Product Description
SUP33T (version V1.1)

Wuxi Super Laser Technology Co.Ltd

Catalogs

Copyright Statement

update a record

releases	Updates	timing	codifiers
V1.0	first edition	25.5.23	Liu Chen
V1.1	Change V7.2 to the standard version	25.8.8	Wang Hui

I. Precautions

This product is an accessory for laser processing equipment and is used in the field of metal material processing. According to the relevant regulations, this product complies with the basic safety standards for all types of handheld, movable and fixed electrical products for indoor and outdoor use. According to the actual demand, it is recommended to set up an operation area of 2~10 square meters for each product (indoor height of 3 meters or more is recommended).

Warning! Please read all safety warnings, instructions, illustrations, specifications, and everything else in this manual. Failure to follow all instructions below may result in electric shock, fire or various other serious injuries! This product is intended for use in specialized industrial professional areas only and must be used by professionals! It must not be used by persons who are not professionally qualified!

1.1 Transportation and storage requirements

The handheld laser welder shall be able to operate properly under the following environmental conditions.

(1)Ambient air temperature range:

During transportation and storage: - 25℃ to +55℃.

(2)Relative air humidity:

Not more than 70 % at 40℃;

Not more than 90 % at 20℃.

(3)The surrounding air does not contain more than the normal amount of dust, acid, corrosive gases or substances, etc., with the exception of those substances produced as a result of the welding process.

(4)No significant vibration or shock.

1.2 Description of possible hazards

1.2.1 Machine hazards

①Entrapment or other secondary hazards caused by fastening structures.

②Smash injuries or other secondary hazards caused by falling equipment.

1.2.2 Electrical hazards

①Electrocution or other secondary hazards caused by leakage of power from equipment.

②Electrocution or other secondary hazards caused by static electricity generated by equipment operation.

1.2.3 Thermal hazards

①Heat stroke, dehydration or other secondary hazards caused by the large amount of heat

generated by laser processing.

②High-temperature materials, residues, and splashes from laser processing cause burns to people, environmental fires, or other secondary hazards.

1.2.4 Radiation hazards

①Skin damage, retinal damage or other secondary hazards to personnel caused by direct laser light or secondary irradiation after reflection.

②Laser energy produces electrolytic plasma hazards or other secondary hazards.

③Material decomposition caused by laser irradiation, secondary radiation or other secondary hazards caused by stimulated radiation.

1.2.5 External interference hazards

Abnormal operation of the product triggered by external factors may result in equipment failure leading to a hazardous condition.

The external environment refers:

①Temperature

②Humidity

③External shock/vibration

④Vapors, dust or gases in the environment

⑤Electromagnetic interference

⑥Raw power interruption/fluctuation

⑦Lightning strikes

⑧Insufficient hardware/software compatibility or integrity

⑨External communication does not comply with the communication protocol.

1.2.6 Restricted space hazards

Possible hazards associated with the use of hand-held laser processing equipment in confined spaces:

①Increase in the concentration of harmful substances in the space

②High concentration of process gas (argon, nitrogen, etc.) in the space

③Hypoxia

④Current enhancement

⑤Increase in temperature

⑥Radiation hazards caused by direct or reflected laser light or diffuse reflection.

1.2.7 Work-at-height hazards

①Falling object hazards.

②User fall hazard.

1.3 Preventive measures

In response to the above hazards, and in order to ensure safe production and normal operation of the product, the following safety signs are posted on the entire product, clearly

informing all personnel who use, maintain, and are in close proximity to the product to be aware of the following safety matters and to be required to take the following safety measures.

Warning! Please read all safety warnings, instructions, illustrations, specifications, and everything else in this manual. Failure to follow all of the following instructions may result in electric shock, fire, or various other serious injuries!

1.3.1 Production operating environment

①Product use should be divided into dedicated laser welding areas.

②Flammable and explosive materials should be prohibited around the product to avoid safety hazards.

③The product should avoid exposure to non-good weather conditions such as fog, high winds, lightning, rain, snow, hail, etc. when working outdoors.

④Products should be well ventilated and have good visibility (daylight or light) when working indoors.

⑤Dust, acid, alkali and corrosive gases in the working environment of the product should not exceed the normal level.

⑥The temperature range of the working environment of the product: - 10~50℃, humidity range ≤70%.

⑦The working environment of the product should avoid obvious vibration and shock.

1.3.2 Engineering protection measures

①The periphery of the laser welding area should be equipped with an isolated protective fence, which should be able to withstand a certain amount of laser energy and prevent the laser from irradiating outside the area.

②Other personnel should not enter the laser welding area without authorization from the operator.

③This product adopts 220V AC power supply, the applicable range is 220V±5% AC 50/60Hz, the power supply voltage should be stable without shock. Please pay attention to the safety of electricity to avoid electric shock hazard.

④In order to ensure the normal operation of the product and to avoid static damage and product leakage, the product should be safely grounded, i.e., the easily conductive parts should be connected to the protective (grounding) conductor in the fixed wiring of the product, so that the easily accessible conductive parts will not become electrically charged even when the basic insulation fails; depending on the situation, additional safety measures (e.g., double insulation or reinforced insulation), or separate grounding may be applied;

⑤There must be an emergency stop switch control device within 2 meters of the operator's work area centered on the individual.

1.3.3 Personal protective measures

Warning! The operator must be a professional who, in addition to being familiar with this product and the associated welding system, is also familiar with the properties of the materials being processed, with the possible side effects, and is capable of assessing the health risks and ensuring effective preventive measures.

①Individuals should wear professional laser protective clothing and gloves.

②Individuals should wear laser protective eyewear and masks with corresponding power and wavelength.

1.3.4 Product maintenance protection measures

①When replacing wearing parts, make sure the product is powered off to avoid light out.

②The control box of this product does not contain accessories that need to be operated by the user, for any installation, maintenance and dismantling of this product should be carried out in the case of power failure at the designated maintenance point, please contact your local dealer.

1.3.5 Other considerations

①Warning! The product is adapted to lasers with wavelengths of 1080nm and its neighborhood, this band is invisible light, and its radiation is difficult to detect before it produces a direct effect, so special attention is required! The operator must wear all protection, the working area must be protected as required, and the working area must not be entered by any other personnel!

②The instantaneous output energy of the laser is very high, so do not point the light outlet toward people or other objects when working or placing it or when it is idle.

③Class 4 lasers can indirectly irradiate the skin and eyes due to diffuse reflection of the material even if they do not directly irradiate the skin and eyes, in which case irreversible damage can still occur. The operator must wear protective equipment such as eyeglasses and protective clothing.

④Specular reflection occurs when the laser is directed to a smooth surface, and is particularly noticeable when processing highly reflective materials such as copper and aluminum. The angle of reflection may also change due to changes in the melt pool while processing the material. The operator should have a good understanding of the possible reflection angles to avoid laser reflection hazards to personnel and equipment.

⑤The gas around the molten pool forms an electrolytic plasma when irradiated by a high-energy laser. The splash waste and exhaust gases generated by the laser action on the material can also be hazardous to personnel. The operator must wear protective equipment such as a mask.

⑥When working, add an emergency stop switch control device within 2 meters of the operator's work area centered on the individual.

⑦When working at heights, operators should wear safety ropes, helmets, etc., and take measures to secure equipment against falling.

⑧When working indoors or in restricted spaces, maintain adequate ventilation measures to avoid the deposition of harmful substances. Maintain adequate visibility to avoid strong light irritation to the human eye. Adequate measures need to be provided to exclude smoke that may be generated from the processing area, and exhaust gases, etc. need to be adequately purified and discharged into the atmosphere away from people.

1.3.6 Safety signs

The following safety signs must be fully understood and used.

Logo	Name
	flammable area
	Warning! Stay safe.
	Beware of hot surfaces
	Chemical fiber clothing is prohibited
	Prohibition of flammable substances

	Laser radiation Avoid direct or diffuse exposure of eyes and skin Class 4 laser products
	laser window Avoid exposure to laser radiation emanating from the window.
	Shade goggles must be worn
	Beware of lasers.
	Beware of ionizing radiation
	Beware of electrocution.
	Must be grounded
	Must be unplugged
	No Closing

II. Product overview

This product belongs to laser welding equipment accessories, applied to the field of metal material processing, including carbon steel, stainless steel, aluminum, copper and other common metals and other metals that can absorb 1080nm band laser.

Suitable for continuous lasers with a laser power of 3000W or less and a wavelength of 1080±10nm.

The cooling method is water cooling and argon is recommended as the protective gas.

Cannot be used for processing non-metallic materials such as wood, stone, plastics, composites, etc.

Cannot be used for underwater work, see [Production Operation Environment] for detailed working condition requirements.

This manual includes a general description of the basic functions, installation, operation, use and maintenance of the SUP33T series of handheld laser welding heads.

2.1 Description of the gun body

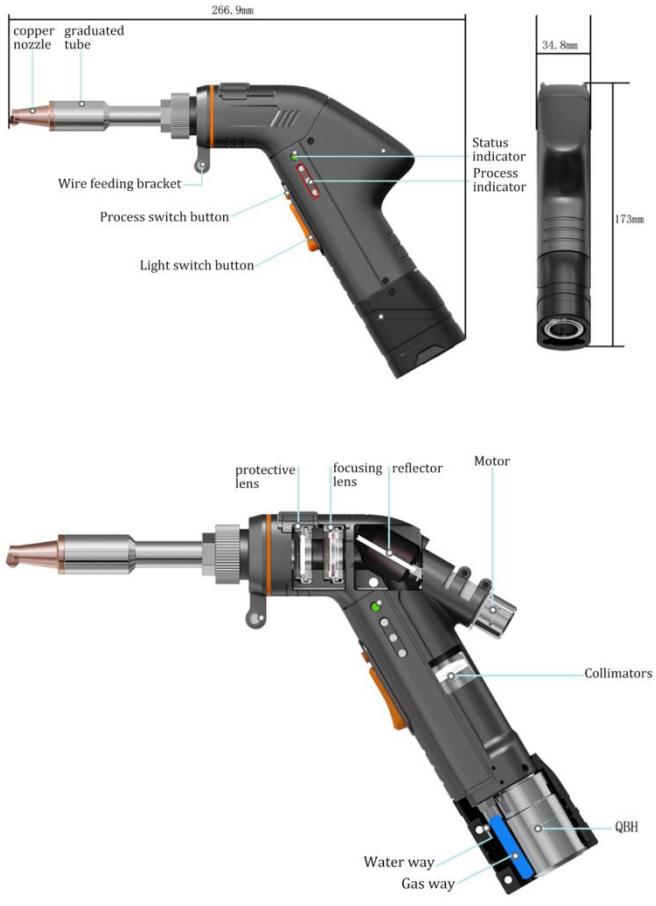


Figure 2.1 SUP33T Body

Auxiliary function description:

1、Status Indicator:

Green Always On	green flash	Red light always on	red light flashing
Normal standby	Safe Ground Lock Conducted	persistent light	System Alarms

2、Process Indicator:

As shown in Figure 2.1, corresponding to [Common Process 1, 2, 3], such as calling [Common Process 1], the No. 1 lamp lights green.

