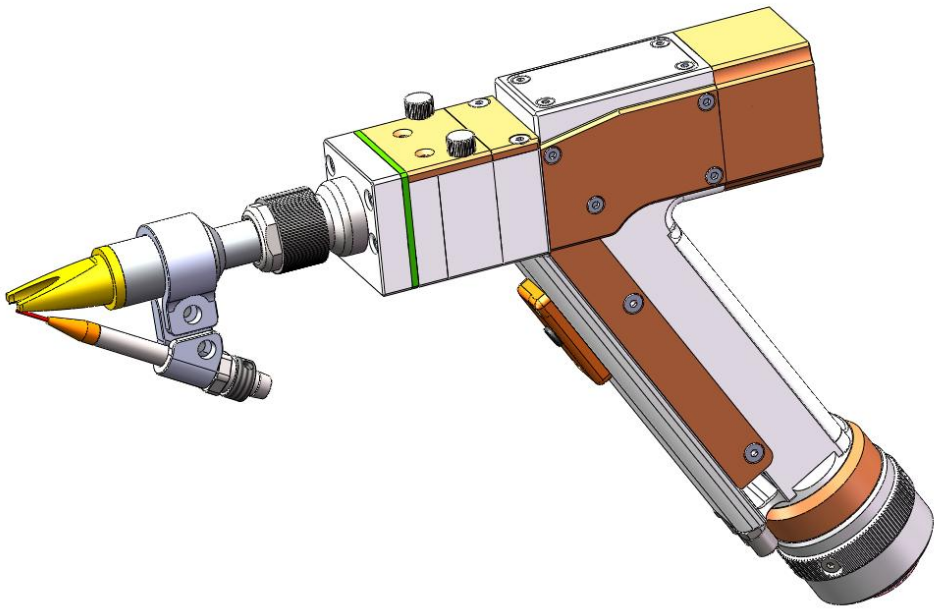
HS21 Fibre Optic Handheld Vibrator Welding head

User's manual



Wuhan Xinghong Photoelectric Technology Co., Ltd.

2022.04.23

Catalogue

Please read this product manual carefully after

Then carry out the installation, debugging and use of the product

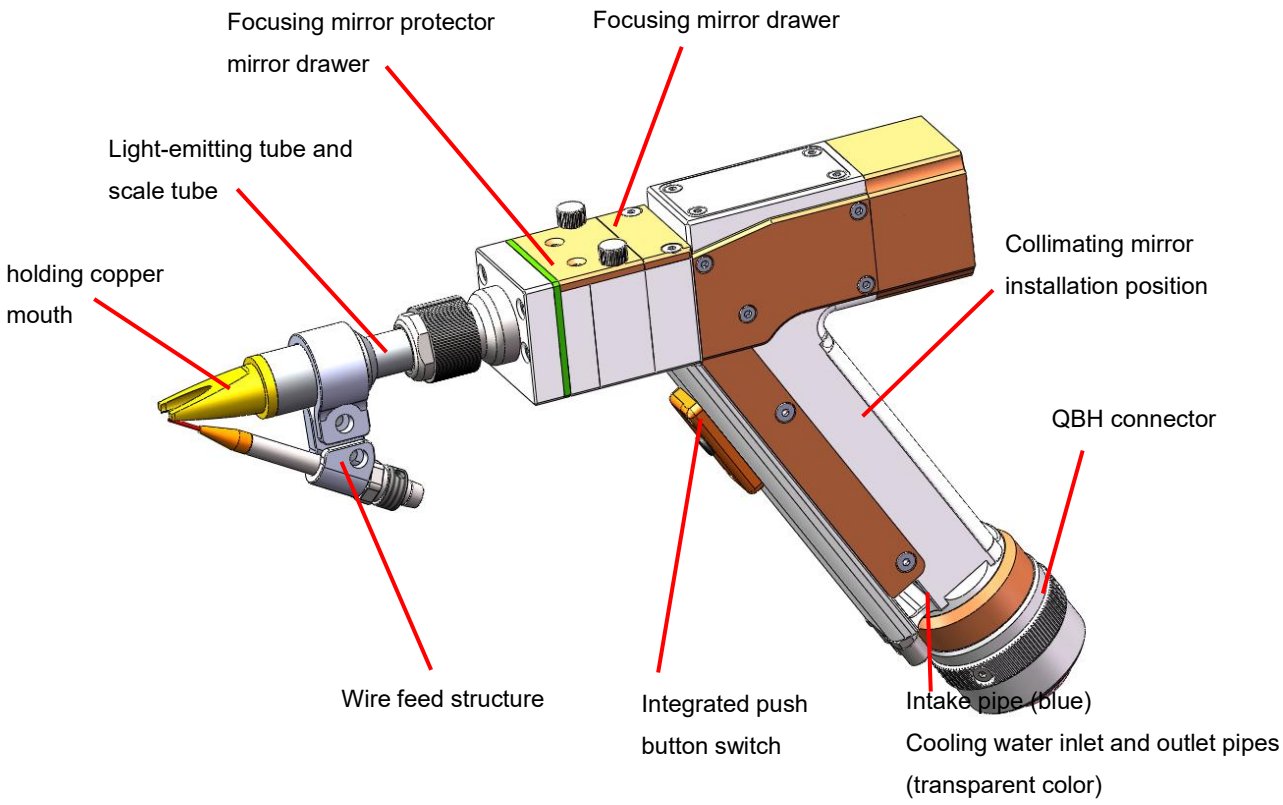
You must wear safety goggles when operating laser equipment. Safety glasses should be reasonably selected according to the wavelength of the laser emitted by the laser equipment. If the device is a laser tunable or Raman product, it will emit laser light beyond the normal output wavelength range of the device's laser, and corresponding safety protection should be taken against this phenomenon during protection. Laser safety glasses should be selected for their ability to shield the entire wavelength range of lasers emitted by laser equipment.

