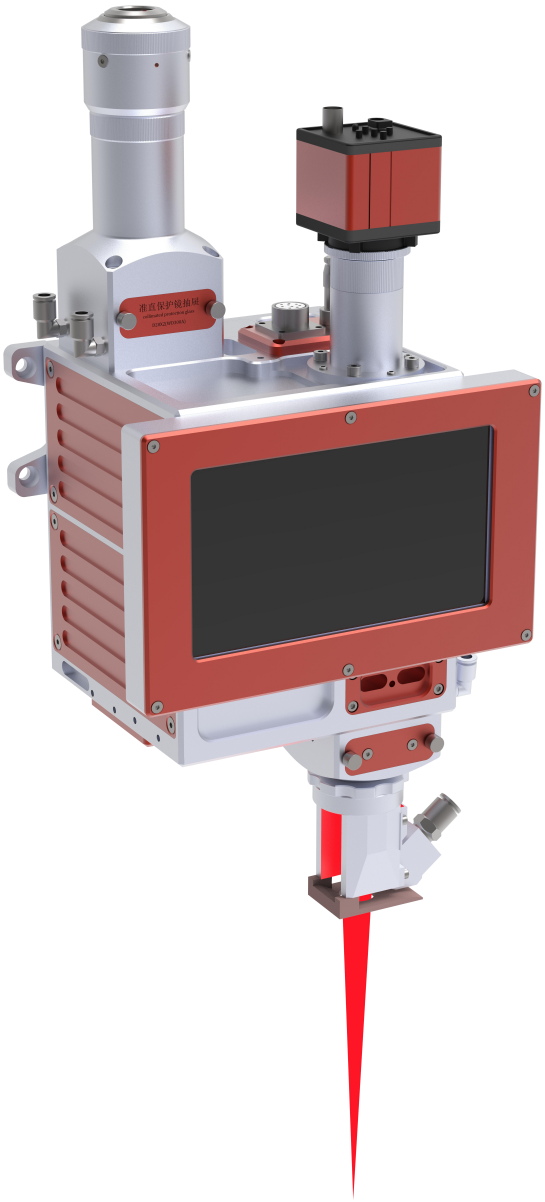
HW30-P Fibre Optic With Double Pendulum Galvo Welding Head



Wuhan Xinghong Photoelectric Technology Co., Ltd.

2022. 7. 18

Catalogue

Please read this product manual carefully after

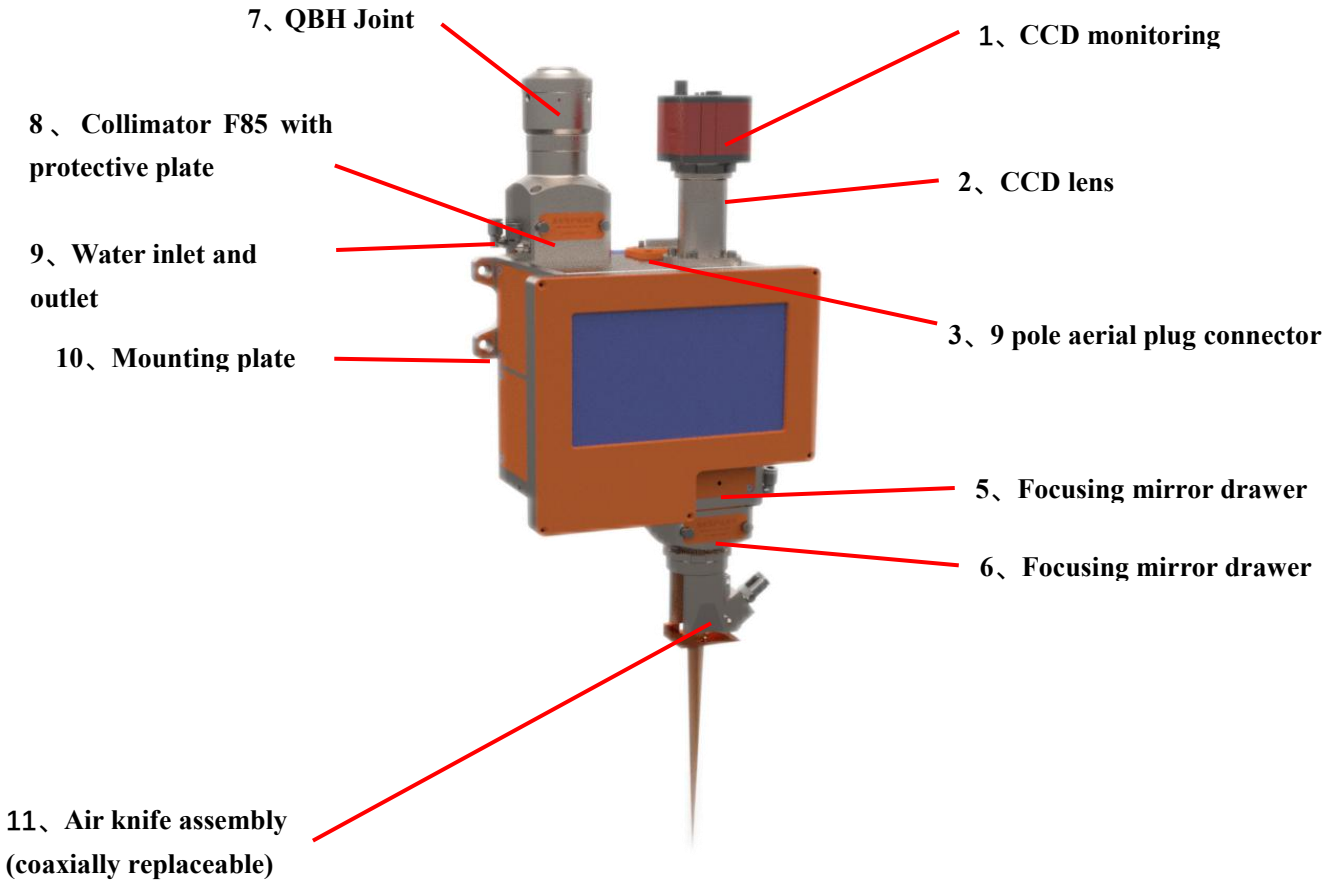
Then carry out the installation, debugging and use of the product

