ND18A handheld welding head (temperature control version) and wire feeder integrated manual

Contents

Please read this manual carefully

and make sure you understand

its contents before using the laser head.

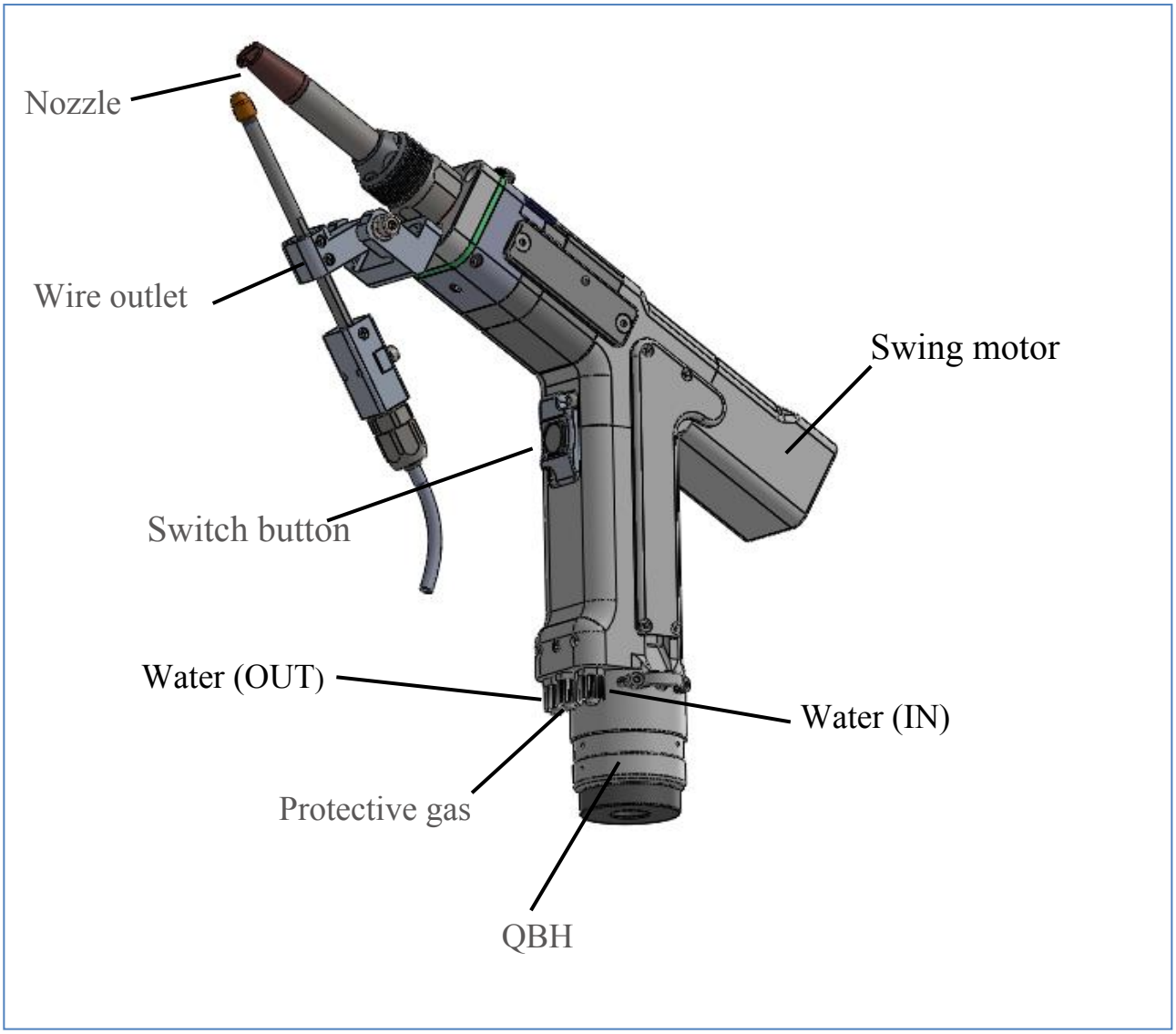
Please keep this manual for future

operation and maintenance.

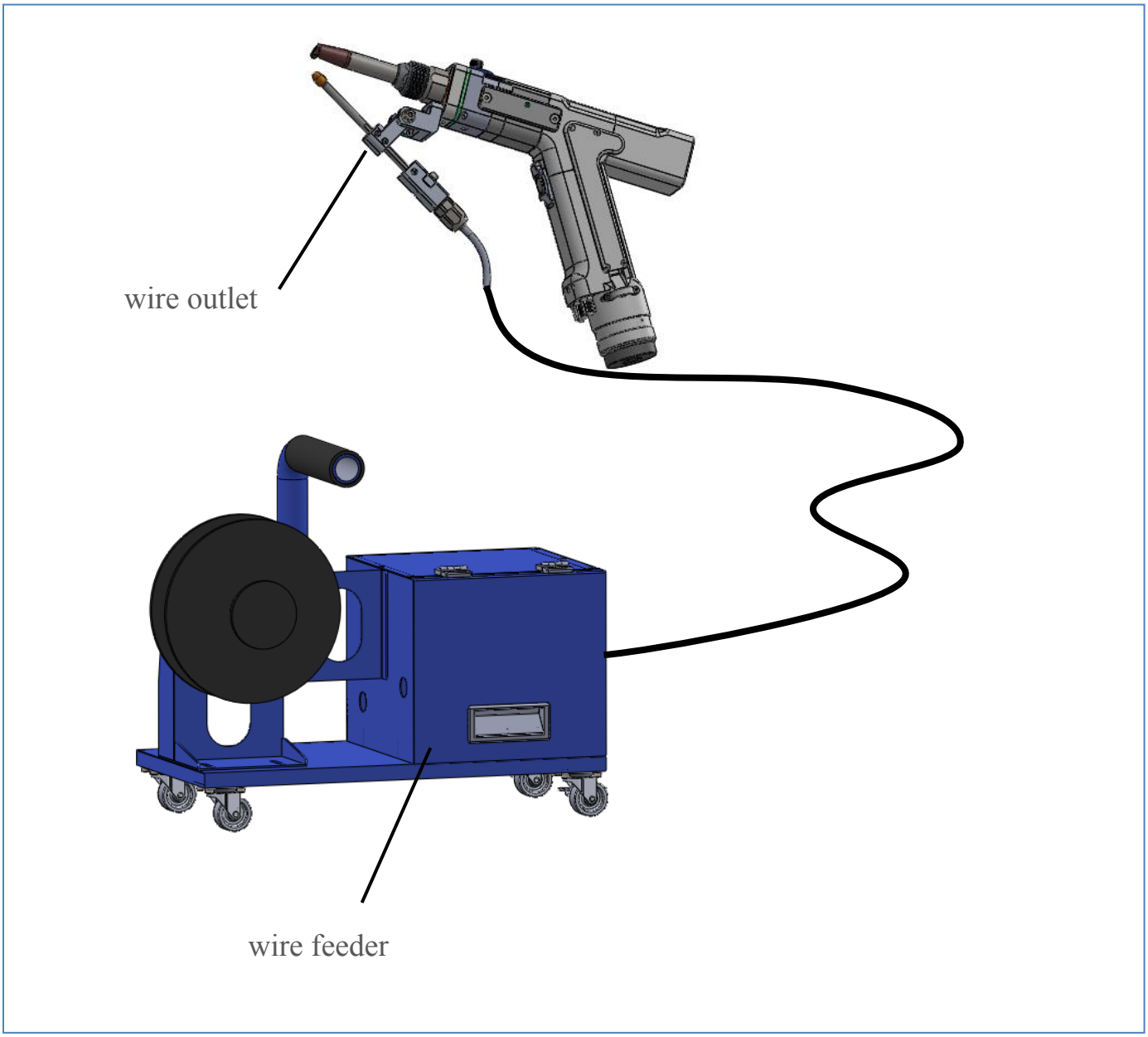
1. Product description

1.1. Product diagram

Hand held welding head



1.Cooling water quantity must be sufficient, the water pressure should be above 0.4MPa；
2.Please keep the bending radius of the connected air pipe not less than 30mm.



1.The wire outlet bracket part can be adjusted according to the use scene, and the straight pipe wire feeding angle is 40°.

1.2. Main function

1.Smart internal design and interactive control system expand the tolerance range and welding width of the processing parts, and solve the disadvantage of minor laser welding spot, and provide better welding forming.

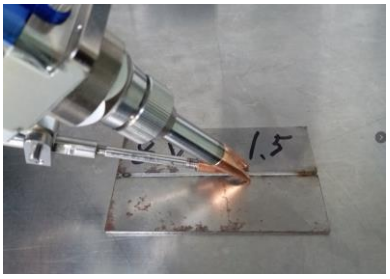
2.Light shape, Ergonomic design, advanced structure, and reliable performance ensure comfort grip and simple operation.

3.With multiple safety alarms, the laser will be locked automatically when the workpiece is removed.

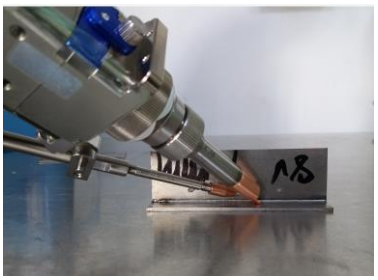
4.Nice welding seam, fast welding speed, no consumables, no welding marks, no discoloration, no later polish.

5.This head could be equipped with a variety of angular nozzles to meet the welding needs of different products.