Chapter 1 Product Introduction and Display

1.product description

"Fibre Optic Handheld Vibrator Welding head" is composed of "optical fiber continuous welding controller" and "optical fiber hand-held galvanometer welding head" (wire feeding hand-held swing welding system also includes wire feeding structure and wire feeder). The frequency of the galvanometer is 300Hz, and the spot width is 0-4mm. The perfect airway design can better protect the inner cavity of the pipette tip and improve the service life of the focusing lens. The overall tip is about 0.75KG, and the lightweight design improves the look and feel of the product.

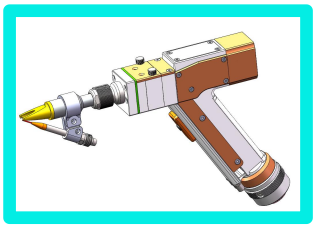
After receiving the product, open the box, including: a set of optical fiber handheld galvanometer welding head, a set of drive control box, a set of touch screen, a motor control wire, adjustment tools, and several accessories.



Note： The water pipes are transparent pipes on the left and right, please see the mark and then pass the water; the air pipe is a blue pipe by default in the

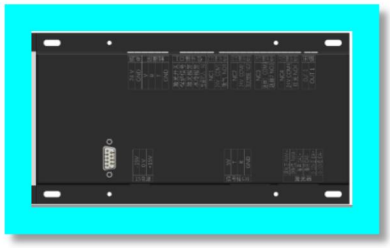
middle of the two water pipes. Please see the mark before ventilating. If the water pipe is connected to the gas pipe mouth, it will cause extremely serious losses. Please be careful not to connect mistakenly.

2. Fittings display



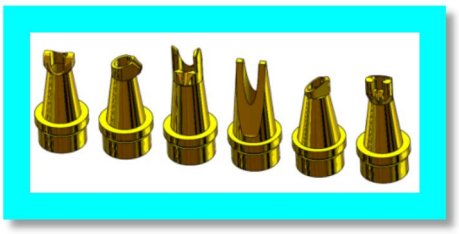
Handheld Vibrator Welding Head (Sample)

Touch screen (sample image)



Controller (Sample)

Vibrator Control Line (Sample)



Welding copper nozzle (sample picture)

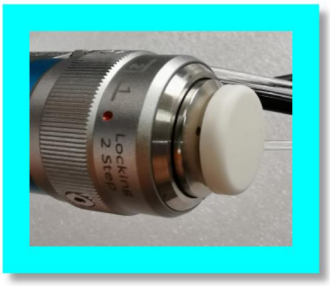
3-core switch wire (sample picture)

Protective lens (sample image)

3.Cautions: Steps of inserting and unplugging optical fiber splice (old QBH connector)

Note: The laser head needs to be placed horizontally when inserting the fiber; ensure that the fiber is inserted horizontally.

3.1Check whether the QBH connector and optical fiber plug are dirty, and wipe it clean with alcohol and cotton swab (tissue paper) in time.


3.2 QBH homing "two points and one line".
3.3 Inserting the optical fiber plug into position.


3.4 Double locking clockwise.
3.5 Fiber Protection Jacket for full protection.

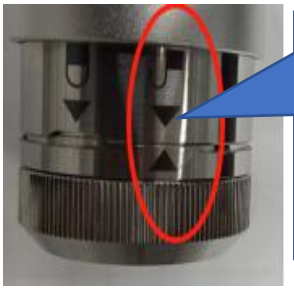

Note: The laser head needs to be placed horizontally when inserting the fiber; ensure that the fiber is inserted horizontally.

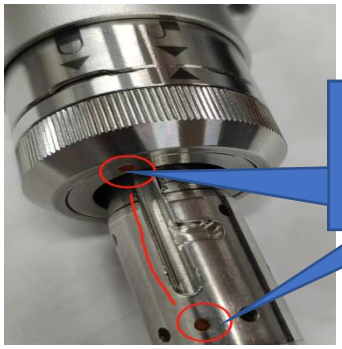
4. Cautions: Steps for inserting and unplugging optical fiber splice (new

QBH connector)

4.1 Check whether the QBH connector and optical fiber plug are dirty, and wipe it clean with alcohol and cotton swab (tissue paper) in time.


4.2 The QBH is in the unlocked state (the arrow points to the unlocking mark), and the red dot of the optical fiber plug is aligned with the red dot on the end face of the QBH and inserted in place.





4.3 Rotate the ring with the lock mark on the QBH connector clockwise until the QBH is in the locked state (the arrow points to the lock mark), and finally tighten the locking ring.

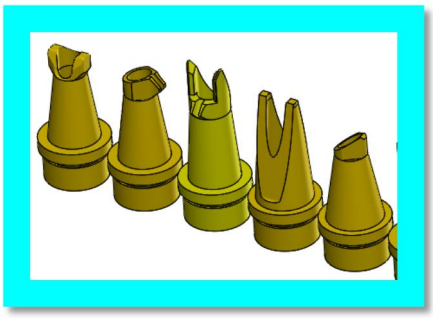
Chapter 2 Product functions and routine operation

1.Introduction of hand-held galvanometer wire feeding

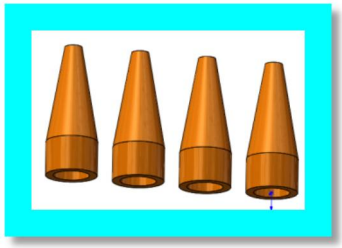
The hand-held galvanometer wire feeding welding head consists of a swing head, a WZ optical fiber continuous welding controller, a wire feeding machine (including welding wire), wire feeding structural parts, etc.