3、Process switching buttons:

When clicked, [Common Processes] is switched in order for quick call of processes. Three sets of process parameters can be preset and then switched by the button as required.

4、Out light switch button:

When the safety ground lock signal is on, press the light out button and the system controls the laser to light out.

2.2 Product Features

- Basic characteristics:

Digital servo drives	Liquid Cooling	Maximum power 3000W	Maximum weld seam 8mm

- Basic functions

serial number	T-shape
1	Laser welding function
2	Laser cutting function
3	Weld seam cleaning function
4	Lens temperature monitoring function
5	System Troubleshooting
6	Support for process libraries
7	Quick Cut Process
8	Quick Adjustment Wire Feeder

2.3 Product operating environment and basic parameters

As shown in Table 2.1, the SUP33T handheld laser welding head's operating environment requirements and main parameters:

Table 2.1 Operating environment requirements and basic parameters

Supply voltage (V)	220V±5% AC 50/60Hz
Operating ambient temperature (℃)	- 10 to 50° C
Working environment humidity (%)	≤70%
Cooling method	water cooling
Applicable wavelength	1080nm (±10nm)
Applicable power	≤3000W
collimating lens	D16*T5/F60
focusing lens	D20*T4.5/F150
reflector	30*14*T2
protective mirror	D18*T2
Recommended air flow	10~15L/min (20℃ 0.15MPa)
Focus vertical adjustment range	±10mm
weights	0.68kg
Adaptive Laser	Beam Φ≤10mm after collimation

Ⅲ.Product accessories and installation

3.1 Unpacking list

Take the standard version as an example, the product factory list as shown in Table 3.1, the physical if different from the schematic, please refer to the specific order.

Table 3.1 Product factory configuration list

SUP33T packing list				
number	material number	name (of a thing)	norm	quantities
1	A01020016	Handheld Laser Welding Heads	SUP33T	1
2	A05010021/ A05010015	Laser Welding Systems	SUP-LWS-E（Standard version）/SUP-LWS-E（Optional Edition）	1
3	K01090004	Eight-pole system connection cable	10 meters	1
4	C04010006	monitor	SUP-DW128 HJT	1
5	C03020011	switching mode power supply	100FGC-24	1
6	K04020001	Display cable (vertical side exit)	1M	1
7	D01010001	protective lens	D18T2	5
8	B06030003	Double feeding copper nozzle	AS-20D	1
9	B06010001	copper nozzle	AS-12	1
10	B06010002	copper nozzle	BS-16	1
11	B06010003	copper nozzle	CS-12	1
12	B06010004	copper nozzle	ES-12	1
13	B06010005	copper nozzle	FS-16	1
14	B06020003	copper nozzle	C	1
15	B06020005	Cutting nozzle adapter	S	1
	B06020006	extrusion nozzle	1.5 single layer M8	1
16	B03210160	graduated tube	FT80	1
17	J01050004	Copper spout box		1
18	E01090001	Large crocodile clip		1