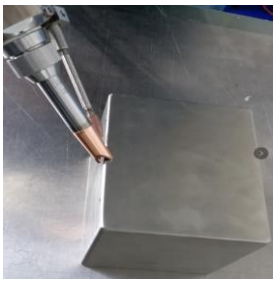
Welding with different angular nozzles



Nozzle1（For planar welding）



Nozzle2（For internal corner welding）



Nozzle3（For outer corner welding）

1.3 Technical specifications

Connector Type: QBH

Laser Incident Mode：Coaxial

Max Power：1500W

Laser Wavelength Range：1070±20

Collimating Length：50mm

Focusing Length：150mm

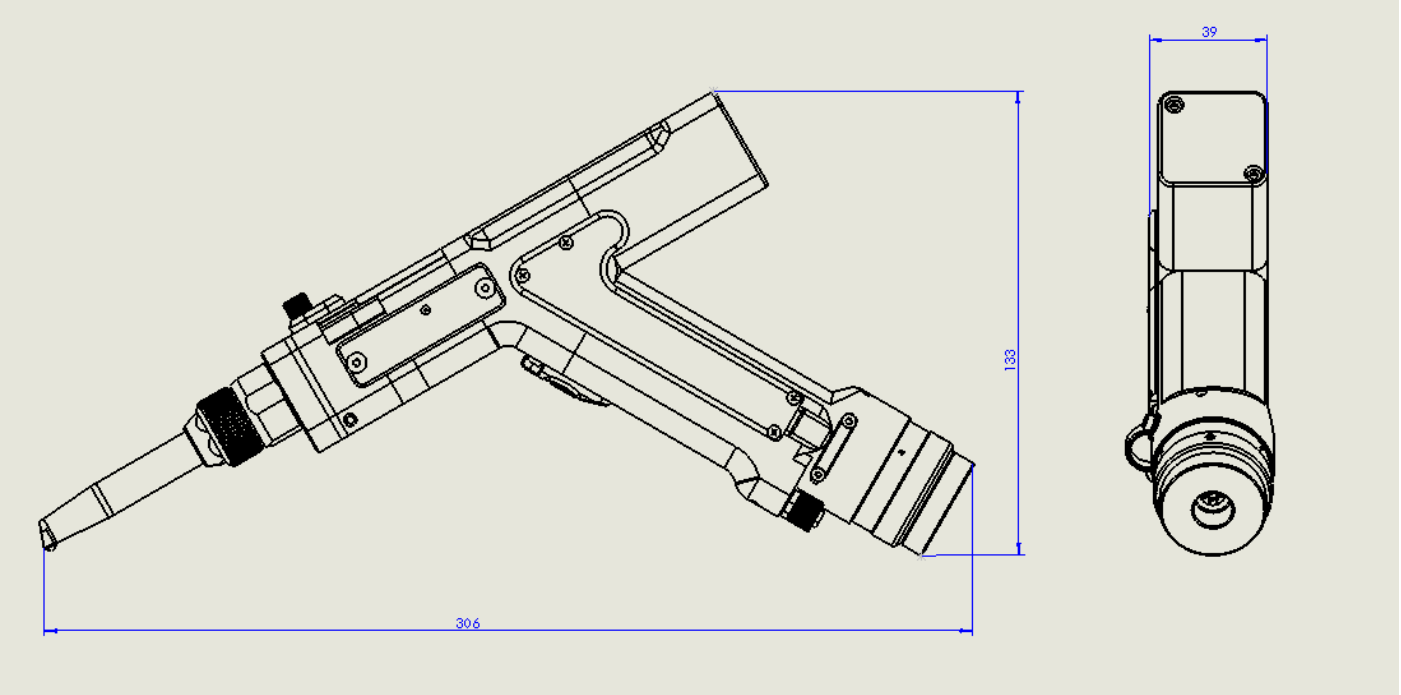
Protective Gas：Nitrogen

Weight：1.0 kg

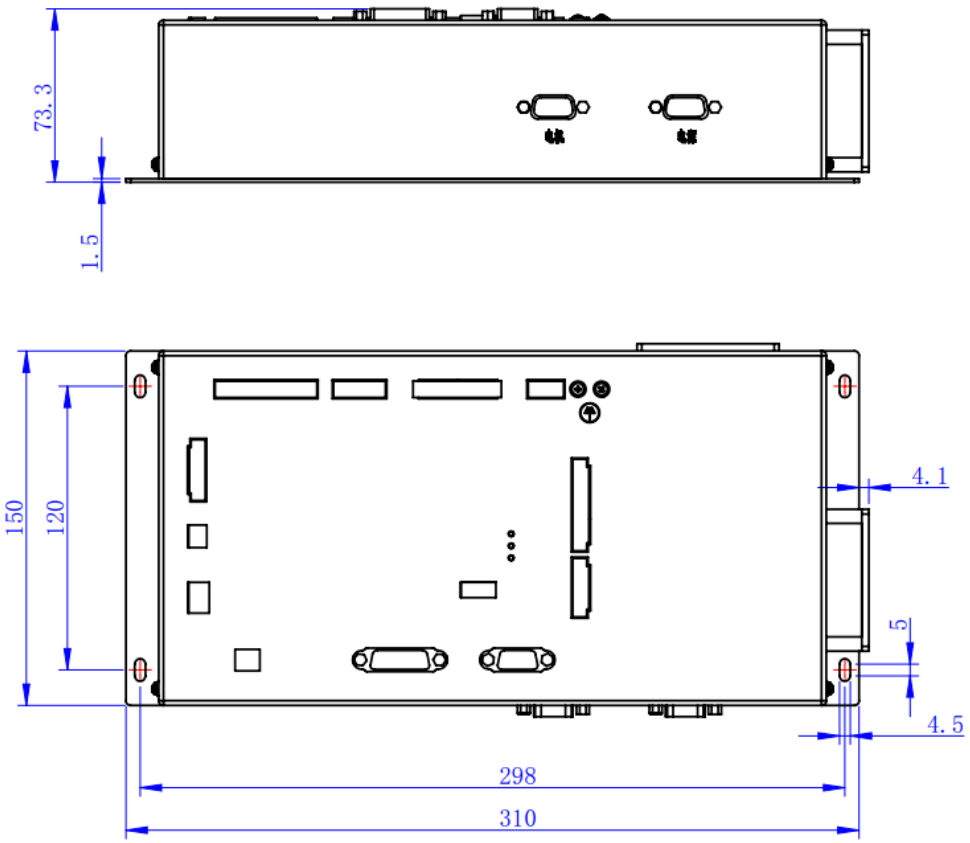
Adjustable Width：0-4mm

2. Main components

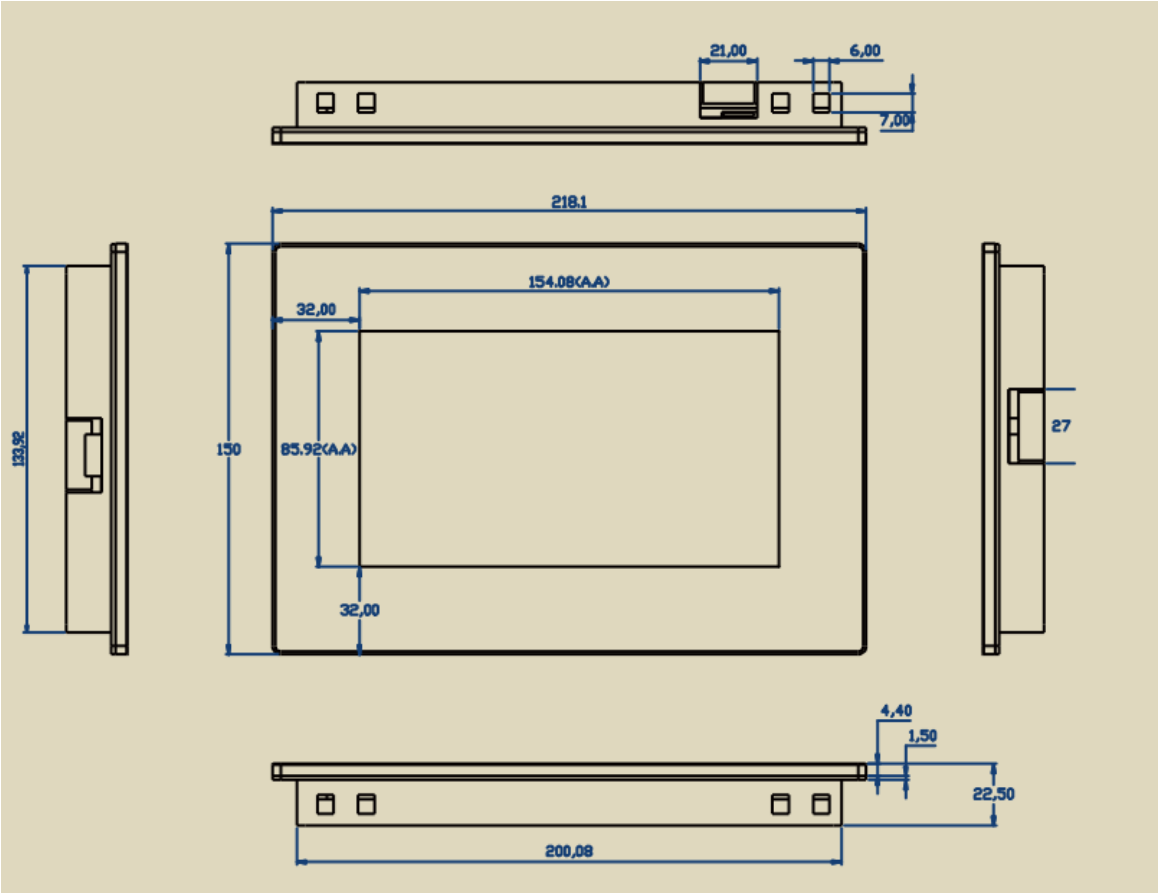
2.1. Welding head



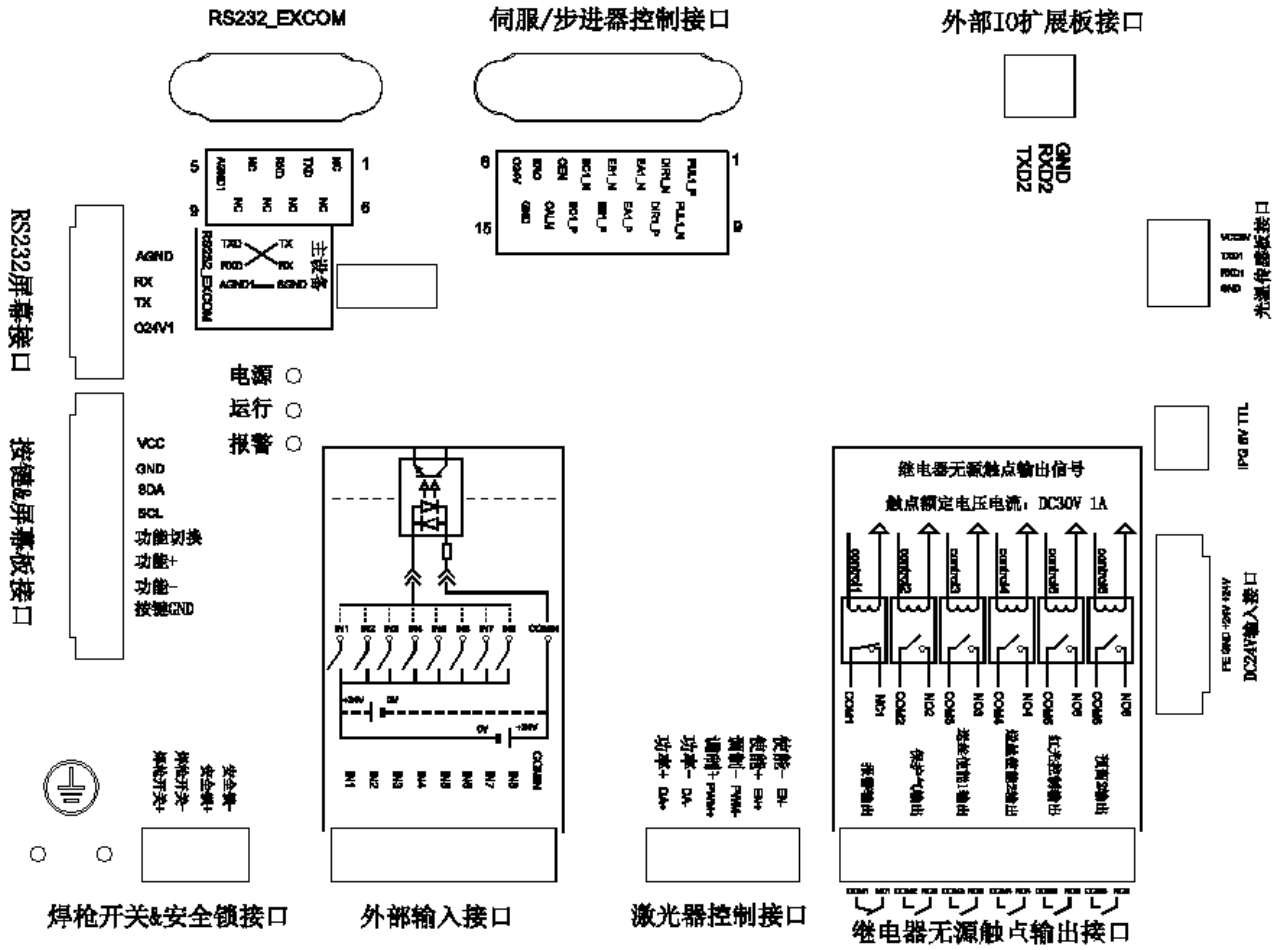
2.2. Controller



2.3. Screen

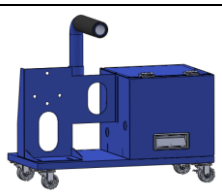

21,00
6,00
7,00
218.1
154.08(A.A)
32,00
150
85.92(A.A)
32,00
123.92
27
4,40
1,50
22,50
200,08

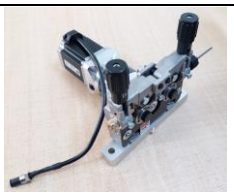
2.3.1. Schematic diagram of external port wiring



3. Parts list

No.	Item	Specification	Qty.	Picture	regular model	wiring model	Note
1	Handheld welding head & motor cable & switch temperature measurement cable	ND18A	1		√	√	
2	Controller box	ND18A-SCSS-KZX-001	1		—	√	
3	Power switch 1	HF55W-SE-24	1		√	√	
4	Power switch 2	±15V.3A	1		√	√	
5	Nozzle	ND18-019T ND18-020T ND18-021T	3 types		√	√	
6	wire feeding nozzle	ND18-187T ND18-188T	2 types		√	√	

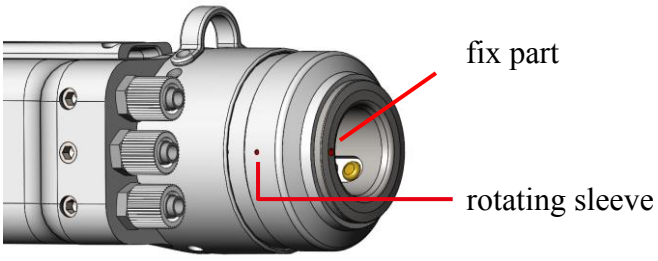
7	PVC Rubber protective cover （red）	Bore diameter 10mm, Length 30mm	1		√	√	
8	DC External power harness; 2 meter	ND18-DYWXS-2MT	1		√	√	
9	Motor extension wire; 10 meter	ND18A-DJYCYC-A-10M/T2	1		√	√	
10	Switch & safety lock lead cable	ND18A-KGAQYC-A-10M/T1	1		√	√	
11	Control box mounting bracket	YW52-240L	4		√	√	
12	Nozzle connecting pipe	ND18-05-015T	1		√	√	
13	Screen +Four-core shielded wire	7.0 inch+4 core 4 pin 2.54mm 4 core 8 pin 2.0mm	1		√	√	
15	Lock ring wrench	ND18-117T	1		√	√	
16	Screen mounting buckle	/	4		√	√	
17	User manual	ND18A	1		√	√	
18	Wire outlet module	ND18-CSZ-001	1 set		—	√	
19	送丝机护罩	SS-BJHZ-002T	1		—	√	

20	步进送丝机	SX-005	1		—	√	
21	钢丝焊丝盘	盘面 ¢ 200mm，筒体 ¢ 100mm，内宽45mm，外宽55mm，轴孔 ¢ 52.5mm	1		—	√	
22	送丝机开关电源	HF150W-SE-24	1		—	√	
23	送丝机驱动器	M542C	1		—	√	
24	步进电机延长线	WSX-SSJBJ-YC001	1		—	√	
25	送丝机电源连接线	WSX-SSJBJ-DY001	1		—	√	
26	步进驱动控制线	SS-BJQDKZ-A-2M/T	1		—	√	

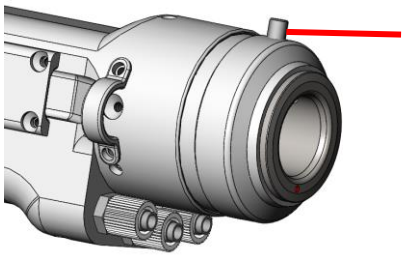
4. Installation

4.1. QBH connection

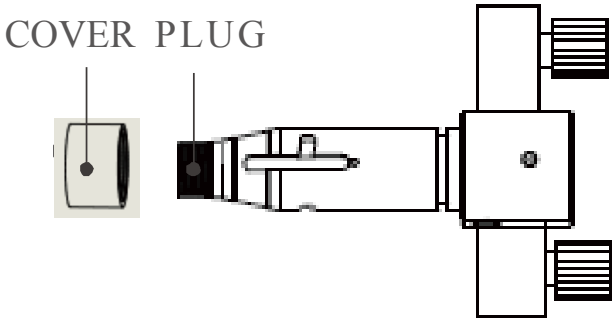
1）Before turning the sleeve as below, make sure the red marks are aligned to the white marks.



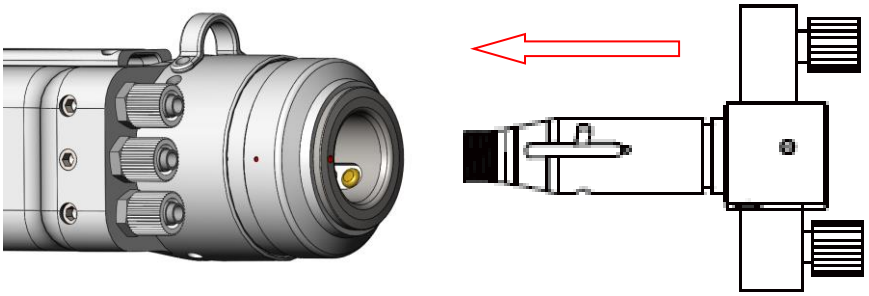
2）Loosen the rotating sleeve locking screw (it is at the 180 degree position of the rotating sleeve red dot), otherwise the QBH cannot be rotated and the optical fiber cannot be locked.



3）Remove the dust cover of fiber rod, clean the fiber rod with anhydrous ethanol. Before installing, check the protective cover of fiber plug to see if it is locked, avoid the cover from loosening and effecting the welding performance or burning the fiber and welding head.



4）Remove the dust cover from QBH, place the clean fiber rod and the QBH coaxially, make sure the white mark on the QBH is aligned with the locating slot (long slot on fiber rod), insert the fiber rod into QBH gently, until the fiber rod joints the QBH contact surface.



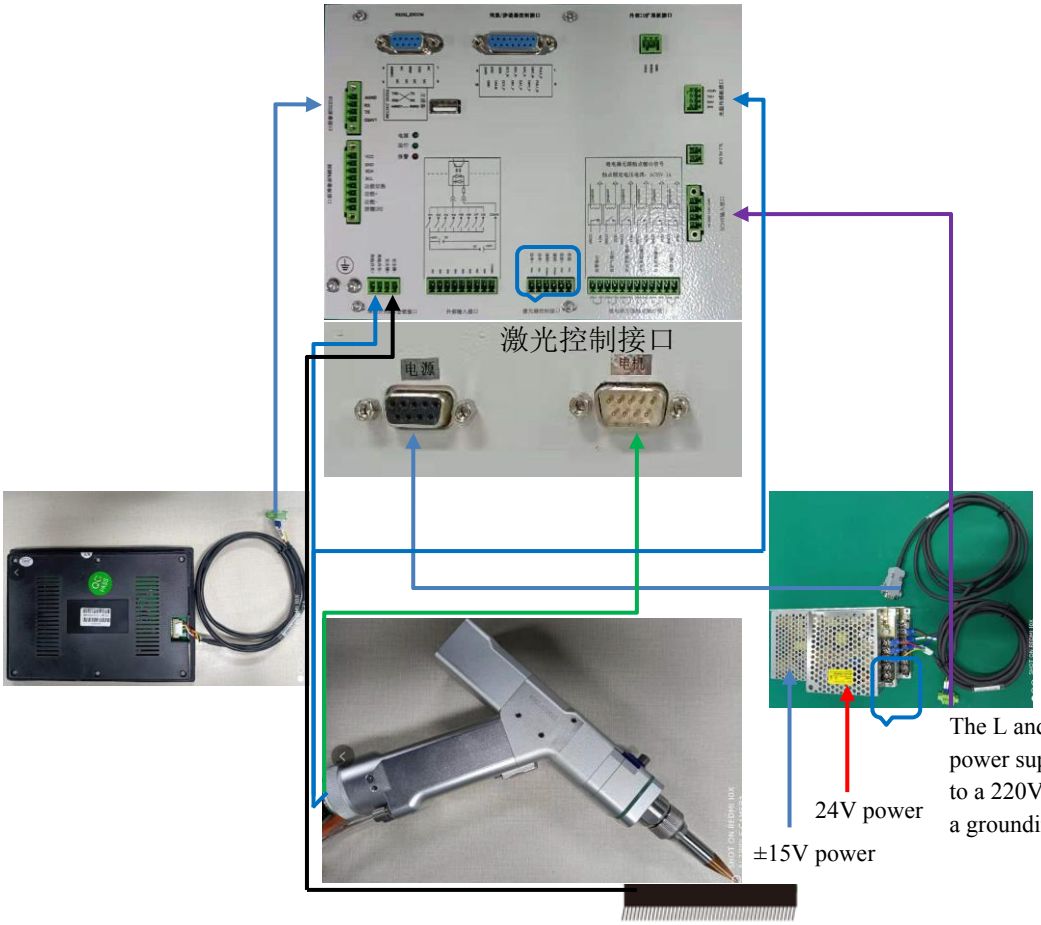
5）After inserting the fiber rod into QBH, press the sleeve gently and turn it about 15 degree along the arrow on the sleeve. Then pull the sleeve until its underside is parallel with the top of QBH, turn the sleeve at the same direction till the limit.

Note:

1. Insert or pull out the fiber rod gently;
2. When inserting or pulling out, QBH and fiber rod should be coaxially;
3. The operation should be kept as dust-free as possible.

6）After inserting the fiber rod into the QBH, turn and lock the rotating sleeve tightly.

4.2. Electrical connections



5. Control board port definition

5.1 Indicator

The position of the indicator light from the end of the power source is as follows:	
Power Indicator	This light is on when 24V power supply is normal.
Operation light	It flickers when the 24V power supply is normal, and it flickers faster when the galvanometer is turned on.
Alarm light	This light will be on when the control card system detects an abnormal and stop output. The abnormal conditions: 1 receiving alarm signal, such as from the chiller; 2 control card system abnormal.

5.2 Welding head switch & safety lock interface

port	function	description
Switch+	Switch+	Connect to the side of the hand-held welding gun button through the switch & temperature measuring cable.
Switch -	Switch -	Connect to the side of the hand-held welding gun button through the switch & temperature measuring cable.
Safety lock+	Safety lock+	Connect to the nozzle through the switch & temperature measuring cable.
Safety lock-	Safety lock-	Connect to the welding platform through a 0.5mm² wire through the safety lock clamp.

Sample operation： （Before operation, make sure that all machines are turned on and everything is normal, and the red light is in the center of the nozzle ）

① Clamp the work piece with the safety lock clamp (safety lock -)

② After setting the laser parameters on the operation screen, click "Save", and click "Laser" to activate the button (input 666666 enter the advanced parameters, confirm that the DA voltage range is not "0"; if it is set to 0, it must be selected manually 0-10V and click "Save" to return to the main page)

③ Touch the nozzle of the welding head to the workpiece and press the button to start welding.

5.3 Temperature sensor interface

The 4P 2.54 terminal of the "switch & temperature measurement cable" branched out of the welding head is connected to this interface. It is used to detect the dirtiness of the protective glass. (If The lens is dirty and the temperature is too high, the indicator light and the main screen will remind the user to keep it clean, prolong the service life of the lens and reduce the loss rate. The indicator light "green" means that the internal temperature is normal, "orange" means that the reminder temperature set by the user has been reached, and "red" means that the alarm temperature set by the user has been reached. Alarm will cut off all outputs. Input 55555 to enter advanced setting to set these temperature parameters. Factory default settings "Reminder temperature" is 40℃, "Alarm temperature" is 50℃. This parameter is the actual measured parameter with normal connection of water cooling and nitrogen to the gun head in the factory. The user can compensate its temperature parameter according to its own use environment to make it more suitable for the actual environment.)