The wire feeder needs to plug in the triangular plug to supply AC220V power, press the power switch (POWER ON) and the power indicator (POWER) will light up. The jog wire feed (WIRE FEED) and jog retract (WIRE RETRACT) on the wire feeder panel operate as required.

Wire feed bracket



copper mouth



Welding wire cap

The welding wire fixing cap needs to match the hole diameter according to the size of the welding wire.

When using the wire feed function, the wire feed button switch on the touch screen must be turned on.

2.Defocus adjustment

The brightness of the laser beam is the strongest, and the welding sound is the loudest. When you hear only a sound, that is, the focus is just on the surface of the workpiece, which is zero defocus.

When the defocus is negative, a larger penetration depth can be obtained, and the power density inside the material is higher than that of the surface, which is easy to form stronger melting and vaporization, so that the light energy can be transmitted to the material deeper. Therefore, in practical applications, when the penetration depth is required to be large, negative defocusing is used; when welding thin materials, positive defocusing should be used.

At the front end of the hand-held light-emitting tube, the scale tube can be adjusted according to the user's application requirements, and the positive and negative defocus amounts can be recorded, which is convenient for the user's operation habits.

3.Replacing the cleaning protection sheet

Importance: To clean and replace the protective sheet, you will need the following equipment:

1、Powder-free rubber gloves or finger cots, lint-free cleaning wipes, and cotton swabs

3、Isopropyl alcohol (optical grade, anhydrous), acetone (optical grade, anhydrous)

5、Compressed air (oil free, water free)

6、light source

Notice:

★ Do not reuse lint-free cotton clothes or swabs to wipe the protective lenses.

★ Do not touch the protective lens with your fingers.

★ Do not blow directly with the mouth to protect the dirt on the surface of the lens, as this may bring new dirt.

★ Do not touch the tip of the cleaning swab with your fingers.

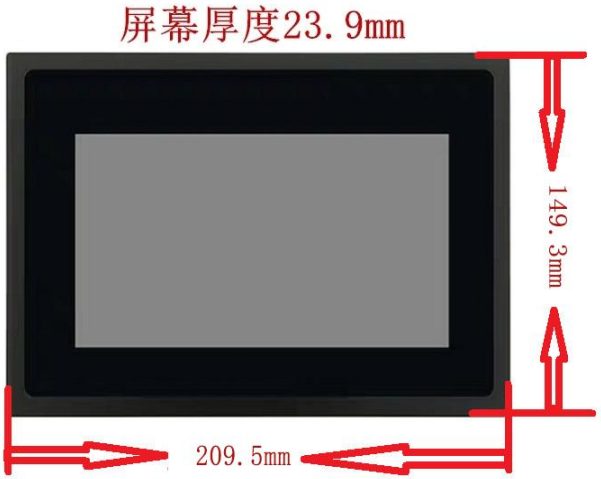
★ Don't forget to clean when replacing the mirror drawer.

★ When using compressed air, please do not blow the dirt directly from the front, and use the method of blowing from the side to avoid the dirt sneaking into the surface.

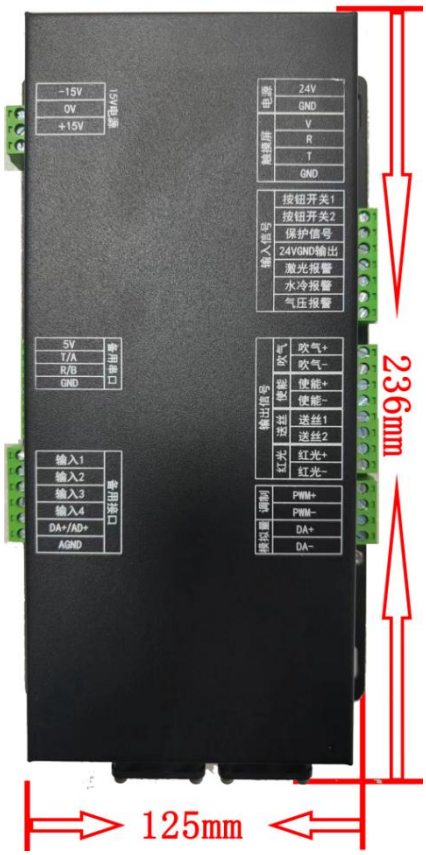
★ **Special Note ,** Powder-free gloves or finger cots must be worn when cleaning the product. It is now clear that if the damage is caused by improper handling or the use of incorrect cleaning procedures or chemical use, damage due to such causes is not covered by the warranty.