Figure 3.1 Product Unboxing 1

Figure 3.2 Product Unboxing 2

3.2 Control Box Wiring and Interface Definitions

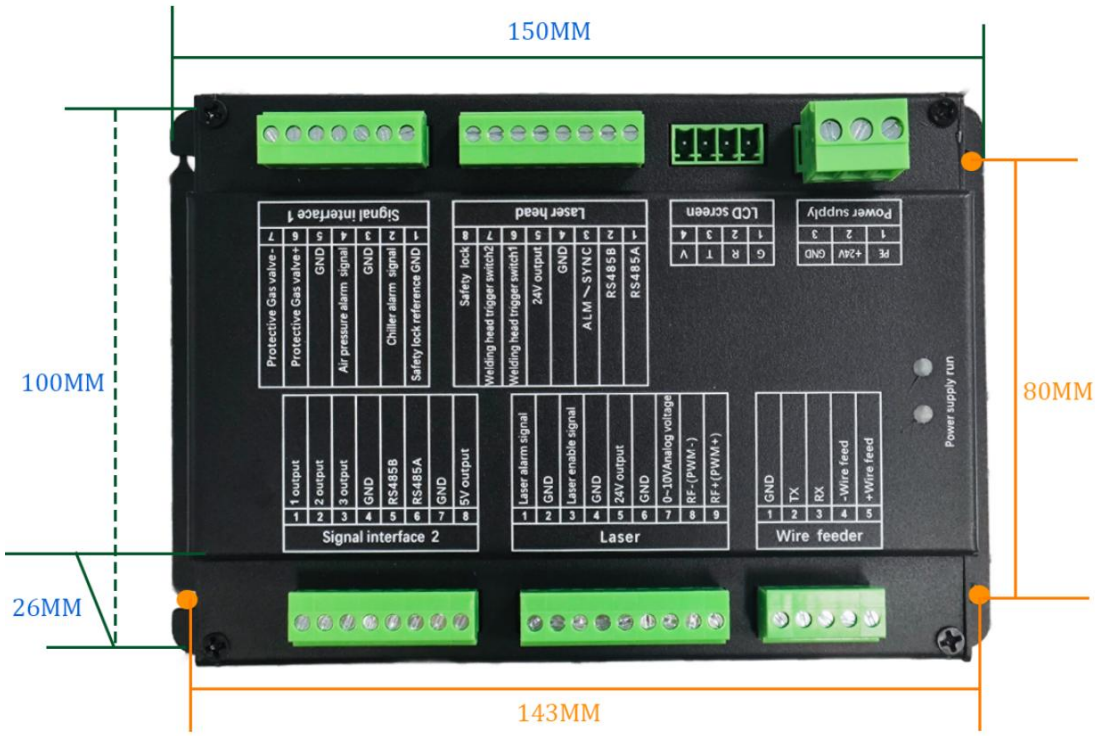


Figure 3.3.1 V 7.2 Control Box（Standard version）

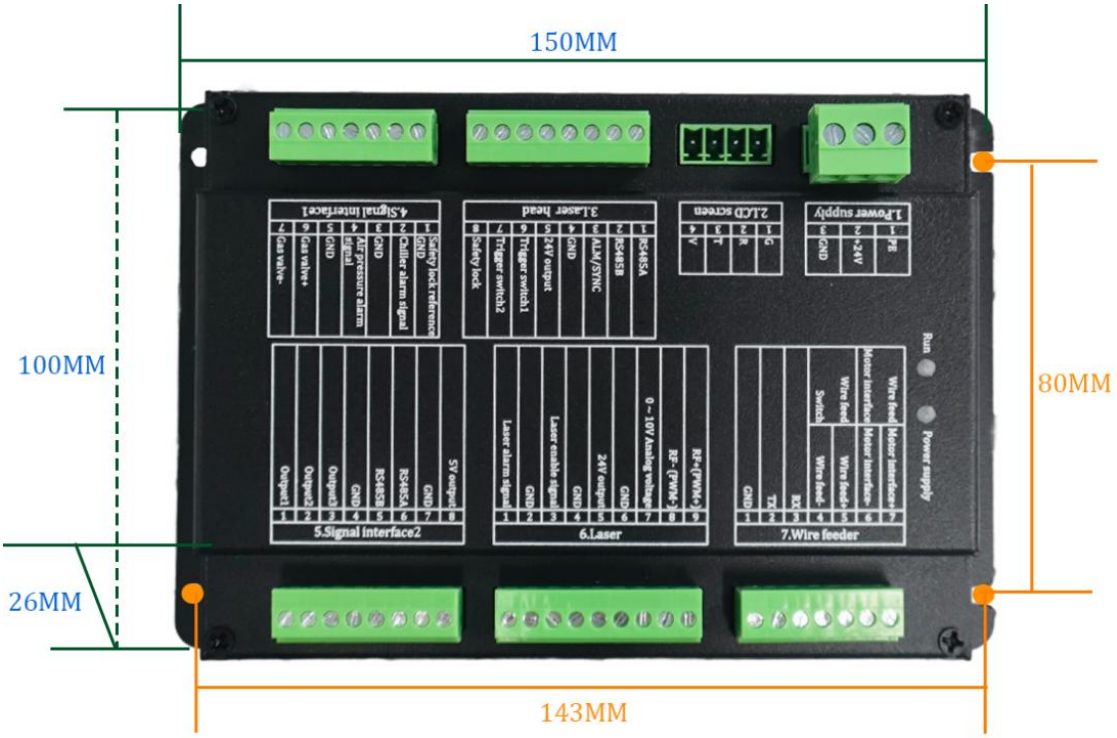


Figure 3.3.2 V 7.4 Control Box（Optional Edition）

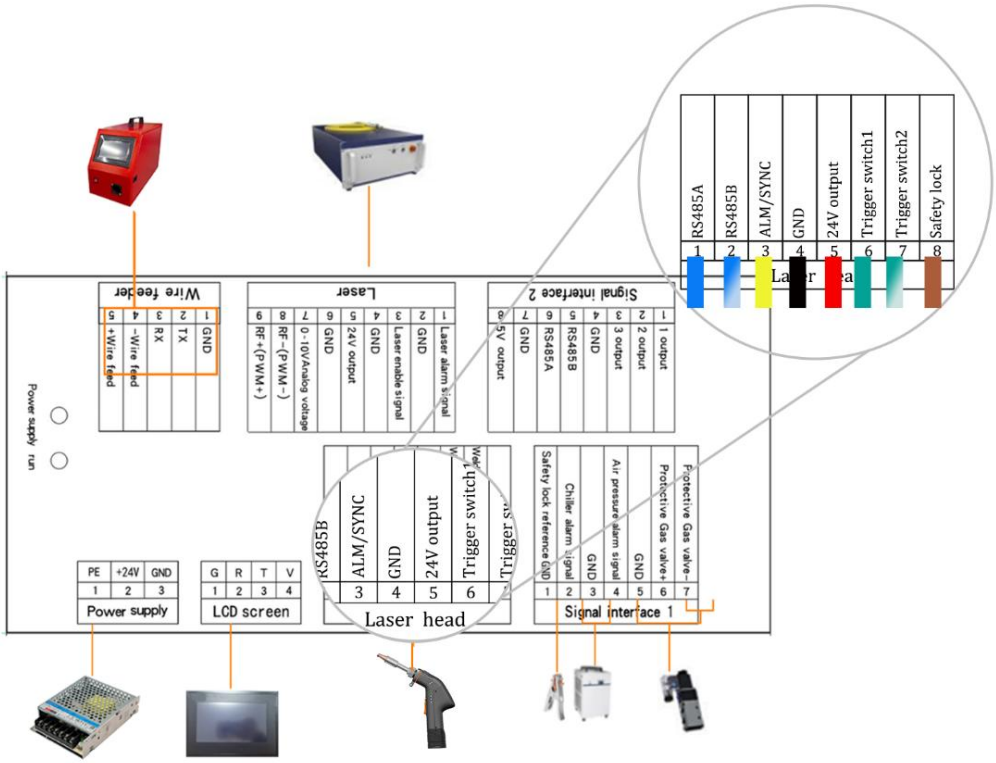


Figure 3.4 .1 V7.2 Wiring diagram（Standard version）

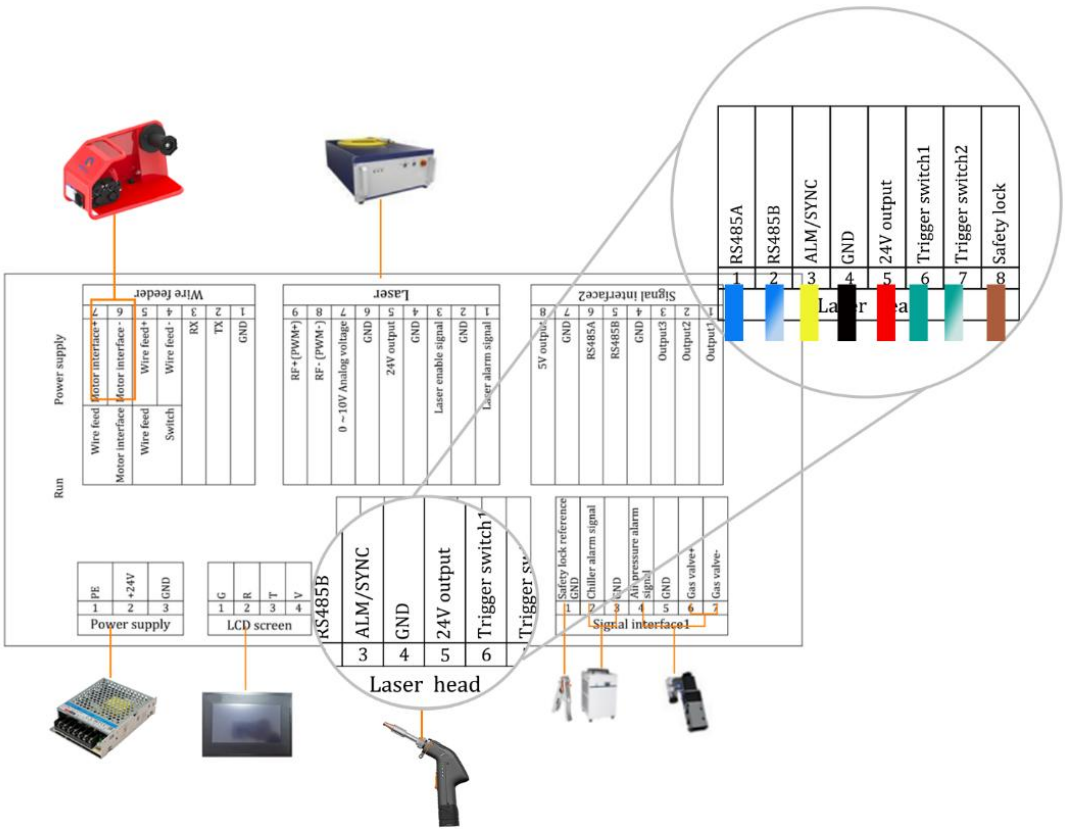


Figure 3.4.2 V7.4 Wiring diagram（Optional Edition）

①To avoid abnormalities in the product's power usage, the ground wire of the switching power supply must be effectively grounded! The product casing must be grounded!

②The diagrams in Figures 3.1 and 3.2 refer only to a certain type of product, and do not specifically refer to the corresponding product.

3.2.1 Control box - [1. Power supply]

The control box signal [1. power supply] interface, as shown in Table 3.2. Please use the supplied 24V switching power supply to power . The dimensions of the power supply are shown in Figure 3.5

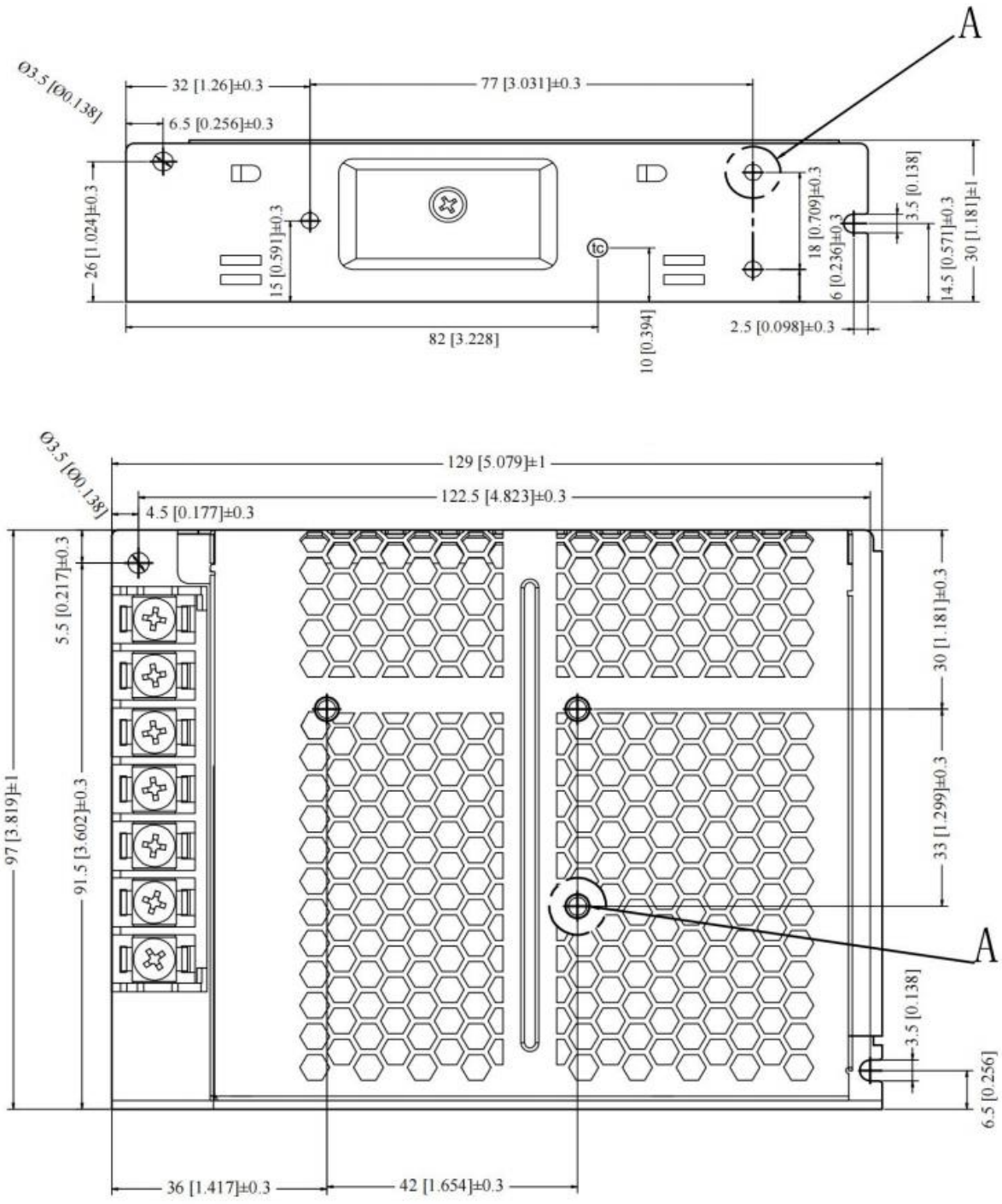


Figure 3.5 Power Supply Dimensioning Diagram

Table 3.2 [1. Power supply] Interface Function Description

1. Power supply		
Pin Number	Signal Definition	Functional Description
1	PE	Ground wire.
2	+24V	24V input, connected to 24V switching power supply output positive, labeled [+Vo].
3	GND	Common ground, connected to 24V switching power supply output negative, labeled [- Vo].
Note: PE must be effectively grounded. 1, confirm that the pair of ground wire conduction, no false connection, disconnection; 2, the ground itself is stable and non-electrified (both the fire wire, the zero line to the PE line of the alternating and direct current voltage are less than 10V, it is best to maintain 0V).		

3.2.2 Control box - [2. Liquid crystal screen]

[2. Liquid crystal screen] interface, as shown in Table 3.3. Screen appearance dimensions as shown in Figure 3.6 (A.A is the effective display area) Installation dimensions diagram as shown in Figure 3.7.

