EH393F-TWXBCB71

Desktop HOTBAR Welding robots

use Household hand book

Thank you for choosing our products!

This manual gives a detailed introduction to the use of this robot, including system features, component operations, etc.; when using this system Before installing the system and related equipment, please read it carefully, which will help you to use it better. Please keep it after reading, Check it out later.

Due to product upgrades or design changes, the products you receive may differ from the statements in this manual in some respects.

Without notice!

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Chapter 1 Precautions for Use

1.1 safety warning

Serious warning	
	• There is a risk of electric shock. • Do not touch the parts that may be live, and non-professionals should not change it easily. Prevent electric shock. • When an emergency occurs, please press the red emergency stop switch immediately, and the machine will shut down Turn on the power. • Do not use when the power cord is damaged. • When not in use for a long time, please turn off the power switch and cut off the power, unplug the power plug head. • Pay attention to the power status when performing circuit maintenance. Please turn off the power before proceeding carefully Maintenance and inspection work. • This product uses a three-wire grounding plug, which must be inserted into a three-hole grounding socket. Don't Change the plug or use an ungrounded three-head adapter to cause poor grounding. If you need to extend the wire, please Use a grounded three-core power cord. • Dangerous voltage inside the device! Inexperienced work is dangerous to life of! When the system fails and needs to be repaired, it can only be repaired by related professionals, or Contact with agents and manufacturers.
	• There is a risk of injury. • Do not extend your limbs when the power is on or the machine is operating. • Do not get the machine wet, do not disassemble and use the machine when in use, and do not pull the electricity Source line. • Please pay attention to keep the machine and its surroundings clean, which will help reduce accidents occur.
	• When repairing, be sure to cut off the power and air pressure, non-professionals do not change change. • This product is not an explosion-proof specification and is strictly prohibited to be used in a potentially explosive environment.
caveat	
	• Do not move the movable parts by hand to avoid damage to the machine. • Make sure not to touch moving parts during work, otherwise it may damage the machine or cause accident. • When the machine is running, please do not put your hands into the equipment at will, it may cause The user is injured or causes substantial damage to the involved objects. • When the machine is paused, please check the condition carefully before performing manual operation, otherwise It may cause the user to be injured or cause substantial damage to the involved objects.
	• When taking out the equipment and various accessories from the bag, if necessary, ask someone to help take them out together. Avoid falling objects or causing accidents. • Pay attention to the bracket or guard plate on the upper part of the machine to prevent head collision. • After moving to a suitable work place, be sure to place the equipment on a flat ground to

	Avoid accidents due to tilt.
0~40℃	• This product should be used or stored in a place with suitable temperature and humidity. • The suitable temperature requirement is 0~40 ℃, the humidity requirement is 20%~90% (No condensation).
	• This equipment is heavy, please place it in a single layer instead of stacking it to avoid damage or An accident occurred. • Do not stack objects within the working range of the machine. • Before daily handling or moving, please make sure that the movable parts of the equipment have been fixed (such as X The shaft may be fixed with sheet metal or rope for safety reasons), Then move it. • After unpacking, please make sure the movable parts of the equipment are fixed before use (such as X The shaft may be fixed by sheet metal or rope for safety reasons) It was dismantled and used again.
	• Regular inspection, maintenance and repair of this product will help ensure that the equipment The performance and extend its service life. • Please follow the normal procedure to boot. • Please check that there are obstacles in the movement range of the movement mechanism before starting up.
	• Make sure to use the rated voltage, current frequency, and The air pressure of the force level. • • Make sure the air source is clean and clean.
	note
	• Do not discard the packaging and foam of the device. • If the robot needs to be returned to the original factory or point of sale due to maintenance and other factors, The robot is fixed and packed in the original way. • Please place the packed robot upright, not upside down or horizontally. • The robot can be placed in the package only after it is reliably protected with foam. • The packaging is made of non-moisture-proof material. During transportation or storage, please avoid rain or moisture. hurt. • After emergency stop or power failure 10s Please do not restart, otherwise it will cause damage to the drive

1.2 Unpack and inspect

Unpacking method:

① Place the wooden box upright on a level ground, and tear off the shock-absorbing fixed film of the outer packaging.

② Take out the wood fixing screws of the wooden box with an electric drill, and open the upper cover and the surrounding covers.

③ Take out the spare parts, lift the machine from the bottom of the machine, move it to a suitable station, and place it firmly.

After unpacking, please make sure that the movable parts of the equipment are fixed (such as X The shaft may be sheet metal for safety reasons

(Fixed or fixed with a rope) has been removed, and then used.

Check carefully whether the machine and accessories are missing or damaged. If you have any questions, please contact the manufacturer.

Chapter 2 Product Overview

The fully automatic robot is a set of full three-dimensional, high-precision dedicated motion control system. In addition, the system provides users with more convenient editing Program instructions, larger storage space, faster speed, richer parameter settings, more effective flow control, to a large extent also improved Production efficiency; At the same time, according to actual production needs, under the premise of meeting sports performance indicators, the product structure is optimized to adapt to Flexible and fast requirements during operation have improved the reliability of the product.

2.1 System characteristics

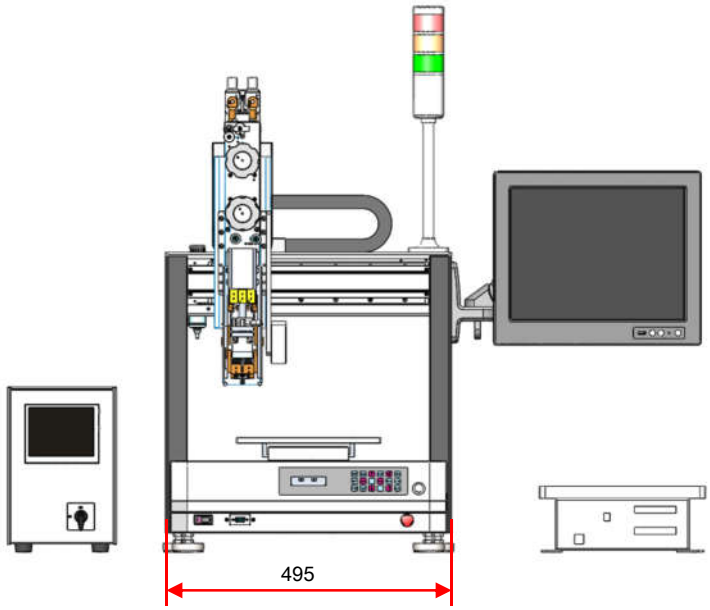
- The movement speed is stable to ensure product reliability.
- Multi-stage heating setting (preheating and welding), real-time display of welding temperature curve.
- The heating speed is adjustable, the time is adjustable (0-99.99s), and the welding head heats up and cools quickly.
- Good temperature, pressure monitoring function and welding head temperature can be set by themselves.
- Temperature closed loop control.
- The equipment has a long service life and low maintenance costs.
- The welding quality is high and the appearance is more beautiful.

2.2 The main technical parameters

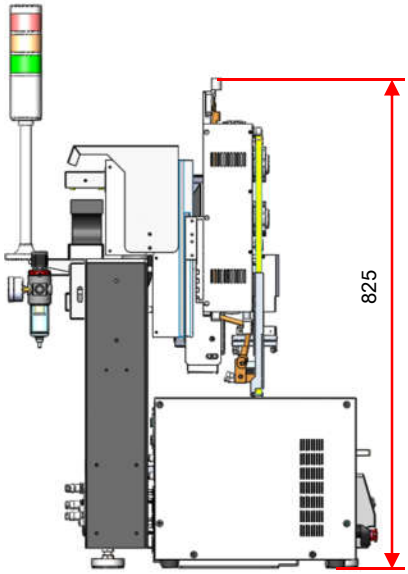
Machine parameters		
Input voltage		220VAC 50/60HZ
power		210W
Number of axes		3
stroke	X /Y axis	300mm
	Z axis	100mm
speed	X/Y axis	600 mm/sec
	Z axis	300 degrees/sec
Repeat accuracy (max)	X/Y/Z axis	±0.02 mm
Resolution	X/Y/Z axis	0.01 mm
Pressure range		0.1N-50N
temperature range		Room temperature -500℃
Thermocouple type		Type K
Corresponding time		10ms
Use environment	temperature	0 ~ 40℃
	humidity	20% ~ 90% (non-condensing state)
Dimensions (W×D×H) mm		495×620×825
weight		75Kg
Controller parameters		
Input voltage		220V AC
Maximum power		1500W
screen size		5.6
Time setting range		0-99.99S
Temperature setting range		50-500℃
Dimensions (W×D×H) mm		190×340×290