Chapter 3 Control System Manual

3.1 Reference size of control panel and control box



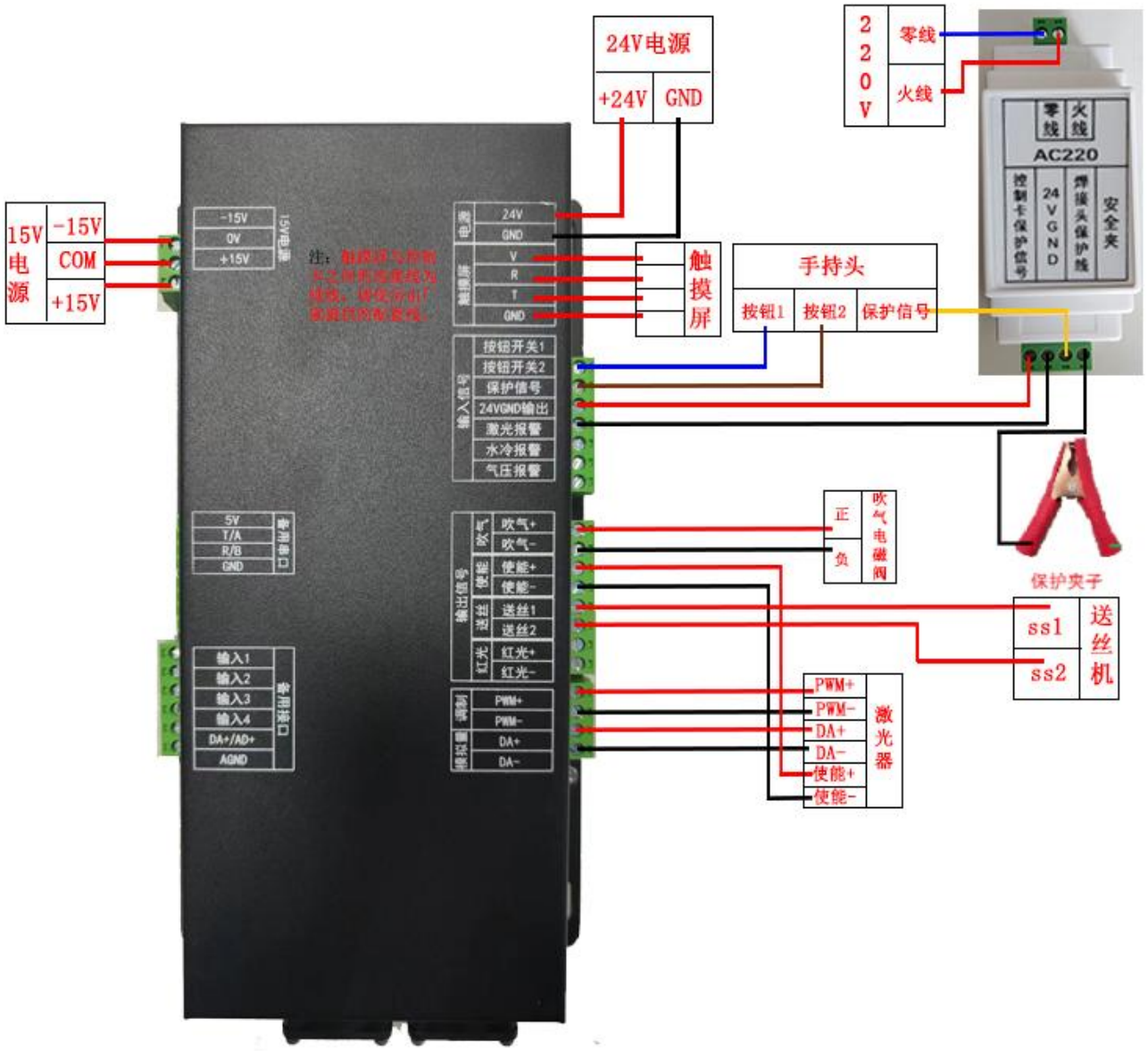
屏幕安装开孔尺寸
197.4mm*137.1mm

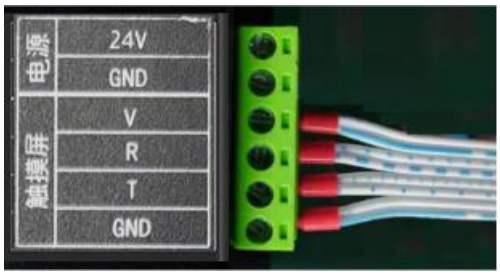


Shell thickness 39mm

Controller (Proofs)

3.2 Control box wiring diagram (below)





Correct connection of touch screen matching cable

3.3 Definition of control card terminals (as follows)

left：

Name	Definition	illustrate
15V power supply	-15V	-15V
	COM	COM
	15V	+15V
Alternate serial port	5V	Alternate serial port
	T	
	R	
	GND	
Alternate interface	Enter 1	Spare
	Enter 2	Spare
	Enter 3	Spare
	Enter 4	Spare
	DA+/AD+	Spare
	AGND	Spare

Right：

Name	Definition	illustrate
power supply	+24V	+24V
	GND	24VGND
touch screen	V	For cable connection, please use the matching cable provided by the manufacturer
	R	
	T	
	GND	
input signal	power switch button 1	Take over the pistol switch button 1
	power switch button 2	Take over the pistol switch button 2
	protection signal	Connect to the isolation module control card protection signal
	24VGND output	Connect to isolation module 24VGND
	Laser Alarm	Connect to laser alarm signal, 24v ground conduction is effective
	water cooling alarm	Water-cooled alarm signal, 24v ground conduction is effective
	Air pressure alarm	Connected to the air pressure alarm signal, 24v ground conduction is effective
blow air	blow air+	air valve positive
	blow air−	air valve negative
Laser enabled	Laser enabled+	Connect to laser enable positive
	Laser enabled−	Connect to laser enable negative
wire feed switch	wire feed 1	wire transfer machine ss1
	wire feed 2	wire transfer machine ss2
red light	red light +	Connect to red light
	red light -	Red light negative
Modulation analog	PWM+	Connect to laser modulation+
	PWM-	Connected to Laser Modulation-
	DA+	0-10VSignal The 0-10V analog signal connected to the laser is positive
	DA-	0-10Vsignal ground The 0-10V analog signal connected to the laser is negative

Chapter 4 HMI Main Operation Parameter Interface Description

4.1 main operation interface

After the power is turned on, the touch screen will enter the main operation interface (as shown in Figure A).