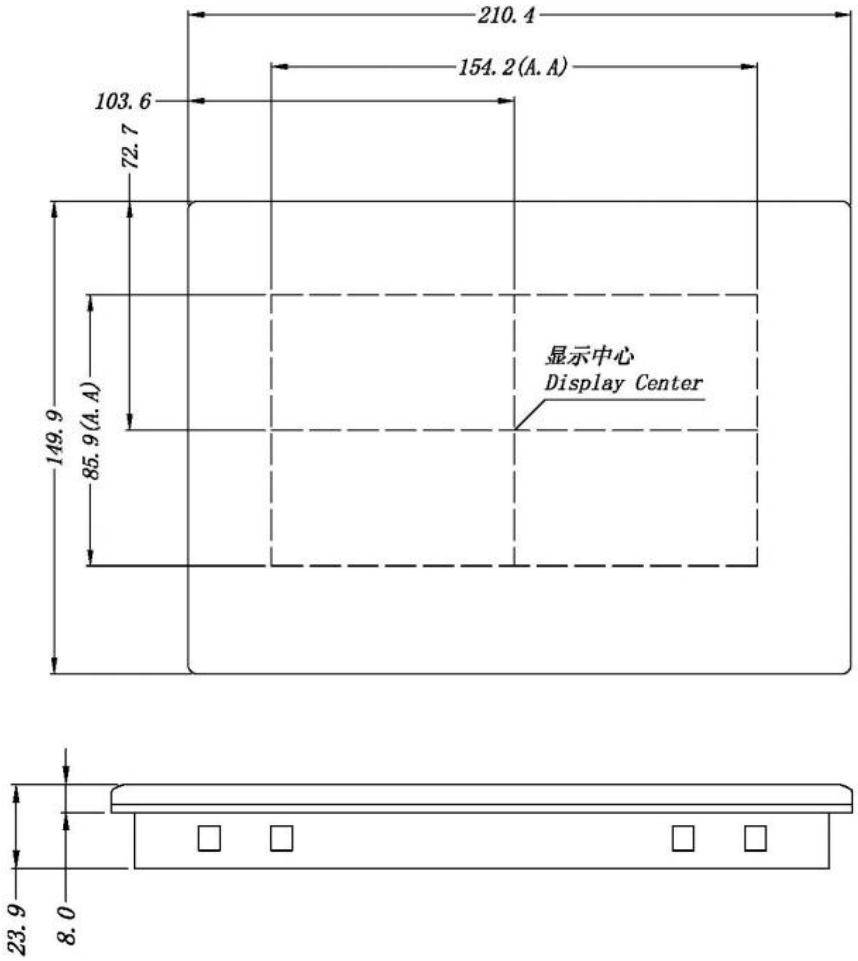


Figure 3.6 Dimensioned view of the display

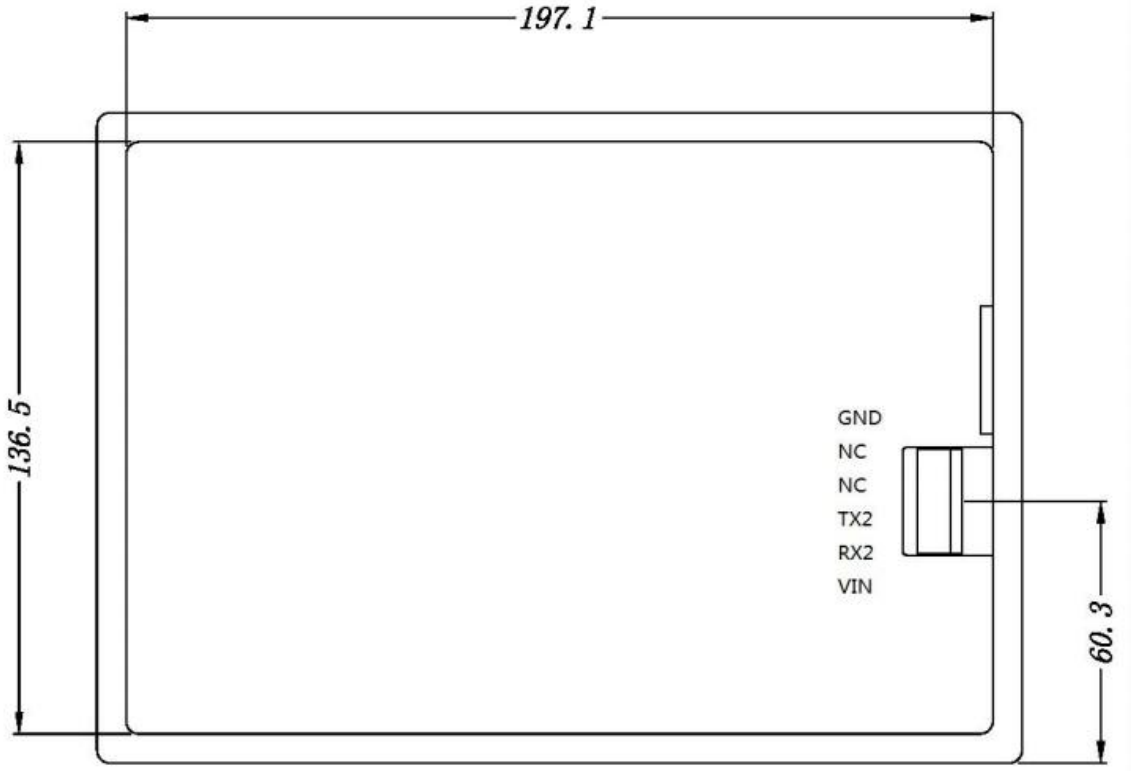


Figure 3.7 Display installation dimensions

Table 3.3 [2. Liquid crystal screen] Interface Function Description

2. Liquid crystal screen		
Pin Number	Signal Definition	Functional Description
1	G	White wire, two terminals [4P-1 foot] - [6P-G foot], 24V power negative and cable shield.
2	R	Black wire, two terminals [4P-2 pin] - [6P-R pin], 232 signal.
3	T	Brown wire, two terminals [4P-3 pins] - [6P-T pins], 232 signal.
4	V	Blue wire, two terminals [4P-4 feet] - [6P-V feet], 24V power positive.
Note: Complete screen cable is included with the package, plug and play.		

3.2.3 Control box - [3. Laser head]

The [3. Laser head] interface is shown in Table 3.4.

Table 3.4 [3. Laser head] Interface function description

3. Laser head		
Pin Number	Signal Definition	Functional Description
1	RS485A	Blue line, labeled [3-1]
2	RS485B	Blue and white lines, labeled [3-2].
3	ALM/Synchronization	Yellow line, marked [3-3]
4	GND	Black wire + shield, labeled [3-4]
5	24V Output	Red line, marked [3-5]
6	Output switch 1	Green line, labeled [3-6]
7	Output switch 2	Green and white lines, labeled [3-7].
8	Safety Floor Locks	Brown line, labeled [3-8]

3.2.4 Control box - [4. Signal interface 1]

[4. Signal interface 1] Connect air valve, safety ground lock (big alligator clip), etc..

Table 3.5 [4. Signal interface 1] Function description

4. Signal interface 1		
Pin Number	Signal Definition	Functional Description
1	Security floor lock reference ground	Connect the large alligator clip. Clamped on the workpiece, the gun head touches the workpiece then [Safety Ground Lock] and [Safety Ground Lock Reference Ground] conduct.
2	Water cooler alarm signal	Input port. Connect the water cooler alarm signal and set the [water cooler alarm level] according to the water cooler alarm output voltage. Air-cooled equipment is not connected.
3	GND	signal ground
4	Air pressure alarm signal	Input port. Connect the air pressure alarm signal and set the [air pressure alarm level] according to the valve alarm output voltage.
5	GND	signal ground
6	Valve +	Valve open: [Valve+] output 24V; Valve closed: [Valve+] no output.
7	Valves -	signal ground

3.2.5 Control box - [5. Signal interface 2]

[5. Signal interface 2] is a reserved port for external expansion devices for customized functions. Usually not used.

Table 3.6 [5. Signal interface 2] Function description

5. Signal interface 2		
Pin Number	Signal Definition	Functional Description
1	Output 1	Reserve the output port for controlling three-color lamps. Three-color lamps need to be common anode, the recommended positive terminal connected to 24V, three-color wire were connected to 1, 2, 3 pins. 1、[Standby mode], [Output 1] connector and [GND] conducting 2、[Operating mode], [Output 2] interface and [GND] conduction 3、[Alarm Mode], [Output 3] interface and [GND] conduction
2	Output 2	
3	Output 3	
4	GND	signal ground
5	RS485B	485 communication
6	RS485A	
7	GND	signal ground
8	5V Output	Normal 5V output

3.2.6 Control box - [6. Laser]

The [6. Laser] interface is used to control the laser.

Table 3.7 [6. Laser] Interface function description

6. Lasers		
Pin Number	Signal Definition	Functional Description
1	Abnormal laser signal	Input port. Connect the laser alarm. According to the signal device of the laser [Laser Alarm Level]
2	GND	signal ground
3	Laser Output Enablement	Connect to laser enable +, output 24V when light is emitted.
4	GND	signal ground
5	24V Output	Normal 24V output
6	GND	signal ground
7	0~10V analog	Analog output (default is 0 to 10V analog voltage).
8	RF - (PWM -)	PWM - Modulating Signal
9	RF+ (PWM+)	PWM + modulation signal

3.2.7 Control box - [7. Wire feeder]

[7. Wire Feeder] Controls the work of the Super Weaver wire feeder.

Table 3.8 [7. Wire feeder] Interface function description

<table>
<tr><th colspan="4">7. Wire feeder</th></tr>
<tr><td>Pin Number</td><td colspan="2">Signal Definition</td><td>Functional Description</td></tr>
<tr><td>1</td><td colspan="2">GND</td><td>Signal ground. Connects to the wire feeder signal wire, labeled [GND].</td></tr>
<tr><td>2</td><td colspan="2">TX</td><td>232 communication. Connects to wire feeder signal line, labeled [RXD].</td></tr>
<tr><td>3</td><td colspan="2">RX</td><td>232 communication. Connect the wire feeder signal line, labeled [TXD].</td></tr>
<tr><td>4</td><td rowspan="2">rayon switchgear</td><td>Wire feed -</td><td>Signal ground. Connect to the wire feeder signal wire, labeled [wire feed -].</td></tr>
<tr><td>5</td><td>Send silk+</td><td>Wire feed enable. When wire feeding, [wire feeding -] [wire feeding +] is on. Connect the wire feed signal line, labeled [wire feed +].</td></tr>
<tr><td>6</td><td rowspan="2">rayon electrical machinery（V7.4）</td><td>Motor -</td><td rowspan="2">24V pulse signal. Connect the motor wire, according to "6-motor - ", "7-motor +" corresponding to the wire marking wiring. When feeding the wire, [7] foot is 24V pulse signal, [6] is negative, and the opposite is true when pumping back. The two feet can not be mixed.</td></tr>
<tr><td>7</td><td>Motor+</td></tr>
<tr><td colspan="4">Standard models of wire feeder only need to be connected to [4, 5 feet], process library models connected to [1, 2, 3 feet] for communication purposes.
When using [V7.4], add [pins 6 and 7]. The [AE, C] wire feeder can be directly connected to [pins 6 and 7].</td></tr>
</table>

3.3 Equipment connection

The interface of the gun body is shown in Fig. 3.7, which mainly includes the interface of water circuit and gas circuit, QBH, and the interface of system connecting line. The model of quick-connector for water and air circuit is: TKP-PU6- ϕ 6, and the water circuit does not distinguish between water inlet and outlet directions.

Figure 3.7 Weld head interface diagram

As shown:

ferrous	open (non-secretive)	red (color)	blue (color)
system connection line	air ducts	Plumbing-1	Plumbing-2

3.3.1 Fiber optic head connection

The product [QBH] interface is suitable for most industrial lasers Caution should be taken when installing:

①Keep the device clean;

②The fiber head is placed horizontally with [QBH] during installation;

③Subject to the [Locked] and [Unlocked] scales in Fig. 3.8, rotate to loosen the QBH first, insert the fiber head and then lock it. After locking, the fiber optic head is placed in [QBH] and cannot be shaken, and [QBH] cannot be rotated.

Figure 3.8 QBH [unlocked], [locked] state

3.3.2 Control box connection

The handheld laser welding head is connected to the control box through the [System Connection Cable]. As shown in Figure 3.9. The [Welding Head] - [System Connection Cable] is connected. The [System Connection Wire] - [Control Box] is connected using (3.81-8P) terminals, see section: 3.2.3 Control Box - [3. Laser Head] for detailed definition.

Figure 3.9 Weld head and system connection lines

Ⅳ.Interface operation and function switching

①Switching of [Welding System] [Cleaning System] can be realized through the screen.

②When using the cutting function, under [Welding System], set [Scan Width] to [0]. And replace the [Cutting Copper Nozzle] as shown in Fig. 4.1.