2.3 physical dimension

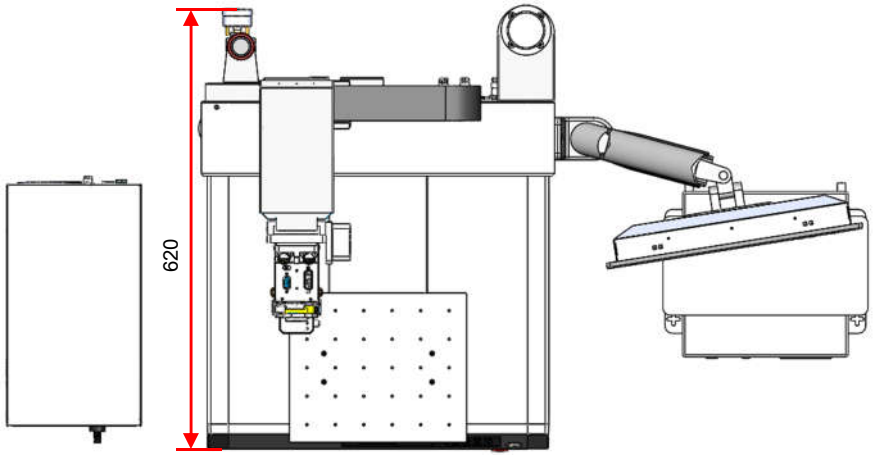
Main view



Left view

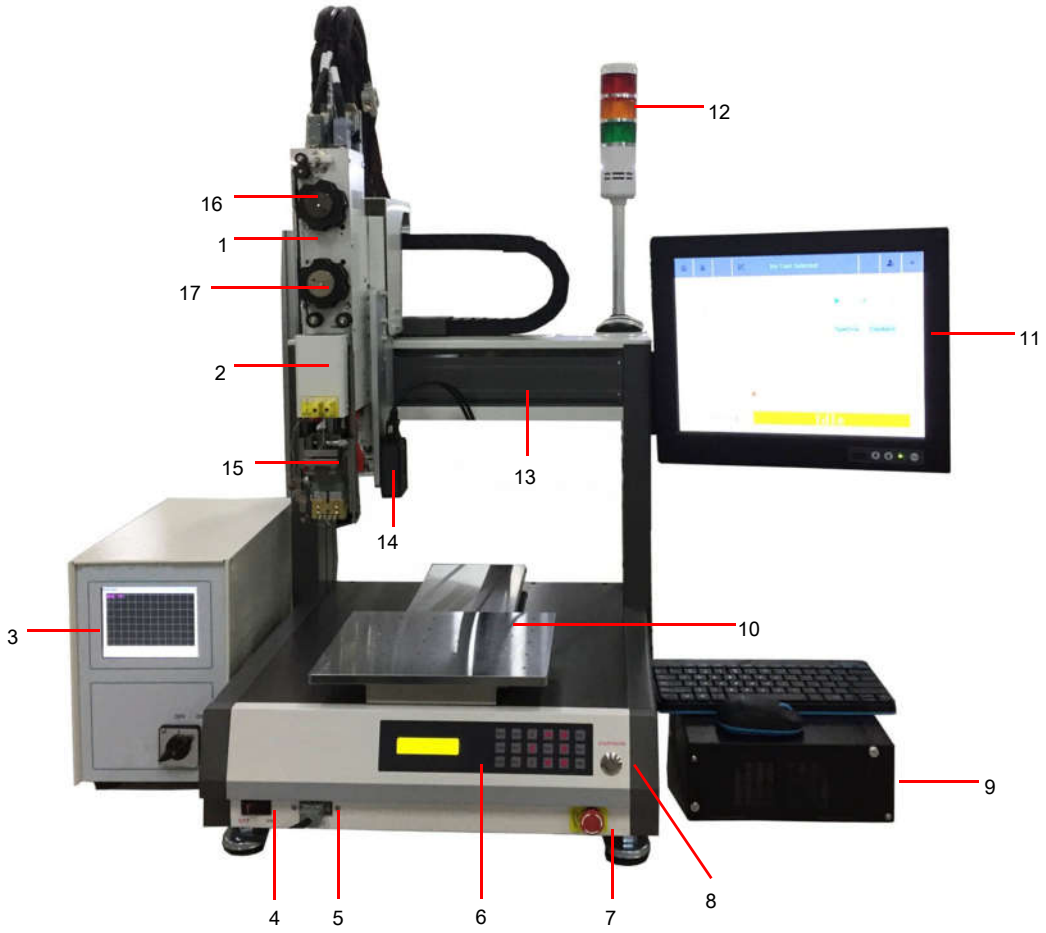


Top view



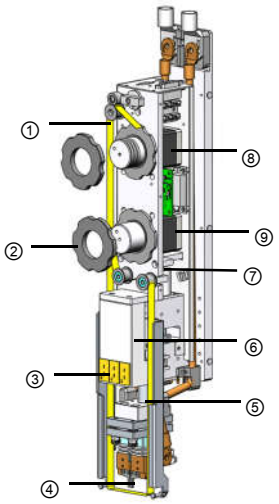
III. Machine description

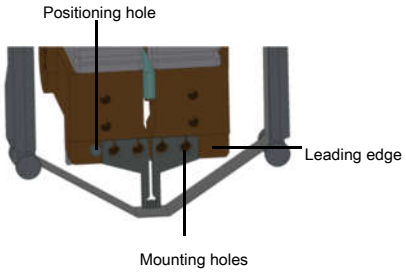
3.1 Overview



Serial number	Description	Serial number	Description
1	PI Membrane module	10	Y Axis servo integrated motor + timing belt
2	Z Axis servo integrated motor + timing belt	11	HMI Operation screen
3	Heating controller	12	lighthouse
4	switch	13	X Axis servo integrated motor + timing belt
5	RS422 port	14	Scan code gun
6	Operation panel	15	HOTBAR Head assembly
7	emergency button	16	Film collection module
8	Start/pause button	17	Film release components
9	Computer components	18	

3.1.1 HOTBAR Head assembly description





Serial number	Description	Serial number	Description
1	PI membrane	6	PI Membrane control cylinder
2	Wheel nut	7	PI Membrane blockage detection sensor
3	Thermocouple socket	8	Receive PI Membrane motor
4	Welding head	9	put PI Membrane motor
5	Differential adjustment knob		

Features

1) PI membrane structure extends the service life of the welding head.

2) Double motor structure, the retractable film is controlled by the motor, and the length control is more precise.

3) X, Y, R, level adjustment to ensure welding quality.

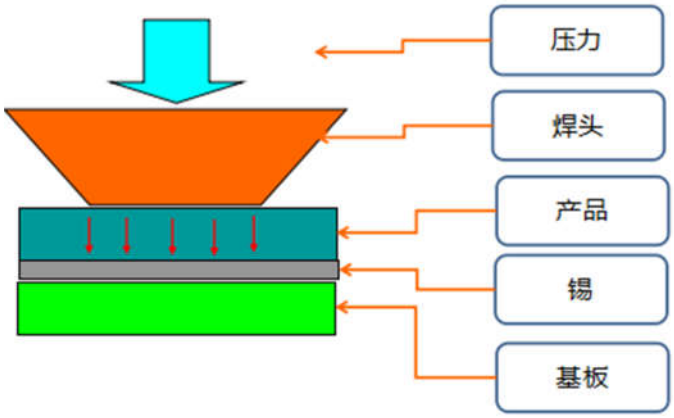
4) The Z axis movement is controlled by pressure.

3.1.2 Welding schematic

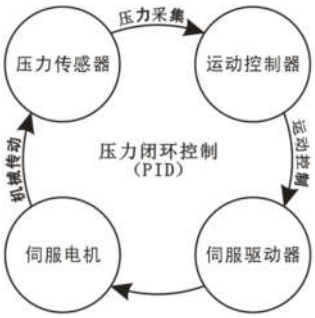
Remarks: When the membrane is broken or lack of material, PI If the membrane detection sensor does not detect the membrane, it will trigger the machine alarm and the equipment will stop running.

Hotbar The working principle of the machine head: the high voltage is converted into a low voltage by a pulse power supply, thereby generating a high current, and the hot pressure welding head (material For titanium alloys, Joule heat is generated, and product welding is carried out by controlling pressure and time.

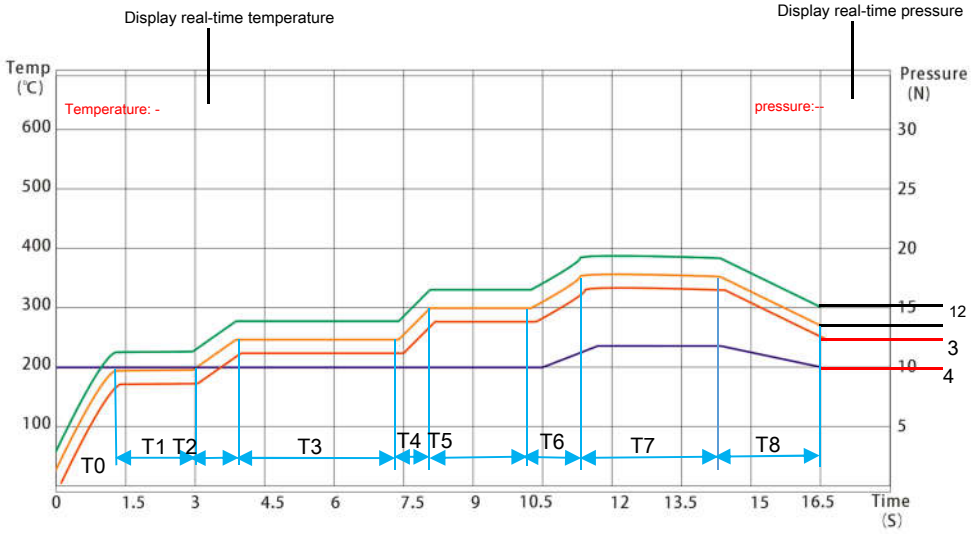
Hotbar Temperature control: The welding head transmits the temperature back to the software through the thermocouple to generate a temperature curve, and finally achieves the temperature control



Pressure control adopts dynamic closed-loop control mode, as shown in the figure below.



3.1.3 Welding temperature and pressure curve



1 Temperature deviation curve

2 Actual temperature curve

3 Temperature negative deviation curve

4 Pressure curve

T0 Preheating area

T1 Insulation area 1

T2 Heating zone 1

T3 Insulation area 2

T4 Heating zone 2

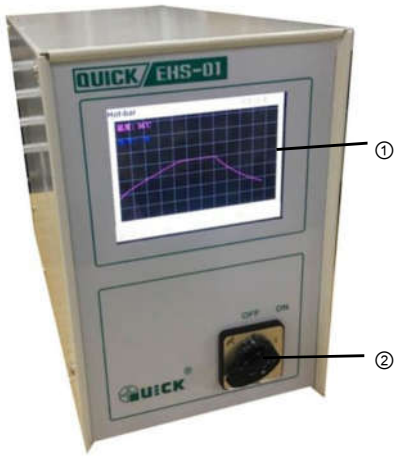
T5 Insulation area 3

T6 Heating zone 3

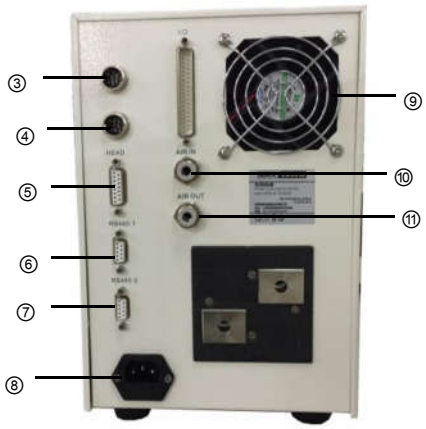
T7 Welding area 4

T8 Welding head cooling zone

3.2 Heating controller instructions



Main view



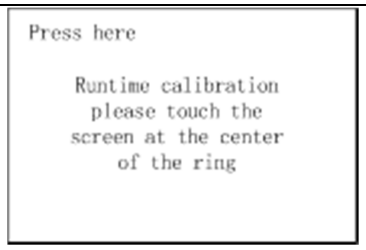
Rear view

Serial number	name	Features	Serial number	name	Features
1	touch screen	Show all information	7	DB9 port	connection RS485 Communication port
2	switch		8	Power outlet	Connect to the outside 220VAC power supply
3	Seven-pin socket	Connect the display	9	cooling fan	Cooling electrical components
4	Eight-pin socket	Can be used to connect rotating motors	10	Air inlet	Connect the oil-water separator
5	DB15 port	Temperature analog signal	11	Vent	Connect the cooling device
6	DB9 port	connection RS485 Communication port			

3.2.1 Interface calibration method

When the touch screen is insensitive, the touch screen needs to be calibrated. The calibration method: first power off, press and hold any point on the screen,

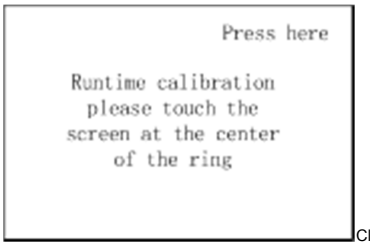
Turn on again, the screen displays as follows:



Click on the upper left corner

Click on the bottom right corner

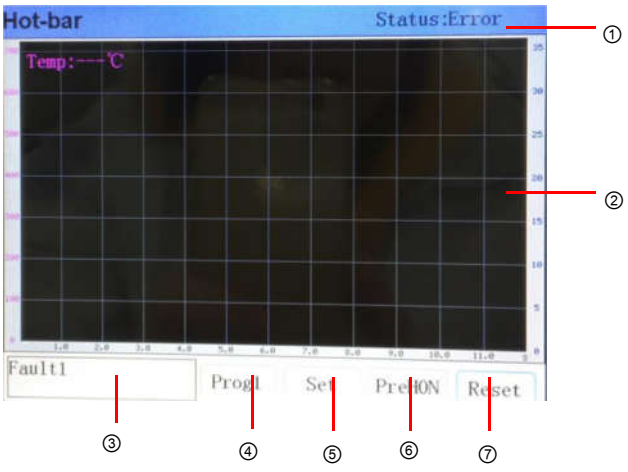
Click on the bottom left corner



Click on the upper right corner

After completing the above four-point calibration, click the middle point of the screen to automatically complete the touch screen calibration.