You must wear safety glasses when operating the laser equipment. Safety glasses should be selected appropriately for the wavelength of the laser emitted by the laser. If the device is a laser tunable or Raman product, it emits laser light outside the normal output wavelength range of the device's laser and requires appropriate safety protection for this phenomenon. Laser safety glasses should be selected to shield the laser from the entire wavelength range emitted by the laser device.

Chapter 1: Product Introduction and Display

1.Product introduction

The "HW30 Fiber Optic Double Oscillating Mirror Welding Head" is a two-axis oscillating welding head developed by our company, consisting of a "Fibre Optic With Double Pendulum Galvo Welding Head" and an "X-Z Laser Welding Control System". "The welding head consists of a QBH collimation module, a dual-axis oscillator assembly, a focusing module and a CCD monitoring module. Equipped with a double oscillator module, it can achieve "O, 8, ∞, -, |, etc." a variety of irregular light spot has met customer needs.



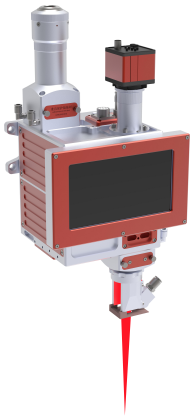
Fibre Optic With Double Pendulum Galvo Welding Head (sample)

Note: The drive is built-in and the dual axis can be effected positively

2.Product parameters

Maximum power	3000W
Fiber interface	RD/QBH
Collimation	F100
Focus	F150/F200/F250/F300
Clear aperture	D22
Collimation protection mirror	D28X4mm
Focus protector	D30X4mm
Protective gas pressure	10、15、20、25par
Weight	3.4kg

3.Accessories display



HW40-P Fibre Optic With Double Pendulum Galvo Welding Head （with screen）(sample)

Blue light (sample)

Protective lens (sample)

4.Special attention: 5 steps for plugging and unplugging optical fibers

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

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

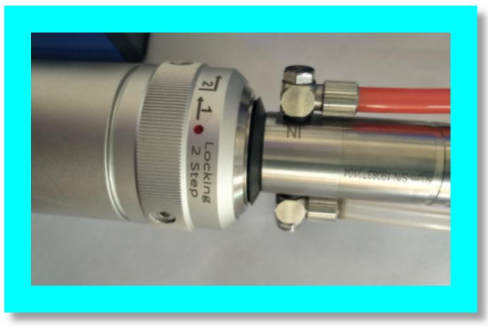


4.2 QBH homing "two points and one line"

4.3 Inserting the optical fiber plug into position


4.4 Double locking clockwise

4.5 Fiber Protection Jacket for full protection

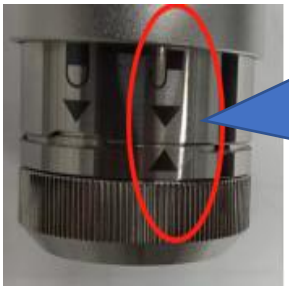


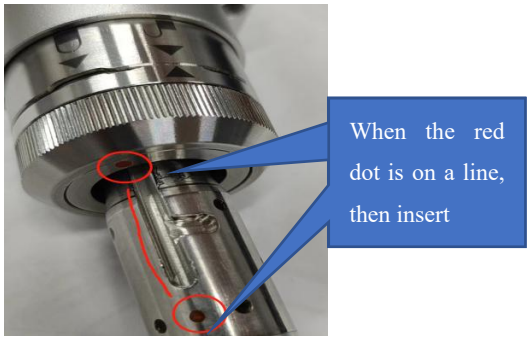

Note: The laser head needs to be placed horizontally when inserting the fiber; ensure that the fiber is inserted horizontally

5.Special note: Steps for plugging and unplugging optical fibres (new QBH connectors)

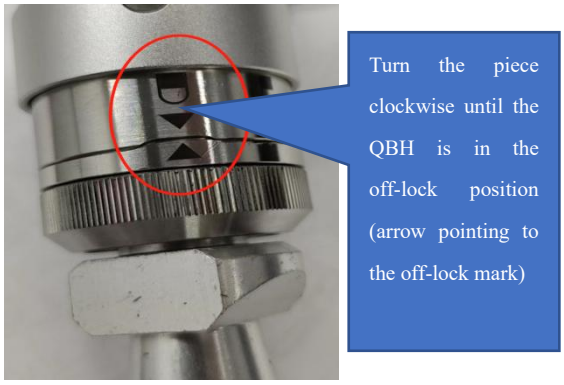
5.1 Inspect QBH connectors and fibre plugs for dirt and wipe them clean promptly with alcohol and cotton swabs (cotton paper).