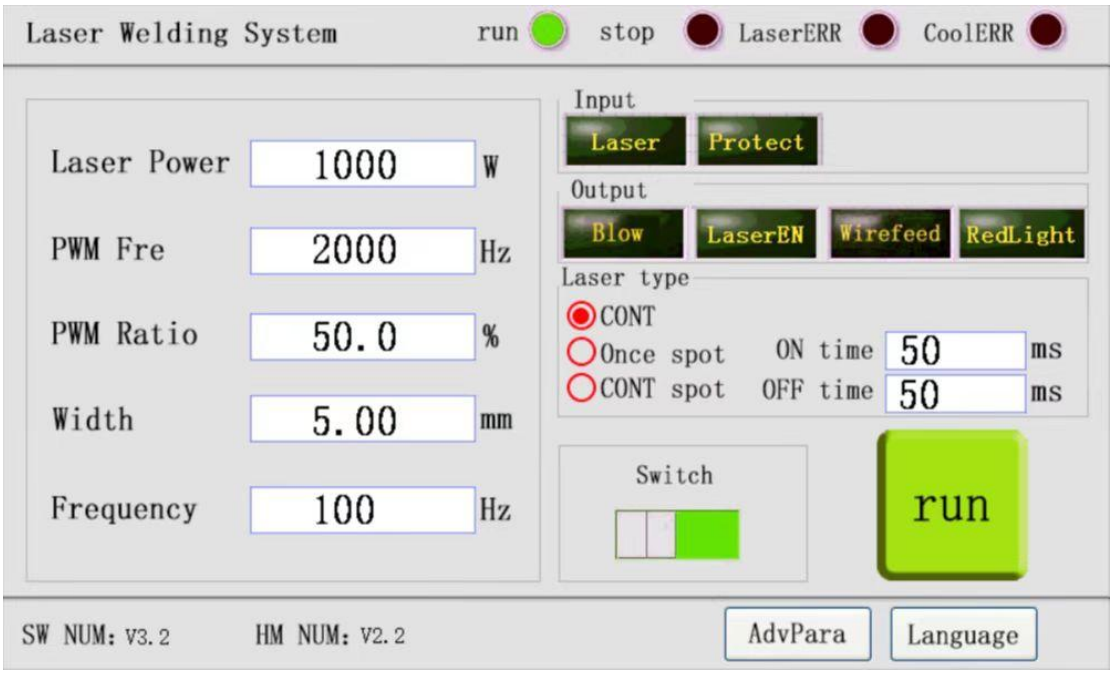


Figure A

●**Sequential display on the interface status bar:** communication indication, air pressure alarm, laser alarm, water cooling alarm.

1. Communication indication: if the light is green and flashing, it means that the touch screen and the main control card are connected normally, and if it does not flash, it means that the communication between the control card and the touch screen is abnormal.

2. Air pressure alarm: When the red light is displayed, there is a problem with the laser, and the dark green is disconnected or the function is not connected to the signal.

3. Laser alarm: When the red light is displayed, there is a problem with the laser, and the dark green is disconnected or the function is not connected to the signal.

4. Water cooling alarm: The red light shows that there is a problem with the water cooler, and the dark green is disconnected or the function is not

connected to the signal.

5. Run/Stop: Click the button to start/stop the welding program. When the button is green, the program is running, and when the button is red, the program is stopped.

6. Advanced parameter: Click to enter the advanced parameter setting interface as shown in Figure B.

7. Language: Click to switch language.

●parameter bar

1. **Laser power:** Set the current output power, which should not be greater than the laser power.
2. **PWM frequency:** set the frequency of PWM modulation signal, 0-200000HZ adjustable.
3. **PWM duty cycle:** set the duty cycle of the PWM modulation signal period, 0-100% adjustable.
4. **Galvo width:** set 0-5 (0-5 for welding mode, 0-120 for cleaning mode).
5. **Galvo frequency:** frequency can be set from 0-200.
6. **Galvanometer switch:** control the on and off of the galvanometer swing.

●Input status bar

1.Button switch: Display the on/off state of the hand-held switch signal, dark green is the off state, green is the on state, and the default is off.

2.Protection signal: display the on/off state of the protection signal, dark green is the off state, green is the on state, and the default is off.

● Output status bar (you can click to output the corresponding signal when the welding program is stopped. It is used for testing)

1. **Blowing:** Start/close the blowing signal function to test the on/off of the blowing electronic valve.

2. Laser enable: enable/disable the laser enable signal, test the laser enable

of the laser.

3. Wire feed: wire feed signal function tests the wire feed of the laser wire feeder.

4. Red light: turn on/off the red light signal, test the on/off of the red light function.

●light mode

1. **Lighting time: T**his parameter is valid only in single spot welding and continuous spot welding. By setting this parameter, the light-emitting time of the laser can be controlled.

2.Interval time: This parameter only takes effect during continuous spot welding. By setting this parameter to match the light output time, the laser continuous spot welding light output is controlled.

3.Continuous: After triggering, the laser emits light continuously.

4.Single-shot spot welding: After triggering, the laser emits light according to the set light-emitting time.

5.Continuous spot welding: After triggering, the laser continuously spot welding light according to the set light output time and interval time.

●

1.Software version number: Display the current board software version number.

2.Firmware version number: Display the current board firmware version number.

3.Click the "Language" button in the lower right corner of the main interface to enter the English interface.

4.Click the "Advanced Parameters" button in the lower right corner of the main interface to enter the advanced parameter interface.