3.2.2 Main interface



1. Work status display bar

2. Temperature and pressure curve display area

3. Alarm information display area

4. Program setting interface: Click the corresponding program in the program setting to set.

5. System setting interface: set system parameters

6. Preheating switch button: the preheating platform starts to heat up.

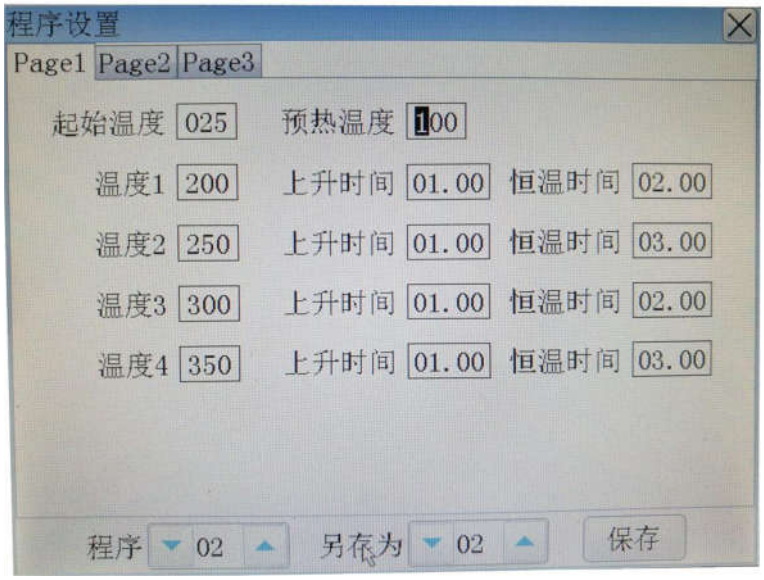
7. reset button

3.2.3 Alarm interface

Remarks: After the alarm information is eliminated, click the "Reset" button to confirm the alarm!

3.2.4 Program setting interface

Click program 1 To enter the program number selection interface. Click <or> to select the program number, you can view the parameter settings of the current program, and click the edit button to modify the parameters. As shown below: Page1 interface



Starting temperature: Set the initial temperature.

Preheating temperature: standby temperature, temperature 1 The temperature before reaching the constant temperature.

temperature 1 , 2 , 3 , 4 : Four temperature zones correspond to temperature.

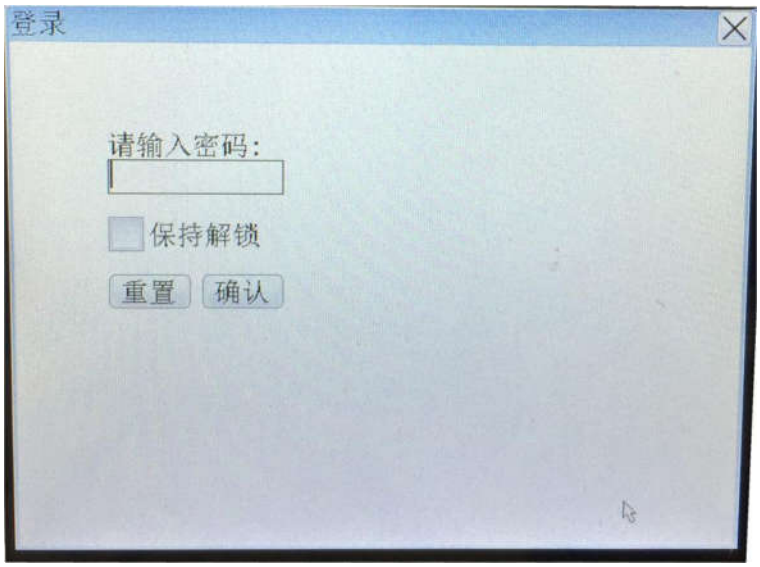
Rise time: the temperature rise time of the corresponding temperature zone.

Constant temperature time: the constant temperature time of the corresponding temperature zone.

Program: The default program number is 1-32 .

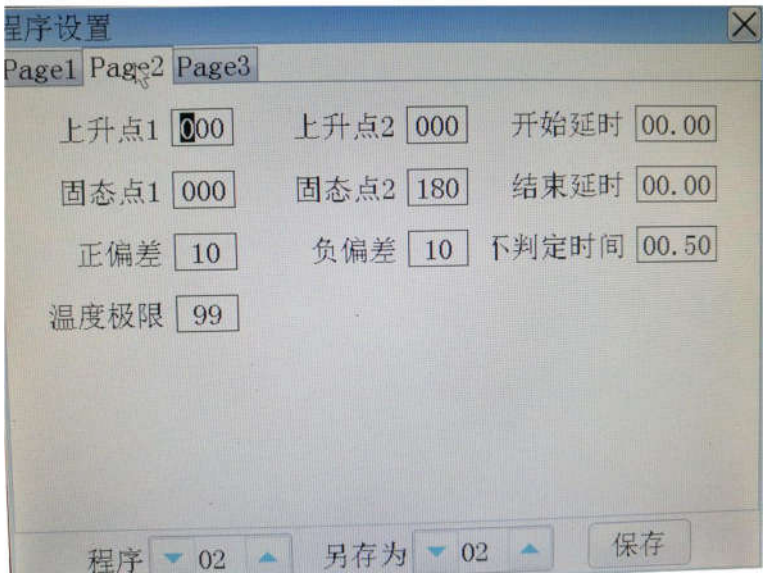
Save as: The setting program is saved as a new program, and the internal parameters are the same as the previous program parameters.

Edit: You need to enter a password before editing a new program. The original password is: 666666



Keep unlocked: After selecting Keep unlocked, you can directly edit without repeating the password, but keep unlocked will be automatically eliminated after power off.

Page2 :



Rising point 1 , 2 : When the temperature rises to this point, a signal will be output.

Start delay: After receiving the start trigger signal, delay the set time before heating.

Solid point 1 , 2 : After the welding is completed, the signal will be output when the temperature drops to this point, solid point 2 After heating is completed, cool down the temperature. End delay: After the welding is completed, delay the set time, and then start blowing air cooling.

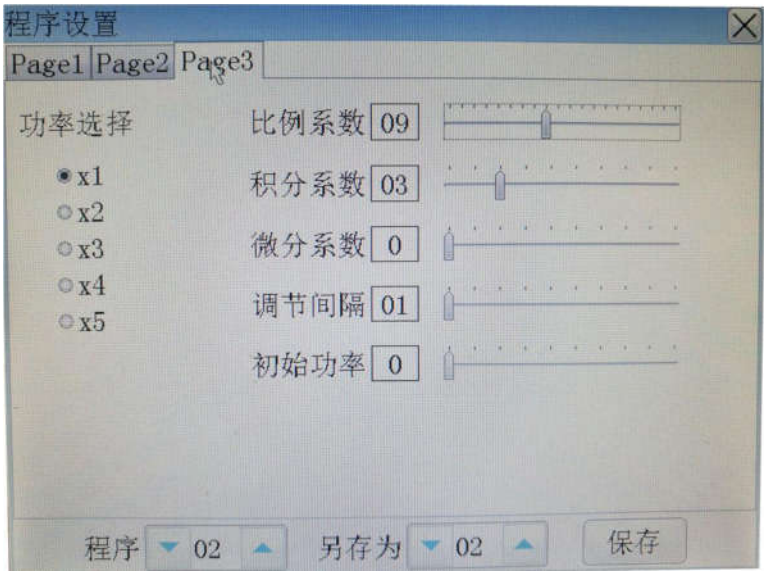
Positive and negative deviation: used for temperature monitoring, setting the upper and lower limits of the temperature in the constant temperature zone.

Non-judgment time: starting from the constant temperature zone, no temperature monitoring will be performed within the set time.

Temperature limit: the sum of the maximum temperature and the temperature limit is the maximum value of the temperature alarm, and the detected temperature is greater than the maximum temp

The sum of limits alarms.

Page3 :



Power selection: × 1 correspond 0.88V X 2 correspond 1.24V X 3 correspond 1.76V

X 4 correspond 2.47V X 5 correspond 3.5V Choose the corresponding power size according to the welding situation.

Scale factor: settable range 0-20 , Used to suppress the actual temperature change, the larger the value, the better the suppression effect, but it will also extend the temperature rise time.

Integral coefficient: settable range 0-10 , Used to adjust the steady-state error, the larger the value, the faster the temperature adjustment, but at the same time it is more likely to cause overshoot Shock.

Differential coefficient: settable range 0-9 , Used to predict in advance, the appropriate value can quickly and accurately control the temperature near the set temperature, If the value is too large, it is easy to oscillate.

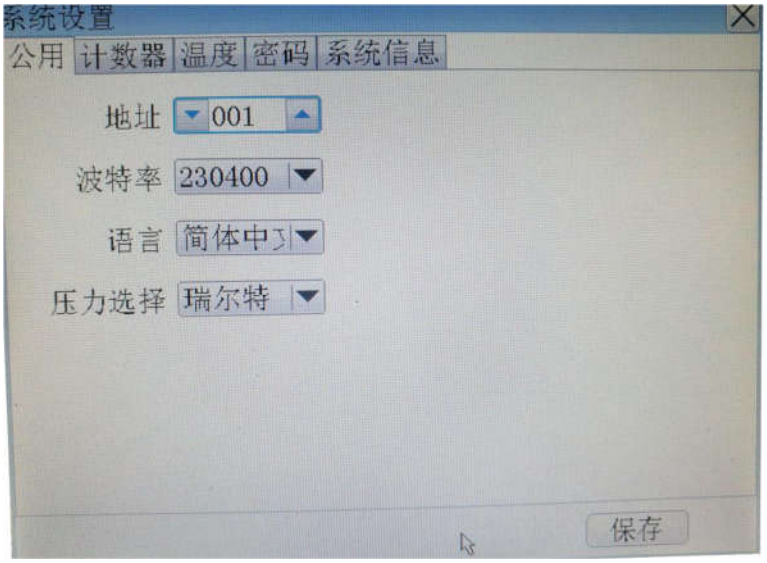
Adjustment interval: adjustable range 0-10 , Which means PID The adjustment period is the set value* 10ms . The smaller the value, the faster the adjustment, but if the welding head or The response of the sensor is slow, so the value should be increased appropriately, otherwise it is easy to produce vibration.

Initial power: adjustable range 0-9 , When the controller starts heating PID The initial power, adjust the value according to the actual situation. Too big, maybe The overshoot is too small and the temperature rise may be slow.

Depending on various factors, such as the size of the indenter used, the heat absorption of the workpiece material, the set welding temperature and time, etc., flexible Adjust the above parameters to pass the inspection LCD Set the appropriate value for the temperature waveform of the panel. Therefore, it should be selected after the actual hot pressing Value.