5.3 External input interface

All input signals of this interface must be DC 24V level signals, and the drive current of each input port is greater than 1mA; support sink input or source input.

Port	definition	function description

IN1	Laser alarm	External laser alarm signal input port; when the alarm input of this port is detected, all external output is stopped, and the screen displays the alarm status for it.
IN2	Water alarm	External water cooler alarm signal input port; when the alarm input of this port is detected, all external outputs are stopped and the screen displays the alarm status.
IN3	Gas pressure alarm	The alarm signal input port of the external gas pressure detector; when the alarm input of this port is detected, all external outputs are stopped and the screen displays the alarm status.
IN4	reserved 1	Reserved for further development
IN5	reserved 2	Reserved for further development
IN6	reserved 3	Reserved for further development
IN7	reserved 4	Reserved for further development
IN8	reserved 5	Reserved for further development
COMIN	Common	External input interface public port, according to the external environment, use NPN interface or PNP input, this port can use +24V or 0V as a public signal return, choose one of 24V and 0V. The DC24V power supply is a choice between 24V and 0V),! ! ! This terminal is often connected to 24V

5.4 Laser source control interface

（The default standard model supports laser power DA voltage 0-10V, modulation and enable signal level 24V. If the user uses a special laser that only supports power DA voltage 0-4V, there is a spare 2.0mm jumper cap in the box, open the control box, and short the jumper cap to the blue board JP2 position. If the modulation signal and the enable signal only support 5V TTL level, also in the JUP1 position of the board, short the jumper to the positions of VCOM and V5V.)

Port	definition	function description
DA+	laser power+	The laser power setting signal is output; the specific power setting can be set on the screen interface, and it can be output only when the screen interface activates "Laser".
DA-	laser power-	
PWM+	Modulated signal+	Output laser light modulation signal; specific settings can be set on the screen interface, and only when the screen interface activates "Laser" can it be output.
PWM-	Modulated signal-	
EN+	Laser enable+	Output laser light emission enable signal; it can be output only when "Laser" is activated on the screen interface.
EN-	laser enable-	

5.5 Relay passive contact output interface

This interface is a passive contact, and each signal port is equipped with 2 passive contacts. When wiring, the corresponding COM port needs to be powered from an external independent power supply as the positive signal, the NO port is connected to the positive electrode of the external signal, and the negative electrode of the external signal is connected to the 0V of the corresponding external independent power supply to complete the power supply loop. All the following relay contacts are rated with load: contact rated voltage and current: DC30V 1A. (If user needs to drive higher voltage and higher current equipment, please make the relay transfer process outside, and the positive and negative ends of the external relay coil must be connected with bypass diodes in reverse, such as 1N4007 high-power high-voltage diodes, the cathode of the diode should be connected to the anode of the relay coil, and the anode of the diode should be connected to the cathode of the relay coil.)

Port	name	Function definition	Function description
COM1	Common 1	Alarm output	When an alarm occurs, COM1 and NC1 are connected, and when normal, COM1 and NC1 are disconnected; after the system receives an external input alarm signal or other alarm signals, it will generate an alarm contact passive output signal.
NC1	Normally closed 1		
COM2	Common 2	Protective gas output	When welding is started and no alarm occurs, COM2 and NO2 are connected; when welding is not started, COM2 and NO2 are disconnected.
NO2	Normally open 2		
COM3	Common 3	Wire feeding enable 1 output	This port is connected to the wire feed enable interface of the external wire feeder. When the welding is started and the screen activates the "wire feeding", and there is no alarm, COM3 and NO3 are connected; when the wire feeding ends or welding is not started, COM3 and NO3 are disconnected.
NO3	Normally open 3		
COM4	Common 4	Wire feeding enable 2 output	This port is connected to the wire unwinding enable interface of the external wire feeder. Start welding and activate the “wire feeding” on the screen. When the wire feeding ends and the wire drawing action starts, and there is no alarm, COM4 and NO4 are connected; when the wire drawing is finished or welding is not started, COM4 and NO4 are disconnected .
NO4	Normally open 4		
COM5	Common 5	Red light control output	Some lasers can be connected to this interface if they must be connected to the red light control signal to allow light to be emitted. When welding is started and the screen activates "Laser" and there is no alarm, COM5 and NO5 are connected; when welding is not started, COM5 and NO5 are disconnected.
NO5	Normally open 5		
COM6	Common 6	Reserved 2 output	Reserved for further development
NO6	Normally open 6		

5.6 DC24V input interface

Please correctly connect the power and the corresponding ground line according to the port number. Do not connect to the DC power supply and mains power exceeding 24V to avoid damage!

Port	Function definition	Function description
PE	Protecting earthing	Leakage discharge safety ground stake or protective ground
GND	Power 24V reference ground	Power input port, DC 24V switching power supply reference ground 0V
+24V	Power 24V +	Power input port, DC 24V switching power supply positive
+24V	Power 24V +	Power output port, DC voltage fixed output +24V, internally connected to the positive port of DC 24V switching power supply

5.7 IPG 5V TTL

Conditions of Use: Special customized reserved interface for the customer uses the laser controlled by 5V TTL level

Function: 5V TTL fixed output signal

Signal type: fixed output

Standby operation: When external equipment, such as some TTL level controlled lasers, this type of equipment is only suitable for 5V TTL level control signals, it needs to be level converted, such as the "red light control" signal of this type of laser only supports 5V input signal to control it. User can use the connecting wire to lead the "IPG 5V TTL" interface to the COM5 port of the "relay passive contact output interface", and use another wire from the NO5 port to connect to the "red light control" interface positive port of the laser, and the negative port of the "red light control" are connected to the GND port of the "DC24V input interface" to complete the control of the red light control using the 5V TTL level.

Do not connect other voltage signals to this interface, and do not short-circuit this interface to GND.

5.8 External IO expansion board interface

Reserved interface for further development.

5.9 Servo/step control interface

This interface is a DB15 female socket, which can be adapted to the wire feeder of our servo or stepper driver. The corresponding signal table of the pin number is as follows:
(If connected to a stepper driver, the pins are only used for 1.2.7.9.10)

Pin	Signal	Function defenition
1	PUL1_P	Output pulse differential signal positive
2	DIR1_N	Output direction differential signal negative
3	EA1_N	Input coding feedback A differential signal negative
4	EB1_N	Input coding feedback B differential signal negative
5	EC1_N	Input coding feedback C differential signal negative
6	OEN	Ouptu enable signal
7	ERC	Output error clear signal
8	O24V	Output 24V power supply
9	PUL1_N	Output pulse differential signal negative
10	DIR1_P	Output direction differential signal positive
11	EA1_P	Input coding feedback A differential signal positive
12	EB1_P	Input coding feedback B differential signal positive
13	EC1_P	Input coding feedback C differential signal positive
14	OALM	Input alarm signal (internal pull-up, connected to the open drain terminal of the server)
15	GND	Signal ground

5.10 RS232_EXCOM

！！！The interface needs to be customized before it is open to use

5.11 RS232 screen interface

This interface is an RS232 level screen interface, which only connects to the screen equipped by our company. The user cannot access other screens or modify the wiring without authorization. (Depending on the actual design environment of the customer's equipment,

the length of the wire can be extended, and the length is recommended to be less than 5 meters) .

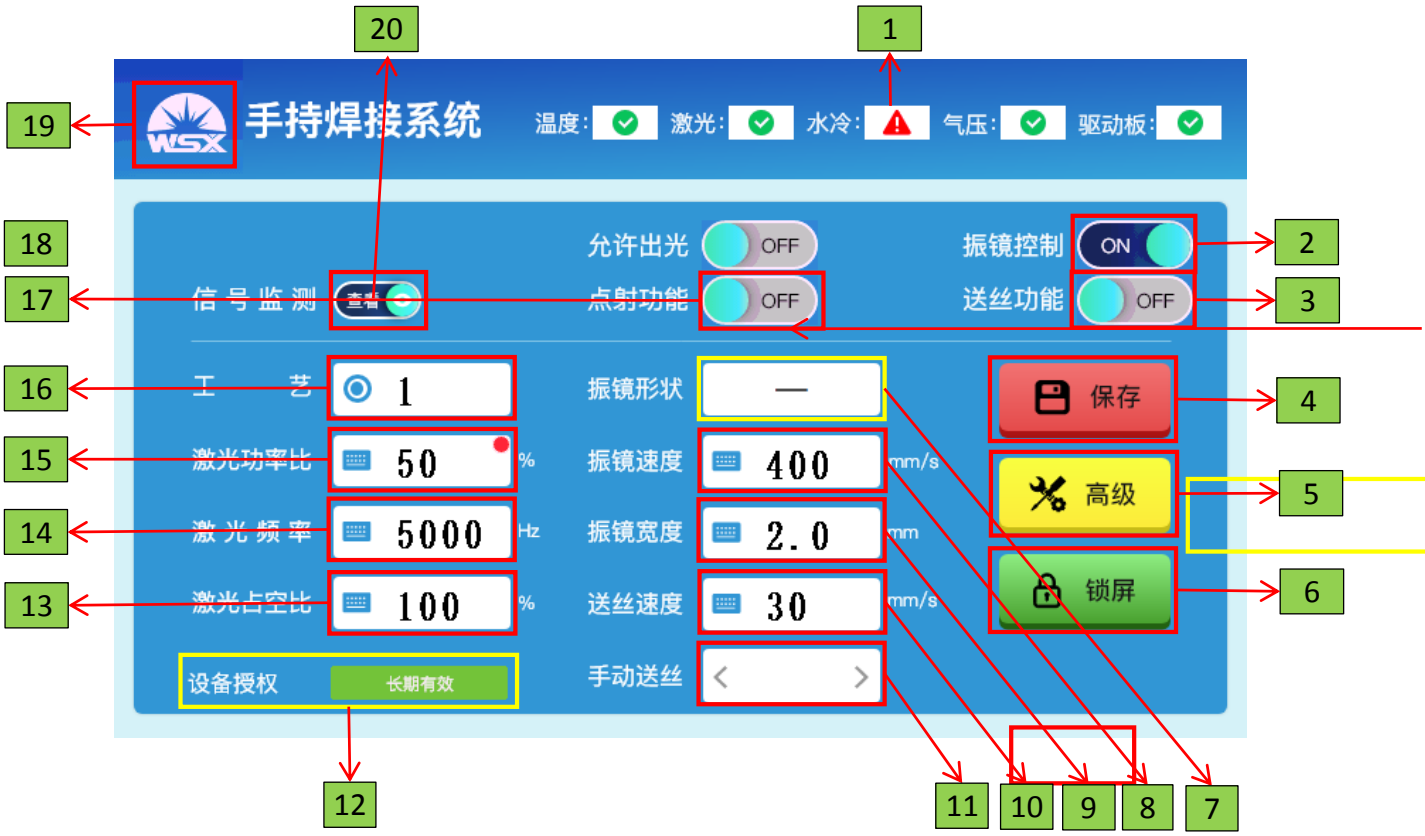
Port	Function defenition
AGND	Signal ground
RX	Data reception
TX	Data sending
O24V1	Output 24V power supply (voltage range 22V-24V)

5.12 Button & screen board interface

(This interface is only used for the spare port of other models)

6. Software description

6.1 Main interface



6.2 Main interface function description

1、Alarm status

Real-time display of the current status of the device

Note:  indicates that the device is normal,  Indicates that the device is faulty. When this status is displayed, other switch operations on the screen will be invalid.

2、Galvo control

Turn on/off galvo output

Galvanometer on: turn on the galvanometer output; note: if there is no laser output, this switch will automatically turn off in 5 minutes

Galvanometer off: stop the galvanometer output

3、Wire feeding

Wire feeding/unwinding

Note：

This function is not interoperable with the spotting function, that is, when this switch is turned on, spotting cannot be used, and when the spotting function is turned on, the wire feeding function cannot be used.

Wire feeding on: start wire feeding, after laser output, wire feeding and unwinding actions will be performed according to the wire feeding related parameters in the advanced settings

Wire feeding off: Turn off the wire feeding function, the wire feeding will not be started after the laser is output, and the manual wire feeding cannot be used.

4、Save

Click "Save" to save the currently modified data.
The red dot in the parameter box of the successful save will disappear. If the red dot does not disappear, it means that the communication between the screen and the control board is abnormal and needs to be repaired!

5、Advanced

Enter advanced settings or temperature control settings

Note:

1) Enter the password 666666 to enter the advanced setting page, and enter the password 55555 to enter the temperature control setting page
2) Enter other passwords, it will jump to [Verification failed] prompt: verification failed, please re-enter

Touch action：

The password keyboard pops up, and the verification is performed according to the password entered by the user. If the verification succeeds, it will jump to [Advanced Settings] or [Temperature Control Settings]. If the verification fails, it will jump to [Verification Failure].

The prompt message after the verification fails, press "OK" to jump to the [Main Menu]

6、Lock screen

Jump to the lock screen page to prevent accidental touch

Lock screen information, click on the above area page to jump to [Main Menu]

7、Galvanometer shape

The current graphic style output by the galvanometer, ND18A only has a "--" style.

8、Galvanometer speed

Set the swing speed of galvanometer

Note:

1) The minimum speed is 1Hz, and the maximum default is 250Hz (according to the maximum speed of the galvanometer in the advanced settings page), and the unit precision is 1Hz

2) Maximum range, 0.1~3mm, max=600Hz; 3.1~4mm, max=350Hz;

Touch action: the keyboard pops up, and the user can enter custom data.

9、Swing width

Set the size of the swing figure (straight line)

Range and accuracy: the minimum width is 0.1mm, the maximum is 4.0mm, and the unit precision is 0.1mm;

Touch action: The keyboard pops up and the user can enter custom data.

10、Wire feeding speed

Set the speed of wire feeding

Setting range: minimum 1mm/s, maximum 80mm/s;

Touch action: The keyboard pops up and the user can enter custom data.

11、Manual wire feeding

Manually control the wire feeder

1) Long press arrow on the right to feed the wire; , long press the arrow on the left to unwind the wire;

2) Long press to continue wire feeding/rewinding, release it to immediately stop wire feeding/rewinding.

12、Device authorization

Display the current period of use of the device

Long-term effective = permanent effective

13、Laser duty cycle

Set the output value of the laser duty cycle

Setting range and description:

1)The minimum value of the laser duty cycle is 0, the maximum value is 100

2)The higher the duty cycle value, the stronger the output laser intensity under the same power frequency

Touch action: The keyboard pops up and the user can enter custom data.

14、Laser frequency

Set the output value of laser frequency

Setting range and description:

1) The minimum laser frequency is 1Hz, the maximum is 10000Hz (10kHz)
2) The higher the frequency value, the stronger the output laser intensity under the same power duty cycle

Touch action: The keyboard pops up and the user can enter custom data.

15、Laser power ratio

Set the output value of laser power

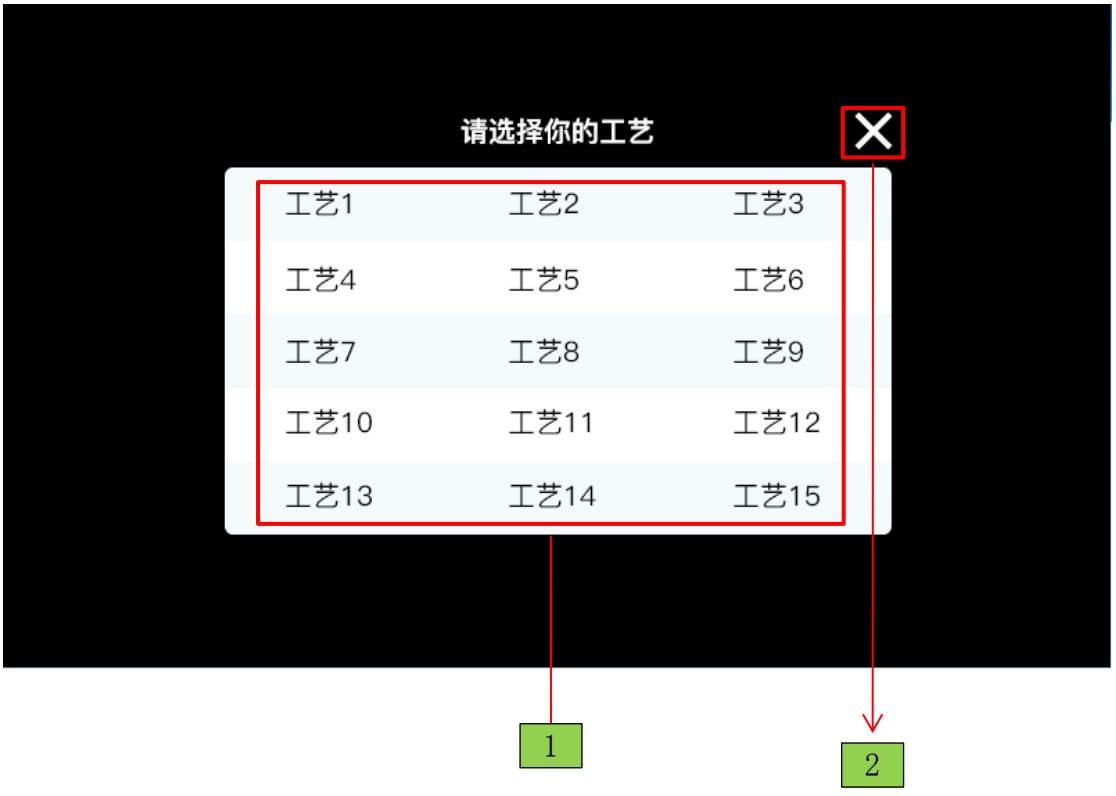
Setting range and description:

1) The minimum value of the laser power is 1, the maximum value is 100 (it can be adapted according to the laser power range in the advanced settings page), and the unit precision is 1
2) The factory default is 0~10V, which corresponds to this value 0~100; that is, 10 %= 1V (actual output)

Touch action: The keyboard pops up and the user can enter custom data.