4.2 Advanced parameter interface

After clicking the advanced parameters on the main interface, enter the advanced parameter interface (the Chinese interface is as shown in Figure B below)

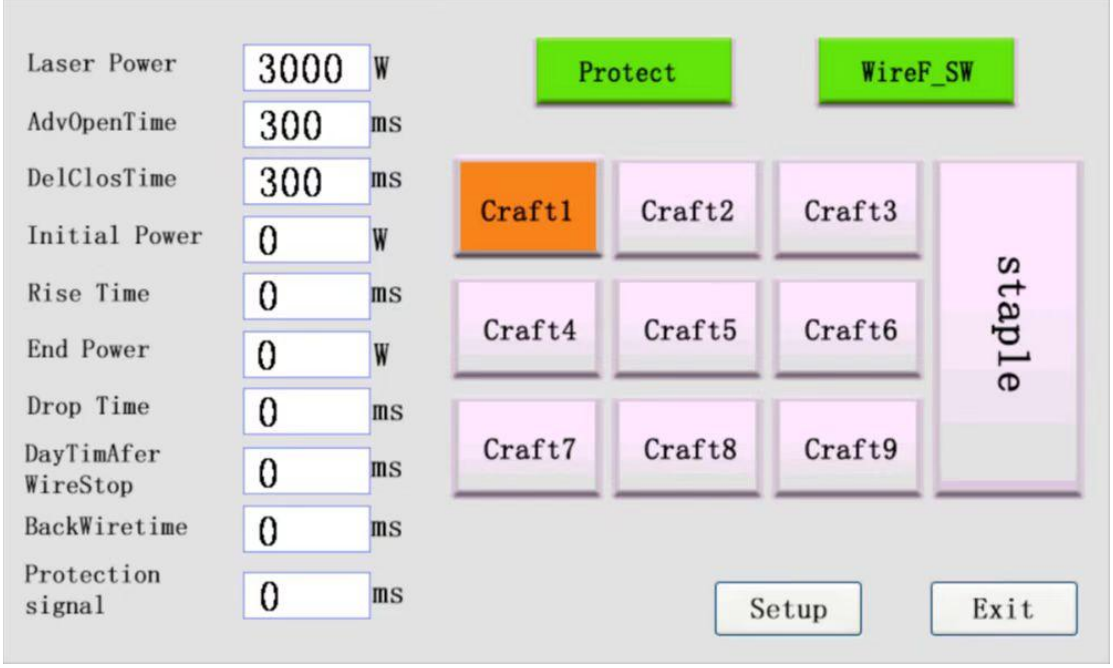


Figure B

●parameter bar

1.Laser Power: Set the maximum power of the laser, in W.

2.Air-on delay: Set the air blowing time in advance before welding starts, in ms.

3.Air off delay: Set the time to keep blowing air after welding, the unit is ms.

4.Power on: Set the initial power of the laser when it emits light, the unit is W.

5.Ramp-up time: Set the ramp-up time of the light-emitting stage, in ms.

6.Off light power: Set the end power of the laser when it receives light, the unit is W.

7.Slow-down time: Set the slow-down time at the end of welding, in ms.

8.Advance wire feeding time: If you need to advance wire feeding before laser welding, set the corresponding advance wire feeding time, if not, change it to 0, the unit is ms.

9.Light-off delay: Set the time for the laser to continue to emit light during the process of drawing back the wire at the end of the wire feeding welding, the

unit is ms.

10.Protection signal disconnection time: The maximum time that the protection signal is allowed to be disconnected during the program running process to prevent hand shake and light interruption.

●

1. Protection signal: enable/disable protection signal, red is off state, green is on state, default on

2**. Wire feed switch:** enable/disable the wire feed switch signal, red is the off state, green is the open state, the default is on.

●craft library

Calls of different parameters can be set separately by selecting different technology libraries

●

1. Click the "Galvanometer Settings" button in the lower right corner of the advanced parameter interface to enter the galvanometer settings interface.

2.Click the "Exit" button in the lower right corner of the advanced parameter interface to return to the main interface.

4.3 Click the "Galvanometer Setting" button at the bottom left of the advanced parameter interface to enter the galvanometer setting interface as shown in Figure C below.

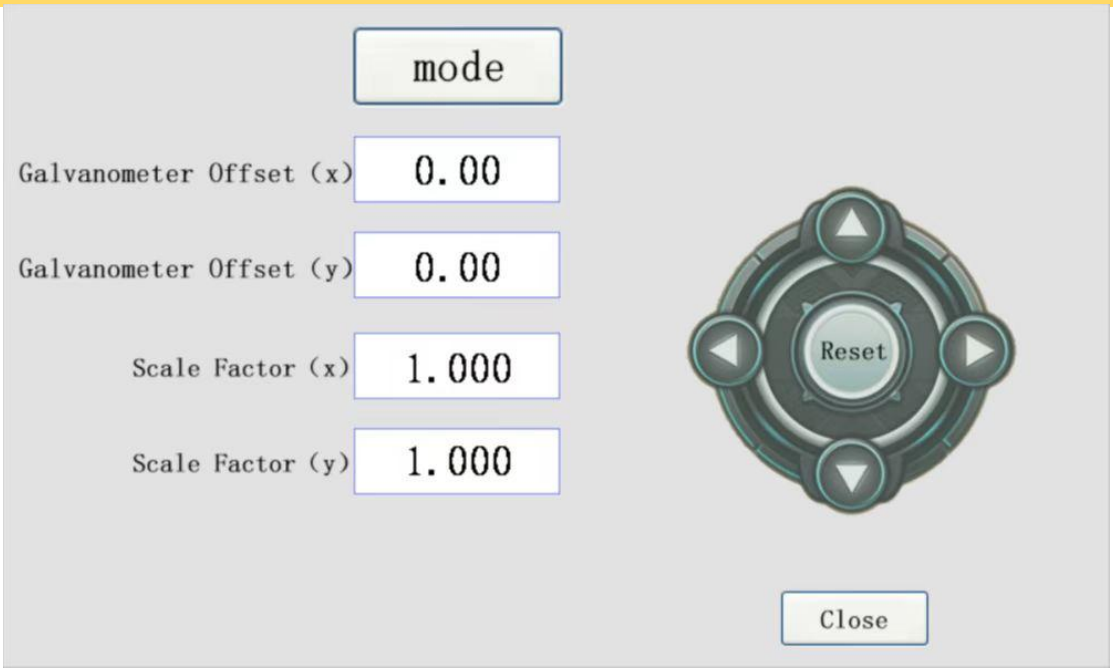


Figure C

●Galvo Settings

1. Galvanometer offset: The galvanometer offset button can control the offset of the light-emitting origin of the galvanometer. The galvanometer offset (x/y) respectively controls the offset in the horizontal and vertical directions of the origin, with a range of -5-5 mm