- **3. Set up**

  Public interface

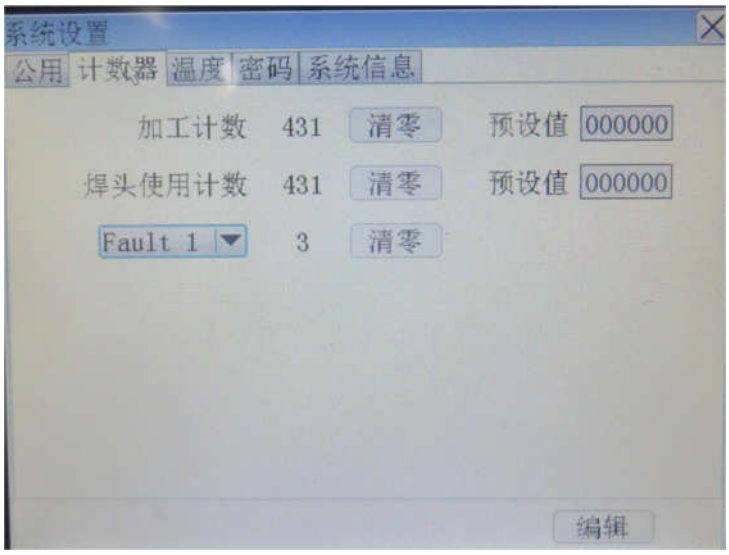


Set the address and baud rate to modify the communication parameters with other controllers such as computers.

Save: save and edit two modes, only the original password (666666) Before the parameter setting.

Language: Chinese and English can be switched mutually.

Counter interface



Processing count: the number of welded joints, and the processing count exceeds the preset value, the device will automatically alarm.

Default value: manually set the number of solder joints.

Welding head use count: the number of times the welding head is used.

Fault 1 : Error signal 1 Quantity, total 8 Kind of program number for selection.

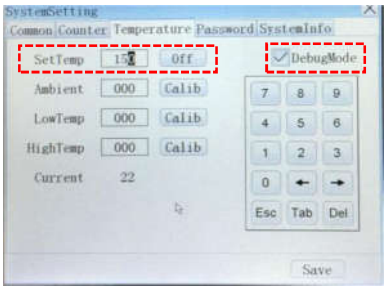
Temperature interface

Calibration tools: QUICK191E thermometer

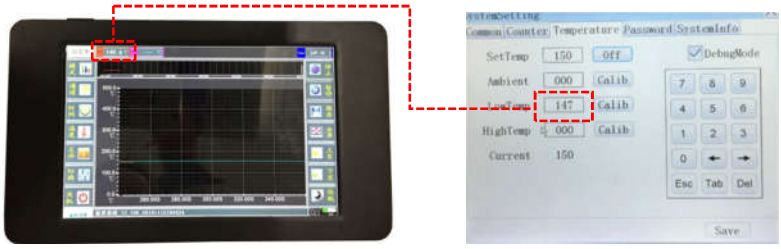
Calibration method:

1. Connect the thermometer to HOTBAR Head assembly, as shown in the figure below

2. Set the calibration temperature to 150 ℃ and select the debugging mode, as shown in the figure below.



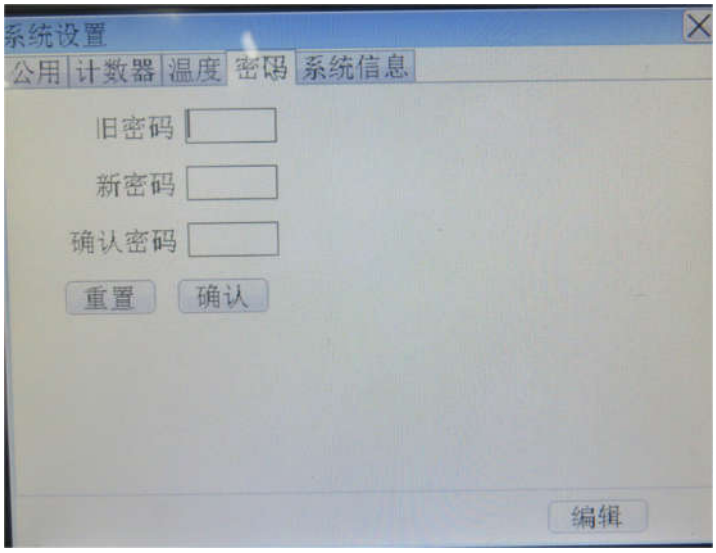
3. Enter the temperature count value as shown in the figure below.



3. Click the "Calibration" button, and the system automatically executes the calibration information.

4. Click "Save" to save the calibration result.

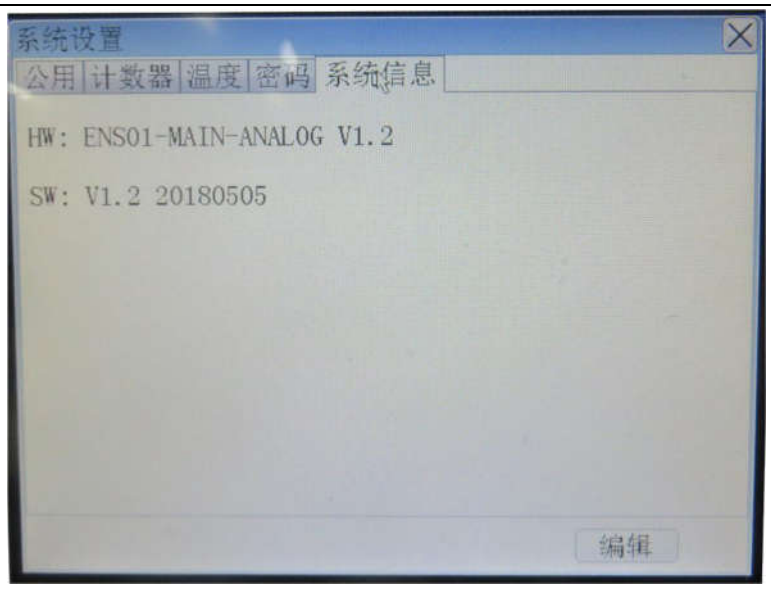
Password interface



This interface is used to reset the old and new passwords. The original password is: 666666 . Click on the input area and the numeric keypad will automatically pop up to enter the password.

The logged-in user can modify the password.

System Information Interface



Display hardware version number and software version number information.

3.3 Operating software instructions

3.3.1 Login/exit interface

Users can click on the desktop shortcut 

Enter the main interface of the software, click  The user login interface will be entered, as shown in the figure below.

Click the user name drop-down list dialog box and select " VECTECH "User, enter the default password 123 , Click the "Login" button, in the username

"Login is successful, permissions: Admin "Prompt dialog box.

Click the "User Management" icon to pop up the user management interface, and the user can set the corresponding level according to the following table.

user level:

Serial number	Operation level	Authority
1	operator	You can view the operation interface.
2	Craftsman	You can view "Operation Interface" and "Process Interface".
3	System administrator	You can view "Operation Interface", "Process Interface" and "Setting Interface".
4	administrator	Have all operation authority and user management authority.

3.3.2 Main interface

title

Display bar

Production status bar

title

The title bar is always displayed, click the shortcut symbol in the title bar to quickly enter the corresponding interface.

 Main interface  Alarm interface  Manual interface  Temperature and pressure graph

 Process interface  Set interface  User management interface  Close software button

Display bar

1. Regular state

The regular status area can be divided into three parts: communication area, production information area and manual operation area. The manual operation area is a hidden interface.

- Communication area

Displays the communication status of the temperature main board, sports main board, roll film main board and code scanning gun. The red circle indicates abnormal communication, and the green circle ir

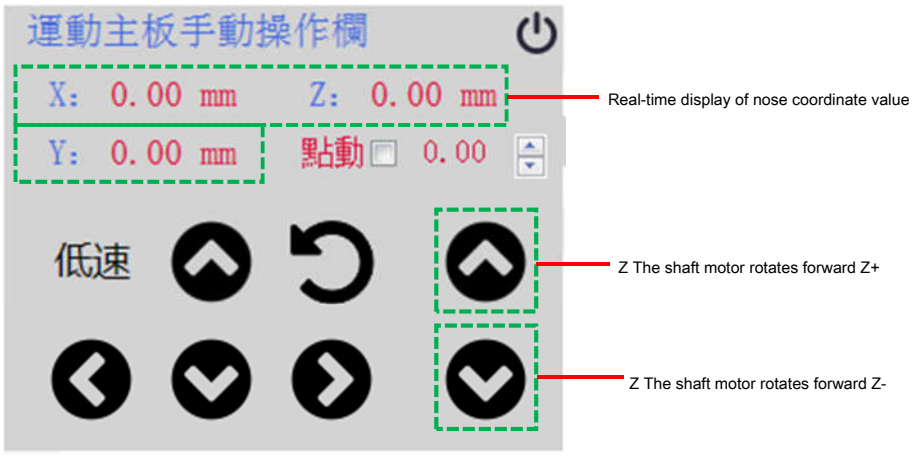
- Production Area

Display the current logged-in user name, production qualification rate, machine operating time and the total number of processed products, the user can click  delete

Production Data.

- Manual operation

Click on  The manual operation area interface will automatically pop up, as shown in the figure below.



Real-time display of nose coordinate value

Z The shaft motor rotates forward Z+

Z The shaft motor rotates forward Z-

 : X The shaft motor rotates forward X+  : X The shaft motor reverses X-

 : Y The shaft motor rotates forward Y+  : Y The shaft motor reverses Y-

 : Reset operation button

 : Speed control symbol, including high-speed, medium-speed and low-speed modes to choose from. Users can double-click the icon to change the speed mode.

 : After selecting the jog mode, the jog distance must be selected.

2. Action bar

The action bar is used HOTBAR It is used for head inspection.

 : Jog control PI The membrane motor rotates forward for one cycle.

 :when HOTBAR After the machine head alarm is confirmed, click the "Clear Alarm" button to confirm.

3. Real-time data

Real-time display of welding head pressure, temperature and current coordinate values.

4. Process information

Select process: Users can select the corresponding process file through the drop-down list according to the welding product process requirements.

Barcode: Display the scanning result of the barcode scanner.

Upload: with customers MES System connection, optional function.

Production status bar

Real-time display of production-related status.

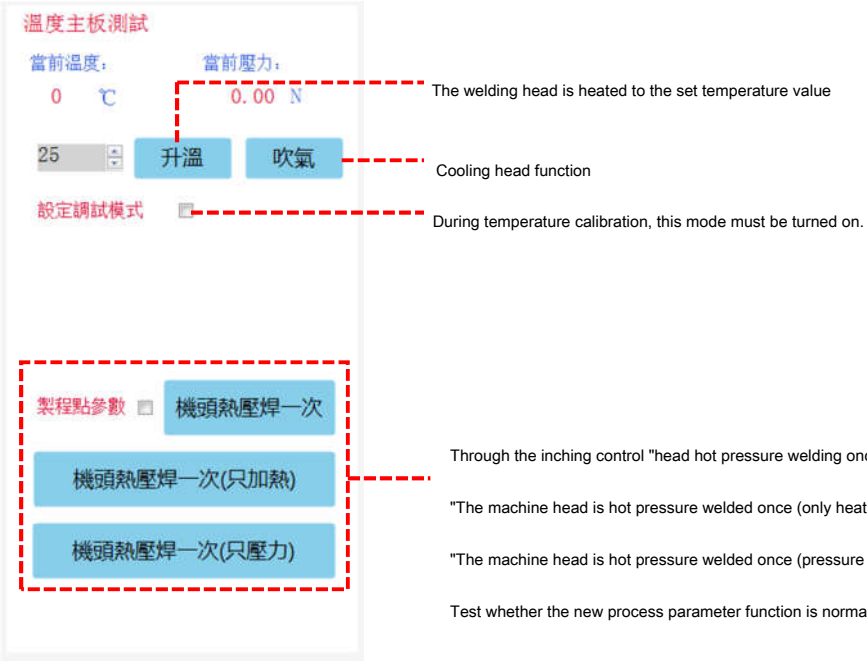
3.3.3 Alarm interface

- Real-time alarm: display the current alarm content, the alarm information must be confirmed by clicking the reset button on the main interface.
- Historical alarm: The confirmed alarm information is saved in the historical alarm interface in the form of a table.

