

Product Description
SUP32C (V1.0 version)



Wuxi Super Laser Technology Co., LTD



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Update Record

Update version	Update Content	Hardware version	Software version	Screen version	Update time
V1.0	First Edition	V7.21	2300	900	25.9.16
		V2.3	203		

I. Notes

This product belongs to laser processing equipment accessories and is used in the field of metal material processing. According to the relevant regulations, this product meets the basic safety standards for all kinds of electrical products that are handheld, portable and fixed for indoor and outdoor use. According to actual requirements, it is recommended that each product have an operating area of 2 to 10 square meters (indoor height is recommended to be more than 3 meters).

Warnings! Please read all safety warnings, instructions, illustrations and specifications in this manual. Failure to follow all of the instructions below may result in electric shock, fire, or any other serious injury!! This product is only intended for use in professional industrial fields and must be used by professionals! No use by people without professional qualifications!

1.1 Transport and storage requirements

Handheld laser cleaners should be able to function properly under the following environmental conditions.

(1) Ambient air temperature range:

During transport and storage: -25°C to $+55^{\circ}\text{C}$.

(2) Air relative humidity:

Not more than 70 percent at 40°C ;

No more than 90 percent at 20°C .

(3) No more than normal amounts of dust, acid, corrosive gas or substance in the surrounding air, except for substances produced during the cleaning process.

(4) No obvious vibration or shock.

1.2 Description of possible hazards

1.2.1 Machine Hazards

① Pinching or other secondary hazards caused by fastening structures.

② Injury from falling equipment or other secondary hazards.

1.2.2 Electrical hazards

① Electric shock or other secondary hazards caused by leakage of the equipment power supply.

② Electric shock or other secondary hazards caused by static electricity generated during the operation of the equipment.

1.2.3 Thermal hazards

① Heatstroke, dehydration or other secondary hazards caused by the large amount of heat generated by laser processing.

② Scalding of personnel, environmental fires or other secondary hazards caused by high-temperature materials, residues and splashes produced by laser processing.

1.2.4 Radiation hazards

- ① Skin damage, retinal damage or other secondary hazards caused by direct laser exposure or secondary exposure after reflection.
- ② Hazards of electrolytic plasma produced by laser energy or other secondary hazards.
- ③ Secondary radiation or other secondary hazards caused by material decomposition and stimulated radiation resulting from laser irradiation.

1.2.5 External interference hazards

Abnormal operation of the product caused by external factors may lead to equipment failure and dangerous conditions.

The external environment refers to:

- ① Temperature
- ② Humidity
- ③ External shock/vibration
- ④ Steam, dust or gases in the environment
- ⑤ Electromagnetic interference
- ⑥ Interruption/fluctuation of the original power supply
- ⑦ Lightning strike
- ⑧ Insufficient hardware/software compatibility or completeness
- ⑨ External communications do not comply with the communication protocol.

1.2.6 Hazard of confined space

Hazards that may result from the use of handheld laser processing equipment in confined Spaces:

- ① An increase in the concentration of harmful substances in the space
- ② Excessive concentrations of process gases (argon, nitrogen, etc.) in the space
- ③ Hypoxia
- ④ Enhanced current
- ⑤ Temperature rise
- ⑥ Radiation hazards caused by direct or diffuse reflection of lasers.

1.2.7 Hazards from working at heights

- ① Hazards of falling objects.
- ② Hazards of personnel falling.

1.3 Precautions

In response to the above hazards, in order to ensure safe production and normal operation of the product, the following safety signs are posted on the complete machine product, clearly informing all personnel using, maintaining and approaching the product of the following safety matters and must take the following safety measures.

Warnings! Please read all safety warnings, instructions, illustrations and specifications in this manual. Failure to follow all of the instructions below may result in electric shock, fire, or any other serious injury!!

1.3.1 Production operating environment

- ① Special laser cleaning areas should be designated for product use.
- ② Flammable and explosive items should not be placed around the product to avoid potential safety hazards.
- ③ The product should be kept away from bad weather conditions such as fog, strong wind, lightning, rain, snow and hail when working outdoors.
- ④ Good ventilation and visibility (sunlight or light) should be maintained when the product is working indoors.
- ⑤ Dust, acids, alkalis, corrosive gases in the working environment of the product should not exceed normal levels.
- ⑥ Temperature range of the product working environment: 10 to 40 ° C, humidity range $\leq 70\%$.
- ⑦ The working environment of the product should avoid obvious vibration and shock.