16、Process

Multiple sets of process parameters can be set and saved, and can be viewed and recalled later



1) Process mode

Select the current process mode and jump to the [Main Menu] for corresponding settings, up to 15 groups can be set;

2) Close

Click the "×" page to jump to the [Main Menu];

Touch action: page jump to [process selection].

17、Spotting function

Wire feeding/unwinding action

Note:

This function is not interoperable with the wire feeding function, that is, the wire feeding cannot be used when the spotting function is turned on, and the spotting function cannot be used when the wire feeding function is turned on;

Spotting on: After the laser is output, the spotting action will be performed according to the spotting related parameters in the advanced settings, and it will stop until the number of spotting points is completed.

Spoting off: the laser emits light regularly (as long as the signal is continuous, the light continues to be emitted)

Touch action: open/close

18、Allow laser output

Turn on/off laser output

Note:

1) This function will only take effect when used in conjunction with the "welding switch" of the control box input port to prevent the screen from being accidentally triggered by the operator, injuring people and workpieces.
2) It is recommended that the allowable laser output of the screen is kept on, and the laser output is controlled by the "welding switch" of the input port of the control box. Use NPN connection to connect the control box input port "welding switch" to the external console. Short the port "welding switch" signal to AGND (common signal ground with the console) to start laser output, otherwise stop laser output.

Laser output:

1、Turn on "Allow laser output" on the screen

2、Use NPN connection to connect the input port "welding switch" of the control box to the external console, and the signal of the port "galvanometer switch" is shorted to AGND (common signal ground with the console).

Laser off: the screen's allowable light function is off or the control box input port "welding switch" is disconnected from AGND.

Touch action: Turn on/off

19、

Click "  " to enter the following interface to view the company's contact information and version information.

Click "Back" to jump to [Main Menu]

20、Signal monitoring

1) Click "  " to enter the following interface.

Input and output display IO, and use colors to indicate different states, as follows

1) The gray mark corresponds to the external IO not working

2) The green indicator corresponds to the external IO working normally

3) The red indicator corresponds to the external IO working abnormal

Click the "Back" button to return to the main menu

2) When the laser is emitted normally, the interface reference is as follows, and the red circles are the bright lights:

6.3 Advanced parameter interface

6.4 Description of advanced parameter function

1、Speed threshold

Set the speed threshold of the galvanometer

Note:

1) When setting the threshold, only downward setting is allowed, but upward setting is not allowed. That is, the set value will not be greater than 600Hz or 2400mm/s;

2) After this value is set, the speed parameter of the galvanometer will be limited according to the maximum value of this value;

Touch action: The keyboard pops up and the user can enter custom data.

2、Width threshold

Set the size threshold of the graph

Note:

1) When setting the threshold, only downward setting is allowed, but upward setting is not allowed. That is, the set value will not be greater than 4mm;

2) After this value is set, the galvanometer width parameter will be limited according to the maximum value of this value;

Touch action: The keyboard pops up and the user can enter custom data.

3、DA voltage range

Set the voltage range of the laser DA output

Touch action: 0V, 0~10V optional

4、Width correction

Correct the size of the current graphic

Note:

1) If the width correction value is >0, the current graphic size will be enlarged; for example, if the setting is 1mm, the actual output is 0.5 mm. At this case, the width correction value needs to be set to 50, and the enlargement will be doubled. Specific can be adjusted according to actual conditions.
2) If the width correction value is less than 0, the current graphic size will be reduced; for example, if the setting is 1mm, the actual output is 2 mm. At this case, the width correction value needs to be set to -50, which is doubled. Specific can be adjusted according to actual conditions.
3) Width correction value range: -100 ~ 100

4)  Width correction value +1, support long press;  Width correction value -1, support long press;
Touch action: The keyboard pops up and the user can enter custom data.

5、Central correction

Adjust the position of red light at the nozzle

Note:

1) Correction value>0, the red light moves to the left;
2) Correction value <0, the red light moves to the right;
3) Correction value range -10.0 ~ 10.0 mm;

4)  Correction value +1, support long press;  Correction value -1, support long press;
Touch action: pop-up keyboard, user can enter custom data.

6、Laser output delay time

Set the delay time of laser output after gas output

Note:

1) Parameter value range: 0~10000ms;

2) If the value is set to 0, the gas and laser will be output at the same time.

Touch action: pop-up keyboard, user can enter custom data.

7、Gas output closing delay time

Set how long after turning off the laser before turning off the gas blowing

Note:

1)Parameter value range: 0~10000ms;

2)If the value is set to 0, the gas and laser output will be turned off at the same time.

Touch action: pop-up keyboard, user can enter custom data.

8、Rise time

Set the time of the laser power rising from 0v to preset power

Note:

1) Parameter value range: 0~10000ms;
2) If the value is set to 0, the laser will be output at preset power

Touch action: pop-up keyboard, user can enter custom data.

9、Down time

Set the time of the laser power reducing from current power to 0v

Note:

1)Parameter value range: 0~10000ms;
2)If the value is set to 0, the laser output will be turned off

Touch action: pop-up keyboard, user can enter custom data.

10、PWM-Freq

Same with the PWM-Freq on the Main page

11、PWM-Duty

Same with the PWM-Duty on the Main page

12、Galvo speed unit switch

Switch the galvanometer speed unit to display Hz <-> mm/s

Note:

1) After switching, click Save to take effect

2) 

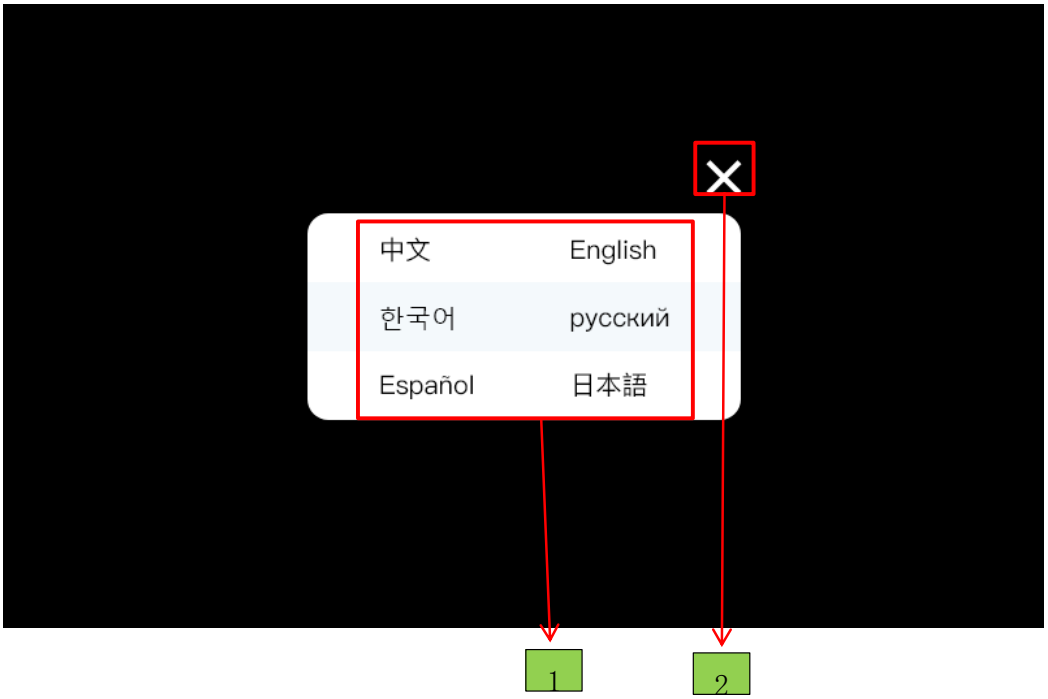
means the unit is mm/s, 

means the unit is Hz

Touch action: unit switch

13、Language selection

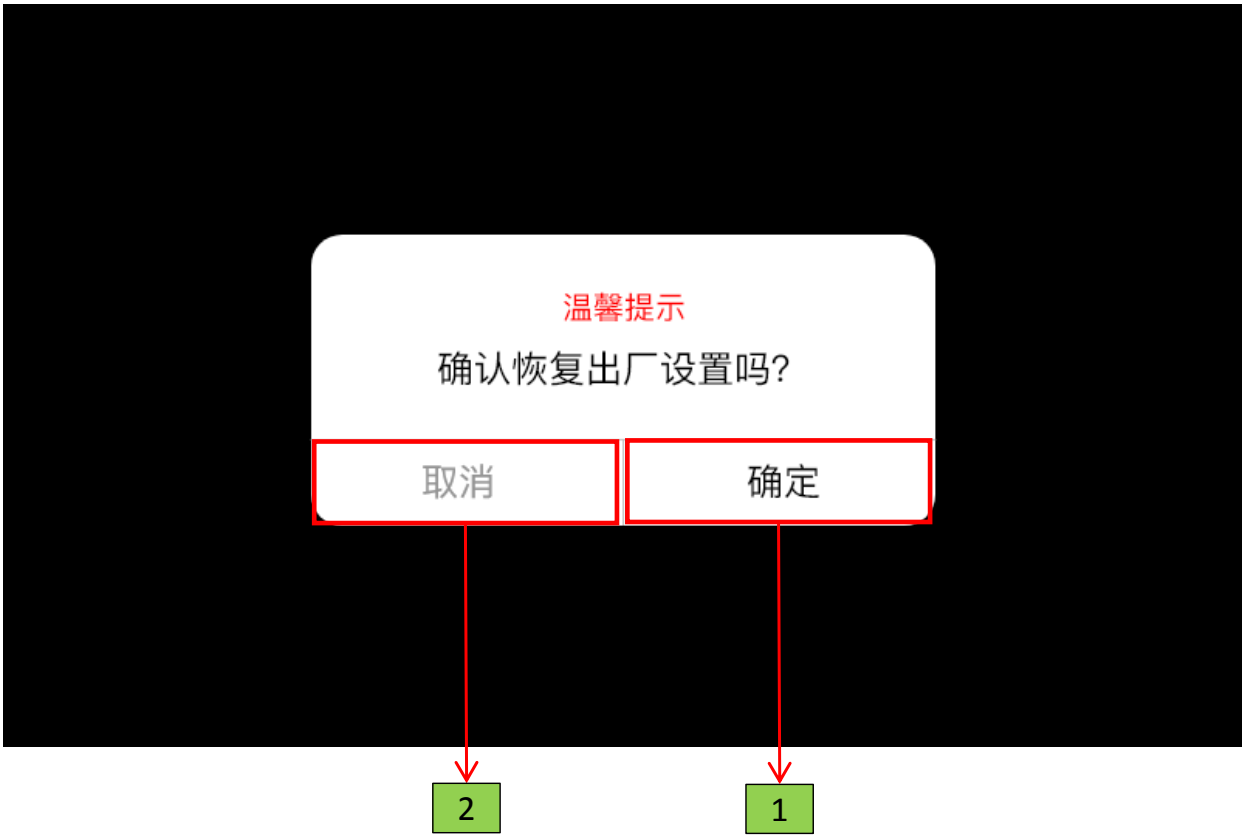
Language selection



Click "1" to select language，click "2" to jump to 【Advanced setting】

14、Reset

If you need to reset the parameters, please restore the factory parameters and click "OK"



1) Click OK

Page as below：

Waiting for the factory restoration to be completed, it will automatically jump to [Main Menu]

Note: During this process, it is strictly forbidden to cut off the power! ! !

2) Click "Cancel", the page jumps to [Advanced Settings]

15、Wire feeding delay time

Set the interval after the laser is emitted to start wire feeding.

Touch action: pop-up keyboard, user can enter custom data.

16、Wire feeding distance

Set the wire distance (if the wire feeding function is turned on, after the laser is stopped, it will perform the two actions of wire withdrawal-wire back and then close)

Parameter value range: 0~1000mm;
Touch action: pop-up keyboard, user can enter custom data.

17、Wire withdrawal distance

Set the wire withdrawal distance (if the wire feeding function is turned on, after the laser is stopped, it will perform the two actions of wire withdrawal-wire back and then close)

Parameter value range: 0~1000mm;
Touch action: pop-up keyboard, user can enter custom data.

18、Wire withdrawal speed

Execute the wire withdrawal action according to the set wire withdrawal speed

If the set unwinding distance is 100mm and the unwinding speed is 50mm/s, the entire unwinding action will take 2s to complete.
Touch action: the keyboard pops up, and the user can enter custom data

19、Spotting interval

The trigger time interval between each spotting

Parameter range: 0 ~ 6000ms；

Touch action: the keyboard pops up, and the user can enter custom data

20、Spotting time

The lasting time of each spotting.

Note:

Parameter range: 0~6000ms;
Touch action: the keyboard pops up, and the user can enter custom data

21、Number of Spotting

The total number of spotting needed

Note:

Parameter range: 0 ~ 128;

Touch action: the keyboard pops up, and the user can enter custom data

22、Back

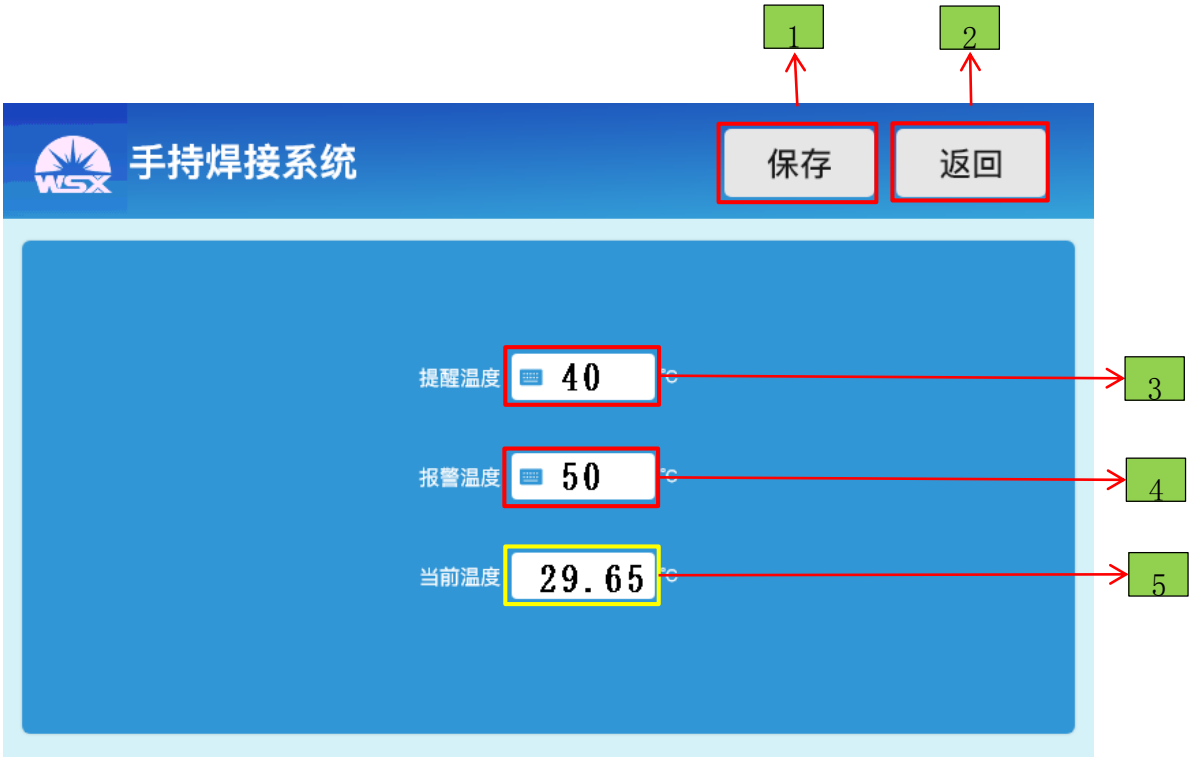
Click "Back" and the page jump to the 【Main Menu】

23、Save

Save the currently modified data

Please note: the red dot in the parameter box will disappear if saved successfully! ! If the red dot does not disappear, it means that there is an abnormality in the communication between the screen and the control board, and it needs to be repaired!

6.5 Temperature control setting



6.6 Temperature setting function description

1、Save

Save the currently modified data

Please note: the red dot in the parameter box will disappear if saved successfully! ! If the red dot does not disappear, it means that there is an abnormality in the communication between the screen and the control board, and it needs to be repaired!