3.3.4 Manual interface

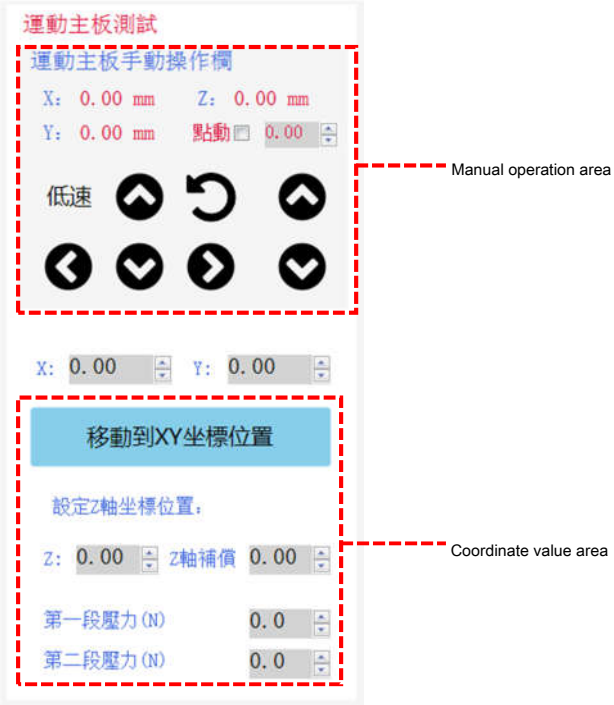
The manual interface can be divided into three parts: temperature mainboard test area, sports mainboard test area and roll film mainboard test area.

- Temperature mainboard test



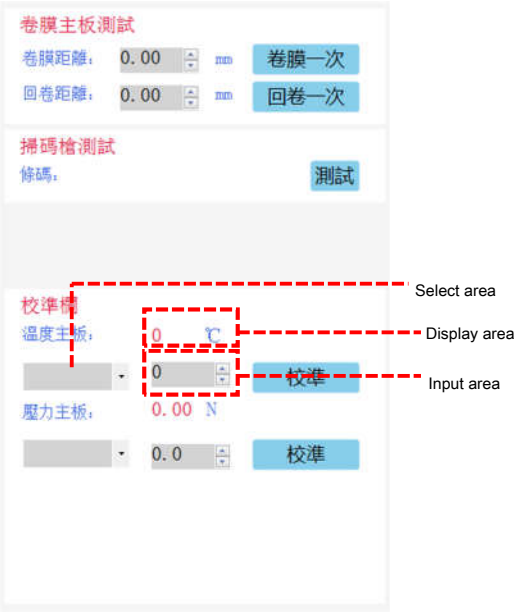
When creating a new process and equipment debugging, this interface is used to test the abnormality of the corresponding function of the temperature motherboard

- Motion motherboard test



The user can test whether the function of the motion board is normal by moving the motion axis. There are two ways to move the motion axis: 1) Jog through the manual operation area Motion axis 2) Control axis movement by inputting coordinate values.

- Roll film motherboard test



The roll film main board test can be divided into three parts: roll film main board test area, scan code gun test area, and calibration bar.

1) Roll film motherboard test area

The user can input the film roll distance and click the "roll film once" button to check whether the film roll motor is working normally.

The user can input the film return distance and click the "rewind once" button to check whether the film unwinding motor works normally.

2) Scanning gun test area

Move the scan code gun to the position where you need to scan the code through the manual operation area, and click the "Test" button to automatically display the scan code result.

Usually, the user can adjust the position of the code scanner and retest.

3) Calibration bar

Temperature motherboard calibration tool: QUICK 191E Thermometer to low temperature 150 ℃ is an example. method: 1)

Connect the thermometer to the machine, as shown in the figure below.

2) Select in the selection area LOW It is the calibration mode.

3) When the display area temperature is 150 When ℃, write the reading on the thermometer in the input area.

4) Click the "Calibrate" button.

Pressure motherboard calibration tool: QUICK 191AD Pressure gauge to low pressure 5N Take it as an example.

method: 1) The pressure gauge detection device is fixed on Y Axis movement platform to ensure that the pressure detection device is horizontally fixed, as shown below 1 Shown.

2) Calibration column selection LOW It is the pressure calibration mode.

2) Move the welding head to the pressure detection point, as shown below 2 Shown.

3) When the pressure in the display area is 5N When, write the reading on the pressure gauge in the input area.

4) Click the "Calibrate" button.

Figure 1

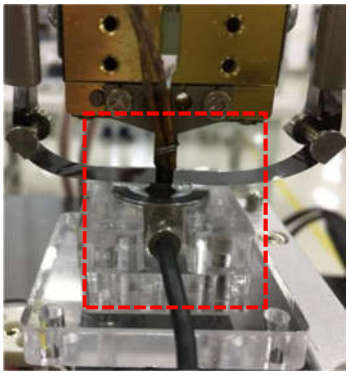
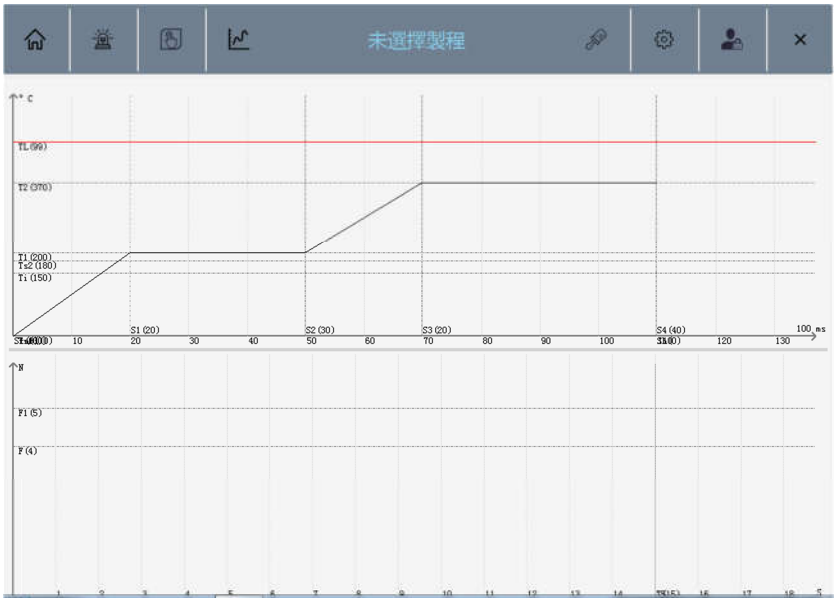


Figure 2

3.3.5 Temperature and pressure curve interface



Real-time display of temperature and pressure curves.

3.3.6 Process interface

New process steps: 1) Click "New Process" and a dialog box for inputting process name will pop up, and users can input the name according to their needs.

2) After selecting the new process name, click "New point" and it will appear in the "Process point" area (0,0,0)coordinate.

3) Select the coordinate value of the process point area, double-click the coordinate value, and the manual operation area will appear, as shown in the figure below.

4) Click the "Save Parameters" button, the software will automatically default to the coordinates of the welding point.

5) Set the temperature process and motion process parameter values according to the welding process.

Temperature compensation range: 5-200 °C

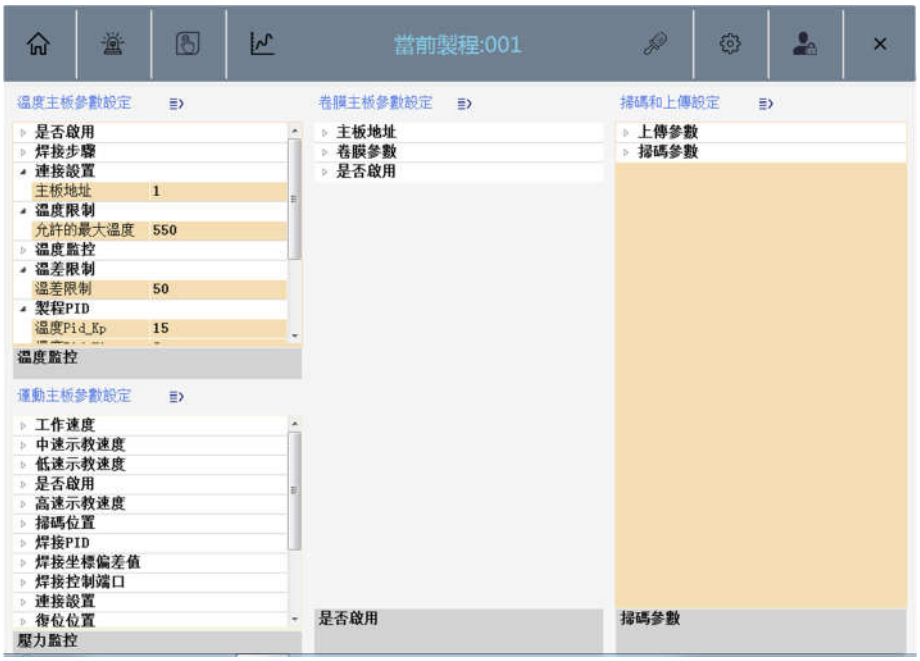
Pressure range: less than 20N

Pressure compensation range: 2-10N

Deceleration position setting: 8-10mm

Deceleration range: 3-5mm/s

3.3.7 Set interface



The setting interface can be divided into four parts according to function: temperature motherboard parameter setting, sports motherboard parameter setting, roll film motherboard parameter setting, and s

Minute.