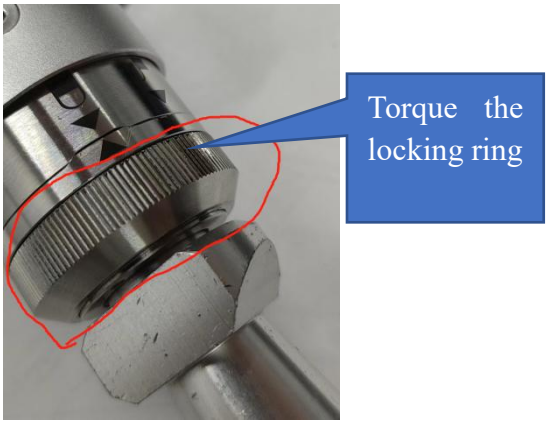
5.2 The QBH is in the unlocked position (arrow pointing to the unlocked logo) and the red dot of the fibre optic plug is inserted into place against the red dot on the end of the QBH.





5.3 Turn the ring with the lock mark on the QBH connector clockwise until the QBH is in the off-lock position (arrow pointing to the off-lock mark) and finally twist the locking ring to tighten it.

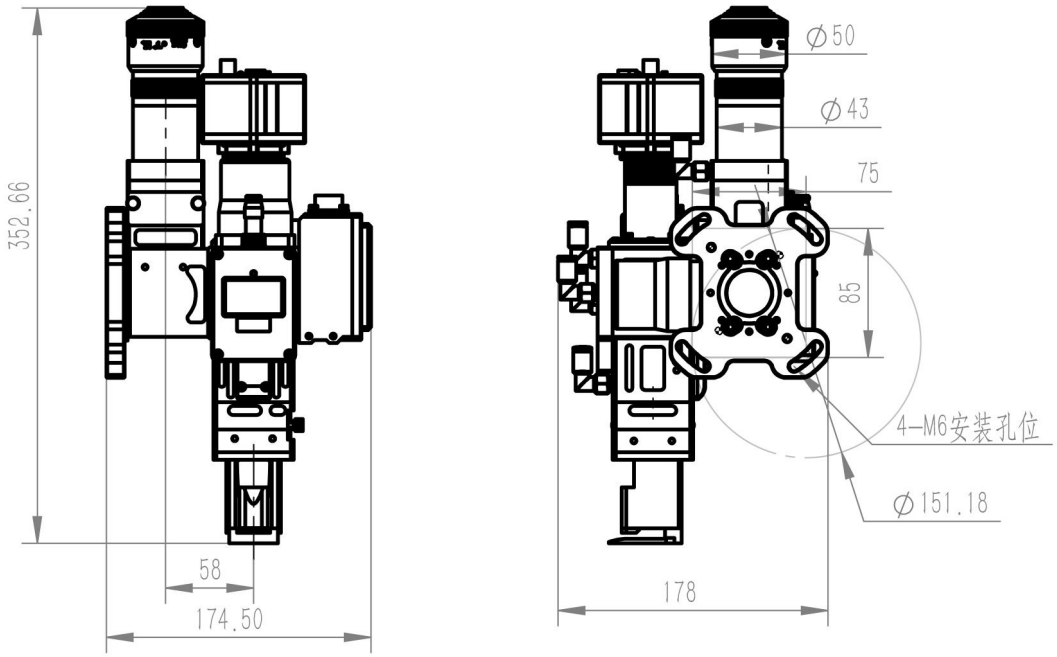




Note: The laser head needs to be placed horizontally when inserting the fiber; ensure that the fiber is inserted horizontally

Chapter 2 Introduction to Product Functions and General Operations

1.Welding head installation dimension drawing



HW40-P Fibre Optic With Double Pendulum Galvo Welding Head
（with screen）(dimension drawing)

2. Defocus adjustment

Adjust the laser power to about 150W, the laser beam brightness is the strongest, "snort" sound maximum, hear the snap only when the focal point is located exactly on the surface of the workpiece, which is zero defocusing.

Negative defocusing, you can get a greater depth of melting, the internal power density of the material is higher than the surface, easy to form a stronger melting, vaporization, so that the light energy to the material deeper transfer. Therefore, in practice, when a greater depth of fusion is required, negative defocusing is used; when welding thin materials, positive defocusing is appropriate.