1.3.2 Engineering protection measures

Isolation protective fences should be set up around the laser cleaning area. The fences should be capable of withstanding a certain amount of laser energy to prevent the laser from shining outside the area.

- ② No other person should enter the laser cleaning area without the operator's authorization.
- ③ This product is powered by 220V AC. The applicable range is 220V \pm 5% AC 50/60Hz. The supply voltage should be stable without shock. Please pay attention to electrical safety when using to avoid the risk of electric shock.
- ④ To ensure the normal operation of the product and to prevent static electricity damage and leakage of the product, the product should adopt safety grounding measures, that is, connect the easily conductive parts to the protective (grounding) wire in the fixed wiring of the product, so that the easily accessible conductive parts will not become live parts when the basic insulation fails; Additional safety measures (such as double insulation or reinforced insulation) may be added as appropriate, or separate grounding may be provided;
- ⑤ Within 2 meters of the operator's working area, there must be an emergency stop switch control device centered on the individual.

1.3.3 Personal protective measures

Warnings! The operator must be a professional who, in addition to being familiar with the product and the associated cleaning system, must also be familiar with the properties of the processed material, be familiar with possible side effects, be capable of assessing health risks, and ensure effective preventive measures.

- ① Individuals should wear professional laser protective clothing and protective gloves.
- ② Individuals should wear laser protective glasses and face masks corresponding to the power and wavelength.

1.3.4 Protective measures for product maintenance

- ① When replacing vulnerable parts, make sure the product is powered off to avoid light exposure.

② The control box of this product does not contain accessories that require user operation. Any installation, maintenance or disassembly of this product should be carried out at the designated repair point when the power is off. Please contact your local dealer.

1.3.5 Other precautions

① Warning! The product is compatible with lasers of wavelengths 1080nm and near, a band that is invisible and whose radiation is hard to detect before it has a direct effect, requiring special attention! Operators must wear all protective gear, work area must be protected as required, and no other personnel are allowed to enter the work area!

② The energy output of the laser is very high in an instant. Do not point the light outlet at people or other objects when it is working, placed or idle.

③ Even if the type 4 laser does not directly shine on the skin and eyes, it will indirectly shine on the skin and eyes due to the diffuse reflection of the material, which will still cause irreversible damage. Operators must wear protective equipment such as glasses and protective clothing.

④ When laser is shone on a smooth surface, mirror-like reflection occurs, which is particularly obvious when processing high-reflectivity materials such as copper and aluminum. When processing materials, the Angle of reflection can also change due to the variation of the molten pool. Operators should be fully aware of the possible angles of reflection to avoid laser reflection from endangering personnel and equipment.

⑤ The gas around the molten pool, when exposed to the high-energy laser, forms electrolytic plasma. The splashing waste and exhaust gas produced by the laser on the material can also pose a threat to personnel. Operators must wear protective equipment such as face masks.

⑥ During work, the emergency stop switch control device should be placed within 2 meters of the operator's working area with the operator as the center.






⑦ When working at heights, the operator should wear a safety rope, helmet, etc. and take measures to secure the equipment to prevent it from falling.

⑧ When working indoors or in confined Spaces, adequate ventilation measures should be maintained to prevent the accumulation of harmful substances. Maintain adequate visibility and avoid exposure to strong light. Appropriate measures need to be provided to remove smoke, exhaust gases, etc. that may be produced from the processing area, which need to be sufficiently purified before being discharged into the atmosphere far from people.

1.3.6 Safety signs

The following safety signs must be fully understood and used.

Signs	Name
	Movable fire zone
	Warning! Be safe
	Beware of hot surfaces
	Do not wear synthetic fiber clothing
	Flammable materials are prohibited
	Laser radiation avoid direct or scattered exposure to eyes and skin Category 4 laser products
	Laser window Avoid exposure to laser radiation coming out of the window
	Protective goggles must be worn
	Beware of lasers

	<p>Beware of ionizing radiation</p>
	<p>Danger ! High Voltage</p>
	<p>Must be grounded</p>
	<p>Must unplug</p>
	<p>Do not close the circuit</p>

II. Product Overview

This product belongs to laser cleaning equipment accessories and is used in the field of metal material processing, including common metals such as carbon steel, stainless steel, aluminum, copper, and other metals that can absorb 1080-band laser.

For continuous lasers with a laser power of 3000W or less and a wavelength of $1080\pm 10\text{nm}$.

Cooling is water cooling.

It is not commonly used for processing non-metallic materials such as wood, stone, plastic, composites, etc.