- Temperature motherboard

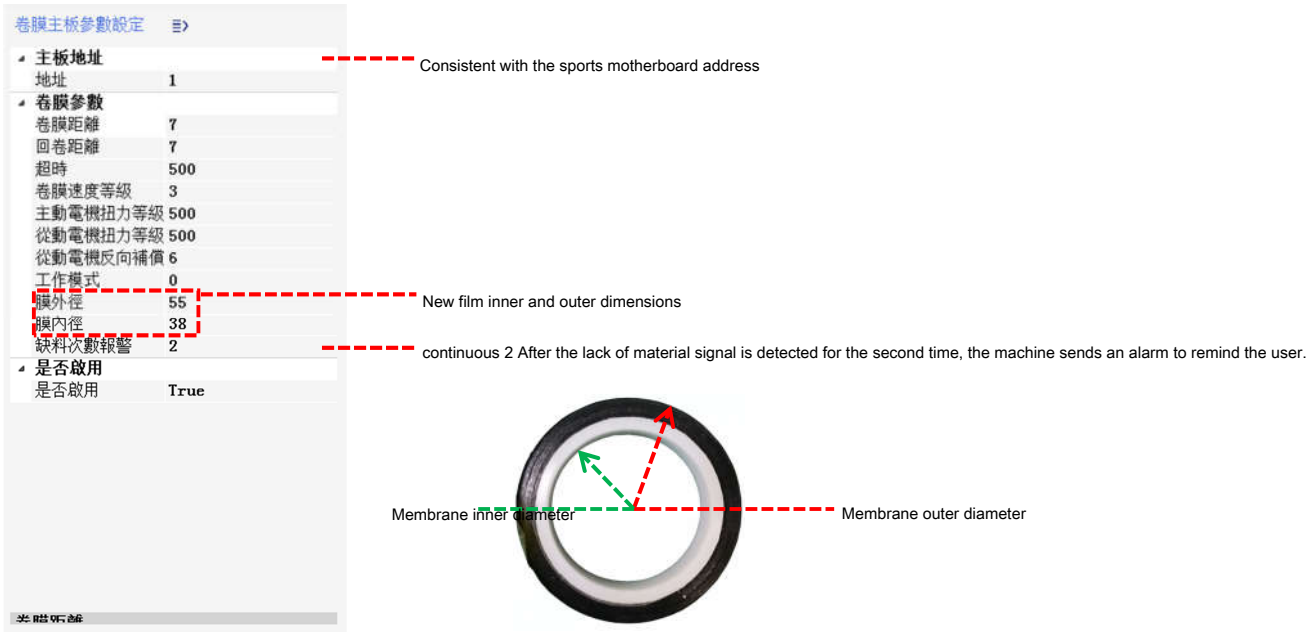
Users can set relevant parameters according to welding process requirements, welding steps and 3.1.3 The content of welding temperature and pressure curve is consistent.

- Parameter setting of sports

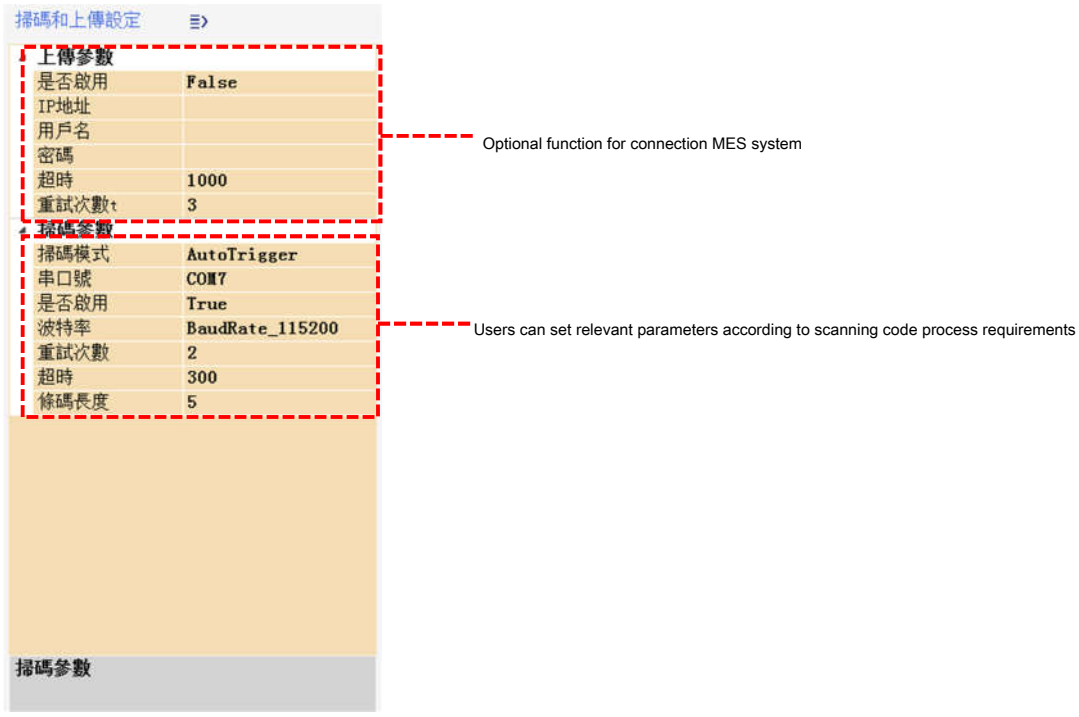
The user can set the relevant parameters according to the welding process requirements. The welding configuration port and connection communication are the parameters of the machine itself. Please do

Avoid affecting the normal use of related functions.

- Parameter setting of roll film main



- Setting code and upload



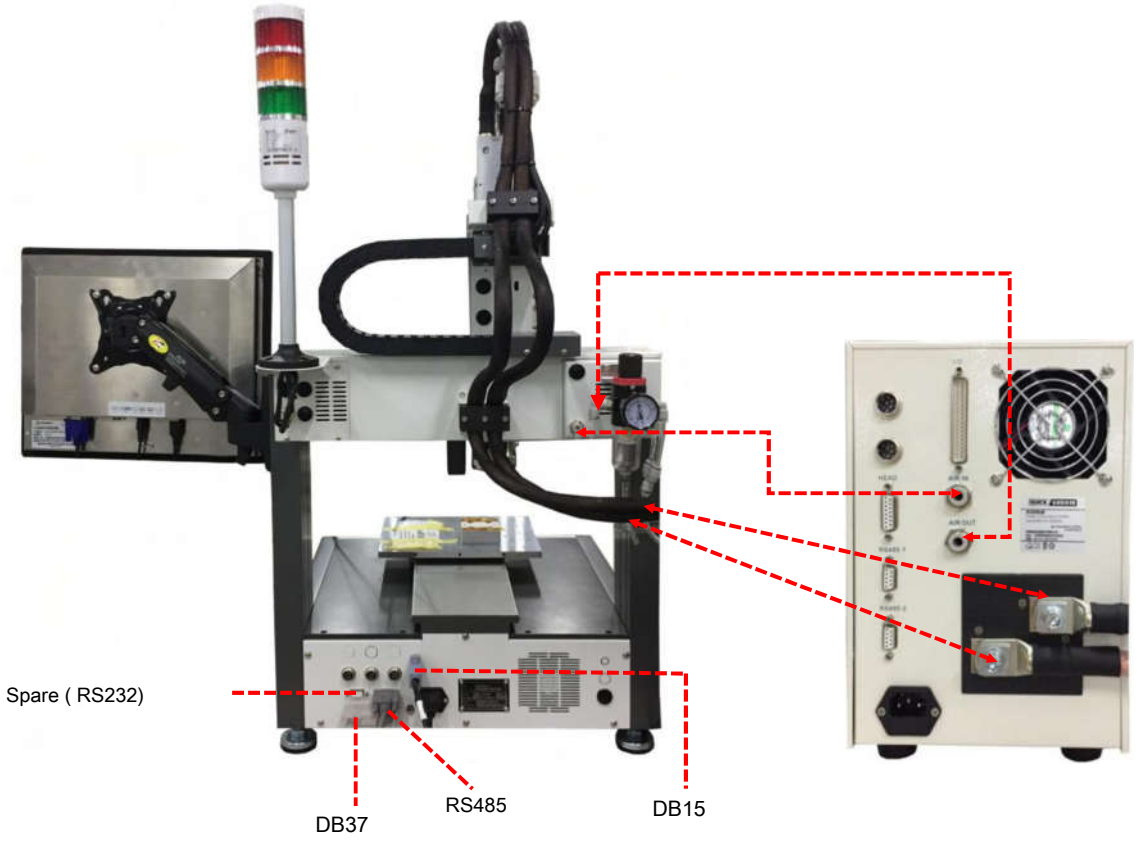
"Speed Level": release PI film speed (1-5mm/s). "Master Level": collecting PI film motor (1-1000N.M). "Slave Level": release PI film motor (1-1000N.M) . "Offset Level": collecting PI film motor speed offset. "Work Mode": three mode can be selected, 0.Use Cylinder

1. Not Use Cylinder
2. Same with 0 Mode, just

NOTE: this machine is cylinder mode!! "Outside Diameter": PI film outside diameter

IV. Connection instructions

4.1 Machine online instructions



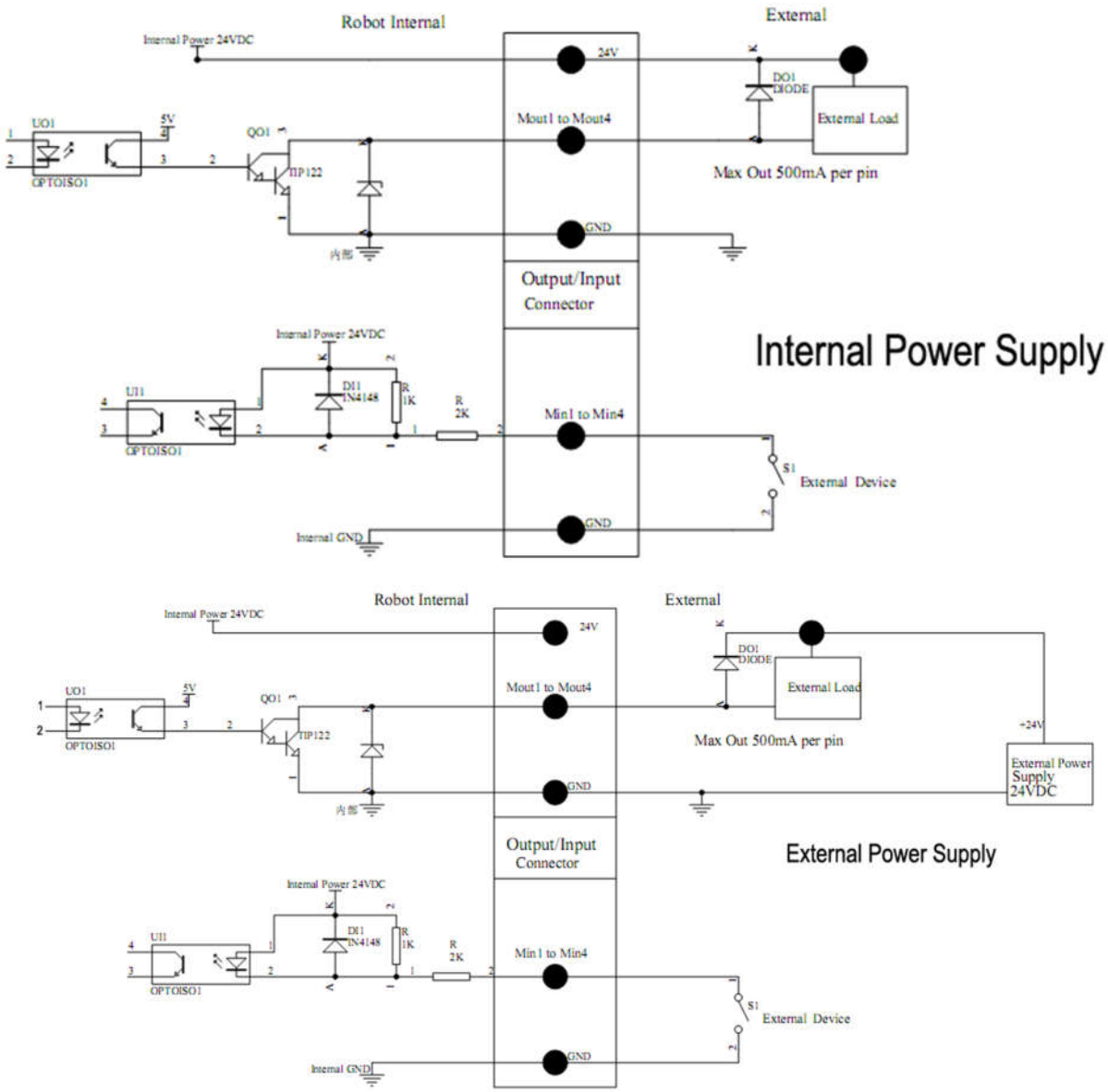
RS485 Port: Connect the film

DB15 Port: Connect to heating controller EHS-01B. DB37 Port:

Connect to heating controller EHS-01B.