2、Back

Back to main menu page

Touch action: Page jump to [Main menu]

3、Reminder temperature

Set the reminder temperature of the temperature control board (the temperature rises during continuous use, remind the user to pay attention)

Touch action: the keyboard pops up, and the user can enter custom data

4、Alarm temperature

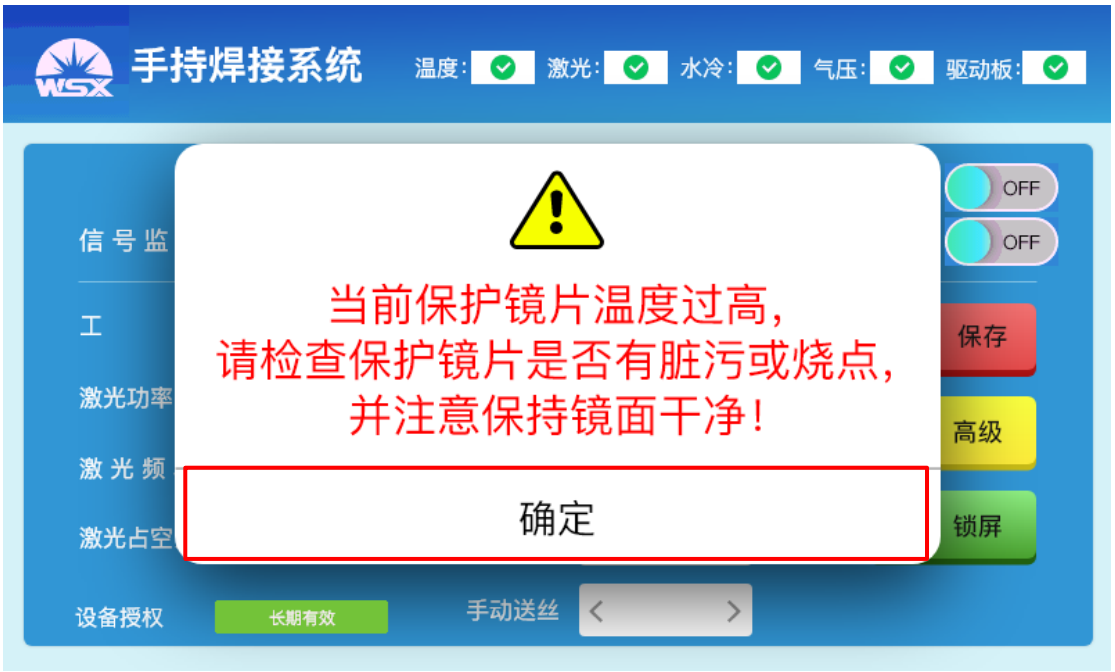
Set the alarm temperature of the temperature control board (Prevent the protective glass from burning out due to high temperature during continuous use)

Touch action: the keyboard pops up, and the user can enter custom data

5、Current temperature

Display the real-time temperature of the current temperature control board

6.7 High temperature reminder



Click "OK" to jump to the [Main Menu]

7 Use and maintenance

7.1 Precautions

Any parts installed in the laser head must be carefully dust-removed!

If the lens must be replaced, the related work must be carried out in a clean environment!

Any assembly or component replacement must be carried out in a clean environment!

Before removing the old lens, please prepare the new one. If there is no spare lens, it is recommended to purchase from our company! When the conditions are difficult to meet the requirements, apply a non-adhesive protective film to seal the opening after the lens is removed!

Minimize the exposure time of the laser head path to the air to prevent dust and dirt from entering!

After any safety or protection equipment is removed, it must be reinstalled before the equipment is operated or debugged.

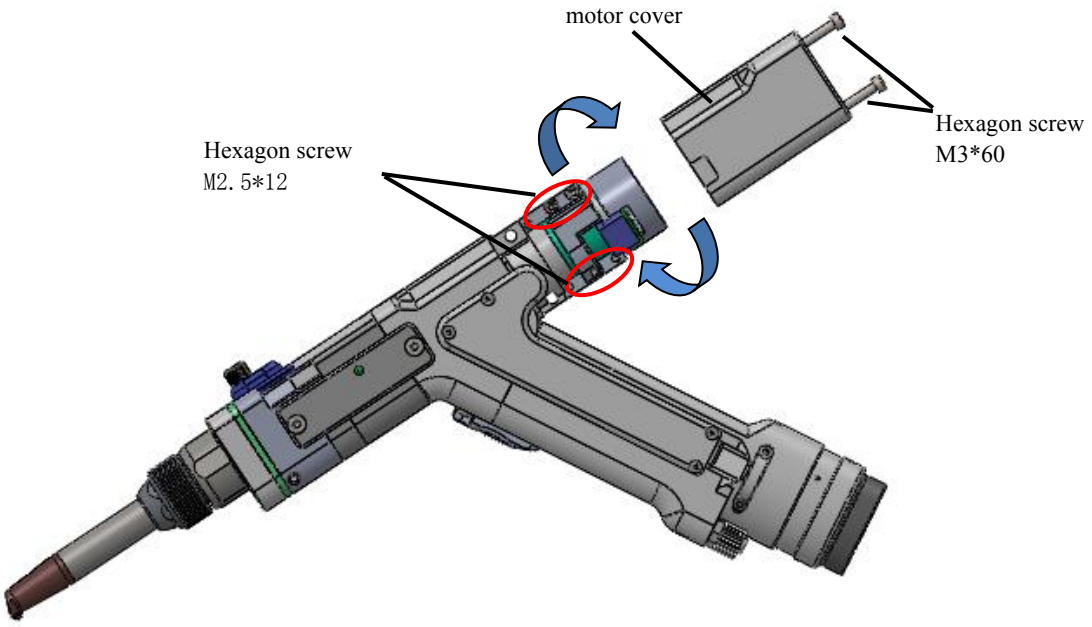
Check and confirm the equipment is in good condition.

7.2 Maintenance of QBH and fiber connectors

1. The connection between the QBH and the optical fiber connector is covered with adhesive paper to avoid dust from entering, which will increase the maintenance difficulty;
2. The cooling water pipe of the optical fiber connector is connected well and no water leaks. If the QBH accidentally enters water, please stop using it immediately and return Our company handles it.

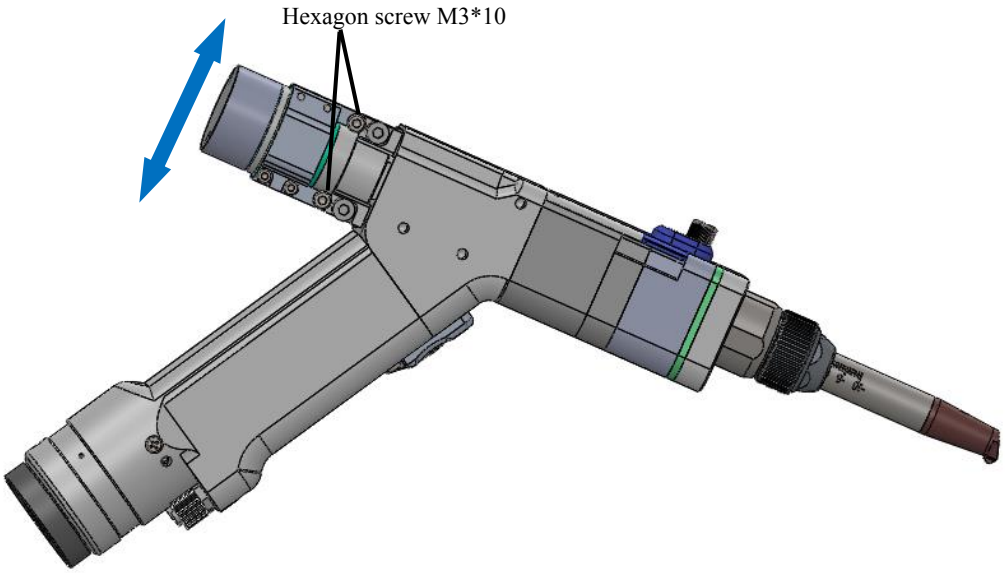
7.3 Polarization adjustment

7.3.1 Adjust left and right polarization



1)Take out the two M3×60 hexagon socket screws on the motor cover, and remove the motor cover;
2)Loosen 4 M2.5×12 hexagon socket head cap screws to twist the motor. The motor rotates "slightly" left and right, and the red light can be adjusted left and right, and the red light can be adjusted to the center of the copper nozzle.

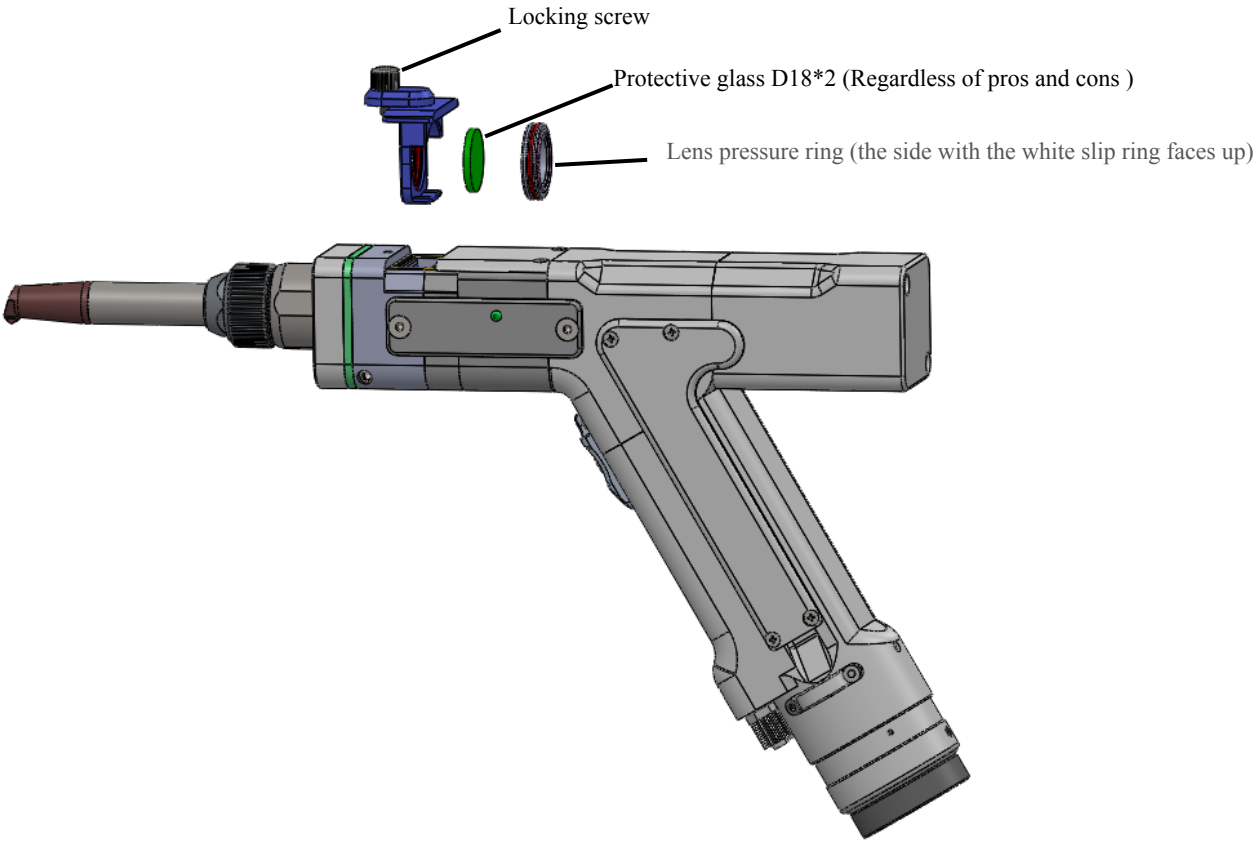
7.3.2 Adjust the up and down polarization



Loosen the two M3×10 hexagon socket screws on the reflector, and adjust the up and down deviation of the light spot according to the method shown in the figure.

7.4 Replace the protective glass

Specification of protective glass：D18*2



1)Loosen the screws and take out the protective window drawer assembly, and seal the drawer cavity with self-adhesive;

2)Take out the lens pressure ring (the side with the white slip ring is facing up)

3)Take out the protective glass;

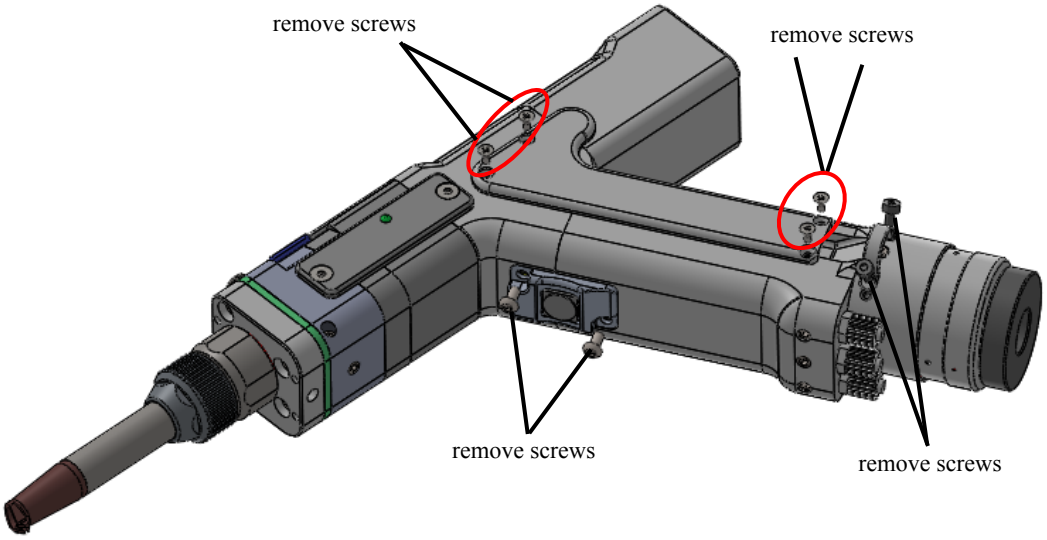
4)Put the new glass in the protective glass holder, and then press the lens pressure ring (with the white slip ring side up) on the glass. The protective glass should be just pressed into the groove of the lens pressure ring;

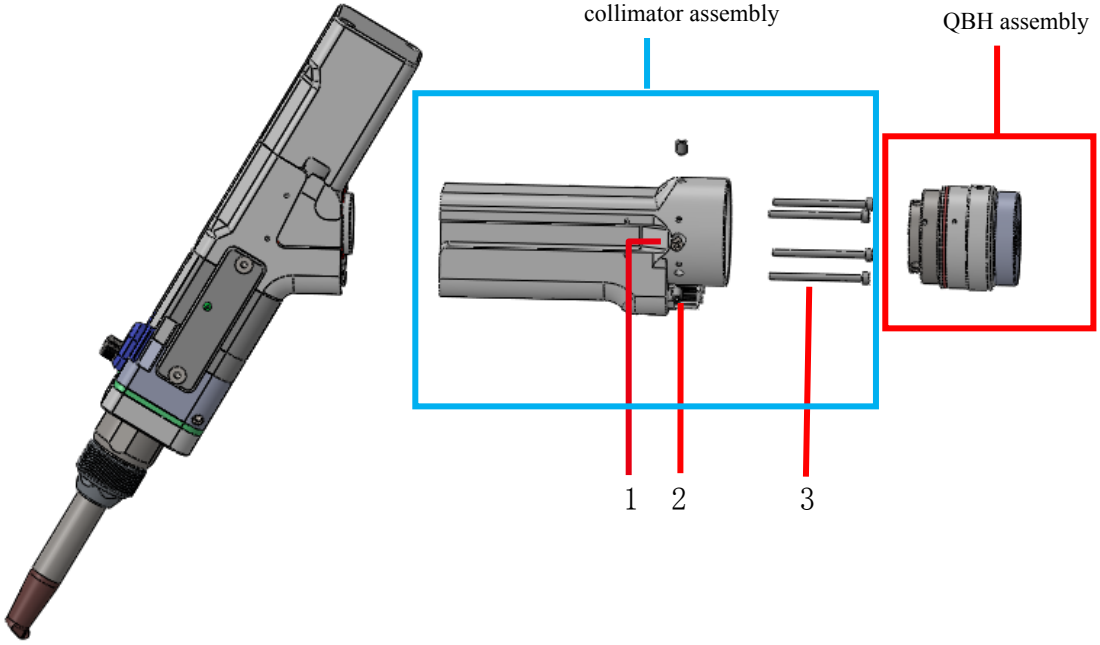
5）Put the protective glass drawer assembly back into the handheld welding head, and lock the screws.