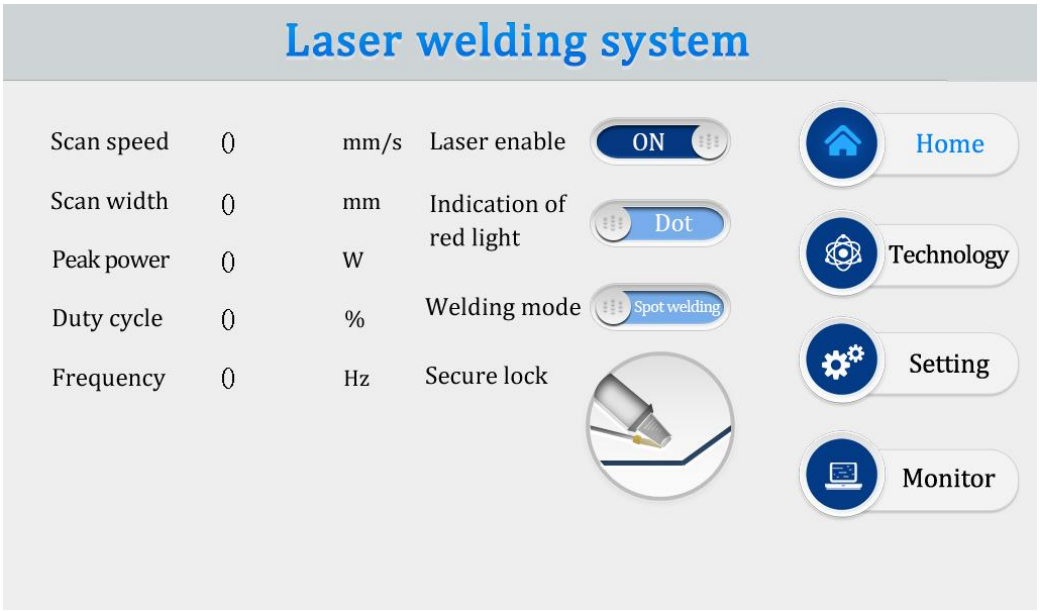
③When using the weld cleaning function, in [Welding Mode], make the [Scanning Width] slightly larger than the [Weld Width]. And replace the [AS-20D type copper nozzle] as shown in Fig. 4.2.

Figure 4.1 Cutting Copper Nozzles

Figure 4.2 AS-20D Copper Nozzles

4.1 Home page

Switches used to display the current process, alarm messages, and to adjust the main output signals, as shown below.



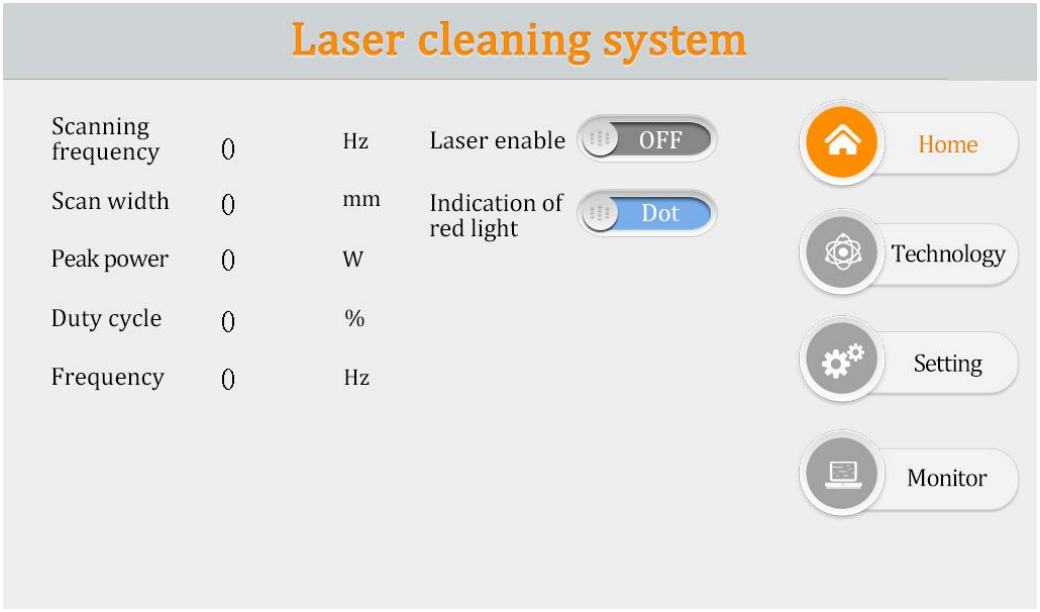


Figure 4.3 Home Page

①[Laser Enable-On/Off]: Controls and indicates whether or not to output the [Laser Output Enable Signal].

②[Indication of red light - point / line]: control, said not out of the laser, the vibration mirror motor whether swing, adjust the red light for the [point] or [line], does not affect the red light with or without, does not affect the welding of the swing.

③[Welding Mode - Spot Welding/Continuous]: Usually [Continuous] is used, [Spot Welding] is the intermittent light output according to the parameter of the setup page, which is used for fish scale welding.

4.2 Process page

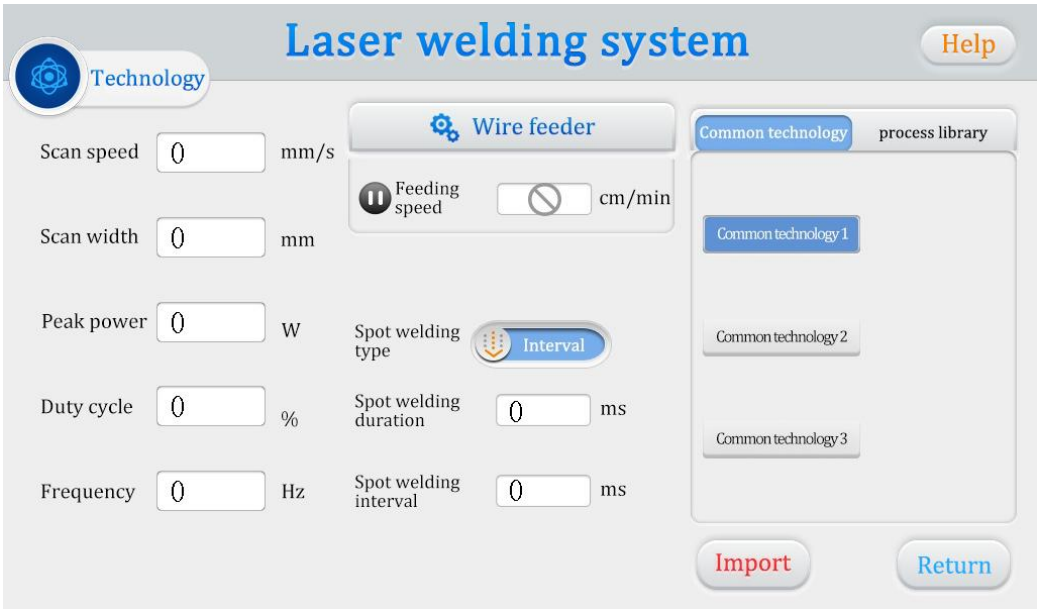


Figure 4.4 Process Page - Common

①[Scanning speed]: the line speed of the focused spot movement, affecting the welding quality. Take [scanning width] 3mm as an example, usually set to 600~1200. [Welding speed] increase, [scanning speed] correspondingly increase.

②[Scanning Frequency]: the number of cycles of the focused spot scanning back and forth within 1 second, affecting the precision or fineness of the cleaning surface. Usually set to 50~100Hz.

③[Scanning Width]: Corresponds to the theoretical width of the spot and controls the spot size. Adjusted according to the size of the weld.

④[Peak power]: the maximum power when the light is out, or processing power, welding power.

⑤[Duty Cycle, Pulse Frequency]: Usually set [Duty Cycle 100%] [Pulse Frequency 2000]. The equivalent processing power can be changed by adjusting the duty cycle and pulse frequency according to the characteristics of the laser, usually without adjustment.

⑥[Common Processes]: Indicates the current process group number, welding mode provides 3 groups of common processes, press the gun body [process switching button] to quickly switch.

⑦[Feeding speed]: Range 15~600cm/min.  Run/stop for feeding status (valid for individual process). Combined with the process switching button, quick switching between wire feed and no wire feed can be realized.

Select [Common Process 1], enter the parameters, and after [Import], all the parameters saved are those of [Common Process 1].

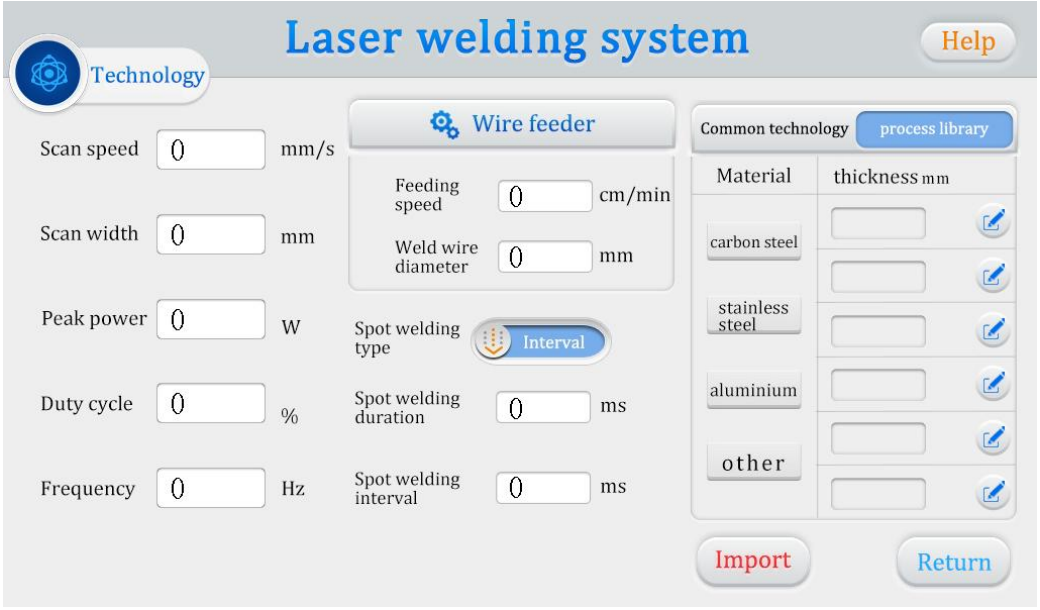


Figure 4.5 Process Page - Process Library

⑧[Wire feeder]

- The blue [Wire Feeder] icon indicates that the parameters can be adjusted and can be clicked to enter the "Wire Feeder Interface", while the gray [Wire Feeder] indicates that the wire feeder is not communicating properly and the parameters cannot be adjusted. When use with A type wire feeder, you need to set [Wire Feeder Motor] to ⊘ in the setting page. Wire feeder through 232 communication to the control box - [7. wire feeder] 1,2,3 feet, at the same time [wire feeder -] [wire feeder +] connected to the 5,6 feet, you can call the complete function of the wire feeder.
- When matching with AE model wire feeder or C model wire feeder, set the setting page [Wire Feeder Motor] to [AE/C] correspondingly. Wire feeder [motor -] [motor +] connect to the control box - [7. wire feeder] 6,7 feet, the system can control the wire feeder to send wire.