3. Replacing the cleaning protection sheet

Importance: When cleaning and replacing the protective sheet, you will need the following:

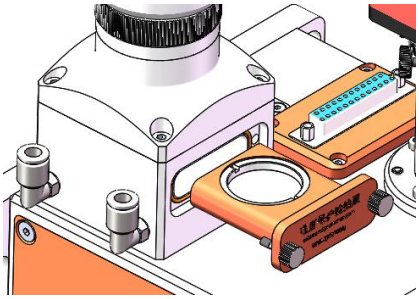
1. Powder-free rubber gloves or finger gloves, lint-free cleaning wipes and cotton swabs

2. Isopropyl alcohol (optical grade, anhydrous), acetone (optical grade, anhydrous), ethanol

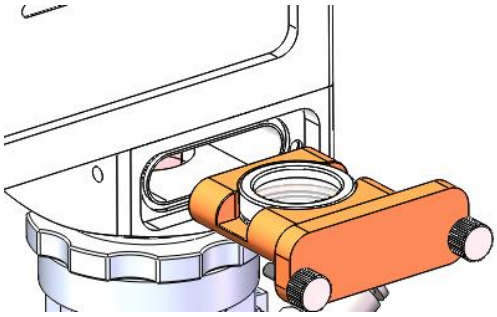
3. Compressed air (oil-free, water-free)

4. Light source

Collimation Mirror Drawer (Threaded Press Ring)



Focus protection mirror drawer (pan plug seal)



★Notice：

★ Do not go back and forth, use a lint-free cotton cloth or cotton swab to wipe the protective lens.

★ Do not touch the translucent surface of the protective lens with your fingers.

★ Do not blow directly with your mouth to protect the dirt on the surface of the lens, because it 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.

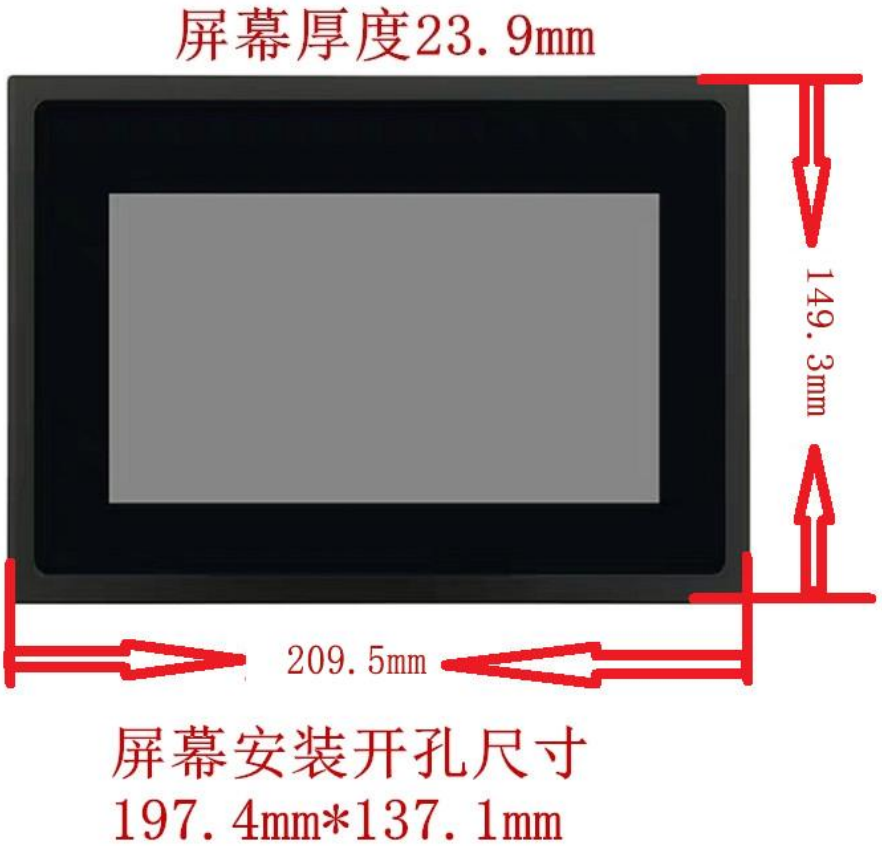
★ When using compressed air, please do not blow the dirt directly from the front, and use the method of blowing from the side to prevent the dirt from sneaking into the surface.

★ Special instructions, 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.