7.5 Replace the collimator lens

Specification of collimator lens:D20*F50

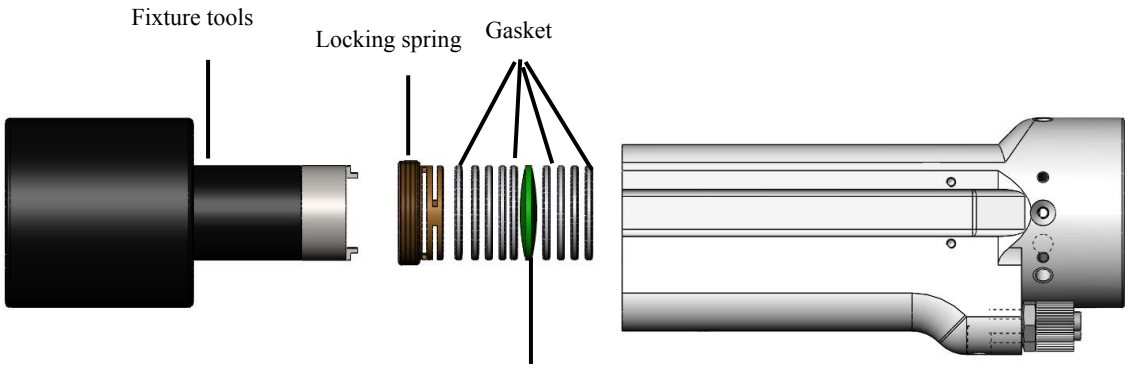
1）Remove the screws marked in the figure below;





2）Remove the two M2.5*8 hexagon socket flat head screws (No. 1) and three screws (No. 2) from the collimation assembly, and take out the QBH connector module;

3）Remove the four M2.5*35 hexagon socket head cap screws (No. 3) in the QBH conversion seat, separate the entire collimator assembly from the welding head, and quickly seal the reflective assembly with adhesive paper to prevent dust from entering .



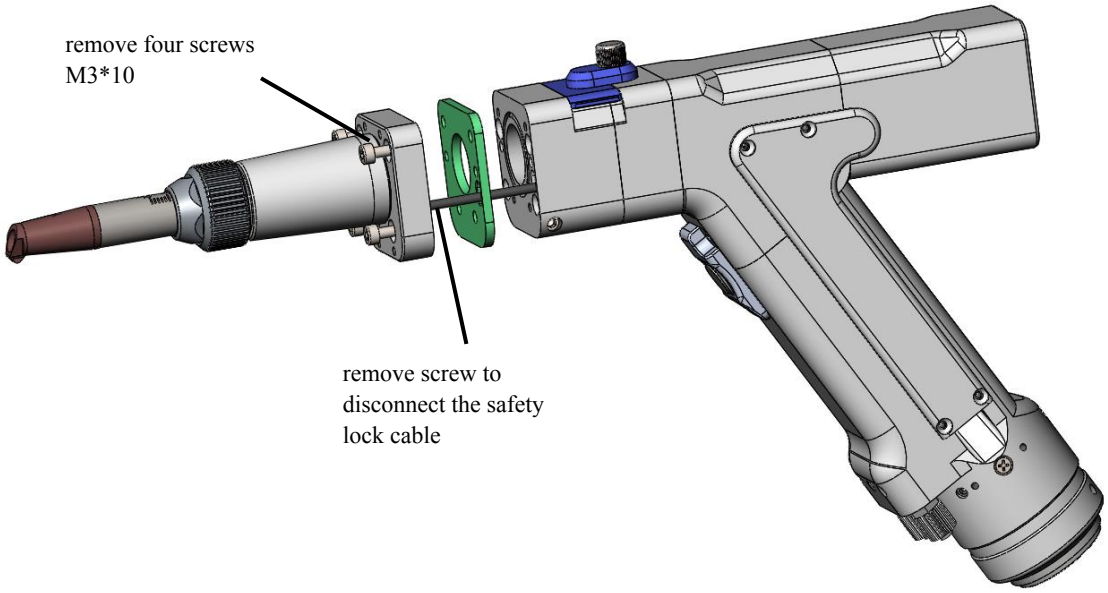
4) In a dust-free environment, use a fixture tool to take out the locking spring and record the thickness of the gaskets;

5)Take out the old lens and replace it with a new, clean collimating lens (the collimating lens does not distinguish the direction), then put in the gaskets, and lock it with the locking spring.

6）Then follow the steps to reversely install the welding head.

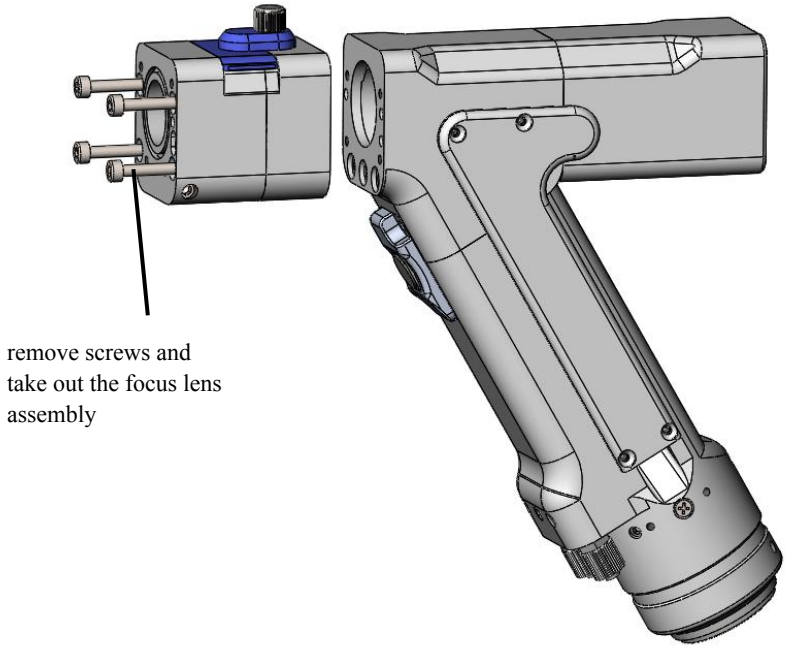
7.6 Replace the focus lens

Specification of focus lens: D20*F150

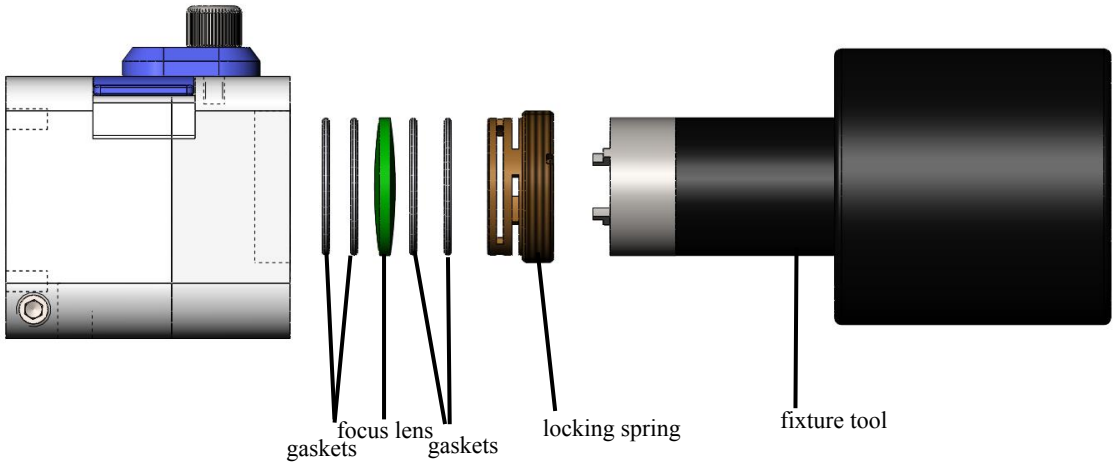


1)Remove the 4 M3*10 hexagon socket head cap screws shown in the figure above;

2)Remove the air seat assembly, and then take out the safety lock cable screw to disconnect it from the air seat assembly, and quickly seal the lens position with a sticker.



3）Remove the 4 hexagon socket head screws and take out the focus lens assembly;

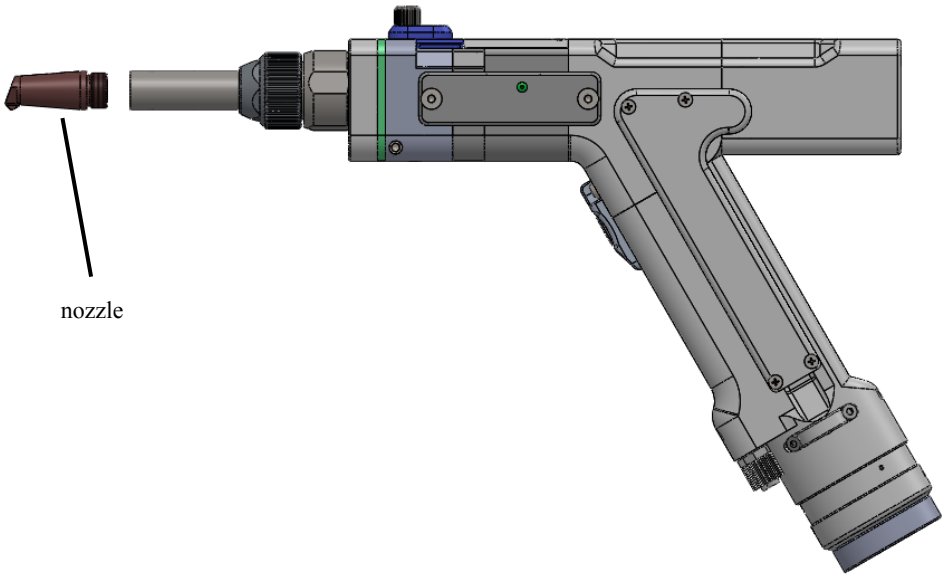


4）Take out the locking spring with a special fixture tool, take out the old lens and replace with a new, clean focusing lens, then put in the gaskets, and lock it with the locking spring;

Note: The convex side of the focusing lens D20*F150 faces the direction of the galvanometer motor.

5）Then follow the steps to reversely install the welding head.

7.7 Replace the nozzle



1)Remove the copper nozzle from the connecting pipe;

2)Tighten the needed copper nipple clockwise and install it on the connecting pipe.

7.8 Precautions for regular maintenance of welding head

1.Regularly check whether the protective glass is contaminated, and replace it in time (daily check) if contaminated;

4.3. Regularly check whether the QBH connector is loose (check every 3 days);

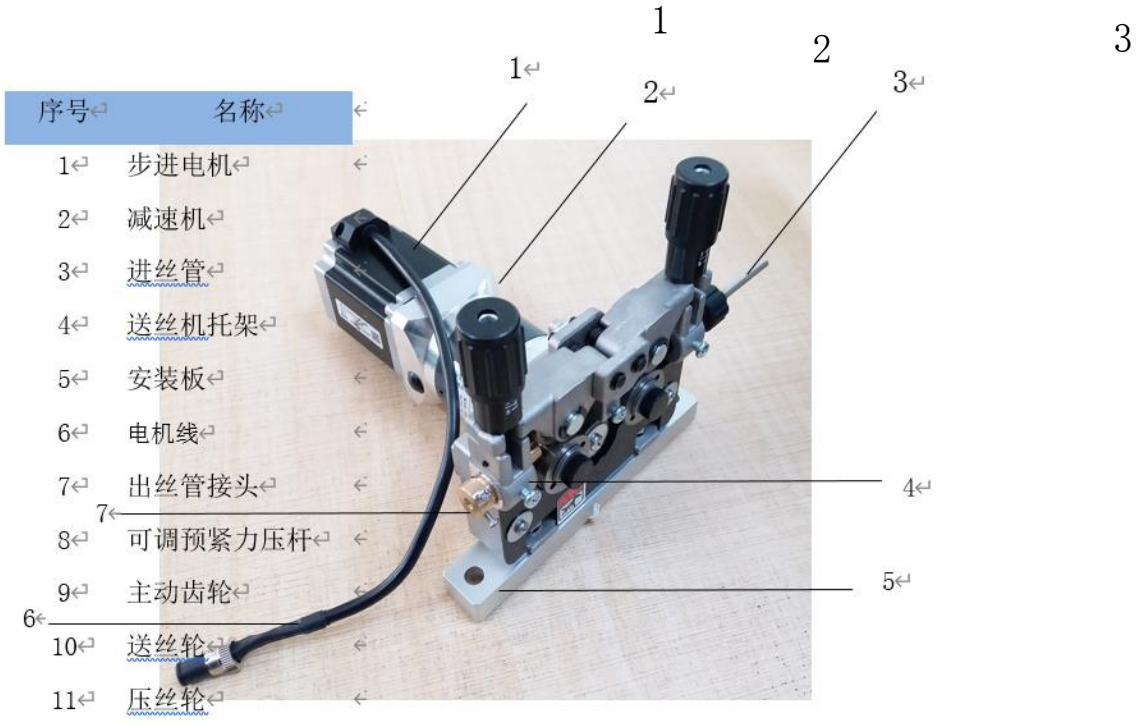
6 5.4. Do not allow water to enter the connecting line, pay attention to protect the interface part; if the galvanometer is abnormal, check whether there is water droplets in the interface (such as an aviation plug).

7.9 Common problems and solutions

No.	problems	reasons	solutions	notes
1	The power indicator does not light up	24V power supply reversed	Please check if the 24V power cable is wired properly	
		Poor contact of 24V power supply	Check whether the wiring is good	
2	No laser	Safety lock-welding platform wire is not connected or has poor contact	Put the safety lock-wire and the welding platform in good contact with the clamp	
		The laser is not connected or the connection of the laser line is poor	Please connect the control wire of the laser with a shielded wire and check whether the laser is in good condition	
		The power voltage is abnormal	select laser power 0-10V soft button	
3	The galvanometer motor does not swing	The galvanometer control is not turned on	Turn on the galvanometer motor control in the main interface	
		The motor wire is not well connected	Check and connect the motor wire	

8 送丝机

8.1 送丝机结构



序号	名称
1	步进电机
2	减速机
3	进丝管
4	送丝机托架
5	安装板
6	电机线
7	出丝管接头
8	可调预紧力压杆
9	主动齿轮
10	送丝轮
11	压丝轮

8.2 主要功能介绍

8.2.1 设计与功能

1. 此送丝机是一款自动驱动的机械化送丝装置。
2. 造型轻便，操作简单。
3. 主要用于激光手持焊自动送丝。
4. 系统采用微电脑控制，步进减速电机传动，送丝精度高，重复性好。
5. 可传送规格0.8mm和1.0mm的钢丝和铜丝。

8.2.2 工作原理

送丝机一般有控制部分提供参数设置，驱动部份在控制部份的控制下进行送丝驱动，出丝嘴部份将焊丝送到焊枪位置。

8.2.3 技术参数

电机类型：步进电机　　送丝速度： 0-80mm/min

送丝长度：5米　　送丝直径：0.8mm,1.0mm

丝盘最大直径：200mm

8.3 安装与连接

8.3.1 安全须知

任何维修或是需要专业知识的事故调查工作必需由受过专业训练的人员进行！ 受训专业人员必需接受过安全培训并了解可能发生的危险和熟悉应对危险的安 全措施。除法律法规规定的安全规定外，生产厂家指明的安全规定也必须得以 遵守。 需在使用前了解的相关安全设备的知识及拥有必要的安全设备。

