	Inbuilt, external chiller optional
Cooling capacity	735W
Inbuilt chiller capacity	12L
Input power	AC 220V±22V 50Hz/60Hz
Machine size	990*540*1030 mm
N.W	210KG
G.W	280KG

### 3.5 Operating environment

Environmental requirements: temperature:25~30℃, humidity: less than 40%, dust-free clean workshop.

## 4. Device panel description

### 4.1 Operation Panel



1: laser source; used to control the on and off of the main power supply of the laser;

2: Chiller; used to control the on and off of the main power supply of the chiller;

3: Key on/off; used to turn on and off the power of the whole machine



4: Emergency stop switch; Press the emergency stop switch to turn off the power supply of the whole machine; release the emergency stop and turn on the light, and the power supply of the whole machine is maintained (note that during the safety period, ensure that the laser and refrigerant buttons are turned off) before starting to work .

System touch screen: used to set the laser light output power, frequency, duty cycle; welding head light output mode, galvanometer frequency, scanning width; shielding gas on/off delay, etc.

## 4.2 Laser front panel description



1. OFF/ON: Key switch. Insert the key, turn it to OFF, it means the laser power is off, turn it to ON, it means the laser is working.
2. START: After the laser power MCB is closed and opened, the laser internal control module must be pressed again to power on.



3. ALRAM: indicator light, green indicates that the laser power is normally powered on; red indicates that the laser is faulty.
4. EMERGENCY STOP: Emergency stop switch, press it to immediately turn off the laser and lock it, turn it clockwise to release the button.

#### 4.3 Description of the front panel of the chiller



Add water steps:

1. Open the "vent" cover;
2. Use the white hose that comes with the machine, insert one

end into the "filling port" and lock it, and insert the other end into the water source;

3. Keep pressing the "Add water switch" until the water is filled;
4. Screw on the "vent" cover;

Drainage steps:

5. Open the "vent" cover;
6. Use the corresponding water pipe, one end is inserted into the "sewage outlet" and locked, and the other end is placed outside;
7. Turn the red handle on the "sewage outlet" until the sewage is discharged;
8. Turn the red handle on the "sewage discharge port" to close the sewage discharge completion port;
9. Remove the water pipe and screw on the "vent" cover;

note:

1. It is recommended to change the water in the water tank every 2 months.
2. Water level observation port: The water level must be kept in a green area. The device will alarm when there is water shortage, and water must be added in time.
3. The display on the water cooler: set the temperature of cold water and normal water. The cold water temperature is the set

temperature of the cooling water for the laser, generally set at 26-28 degrees; the normal water temperature is supplied to the QBH head and laser welding head for cooling, and the set temperature is 28 degrees.

## **5. Device startup steps**

1. Connect the gas cylinder to the protective gas interface of the machine. Shielding gas recommends pure argon, and the gas flow rate is greater than 15L/min. First check whether the nameplate on the welding gas cylinder meets the requirements of the gas used, such as purity and pressure. Secondly, use the correct method to introduce the gas from the cylinder to the gas inlet.

2. Connect the power cord correctly. Single-phase AC 220V 50Hz. Make sure that the neutral wire is correctly connected according to the wire mark and the ground wire is well connected. Poor ground wire connection may cause potential damage to the equipment.

3. Turn on the main power switch. The power indicator and touch screen will light up.



4. Ensure that the laser button and water cooler button on the front panel are in the released state;

5. Release the "emergency stop switch" and press the "start button".

6. After waiting for the touch screen to display normally, turn on the power of the water chiller and wait for about 10 seconds (to ensure the normal operation of the water chiller).

7. Press the "Laser Start Button" on the front panel

8. Open the front door of the machine and turn the laser key switch to ON. After waiting for the "ALRAM indicator" of the laser to change from red to green, press the "start" button on the front panel of the laser. At this time, the start button and other lights are red.

9. Press the start button on the upper control panel to turn on the laser.

10. Hold the "bottom line clamp" to the workpiece to be welded, and the copper nozzle on the front of the welding head touches the workpiece (the laser head status and the conduction status are

both displayed on the touch screen at this time).

11. Set on the touch screen: After the laser power, welding head and gas parameters, the copper nozzle touches the workpiece and presses the torch switch to start welding.

Note: The gas opening and closing delay is generally recommended to be 150ms

## **6. Device shutdown steps**

1. Darkly adjust the START key on the laser panel, turn the key to OFF, and the laser will stop.

2. On the front panel of the device, first release the "laser button", then release the "water cooler button", take the "emergency stop button" again, and finally turn off the "air switch" on the back of the device.

3. Turn off the switch at the gas cylinder.

4. Put away the welding gun and put away the return ground wire.

### **7. Precautions for use**

1. The power supply wiring must be accurate and grounded to avoid electric shock damage to the chassis and equipment damage.

2. The operator shall perform necessary protection and wear

protective glasses.

3. When the optical cable is suspended, the bending radius cannot be less than 20CM.

4. The welding torch is a precision part, so handle it gently to avoid dropping it.

5. Necessary protection for regional work. The laser may penetrate the welding seam and damage the back. The laser has reflection damage when welding high-reflective materials such as copper and aluminum. It is recommended to isolate the work area as necessary.

## **7. Common troubleshooting**

### **1. Cannot emit light normally after booting**

If the laser fails to start, it is recommended to restart according to the steps to make sure that the water cooler is started before starting the laser.

### **2. Water level alarm of water chiller**

The pure water in the water cooler tank is not enough. Check the water level and add pure water.

3. The laser power and the set value are too small during welding

Check whether the protective lens of the welding gun is clean, and replace the protective lens in time

#### 4. Serious loss of protective lens

Check the protection gas flow

## 8. Attention

8.1 Change water regularly or at a certain frequency;

8.2 OD5+ and higher class laser protective goggles needed to be weared properly when operating the machine or watching the welding process in order to protect yourself from laser radiation and strong lighting;

8.3 Lock the laser at any time when there's a welding break, or power off the laser welding machine for sure;

8.4 Change different nozzles when different angle of laser welding happens;

8.5 Any confusion happens, please do consult us and professional person you know.

8.6 Please do not disassemble the machine without our authorization, otherwise, the warranty expire immediately.

8.7 Do not touch and switch any keys and buttons on the panel of laser source at any time. Please follow this manual to turrn on



and turn off the machine.

8.8 Press the emergency button in time when wrongly operation happened.

## 9. Laser welding samples