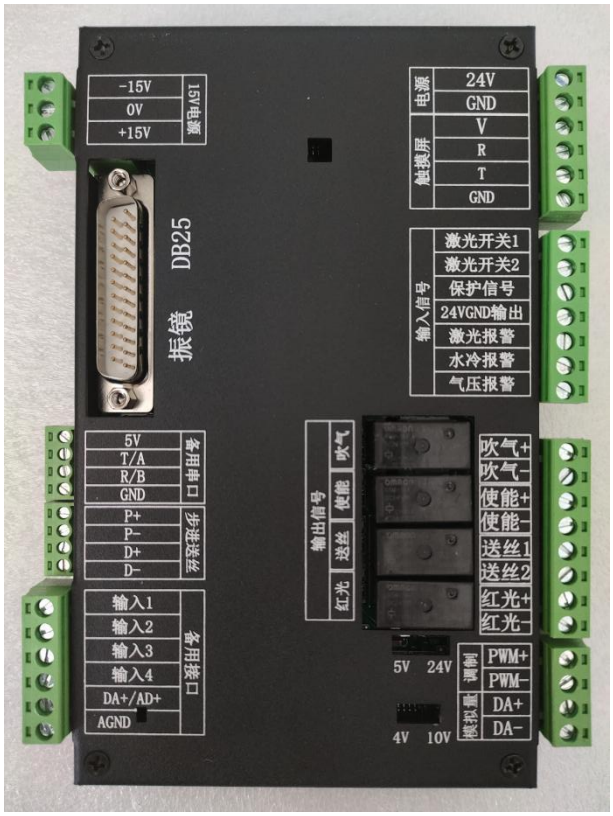
Chapter 3: Control system instructions

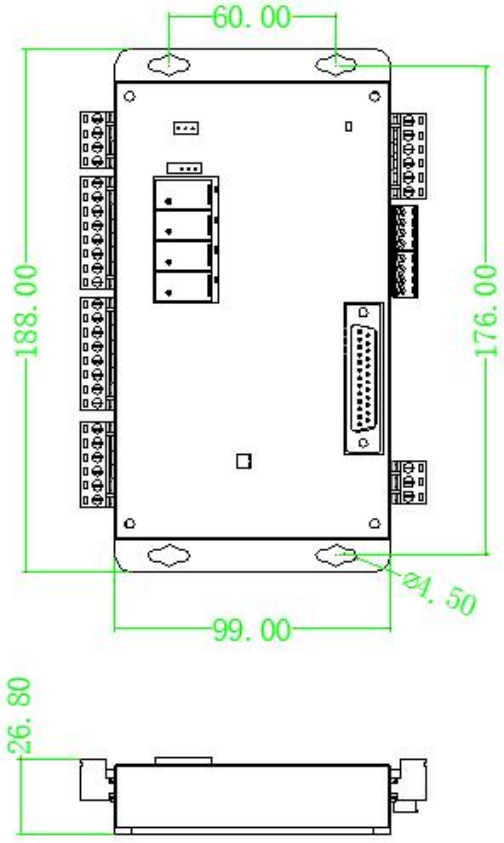
Model：PTZJ

Name：Platform Platform With Double Pendulum Galvo step wire feed laser welding control system (V3.2)