8.4 注意事项

在设备维护及修理期间，必需关闭电源并防止在此期间被打开。

危险 - 防止旋转运动部件伤人！

1. 请勿将手指、头发、衣服等靠近送丝轮等旋转部件。
2. 送进焊丝时，请勿将焊枪端部靠近眼睛、脸及身体，以免焊丝伤人。

当心高温！

1. 电机运转产生热量，请勿用手直接接触。
2. 焊丝熔化产生高温，请勿用手直接接触。

8.4.1 安装前准备

准备工具

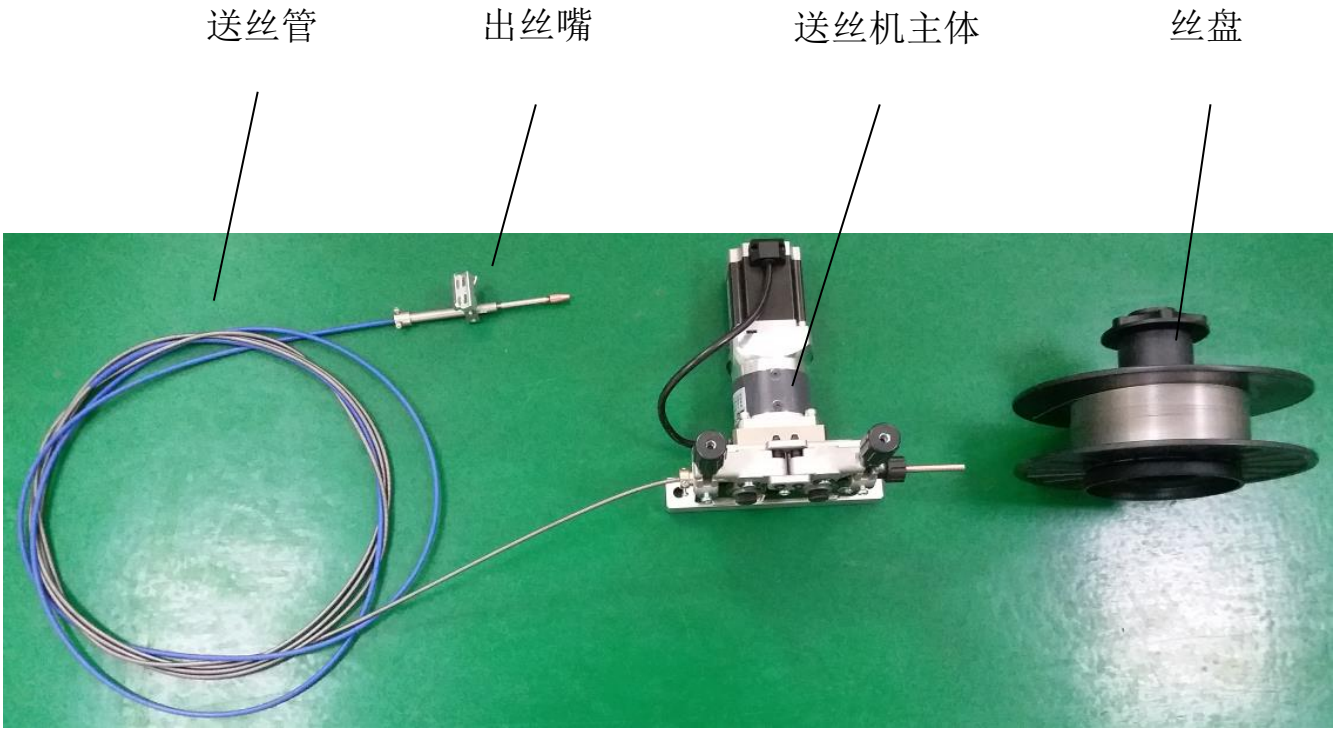
1. 公制内六角把手一套；
2. 大号十字螺丝刀一把；
3. 防护手套一双。

安装人员准备

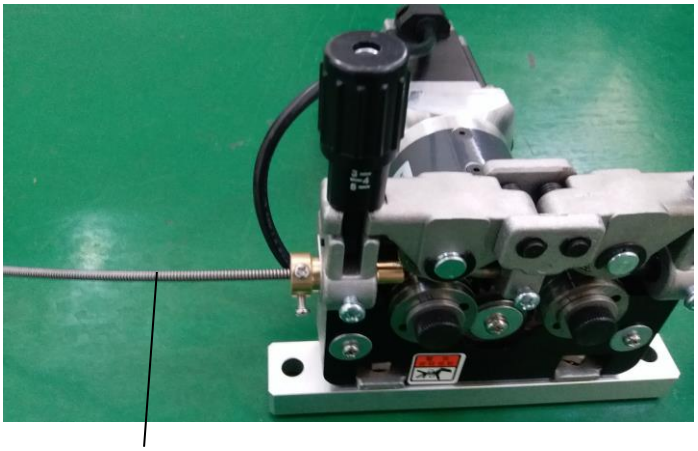
1. 仔细阅读本手册；
2. 戴上防护手套。

8.4.2 送丝机连接

第一步：将送丝机主体、出丝嘴用送丝管连接起来，并安装好合适的丝盘，如下图。



有保护膜



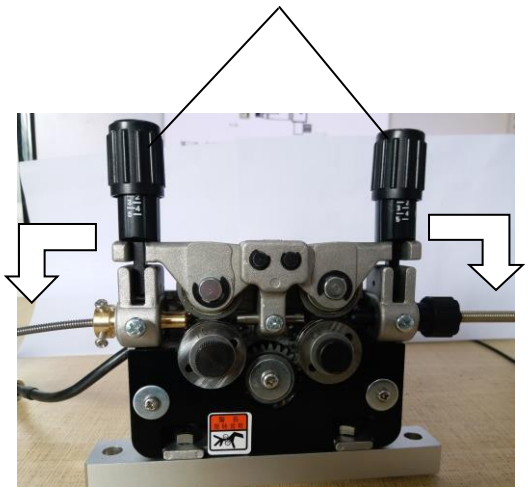
没有保护膜

注意：

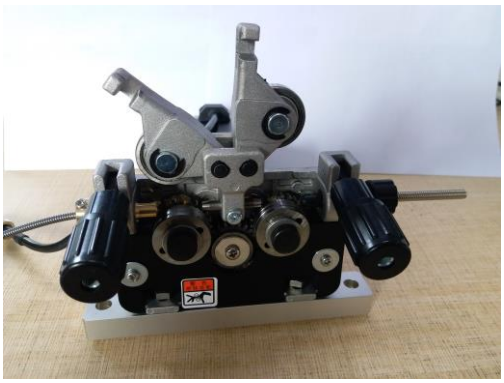
1. 将送丝管有保护膜的一头连接到出丝嘴，没有保护膜的另一头连接到送丝机。
2. 焊丝连接使用时必须保证焊丝顺畅，不打结。