⑨[Wire Diameter] Here [Wire Diameter] is to help the operator record the process conditions.

⑩[Material-xx thickness] Click the thickness, such as [1.0mm] - [Carbon Steel], will display the recommended process parameters. Each material can be set corresponding to 12 thickness. Click [1/2] to switch to the second page of thickness.

4.3 Setup Page

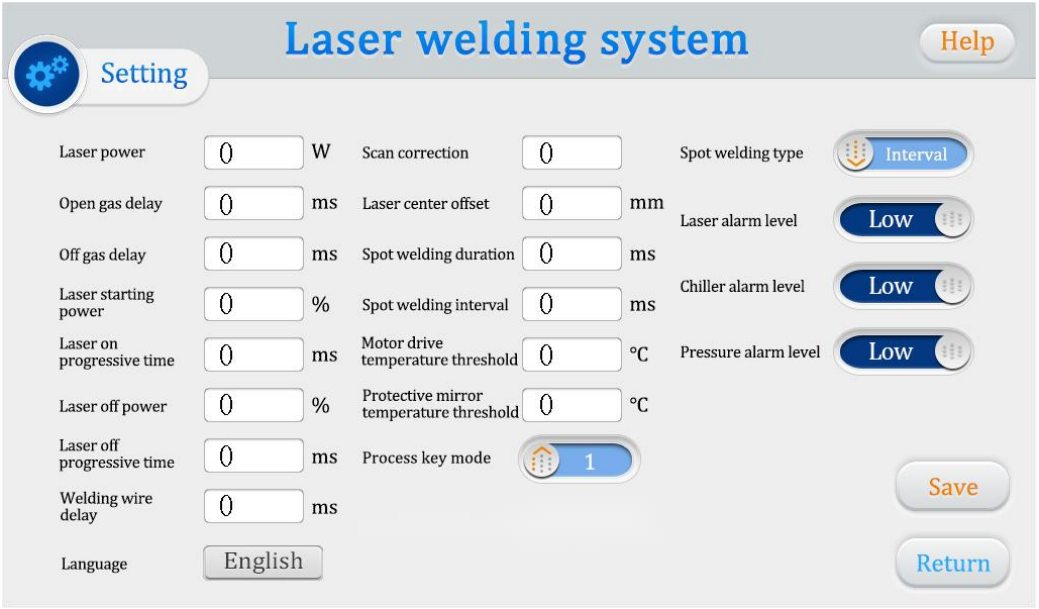


Figure 4.6.1 V7.2 Setting Page

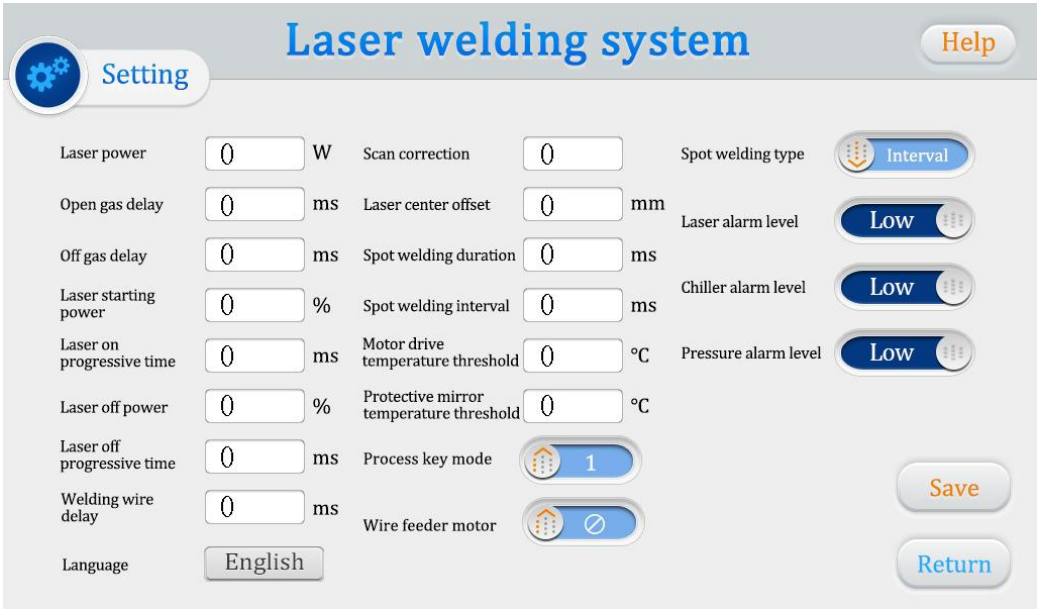


Figure 4.6.2 V7.4 Setting Page

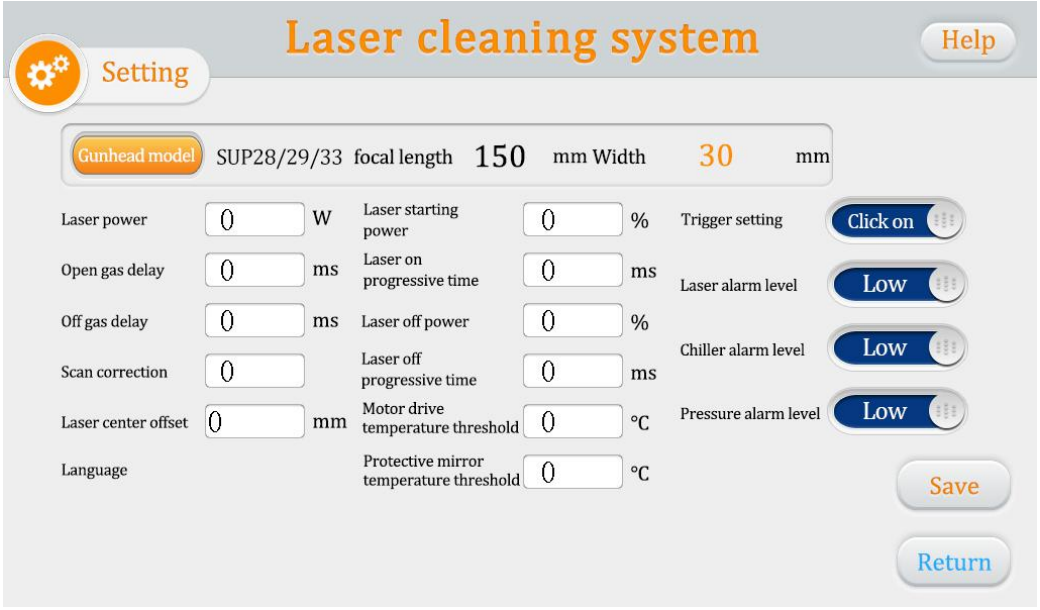


Figure 4.6.3 Setup Page

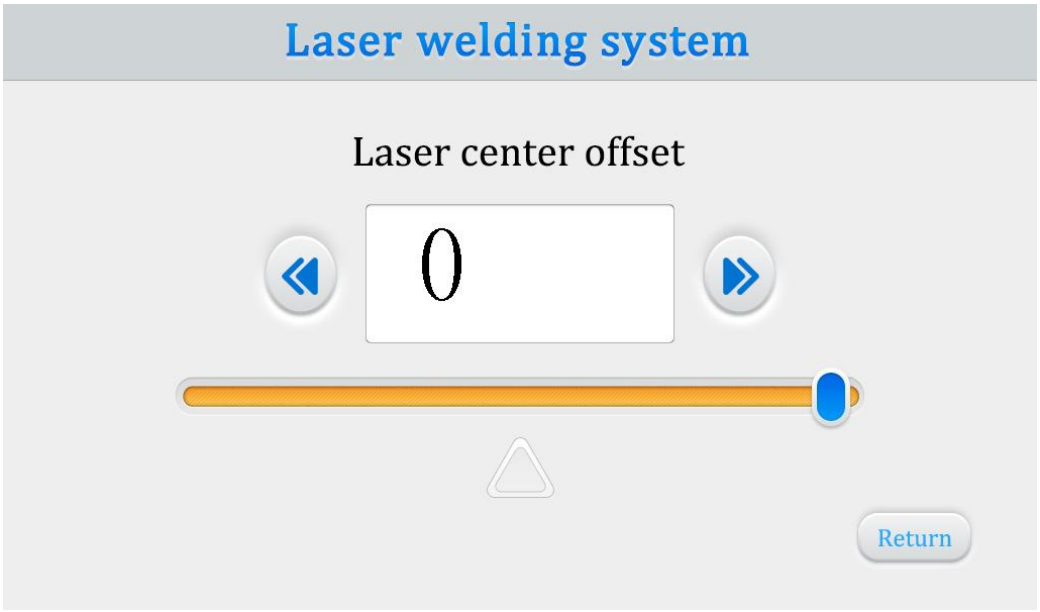


Figure 4.7 Laser Center Offset

The page shown in Figure 4.6 is used to set the factory parameters, including the product's power and alarm level.

①[Laser power]: Subject to the actual laser.

②[Feed delay compensation]: Feed the wire in advance. Example: If 1000 is set, after the trigger is pressed, the wire will be fed first for 1s and then the light will come out.

③[Scanning correction]: correction factor = target line width / measurement line width, used to adjust the actual spot size, so that it is consistent with the system display.

④[Laser Center Shift]: [Negative] means left shift, [Positive] means right shift. Used to adjust the spot to center.

⑤[Open Air Delay]: Before the light is released, the air is released in advance.

⑥[Delay in turning off the gas]: After turning off the light, delay in turning off the gas.

⑦[On/Off Power] [On/Off Progressive Time]: As shown in Fig. 4.7, [On Progressive Time T1] indicates the time from [On Power N1] to [Peak Power N3], and [Off Progressive Time T2] indicates the time from [Peak Power N3] to [Off Power N2].