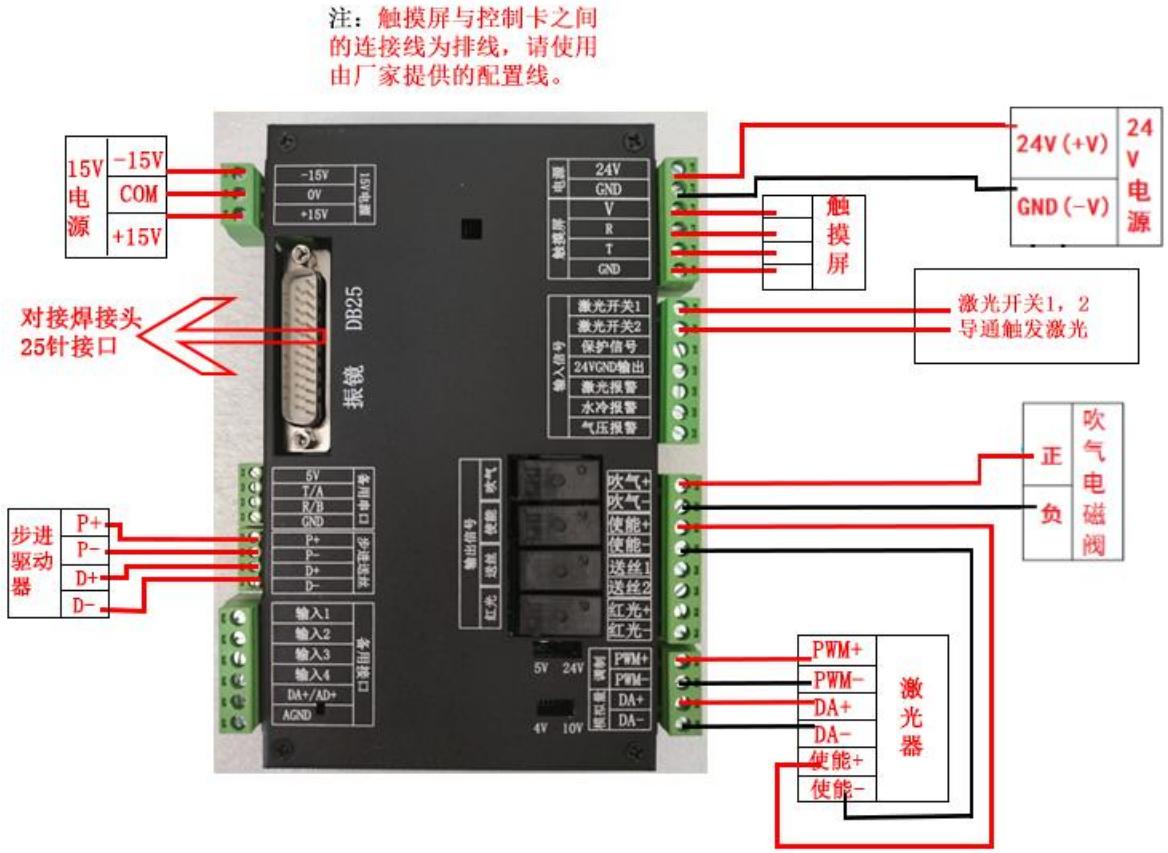


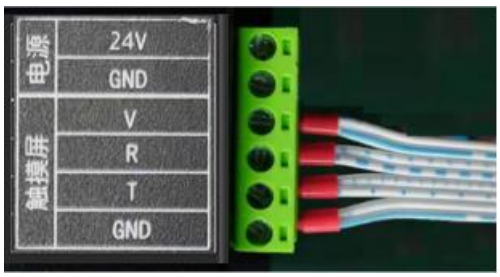
1. Control box terminal definition diagram (below)





2. Control box wiring diagram (below)





The correct way to connect touchscreen matching cables

3.Description of control card terminal definitions (below)

Left：

Name	Definition	Description
Power supply	-15V	Connected to the manufacturer's ±15V supply of -15V
	COM	COM connected to the manufacturer's ±15V supply
	15V	Connected to the manufacturer's ±15V supply of +15V
Spare serial port	5V	Spare
	T/A	
	R/B	
	GND	
Stepper wire feeding	Pulse+（P+）	Connects to the corresponding port on the drive of the stepper feeder
	Pulse-（P-）	
	Direction+（D+）	
	Direction-（D-）	
Spare serial port	Wire feed switch signal	24V ground conduction wire feed
	Input2	Calling parameters in parameter number 1
	Input3	Calling parameters in parameter number 2
	Input4	Calling parameters in parameter number 3
	DA+/AD+	Spare
	AGND	Spare

Right：

Name	Definition	Description
Power supply	+24V	+24V
	GND	24VGND
Touch Screen	V	For cable connections, please use the matching cable provided by the manufacturer
	R	
	T	
	GND	
Input signal	Laser switch 1	Connect laser switch signal line 1
	Laser switch 2	Connect laser switch signal line 2
	Protection signals	Spare
	24VGND output	Spare
	Laser alarm	Laser alarm signal connected, 24v ground active
	Water cooling alarm	Water-cooled alarm signal connected, active 24v ground conduction
	Air pressure alarm	Air pressure alarm signal connected, 24v ground active
Blow	Blow+	Positive air connection valve
	Blow-	Negative air connection valve
Laser -en	Laser-en+	Connect laser enable positive
	Laser-en-	Connect laser enable negative
Wire feed switch	Wire feeding 1	Spare
	Wire feeding 2	Spare
Red Light	Red Light+	Connected to red light positive
	Red Light-	Connected to red light negative
Modulated analogue	PWM+	Connected to laser modulation +
	PWM-	Connected laser modulation-
	DA+	0-10V signal 0-10V analogue signal to laser positive
	DA-	0-10V signal ground 0-10V analogue signal to laser negative

4.Description of the main operating interface and the advanced parameter interface of the touch screen

4.1 Main operating interface

Once powered up the touch screen enters the main operating interface (Figure A below).

Figure A

●The status bar of the interface shows in sequence: communication indication, air pressure alarm, laser alarm, water cooling alarm

1. Communication indication: if the light is green and blinking, the touch screen and the main control card are connected normally, if not blinking, the control card and the touch screen are communicating abnormally.

2. Air pressure alarm： The laser is faulty when displayed,

Disconnected state or no signal is connected to this function.

3. Laser alarm： The laser is faulty when displayed,

Disconnected state or no signal is connected to this function.

4. Water cooling alarm： Shows as a faulty water cooler，

 Disconnected state or no signal is connected to this function.

5. Laser switch: lights up green to show that the handheld head switch signal is on, as shown in the picture disconnected state or this function is not connected to the signal.

6. Run/Stop: Click on the button to start/stop the welding program, the button is green to run when the program is running, the button is brown to stop when the program is stopped.

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

8. Language: Click to switch the language.

●Parameter column

1. parameter number: you can select the parameter group number here in advance to edit multiple groups of parameters, and then select the required parameter group number to work.

2. Laser power: set the current light power, must not be greater than the laser power.

3. PWM frequency: set the frequency of the PWM modulation signal, 0-200000HZ adjustable.

4. PWM duty cycle: set the duty cycle of the PWM modulation signal, 0-100% adjustable.

5. Early start time: set the early blowing time before welding starts.

6. Delayed off time: set the time to keep blowing after the welding is finished, the time unit is ms.

●Input status bar

1. Laser switch: shows the on/off status of the handheld head switch signal, brown is off, green is on, default is off

2. Protection signal: shows the on/off status of the protection signal, brown is off, green is on, default is off

●Output status bar (can be clicked to output the corresponding signal when the weld

program is stopped. For testing purposes)

1. Blowing: activates/deactivates the blow signal function to test the blow electronic valve on/off

2. Laser enable: activates/deactivates the laser enable signal to test the laser enable of the laser

3. Red light: activates/deactivates the red light signal to test the on/off of the red light function

4. Wire feed: by pressing this button you can feed the wire manually

5. Unwinding: manual unwinding by pressing this button

●Light output mode

1. Output time: This parameter is only valid for single and continuous spot welding and is set to control the output time of the laser.