第二步：根据焊丝直径安装合适的送丝轮。

可调预紧力压杆



压杆松开前



压杆松开后

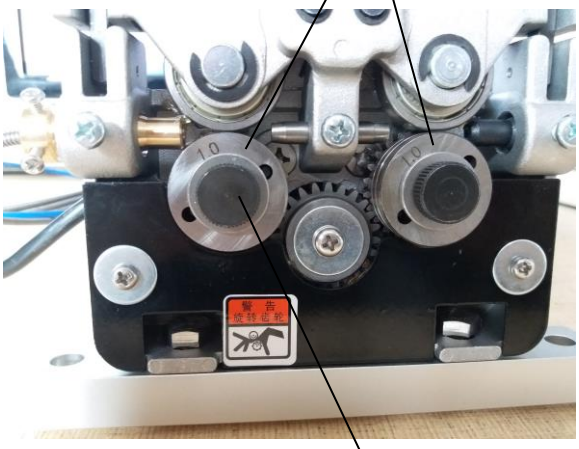
安装送丝轮的操作步骤：

1，先松开两个可调预紧力压杆，如上图

2，然后松开两个螺丝，把送丝轮取下；

3，换上合适的送丝轮，把对应规格型号送丝槽的那一面

送丝轮



螺丝

送丝轮

规格型号

送丝槽

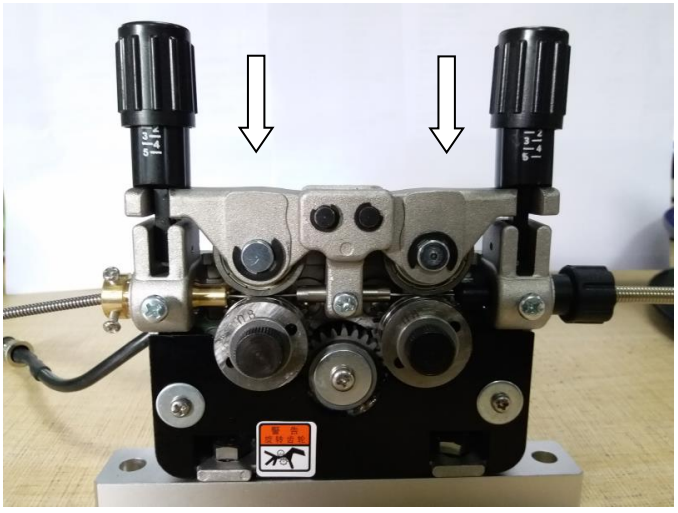
第三步：穿丝，连接丝盘。

穿丝操作步骤：

1，先松开两个可调预紧力压杆，弹开压丝轮，如上图

2，从丝盘抽出焊丝，按照图示方向从丝管插入焊丝，穿过中间导丝管，从出丝管接头方向出。

3，将焊丝压入送丝轮的送丝槽内，按下压丝轮，锁上可调预紧力压杆，把焊丝压紧，如右图。

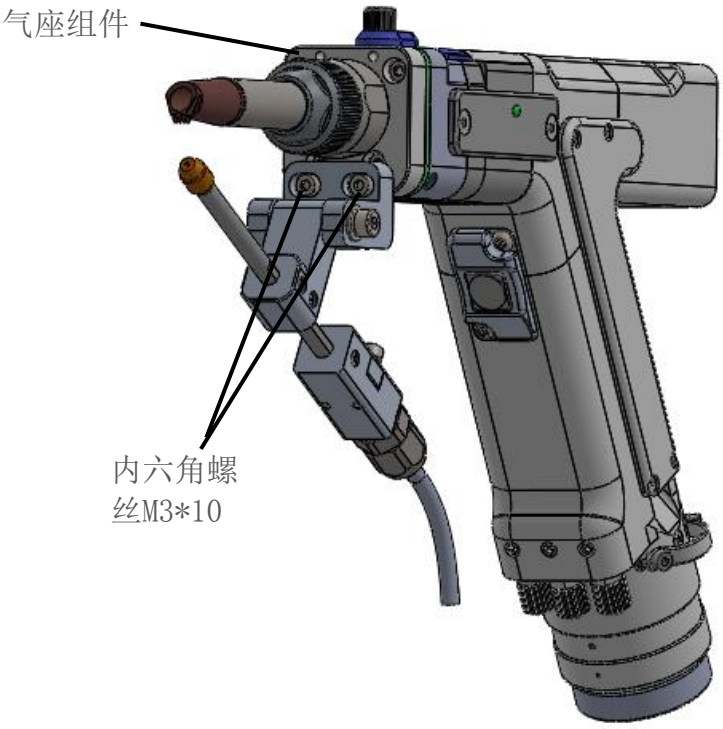


4，将电源插头接好，打开电源开关，将送丝速度调节到最快，点

8.4.3出丝嘴与手持焊连接

1，先用两个M3*10内六角螺丝把出丝嘴组件连接在手持焊的气座上，不用锁紧；

2，左右调整出丝嘴组件，使焊丝在红光中心，然后锁紧螺丝。



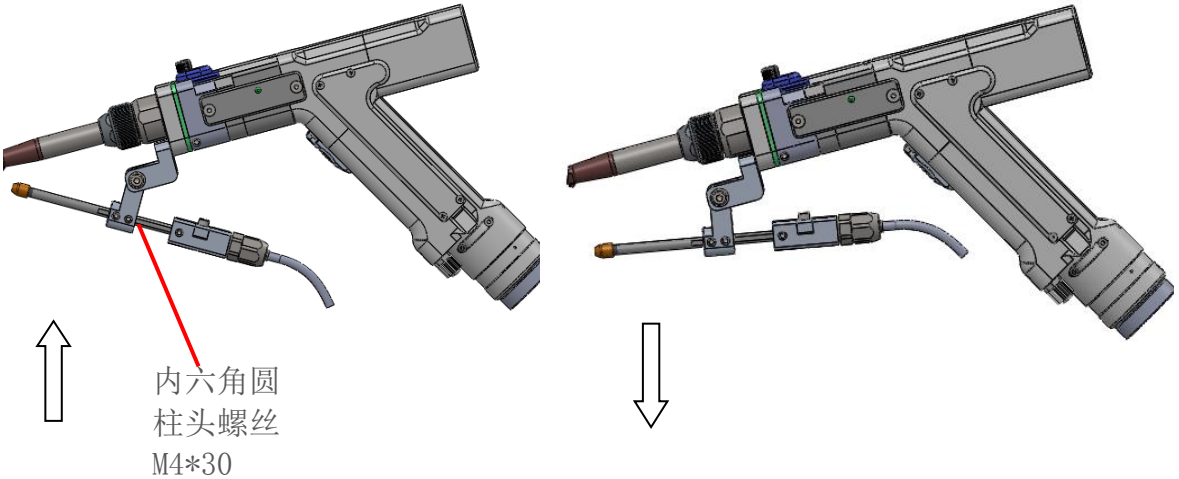
8.5 调节

8.5.1出丝嘴角度和长度调节

角度调节：

松开内六角螺丝，

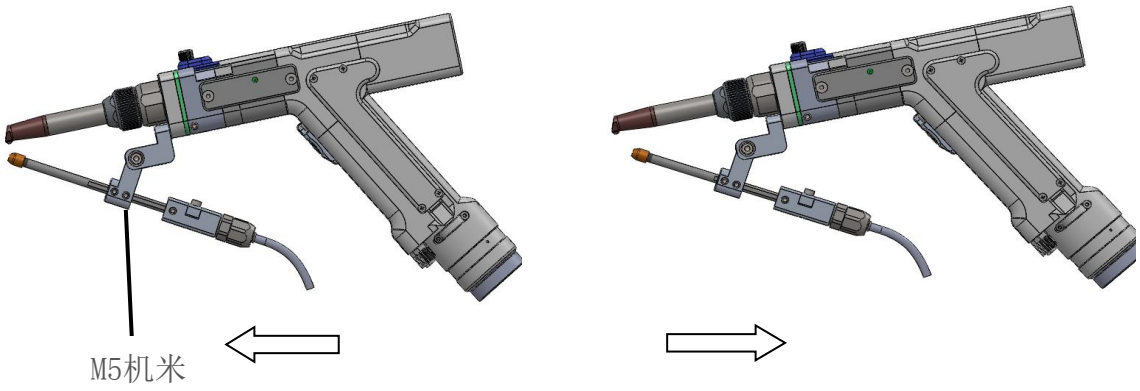
可以上下调整丝嘴



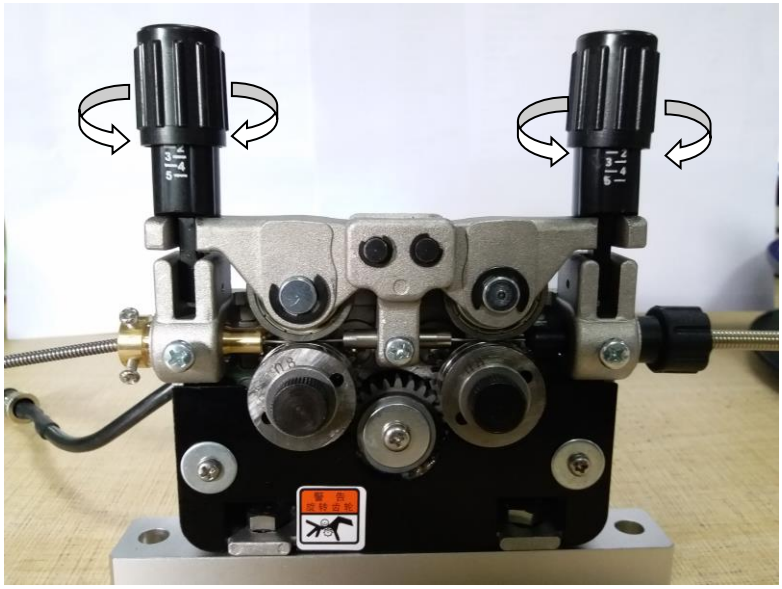
长度调节：

松开M5机米，可以

前后调整丝嘴长



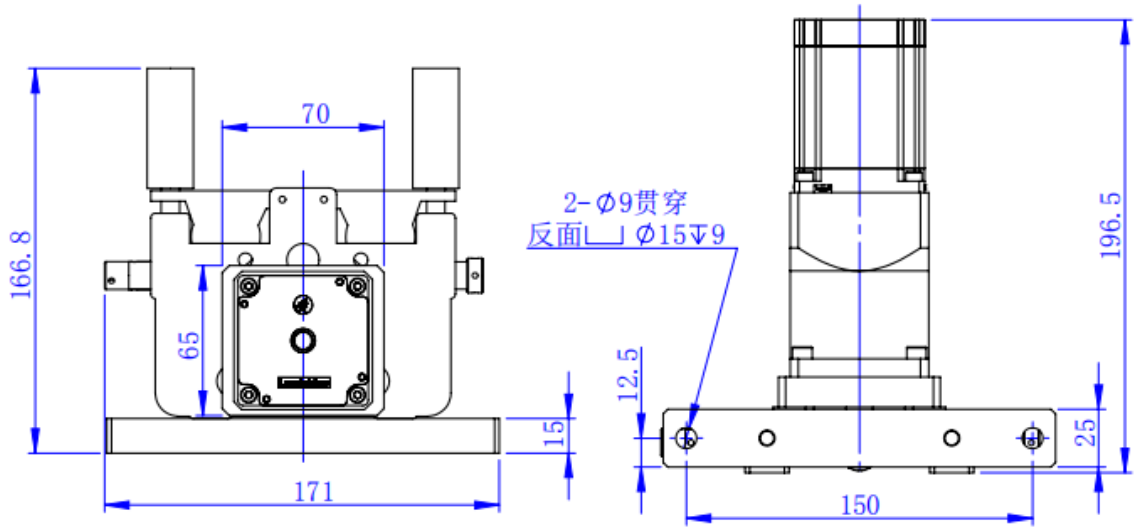
8.5.2压紧力调节



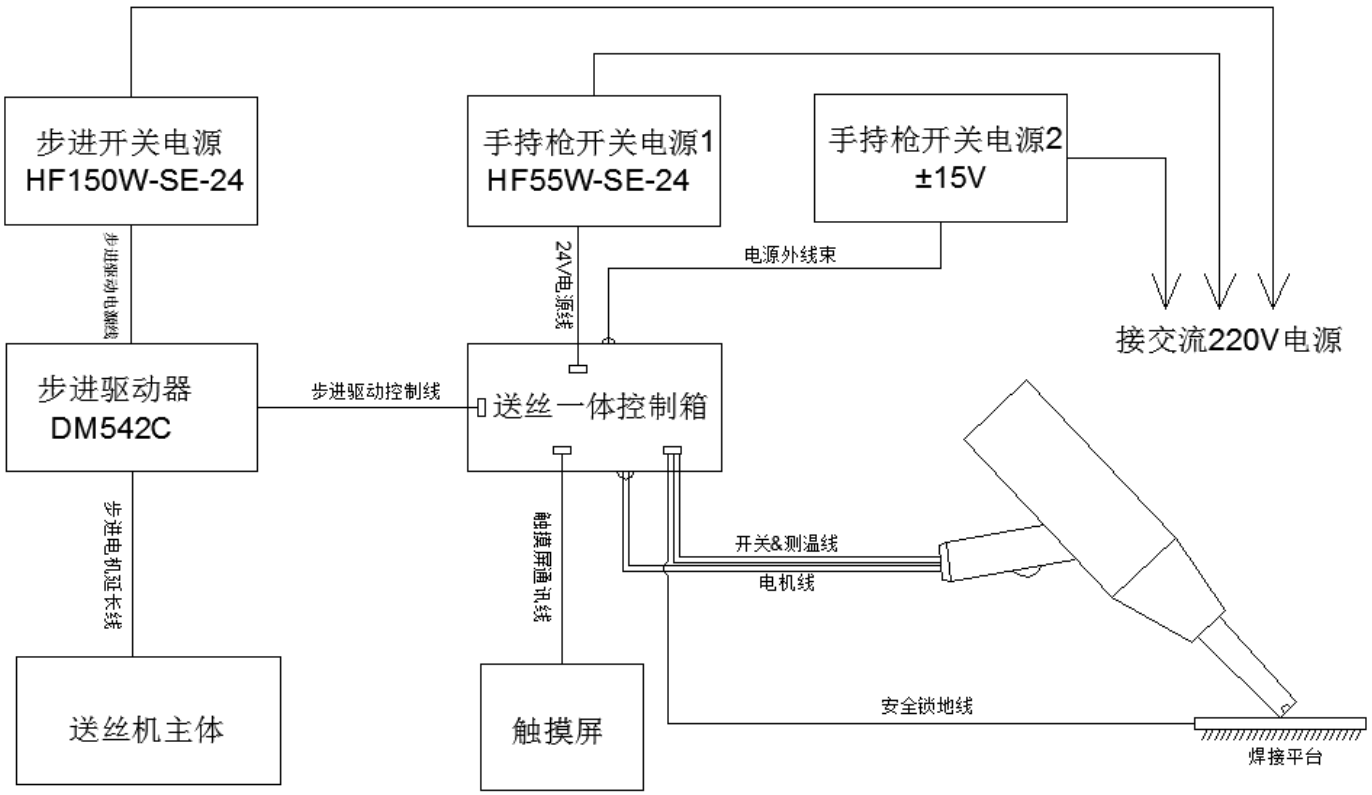
调节方法：

根据送丝的松紧情况，左右拧动两个可调预紧力压杆转动套，直到夹紧力合适。

8.6 外型与安装尺寸



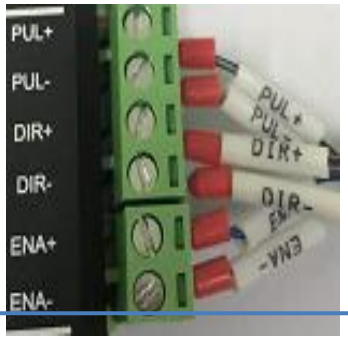
8.7　手持枪、送丝机接线示意图

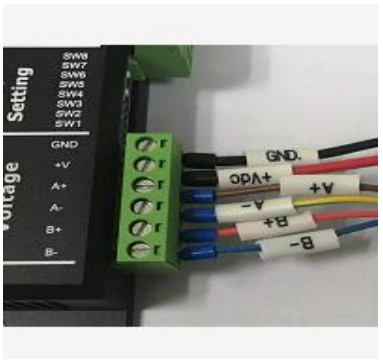


接线图片展示：

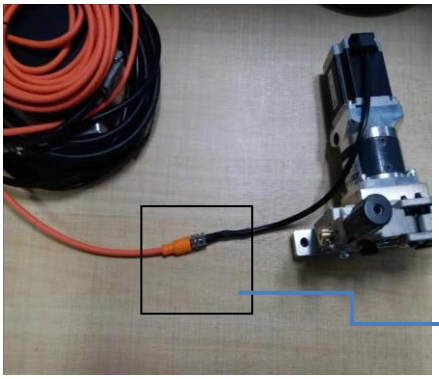
标示1.步进开关电源及接线图

标示2. 步进驱动器及接线图

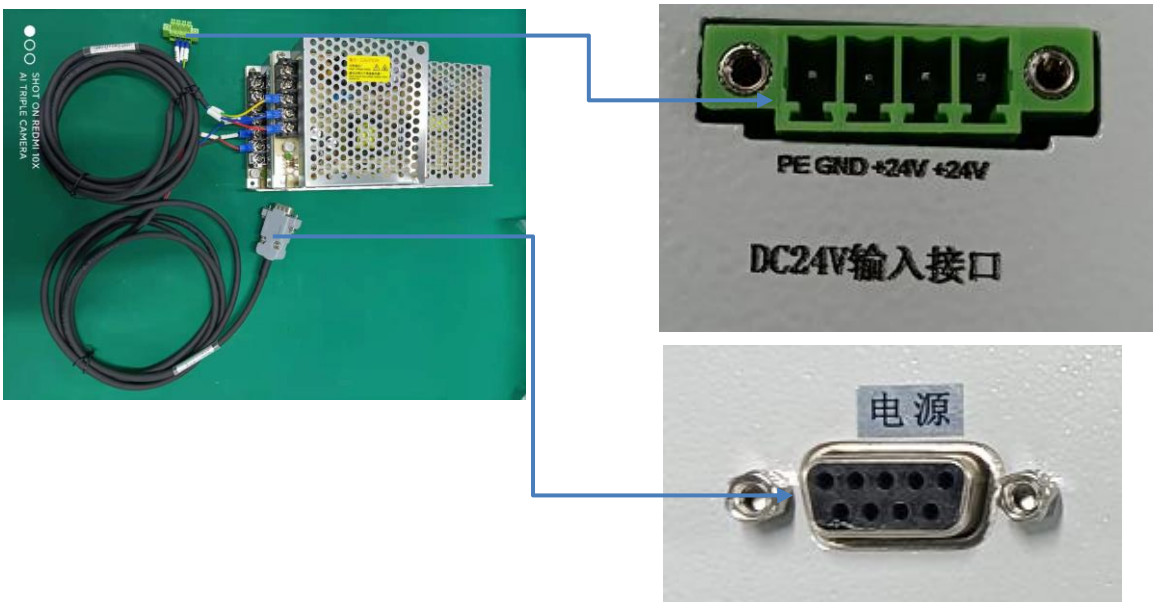




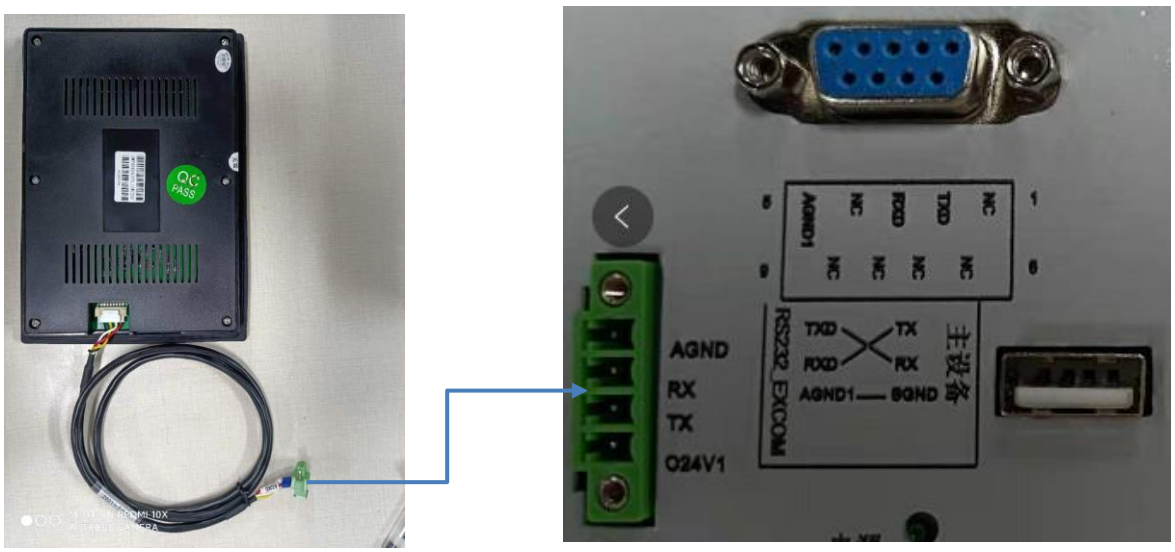
标示3. 送丝机主体及连线图



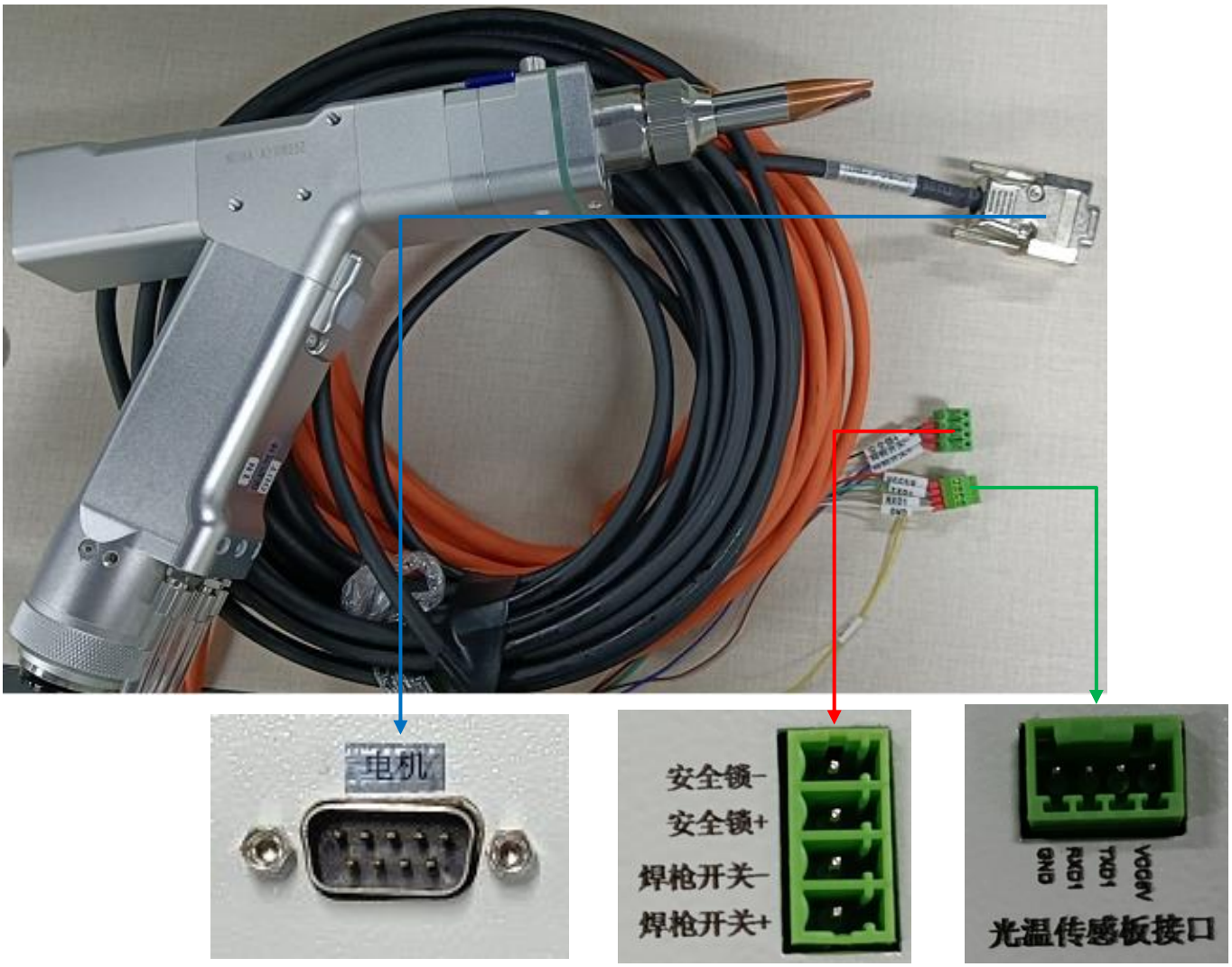
标示4. 一体箱开关电源、电源外线束及接线图



标示5. 触摸屏及通讯线和控制箱对插图



标示6. 手持枪及开关&安全锁延长线、电机延长线、对接插头等


电机
安全锁-
安全锁+
焊枪开关-
焊枪开关+
GND
RXD1
TXD1
VCC5V
光温传感板接口

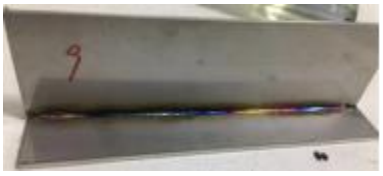
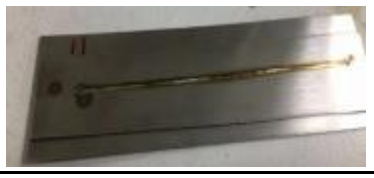
9　手持焊接头焊接工艺参考表

WSX ND18手持激光焊接头工艺测试

测试环境：室温30℃，激光头-ND18手持激光焊接头，激光器-IPG-700激光器；

测试条件：激光器自带风冷，焊接头冷却水流量1.2L/min，水温度28℃；

材质	激光器模式 CW/QCW	板厚（mm）	焊接工艺					图片	焊接效果
			功率（0-10V）	摆动速度（mm/s）	摆动直径（mm）	焊速（预估）（mm/s）	保护气压（bar）		
不锈钢	CW	0.5	5	300	1	20	0.3	拼焊 	0.5mm不锈钢拼焊，焊接功率在350瓦时板材会产生热量，因为板材薄导致板材变形，但焊接效果良好。
		1	9	300	1.5	20	0.3	拼焊 	1mm不锈钢拼焊，焊接功率在600多瓦时板材仍然会产生热量，因为激光器穿透力强，1mm板材已焊透没有产生形变，焊接效果良好。
		1.2	9	300	1.5	18	0.3	拼焊 	1.2mm不锈钢与1.0不锈钢厚度不分上下，效果相同。
		1.5	10	300	1.5	15	0.3	拼焊 	1.5不锈钢拼焊，仍然可以焊透，但是在700瓦功率焊接温度过高，材料表面有点发黑，但焊接效果很好。
		2	10	300	1.5	10	0.3	拼焊 	2mm不锈钢拼焊，功率为700瓦情况下焊熔深刚刚达到2mm，由于速度慢手持控制速度没有快那么稳定导致焊接效果达不到焊接速度快的效果好。
		0.5	5	300	1	20	0.3	角焊	0.5mm不锈钢角焊，功率为350瓦时熔深较好，表面焊白、焊透，无变形。

									
		0.9	8	300	1	20	0.3	角焊 	0.9mm不锈钢角焊，功率为500多瓦焊接时功率较大，焊出来烟较多温度过高，表面焊缝有点过黑，效果良好。
		1.2	8	300	1.5	15	37	角焊 	1.2mm不锈钢与0.9mm不锈钢效果相同。
		1.5	10	300	1.5	10	0.3	角焊 	1.5mm不锈钢角焊，功率为700瓦熔深较好，无变形。
		2	10	300	1.5	10	0.3	角焊 	2mm不锈钢角焊，功率为700瓦焊接因输入热量不够未能焊透材料，表面焊接效果很好。
		0.5	7	300	1	20	0.3	穿透焊 	0.5/0.5不锈钢穿透焊，功率为400多瓦焊接背面已焊透，材料薄导致形变较大。
		1	10	300	1.5	8	0.3	穿透焊 	1mm/1mm不锈钢穿透焊，未能将2块1mm的不锈钢焊透，效果很好。
碳钢	CW	1	7	300	1.5	20	0.3	拼焊 	1mm碳钢拼焊，焊接功率在400多瓦条件下效果很好，表面能吹白。
		1.5	9	300	1.5	20	0.3	拼焊 	1.5mm碳钢拼焊，焊接功率为630瓦熔深较好背后已焊透，但表面发黑。
		2	10	300	1.5	10	0.3	拼焊 	在满功率情况下焊接2mm碳钢未能焊透，无形变，表面发黑。效果良好

		0.8	8	300	1	20	0.3	角焊 	0.8㎜碳钢角焊，功率为640瓦，无变形，无发黑，穿透焊。
		1.5	10	300	1	15	0.3	角焊 	1.5㎜碳钢角焊，用满功率焊接效果良好，但表面有发黑，无穿透。
		2	10	300	1.5	10	38 0.3	角焊 	2㎜碳钢角焊，因板材过于厚未能焊透。
		0.5	10	300	1.5	10	0.3	穿透焊 	0.5与0.5叠焊，满功率焊接时可以焊透，效果良好
		1.5	10	300	1.5	10	0.3	穿透焊 	1.5与1.5叠焊，焊接效果可以，但是无法焊透，表面发黑。

备注：本次试用的是700W CW激光器，连续模式700W的激光功率，连续模式下焊道光亮平滑， 穿透力强 ，焊点重叠率低，焊接时飞溅少， 但IPG激光器与其他激光器相比较感觉功率控制更加精确，光斑的功率分布更加均匀。焊接过程更稳定，且IPG激光器焊接熔深更大，焊接效果更好。而且本激光器是风冷结构，用于手持焊接更省心、省力、安装方便快捷。

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