2. Back to center: the adjusted offset can be zeroed

3. Scale factor: Adjust the magnification factor, the range is 0-5

4. Close: go back to the upper interface

5. Mode: Click to enter the mode selection interface, as shown in Figure D

4.4 Mode selection interface

Click the mode button on the upper left of the galvanometer settings to enter the mode selection interface, as shown in **Figure D**

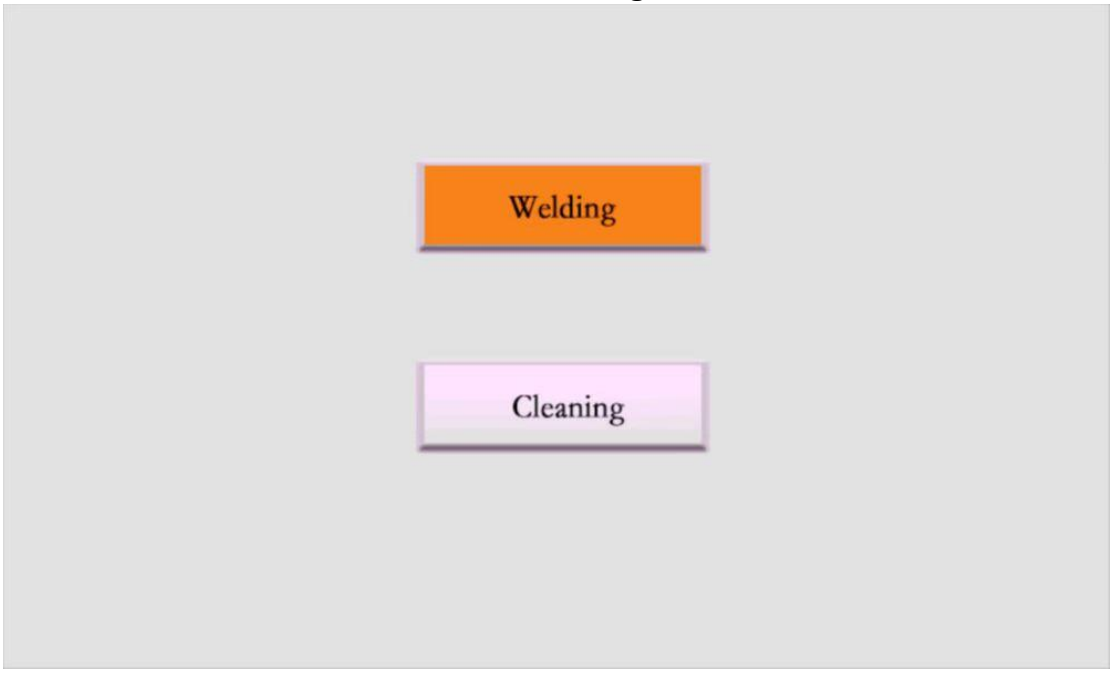


Figure D

●Mode selection

The current mode is welding mode, click to enter the welding main interface as shown in Figure A.

Click the cleaning button, then jump to Figure E

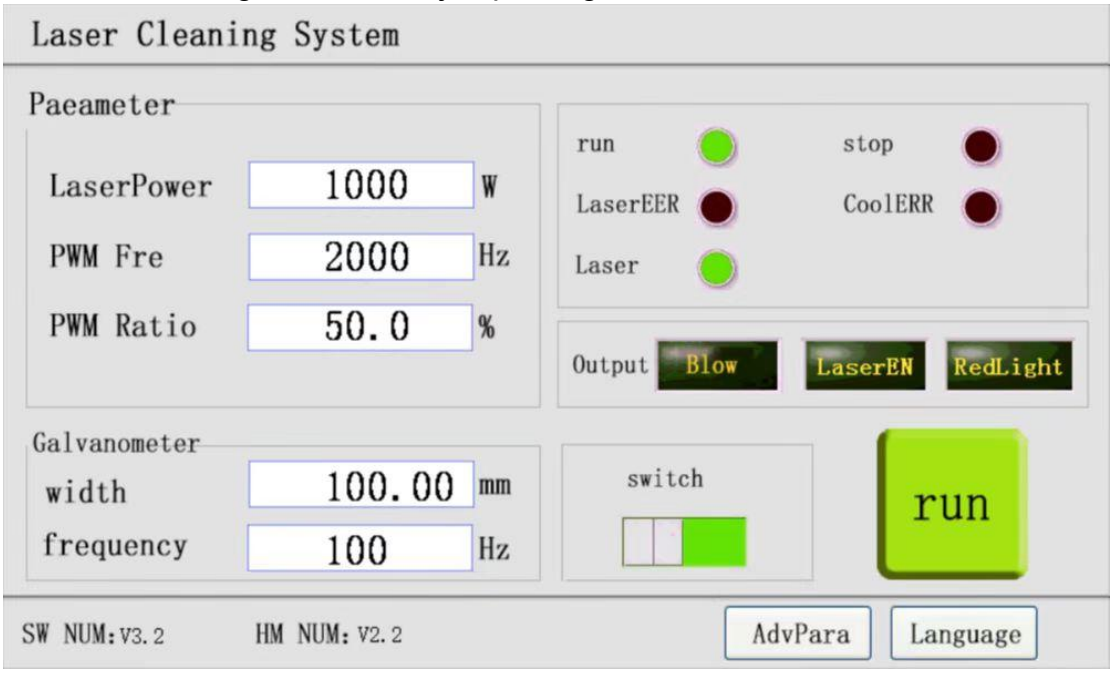


Figure E

4.5 Password change interface

Click the hidden button in the red box at the upper left of the advanced parameter interface as shown in Figure F to enter the password modification interface as shown in Figure G.