2. Interval time: this parameter is only valid for continuous spot welding, set this parameter to control the laser's continuous spot welding light output in conjunction with the light output time.

3. Continuous: the laser will emit light continuously after the trigger.

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

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

●

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

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

4.2 Advanced parameters screen

After clicking on Advanced Parameters in the main interface, you will enter the Advanced Parameters interface (Chinese interface as shown in Figure B below)

●Manual operation (stopping the program for operation when a test signal is required)

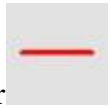
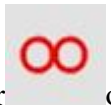
1. DA: Start/Stop DA signal, red is off, green is on, default is off

2. PWM: start/shutdown PWM signal, red for off state, green for start state, default off

3. Protection signal: start/shutdown protection signal, red is off state, green is start state, default is off

4. Wire feed switch: start/close the wire feed switch signal, red is off, green is on, default is on

●Galvo status

1.Shape: shape can be adjusted vibrator out of light graphics, there are five, click to switch in sequence; select the graphics when connected to the Y motor  , and select when connecting X motor , When connecting the X motor to the Y motor you can choose  or  or  。

2. Width: Set 0-5

3. Frequency: Frequency can be set from 0-200

4. Oscillation switch: controls the opening and closing of the oscillator

●

1. Laser power: set the maximum power of the laser, unit W

2. Open power: set the initial power of the laser, unit W

3. Slow rise time: set the slow rise time when the laser starts to emit light, unit ms

4. Off power: set the end power of the laser when closing the light, unit W

5. Slow down time: set the slow down time at the end of the welding closing phase, unit ms

6. Light off delay time: Set the time for the laser to continue to emit light when the gun head returns to the wire extraction process at the end of the wire feed welding.

●Click on the "Exit" button in the bottom right corner of the Advanced Parameters screen to return to the main screen.

4.3 Galvo setting interface

Click on the "Vibrator Settings" button at the bottom left of the Advanced Parameters screen to enter the Vibrator Settings screen as shown in Figure C below.

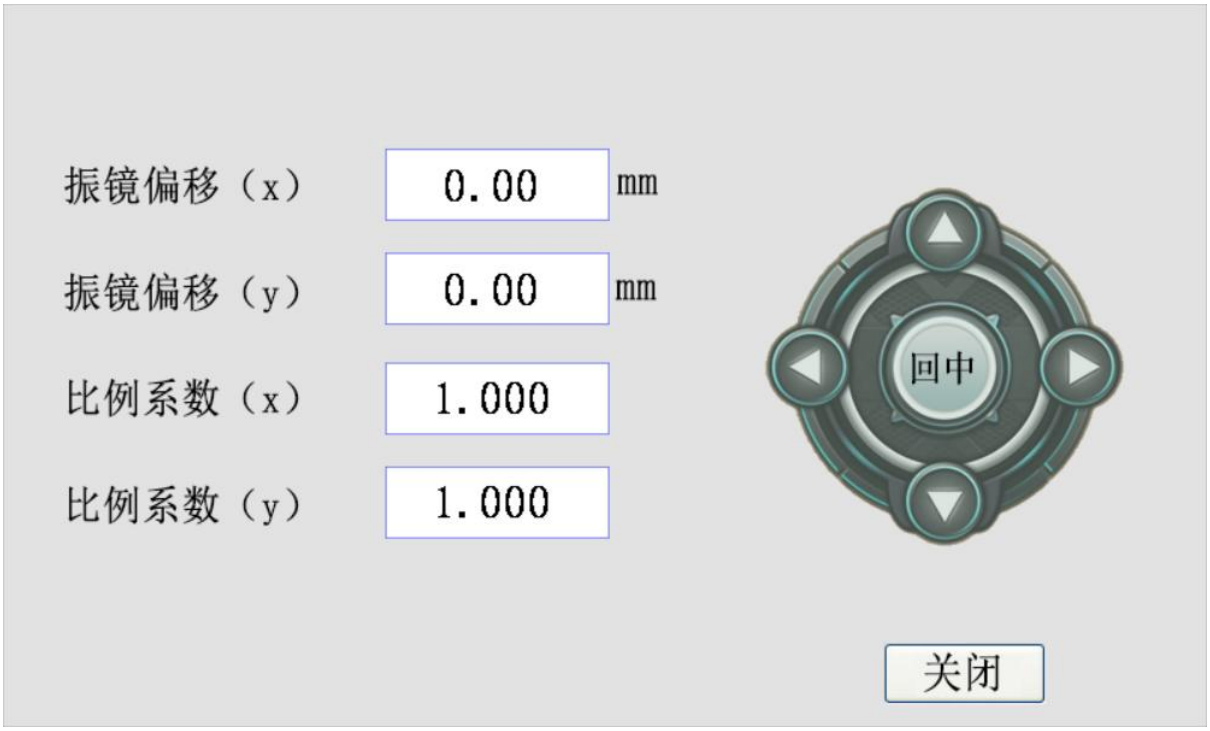


Figure C

●Galvo settings

1. Centre offset: The mirror offset button controls the offset of the origin of the mirror, the mirror offset (x/y) controls the offset of the origin in the horizontal and vertical directions respectively, in the range -5-5 mm

2. Return to centre: the adjusted offset can be returned to zero

3. Scale factor: adjusts the magnification of the adjustment, in the range 0-5

4. Close: return to the upper screen

4.4 Wire feed parameters interface

Click on the "Wire Feeding Parameters" button at the bottom of the Advanced Parameters screen to enter the Wire Feeding Parameters screen as shown in Figure D below.