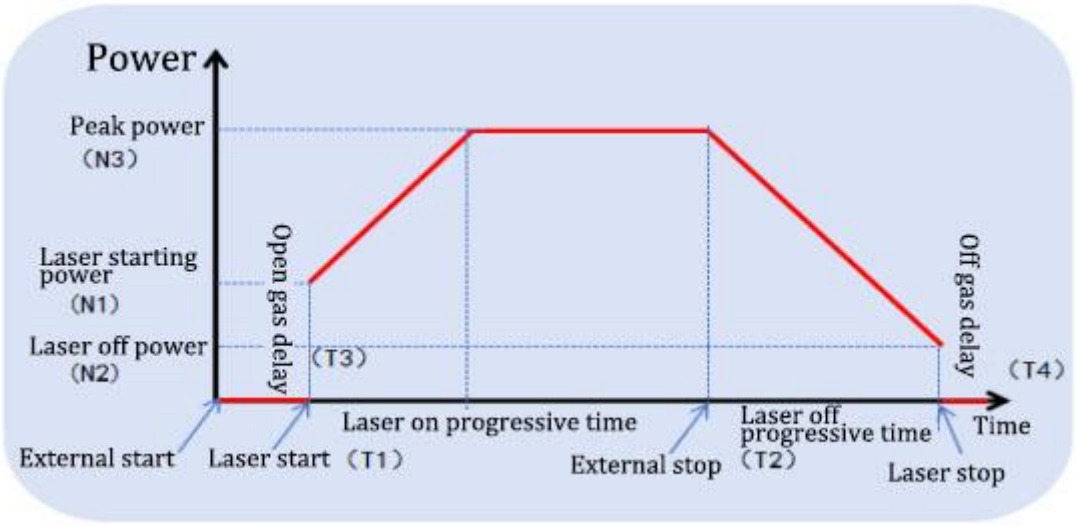


Fig. 4.8 Relationship between the time of light out and gas out

⑧[Temperature Threshold]: Maximum 80℃, when the value is set to 0, the temperature alarm will not be detected.

⑨[Alarm Level-High/Low]: set to low level when not in use, according to the external product setting.

⑩[Spot Welding Type-Intermittent/Fish Scale/Single Shot]: [Fish Scale] is suitable for fish scale pattern welding, [Intermittent] is suitable for segmental welding. Single shot] is suitable for continuous welding for a short period of time. When selecting [Single Shot], set the [Spot Welding Duration] to stop the light when the welding is completed, and you need to pull the trigger again to light up again.

⑪[Spot Duration] [Spot Interval]: As shown in Fig. 4.9, [T1] does not emit light and [T2] emits light.

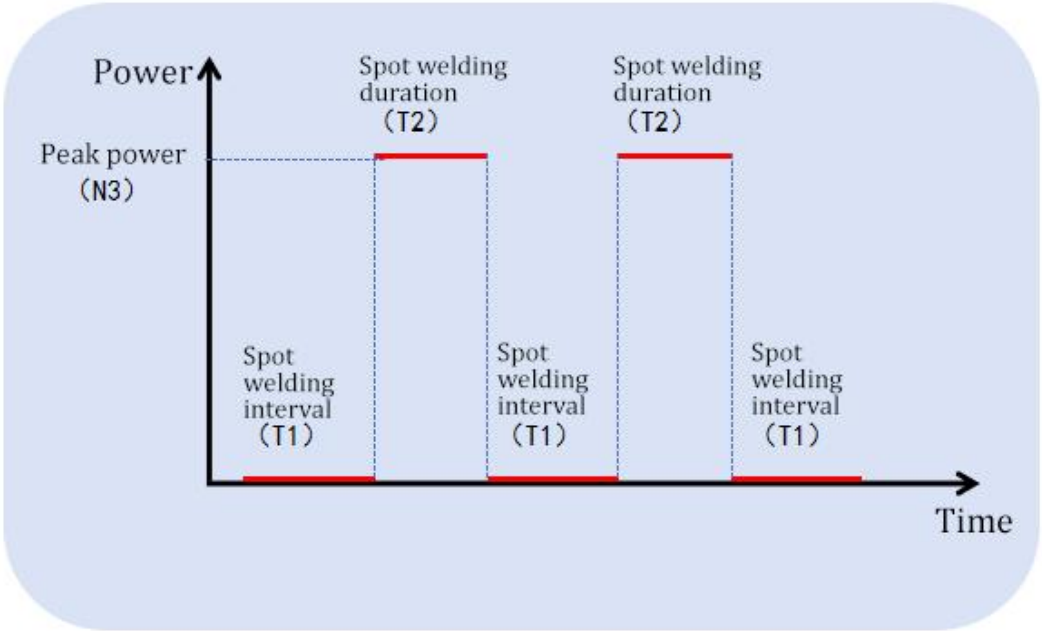


Figure 4.9 Spot welding power-time relationship

⑫[Craft Key Mode]:

1	2	3
Buttons do not switch processes	Switching between process 1/2	Switching between process 1/2/3

⑬[Wire Feeder Motor]: Combined with the process page, choose the actual wire feeder model: AMF-AE for AE, AMF-C for C, or ⊘ for other models.

⊘	AE	C
Other Models	AMF-AE	AMF-C

4.4 Monitoring page

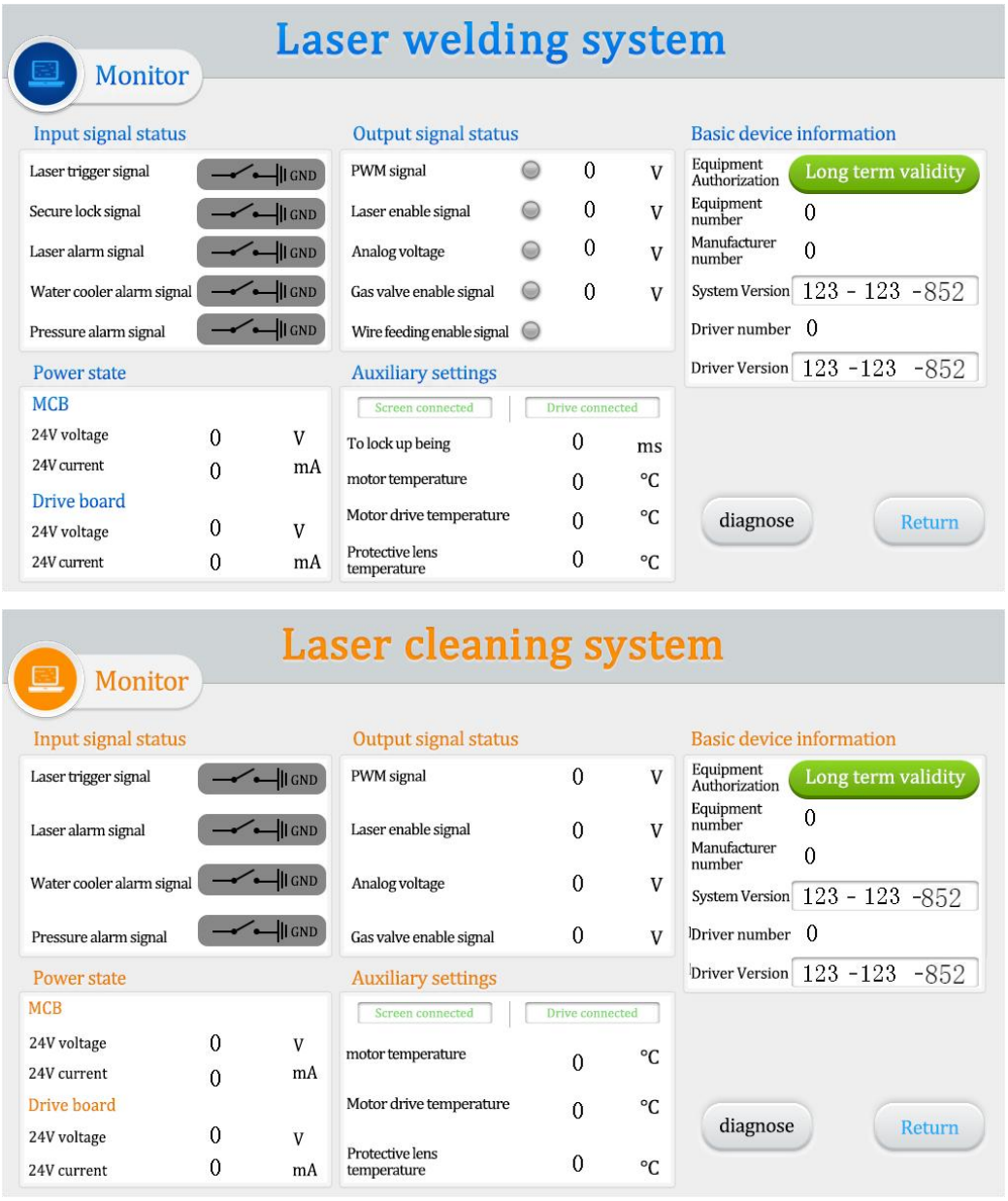


Figure 4.10 Monitoring page

The page shown in Figure 4.10 displays the monitored live machine information.

①Among them, [Input Signal Status] [Output Signal Status] [Power Supply Status] are real-time monitoring signals for judging whether the product is working normally or not.

②[Basic Product Information]:

- [Product Authorization] can be clicked to operate for product encryption.
- [Product number][Manufacturer number][System version]is simply display information for after-sales work provided to technicians.

③[Auxiliary state]:

- The [xx temperature] is the measured temperature, and the system alarms when it exceeds the corresponding [xx temperature alarm threshold] on the setup page.
- The [Ground Lock Anti Jitter] is the compatible intermittent time in case of poor contact of the [Safety Ground Lock] signal, range [0~300ms]. Click [Product Authorization] and enter [FFFFFFFAAxxx], [xxx] indicates the time. Effective in welding mode.