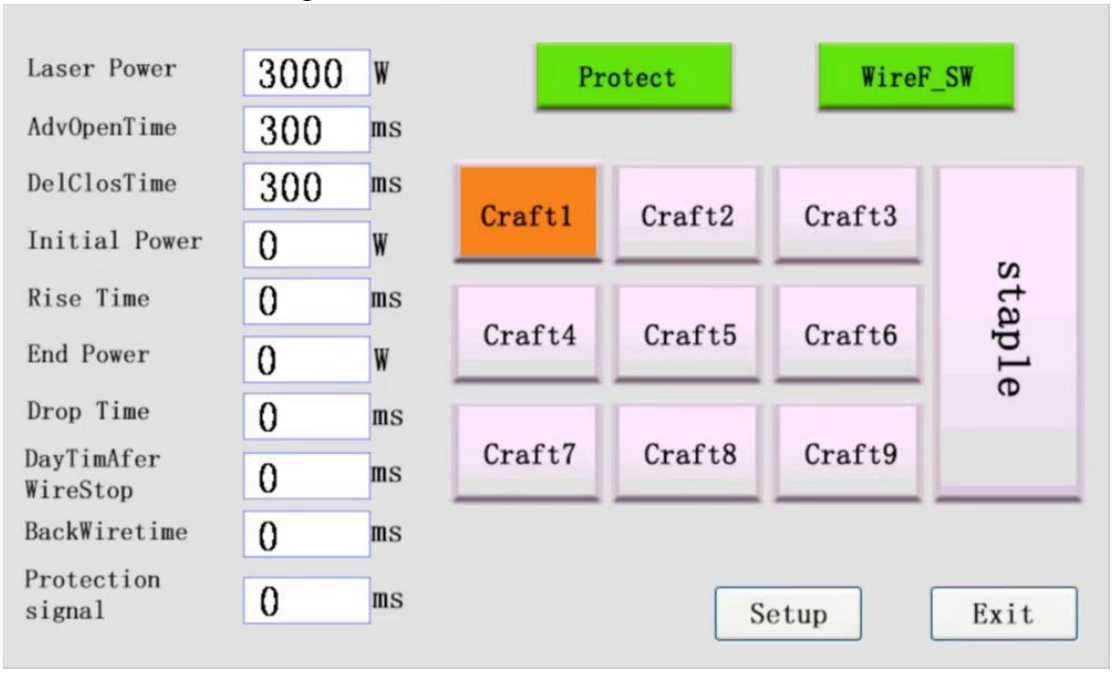


Figure F.

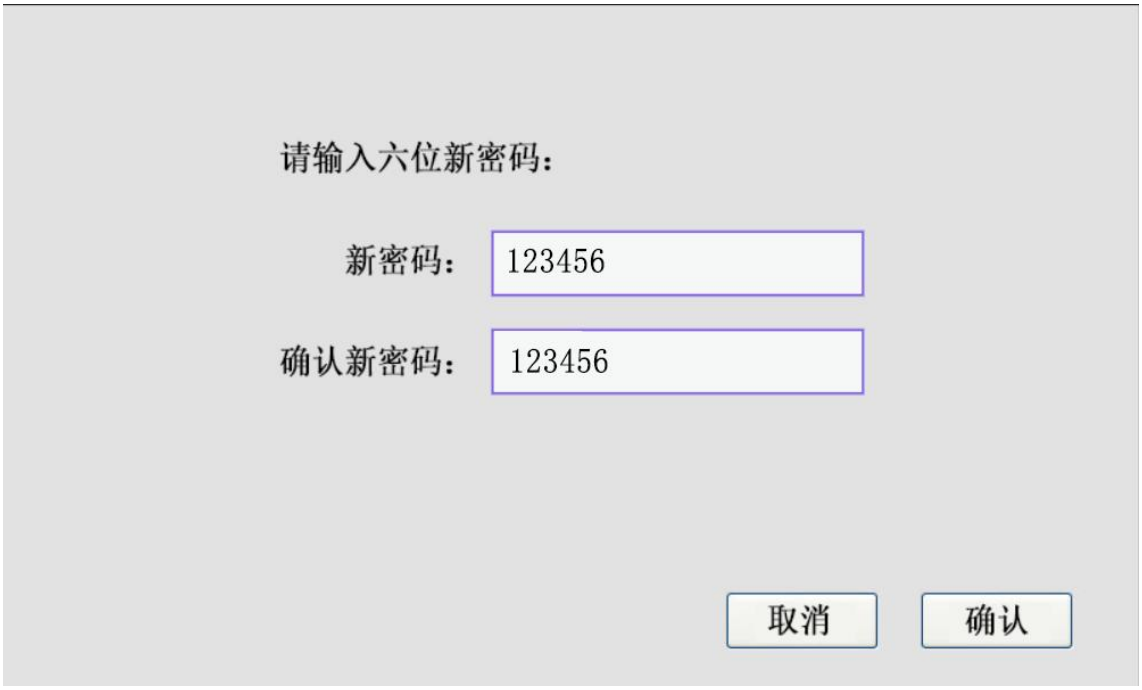


Figure G.

●change Password

To change the password, first enter the new password, then enter the new password to confirm, click OK to change the password, click Cancel to return to the upper interface.

Revision history

Date	Modify the content	Software version
20211101	**First Edition (First Release)**	**V1.0**
20220423	**The second edition (the appearance of the welding head is adjusted, and the galvanometer controller system is upgraded to V3.0 version)**	**V1.1**

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