Figure D

●Movement parameters

In the motion parameters you can set the stepping equivalents, acceleration and deceleration times, start speed, advance feed distance, end rewind distance, feed/rewind speed and working speed of the wire feed axis.

1. Step equivalent: the number of pulses required to feed 1 mm of wire, which can be calculated by fine-tuning

2. Acceleration and deceleration time: the time it takes to move the wire feeder from the start speed to the wire feeder speed and to decelerate from the wire feeder speed to the stop, recommended to be set to 0.05-0.1, unit s

3. Start speed: The initial movement speed of the wire feed axis, it is recommended not to set it too large to avoid losing steps in the stepper motor.

4. End draw distance: the distance after the laser head begins to light the end of the welding draw, set according to the specific requirements of the process

5. Draw back time: a delay time after the end of the draw back to the wire before the wire, set according to the specific requirements of the process

6. Return distance: the distance the wire feeder returns the wire after the end of the drawing process to avoid a sticky wire situation at the end, set according to the process requirements

6. Sending/returning speed: set the speed of sending and retiring the wire in advance, this speed is recommended to be set as large as possible, the faster the better if the motor does not lose a step.

7. Working speed: the speed of automatic and manual wire feeding, unit mm/s

8. Single-step distance: the distance between manual wire feed and retraction

9. Wire withdrawal: the distance set by the automatic wire feeder after clicking on the wire withdrawal

10. Wire feed: The distance set by the automatic wire feeder after clicking on the wire feed.

Once set, click on Save Parameters

4.5 Password change screen

Click on the hidden button in the red box at the top left of the Advanced Parameters screen as shown in Figure E to access the password change screen as shown in Figure F.

Figure E

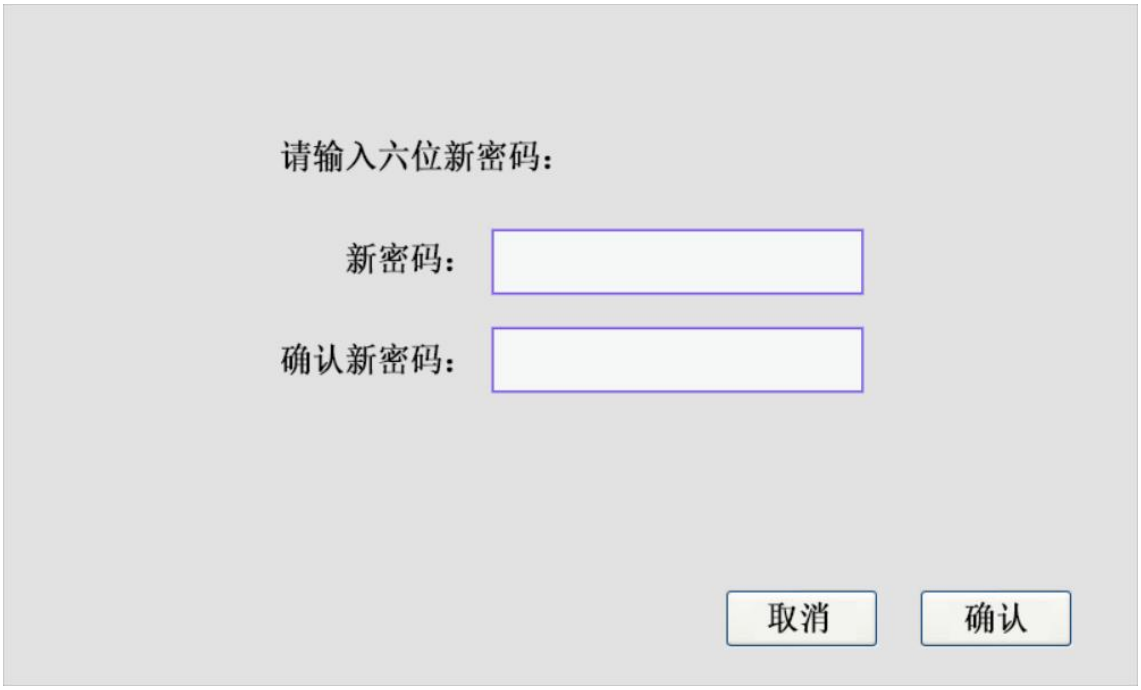


Figure F

●Password change

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

Revision History:

日期	修订内容	软件版本
20220414	First Edition (First Release)	V1.0
202201107	Version 2 ((follow-on control system to Platform Platform With Double Pendulum Galvo step wire feed laser welding control system (V3.2))	V1.1

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