4.5 Diagnostic page

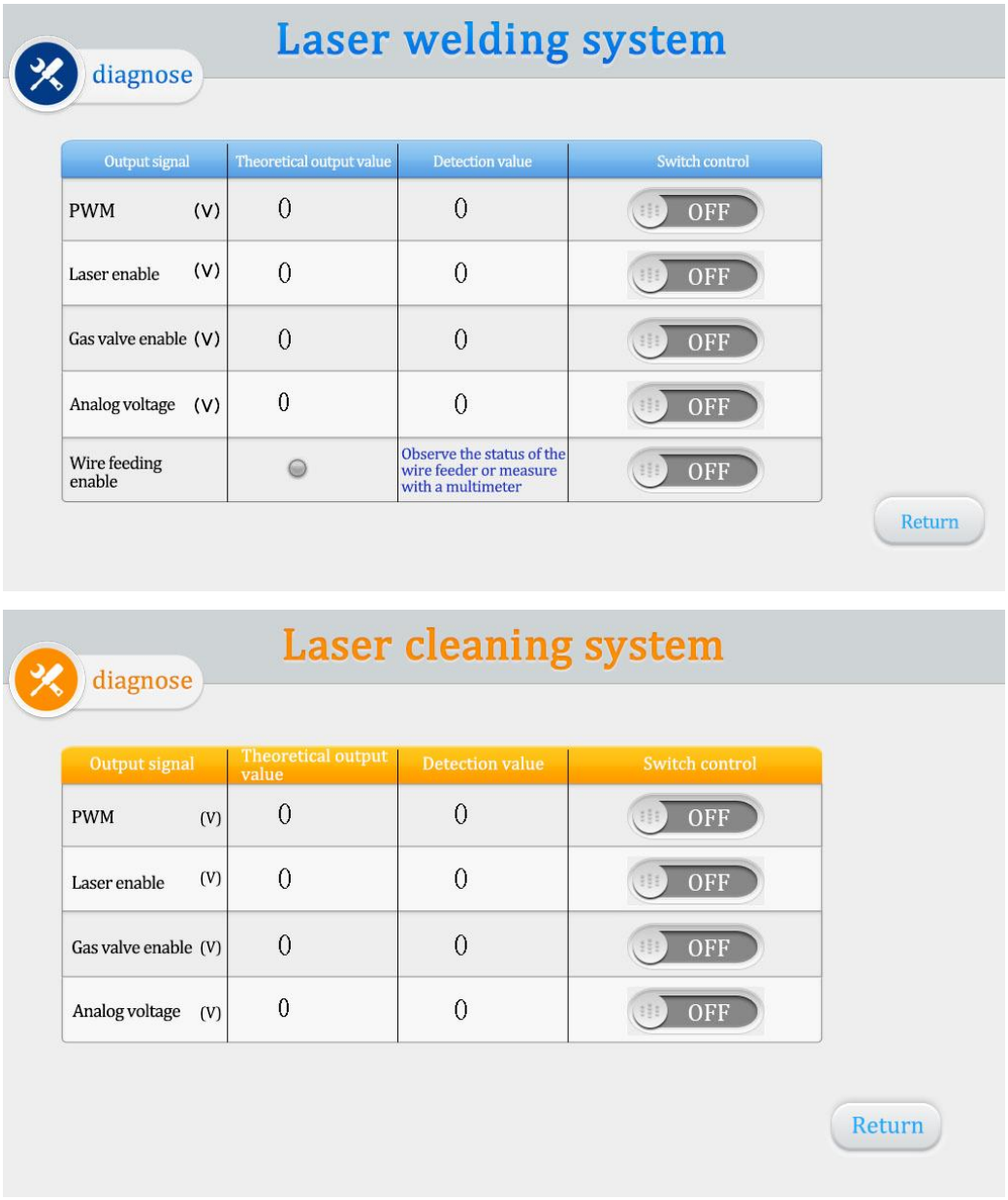


Figure 4.11 Diagnostics page

Diagnostics page added

[ALM Line Abnormal] alarm,input [FFFFFF33001] to enable detection,[FFFFFF33002] to disable detection;

[Abnormal drive voltage] alarm and [Abnormal drive current] alarm, input [FFFFFFF36001] to enable detection and [FFFFFFF36002] to disable detection;

[Abnormal motor swing] alarm, input [FFFFFFF31001] to enable detection, [FFFFFFF31002] to disable detection;

[Motor Failure Abnormal] alarm, input [FFFFFFF32001] to enable detection, [FFFFFFF32002] to disable detection.

The above picture is a demonstration of the diagnostic mode. This mode can only do [separate signal] output, used in the security situation to determine whether the main control board each output signal is normal, this mode can not be out of the light.

4.6 Wire Feed Sheet

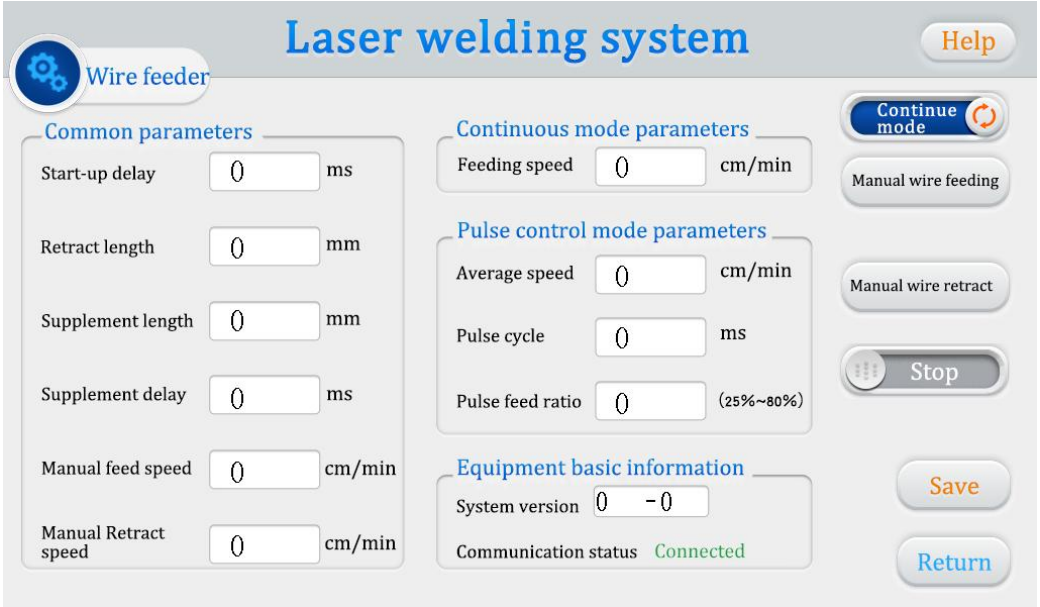


Figure 4.12 Process Library - Wire Feeder Parameters

Refer to the process page [Wire Feeder] introduction and [Wire Feeder Motor] selection as described above, and you can enter the Wire Feeder page from the process page after normal communication.V7.4 includes the features of V7.2. The figure below shows the wire feeder communication interface using V7.4 as an example.

①[General Parameters] The wire feed parameters can be adjusted when connecting the wire feeder, and the parameters of the original [wire feeder].

②[Continuous Mode/Pulse Mode] is used to switch the state of wire feeding, usually use [Continuous Mode], [Pulse Mode] is used for fish scale welding.

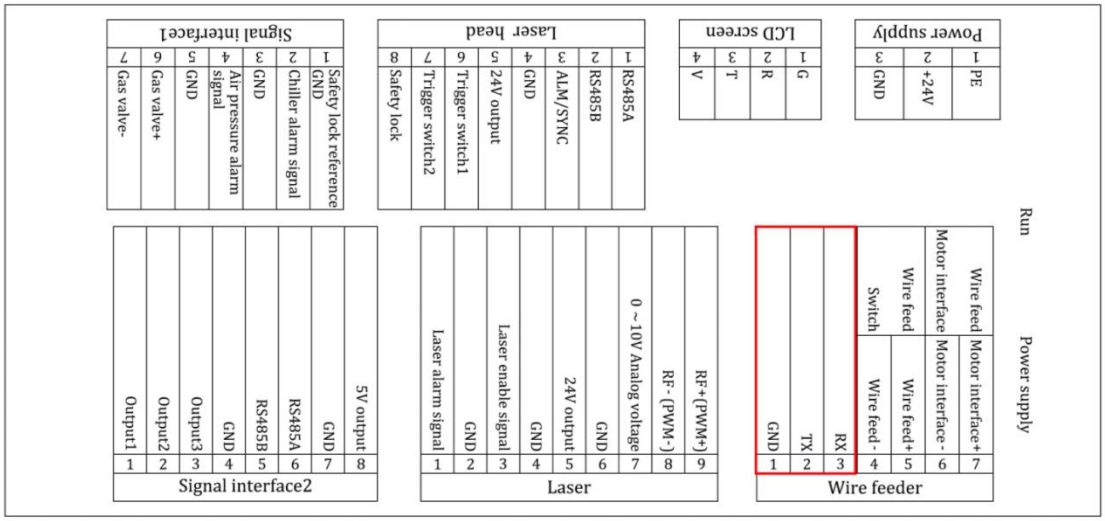


Figure 4.12 Wire Feeder Communication Interface

V. Product routine maintenance

1. Users are advised to clean the dust of the chassis cooling system once a month to keep the chassis smoothly ventilated.

2. Lens maintenance and replacement should be carried out in a relatively clean field environment. When open operations such as opening the protective mirror, focusing mirror compartment cover, pulling out the lens holder, etc. are performed, they should be well protected (covered with a beautiful paper). Replacement of different lenses for all gun models can be found in the WeChat program →→ Lens Installation.

3. When using it, please hold it gently. For complex production environment, please clear the ash in time.

Ⅵ.The product common problems and measures to deal with

Warning! All power must be disconnected before handling any problems to avoid any danger!

Repair and maintenance of this product must be done by a professional! Do not operate without training! Please contact your dealer for a professional if you have any problems!

Repair will not fix the appearance of the product.

Descriptions of common alarms and solutions to problems are listed below:

Items at issue	impunity	prescription
Temperature alarms to indicate that various types of temperatures are too high	HomePrompt XXX temperature is too high	The general lens temperature alarm is usually checked first for damage to the lens and the damaged lens is replaced. If the lens is normal, you need to block this alarm directly in the setup page, and set the corresponding lens temperature alarm threshold to 0 in the setup page to save it.
Chiller/Laser/Air Pressure Alarm	HomePop-up window showing chiller/laser/air pressure alarms	Alarm Logic for Level: The system will compare the wiring of the corresponding product with the set level in the setup page, and the alarm will be raised if the level is different. Usually, alarms are caused by incorrect alarm level settings, so it is sufficient to change the corresponding alarm level. If an alarm occurs when there is an alarm signal connected, and the alarm occurs regardless of the settings, unplug the alarm signal wire and set it to a low level.
Poor soldering results	Starts out strong and slowly gets weaker/lighter, making it impossible to fuse the wire	Typically the welding gun lens is damaged, including but not limited to the protective lens, focus, collimation, reflection, any one or more of which can cause this situation. Replace the protective lens and look at the focus, then check the reflection and collimation, and replace the damaged lens. About the copper nozzle at the spark may be the focus problem, should be ruled out first. Also look at the laser fiber head section for dirt or damage.
Motor does not oscillate	The spot is a point	I. Is the software section set up correctly Setup-Scan Correction: 1.0 or 1.25 Process-scan width: greater than 0 Home-Indicating red light: line II. Hardware part check (first time installation) The motor driver is powered by 24V for the main board, we should first measure whether the [24V output] [GND] of the [laser head] interface is normal. This interface controls whether the motor can swing.
Abnormal motor	①Whistling of	The [RS485A] [RS485B] of the [laser head] interface

oscillation	the motor at the end of the welding head after power on/abnormal swinging red light/heat/unable to adjust the swinging width. ② Directly burned out the lens, there are seals and focusing lenses burned out at the same time	controls parameters such as motor swing width and speed. Problems ① may occur when there is a signal error (poor wire contact, disconnection), external interference, or a mismatch between the driver and the motor. If the ② problem, it is recommended to check the surrounding sources of interference, such as no source of interference, it may be a motor cable failure, direct replacement of the motor cable can be.

For more solutions, please refer to the WeChat app [Problem Handling] page.

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