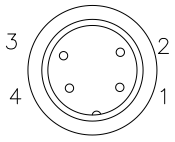
4.2I/O Port description

4.2.1 I/O Port wiring diagram



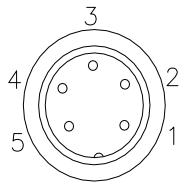
4.2.2 Four-core metal socket description

The four-core metal socket is used to connect to the button box. The following table shows the wiring instructions for the four-core metal socket:

Four-core metal socket	Pin	Pin name	Pin function	Remarks
	1	Min4	Main input 4	Used to connect start/pause signal
	2	GND	Ground wire	
	3	Min1	Main input 1	Used to connect the reset signal
	4	Min2	Main input 2	Used to connect emergency stop signal

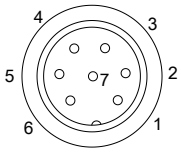
4.2.3 Five-core metal socket description

The five-core metal socket is used to connect safety signals such as gratings. The following table shows the wiring instructions for the five-core metal socket:

Five-core metal socket	Pin	Pin name	Pin function	Remarks
	1	24V		Power "+"
	2	0V		power supply"-"
	3	Min 3	Main input 3	Can be used to connect safety signals such as light barriers
	4	Ein13	Extended input 13	Can be connected to lack of material signal
	5	Ein14	Extended input 14	Temperature alarm signal can be connected

4.2.4 Seven core metal socket

The seven-core metal socket is used to connect to the heating controller. The following table shows the wiring instructions for the seven-core metal socket:

Seven core metal socket	Pin	Pin name minister	Pin function	Remarks
	1	24V		Power "+"
	2	0V		power supply"-"
	3	6-485A	RS 485A	RS 485 port
	4	6-485B	RS 485B	RS 485 port
	5	NC	Not connection	Not connected
	6	NC	Not connection	Not connected
	7	NC	Not connection	Not connected

4.3 DB37 Port description

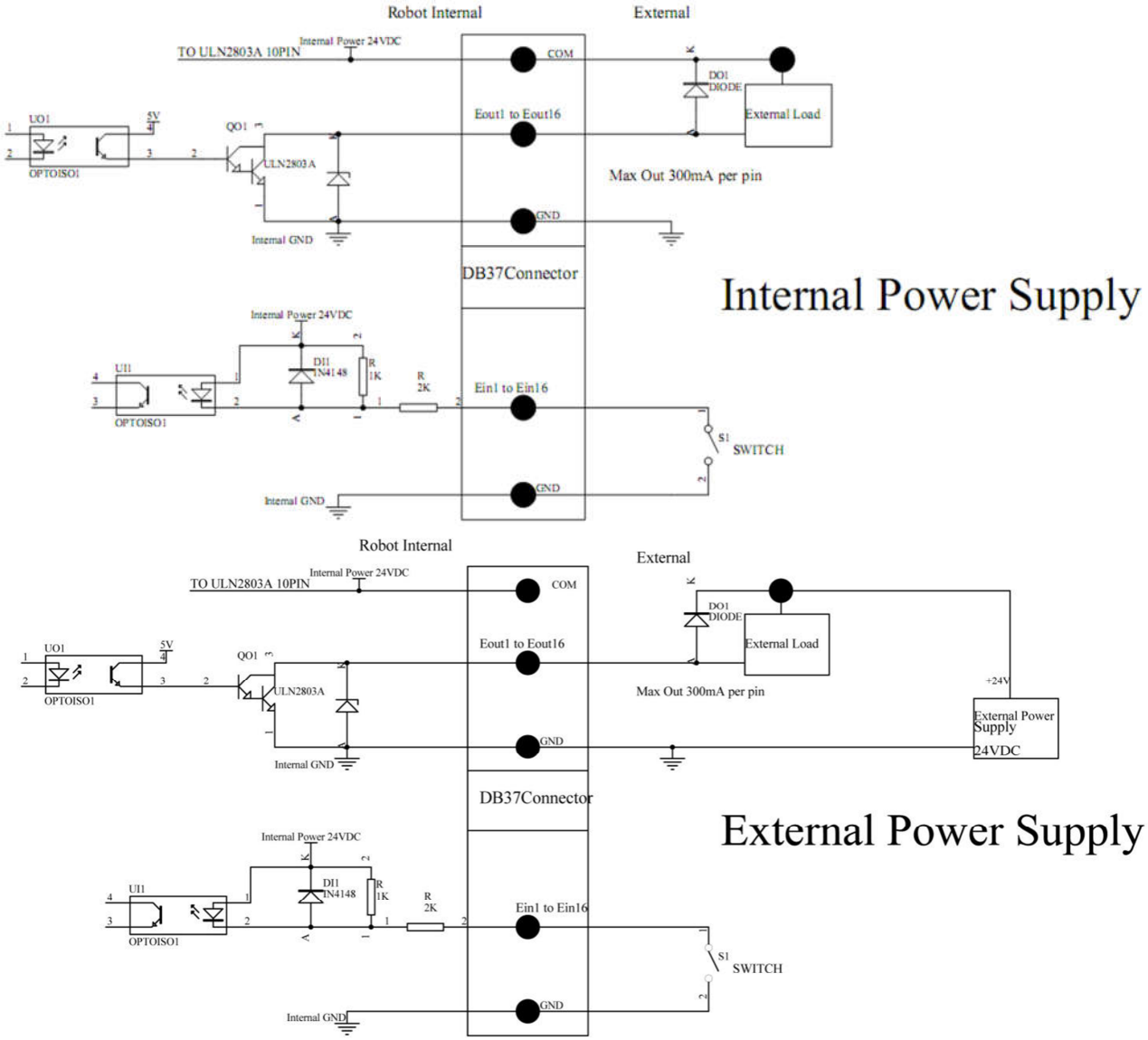
4.3.1 DB37 Pin description

(socket of DB37)

NO.	Pins	Function	NO.	Pins	Function
1	GND	P01 power supply(-)	20	GND	P20
2	Eout8	P02 Red light (lighthouse)	twenty one	Ein8	P21 Alarm mode
3	Eout7	P03 Yellow light (lighthouse)	twenty two	Ein7	P22 Operating mode
4	Eout6	P04 Green light (lighthouse)	twenty three	Ein6	P23 Standby mode
5	Eout5	P05 Buzzer (lighthouse)	twenty four	Ein5	P24

6	Eout4	P06	25	Ein4	P25
7	Eout3	P07	26	Ein3	P26
8	Eout2	P08	27	Ein2	P27
9	Eout1	P09	28	Ein1	P28
10	COM	P10	29	GND	P29
11	GND	P11 power supply(-)	30	Ein16	P30
12	Eout16	P12 Take-up stop signal	31	Ein15	P31
13	Eout15	P13 Reverse film signal	32	Ein14	P32 5P-5
14	Eout14	P14 Trigger film signal	33	Ein13	P33 5P-4
15	Eout13	P15	34	Ein12	P34 7P-5
16	Eout12	P16 Welding ready	35	Ein11	P35
17	Eout11	P17 Preheat signal (alternate port)	36	Ein10	P36
18	Eout10	P18 Welding completed	37	Ein9	P37
19	Eout9	P19 Start of welding			

4.3.2 DB37 Wiring diagram



Chapter 5 Debugging and Use

5.1 Safety check before operation


When checking the circuit, if there is a broken circuit or wet parts, please do not turn on the power immediately! Please find a professional when you need to remove or repair Personnel operation!


Pay attention to safe use of electricity to prevent the risk of electric shock.

When the machine is newly installed or idle for a long time, before energizing and ventilating the machine and operating, the following safety checks must be done:

1 , Check whether the power supply is rated voltage.

2 , Check whether the equipment is properly grounded.

3 , Make sure that no irrelevant objects are left on the movable parts of the electrical cabinet and the machine.

4 , Check whether the moving part is fixed.

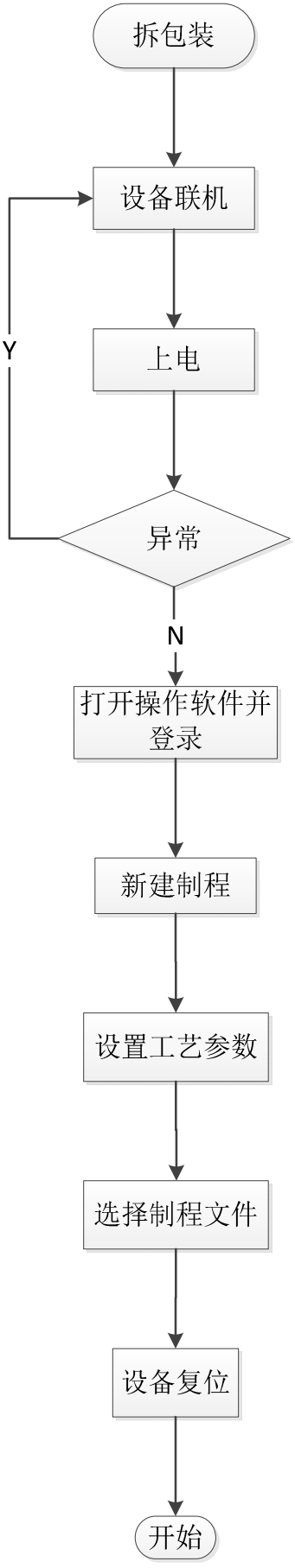
5 , Check whether the emergency switch is pressed.

6 、 Check whether the main power switch is in OFF status.

7 , Push and pull the movable part by hand to check whether the movement is smooth.

8 , Check whether the wiring plugs and air pipes are well connected, and whether there is any air leakage.

5.2 Flow chart of equipment first use



Chapter 6 Frequently Asked Questions

6.1 Faults and solutions

Serial number	Fault type	the reason	solution
1	The system cannot be reset	Please check if the emergency stop button is pressed	Release the emergency stop button and reset operation
2	Z axis or XY axis positioning is not accurate	The load is too heavy or the speed is too fast	If a certain axis deviation is particularly obvious, reduce The acceleration of this axis can alleviate this phenomenonElephant. Reduce the speed and acceleration before addingwork First, the motor signals of several axes on the driveboard
3	The motor works abnormally	The motherboard program problem or the motor is Up	Line interchange, if the fault persists, In addition to the motherboard program problem, and then the driver board Broken The motor wires of several axes are interchanged. in case It's also bad to change a good shaft to a bad one. It means that the driver is broken, if it is broken If the shaft is changed to a good one, it is still bad, then That means the motor is broken, just replace it with a new one.
4	Turn on the fuse	If replacing the fuse still occurs The fault may be the motherboard is broken	Replace with new products
5	The motor is at the origin when reset Jitter	The photoelectric switch is damaged or the drive has a problem	The problem of replacing the photoelectric is still bad question.
6	X axis can only be transported in one direction move	Generally, the X-axis drive board is broken to make	Replace with new products
7	The machine keeps alarming	If the alarm still remains after troubleshooting see if it is It may be that the emergency stop switch is broken or the report No warning signal feedback	Press emergency stop to see if the power will be cut off, Whether there is a fault
8	Drive motor drive shaft broken crack	Due to long-term forced operation, drive The screws of the shaft and the base are loose, resulting in Gaps, causing wear and tear	Remove the drive shaft and weld, tighten and loosen The screw
9	Moving parts are stuck	The proximity sensor screws are loose, causing Offset of proximity sensor position	Calibrate proximity sensor
10	Machine accuracy is reduced	1. The guide rail is loose 2. X axis and Y axis are not perpendicular	1. Readjust the straightness of the guide rail to be vertical Degree and levelness. 2. Adjust the connecting bolts of the beam and the machine
11	There is a foreign body in the screw	1. Debris or damage to the bearing	1. Clean or replace the bearing

Serial number	Fault type	the reason	solution
		2. Lack of lubricant	2. Add lubricant
12	The screw swings when it is running, Periodic scratching	1. The screw rod is bent due to misoperation 2. The screw rod and the motor shaft are not concentric	1. Replace the screw 2. Readjust or replace
13	Pressure gauge needle jumps when working oxidized Move, and then set the pressure value Swing around	The valve sealing surface is moisture or Matter attachment	Disassemble the valve to remove the attached moisture and oxygen Chemical removal
14	V-belt slipping	1. The belt is too loose 2. The belt is contaminated by lubricating oil	1. Adjust the motor base to tighten the belt 2. Wipe off the oil on the belt and prevent it from continuing occur
15	Sliding block movement lag, guide The rail heats up seriously, and the Current wear	gap between the rail and the slider is too small	1. Adjust the gap between the guide rail and the slider 2. When wear and puncture, you need to remove the guide rail, Slider, repair the puncture parts damaged by scratching.

6.2 Robot maintenance and maintenance

Welding robots are precision equipment and need to be maintained at all times, to maintain a good lubrication state, and to strengthen maintenance and maintenance, and clean up at any time and

Dirt and household grease ensure that the robot is working in good condition, which can avoid frequent occurrence of some faults and reduce downtime.

It can also guarantee or extend the life of the machine.

Inspection cycle of robot-related items:

power supply OFF Time (when not exercising)						
Check item	Check location	daily 1 Months 3 Months Check		an examination	6 Months an examination	12 Months an examination
Confirm the presence of screws/ bolts Loose/sway	Guard plate, cover plate screw	√	√	√	√	√
	Robot setting bolt	√	√	√	√	√
	Lock bolts of each mechanical shaft	√	√	√	√	√
	Bolts/screws around the shaft					√
	Screws of motors, reducers, etc. Bolt/screw					√
Confirm whether there is a connection Looseket Loose.	l connection on the robot Socket	√	√	√	√	√
	Robot cable unit		√	√	√	√
Visually check for presence	Robot appearance	√	√	√	√	√
External defects. Clear attachment Dust and so on.	External cable		√	√	√	√

power supply ON Time (during exercise) inspection

Check item	Check location	daily 1 Months 3 Months 6 Months 12 Months Check		an examination	an examination	an examination
Confirmation of work area	Each axis					√
Shake the electrical and external cables (including machine Cable, confirm whether there is any disconnection.	Robot cable unit)				√	√
in MOTOR ON shape Press each transport Move the shaft, confirm whether there is shaking move.	Equipment movement axis					√
Human-computer interaction interface function Is it normal, including each Buttons and button lights, Whether the emergency stop button can be used The drive is powered off.	Operation button, lighthouse.	√	√	√	√	√
Check if there is any abnormality Sound, abnormal vibration.	Whole machine	√	√	√	√	√

Maintenance cycle of robot equipment

Maintenance of equipment	Maintenance project	Maintenance time	Remarks
fan	Confirm fan rotation	appropriate	When turning on the power
Emergency stop button	Action confirmation	appropriate	When the servo is turned on
Safety switch	Action confirmation	appropriate	In teaching mode

Check list of related parts:

unit	project	Inspection and maintenance	Maintenance cycle			
			Every operation	per month	Every 6 months	every 12 months
Power and turn on the main power/ switch turn off	panel	Main power switch	O			
		Emergency stop health and safety sensors	O			
		Indicator light	O			
		Switch button	O			
Air pressure	Air pressure control	Pressure regulating filter		O		
		Water separator		O		
		Air pressure	O			
		trachea	O			
		The electromagnetic valve	O			

		cylinder	O			
Electric cabinet	fan	Fan function check	O			
		Fan filter inspection and replacement		O		
	wiring	Whether it is loose or damaged		O		
	clean	Electric cabinet cleaning		O		
	Seal plate	Sealing plate damage and deformation inspection				O
Safety instructions	Three-color light	Alarm function and sound check	O			

6.2.1 Maintenance steps of robot motion mechanism

(1) Daily maintenance

1. Remove residues such as tin dross after processing.

2. in Z Lubricating oil is added to the shaft screw (some are belts, but the belt does not need to be lubricated), the oil injection hole above the guide rail,

Once a day.

3. Clean and replace the soldering iron tip frequently.

4.X axis, Y Lubricate the shaft screw and guide rail once a day.

5. Do not touch the guide rail with your hands to prevent rust.

6. Check whether the parts are normal before daily work.

(2) Regular maintenance

For frequently used machines, regular maintenance should be done carefully and carefully, the cycle is about three months, and the content is as follows:

1. Remove X Shaft guard, clean the oil stains on the lead screw and guide rail (silk cloth is preferred), check the lead screw, nut seat, and front and rear bearings of the lead screw, etc. Whether the screws are loose, check whether the coupling screws are loose. Then add lubricating oil (grease) (No. 2 lithium base grease) on the screw and guide rail to let the machine The head assembly moves back and forth several times to add enough lubricating oil (grease).

2. Remove Y Shaft guard, clean the oil stains on the lead screw and guide rail (preferably with silk cloth), and clean the underside of the workbench, check Y Axis light Electricity, whether the connection is reliable, check Y Whether the shaft guide rail, screw assembly, nut seat, etc. are loose, check whether the coupling screws are loose, and after checking, will Y Add sufficient lubricating oil (grease) to the shaft guide and lead screw. Reinstall Y Shaft guard plate.

3. open Z Shaft guard, clean the dirt that may enter, check whether the screws of the lead screw and the support are loose; add lubrication to the lead screw after inspection grease). an examination Z Whether the shaft connecting plate is loose, you can push and pull it by hand and shake to see if there is any gap, and then check the machine head and Z Whether the connect Loose, add lubricating oil to the guide rail after inspection, check the drag chain connecting plate and Z Whether the screws fixing the shaft connecting plate are loose, then check X Shaft connection

Whether the screws of the light inspection baffle are loose.

4. Belt: Check whether the belt tightness has changed monthly to prevent the change of belt tightness from affecting the transmission. V-belt adjustment method: loose

Open the bolts that fix the motor, move the motor backward, and apply it at the midpoint of the belt by hand. 10N Pressure, belt bends 10~15mm It is advisable to

Fasten the bolts to fix the motor.

5. Regularly check the straightness, verticality of the guide rail and the running accuracy of the machine every quarter, and adjust it in time if it is abnormal.

6. The severely worn and damaged parts should be replaced in time.

7. The maintenance of the electrical part is mainly to check the plug and socket. It is necessary to check whether each plug is skewed, whether the wire is damaged, and whether the welding

Falling off.

8. To clean up the dust on the machine, you must carefully clean and check whether the joints are loose, whether the appearance of the components is abnormal, and whether the switches and bu

They all operate normally.

6.2.2 Daily maintenance and maintenance of oil-water separator

1. It is forbidden to drop or subject it to strong impact during installation to avoid damage.

2. It can be used only after confirming that it has been safely and reliably fixed to the welding robot with screws.

3. It is recommended to use air pressure less than 0.7Mpa.

4. Always drain the water in the oil-water separator, remove it regularly and clean it with a test tube brush.

6.2.3 Linear guide maintenance method

1. Every walk about 100km Replenish grease. Even if you don't use it often, you should refill it once a month.

2. Do not add too much grease.

3. Do not apply grease directly to both sides of the slider without injecting it into the inside of the slider.

4. Prevent the slider from entering foreign objects to affect its life.

5. Grease injection steps:

① In the stopped state, inject from the nozzle 0.7cc Grease

② Let the slider move back and forth to make the inner steel ball roll completely

③ After repeating ① and ②, check whether there is any trace of grease adhesion at the end of the slide rail.

6.2.4 Ball screw maintenance method

1. Use the oil gun to inject several times. After each injection, let the screw shaft rotate half a circle (each injection 0.7cc , For injection 7.0cc ,this needs

Minute 10 Injection). Note: Injecting the specified amount of grease at one time will make the amount of grease injected into the nut insufficient.

2. After injecting a certain amount of grease, push the lead screw slider to move back and forth to distribute the grease evenly.

6.2.5 Daily maintenance and maintenance of oil-water separator

1. It is forbidden to drop or subject it to strong impact during installation to avoid damage.

2. After confirming that it has been safely and reliably fixed to the welding robot with screws, it can be used.

3. It is recommended to use air pressure less than 0.7Mpa.

4. Frequently drain the water in the oil-water separator, remove it regularly and clean it with a test tube brush.

6.3.6 Daily maintenance and maintenance of soldering iron tip components

Soldering iron tip: The soldering iron tip should be tinned to protect the soldering iron tip every time it is used up to prevent oxidation. Do not let the soldering iron tip burn out, and do not use too hi

The soldering iron tip is severely oxidized or deformed or perforated and needs to be replaced with a new one.

What to do when the soldering iron tip has been oxidized:

1. First adjust the welding head temperature to 300 ℃, then clean the welding head with a cleaning sponge and check the condition of the welding head.
2. If the tin-plated layer of the soldering tip contains oxides, you can plate a new tin layer, and then wipe the soldering iron tip with a cleaning sponge, and repeat

Clean, thoroughly remove oxides, and then plate a new tin layer.

note : **Do not use a file to remove oxides on the welding head.**

6.3.7 Plexiglass/acrylic board maintenance instructions

After plexiglass/acrylic is in contact with chemicals, silver threads and cracks will appear. Do not use alcohol/ethanol and other low-carbon alcohols to wipe the surface

Surface; In addition, organic glass/acrylic is soluble in many chlorinated hydrocarbons: such as dichloroethane, trichloroethylene, chloroform, toluene, ethylene acetic acid, acetone

In other solvents, you should avoid contact with these reagents when wiping Plexiglas/acrylic.