Not suitable for underwater work. For detailed operating conditions, see [Production Operating Environment].

This manual includes a general description of the basic functions, installation, operation, and maintenance of the SUP32C series of handheld laser cleaning head products.

2.1 Gun body Description

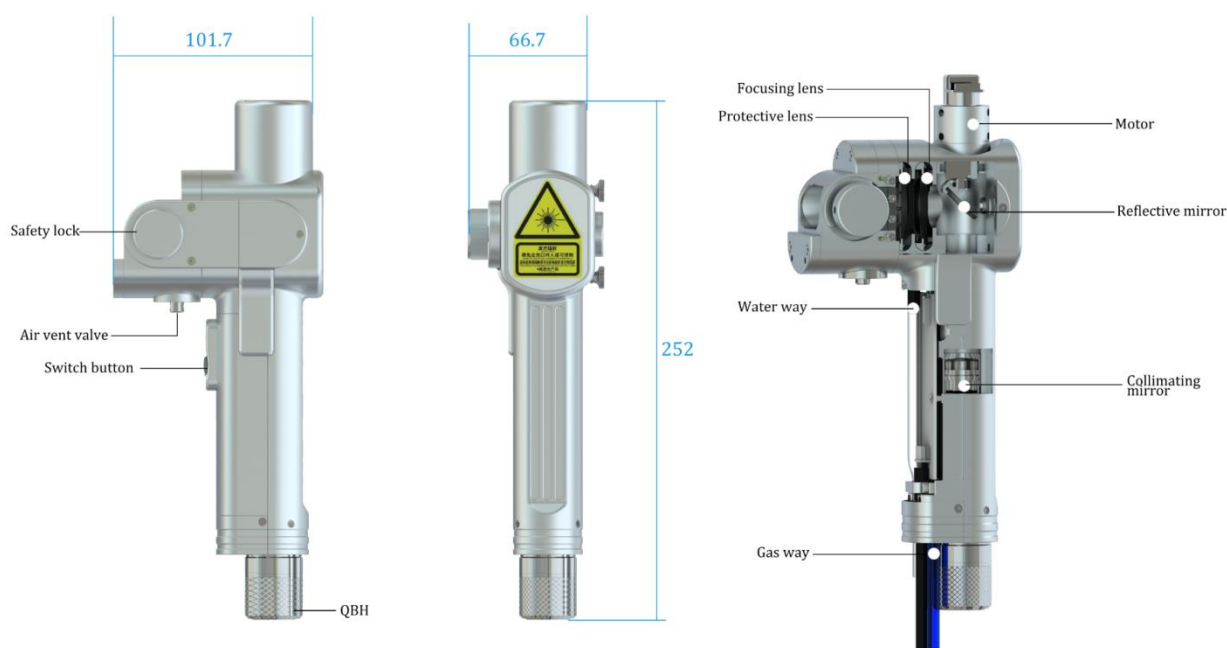


Figure 2.1 SUP32C body

32C Air Supply mode description: The SUP-32C has three air supply modes, namely coaxial air supply mode, side-axis air supply mode, and simultaneous air supply mode. Different air supply modes can be switched between the three modes by rotating the knob. In coaxial blowing, the direction of the air is the same as the direction of the light output; In paraxial blowing, the air direction intersects the light direction; When blowing simultaneously, the direction of the air is the same and intersects with the direction of the light, blowing in both directions simultaneously. The illustration is shown in Figures 2.2, 2.3, 2.4 below:



Figure 2.2 Coaxial Blowing Mode



Figure 2.3 Paraxial blowing Mode



Figure 2.4 Simultaneous Blowing Mode

2.2 Product Features

- Basic features of the product: Self-developed control system and structural design, suitable for various cleaning requirements within 3000W, multiple safety alarms set, simple and flexible operation.
- More stable whole machine: All parameters are visible, real-time monitoring of the whole machine status, early avoidance of problems, convenient troubleshooting and resolution of faults, ensuring stable operation of the handheld cleaning head.
- Unique air knife design: The unique outlet "air knife" design can greatly increase the flow rate of the protective gas at the light outlet to better prevent lens contamination.
- Controllable parameters with high repeatability. Stabilize the mechanical structure and lens state. As long as the laser power is stable, the process parameters must be repeatable, greatly improving efficiency.

2.3 Operating environment and basic parameters of the product

The operating environment requirements and main parameters of the SUP32C handheld laser cleaning head are shown in Table 2.1:

Table 2.1 Operating Environment Requirements and Basic Parameters

Supply voltage (V)	220V±5% AC 50/60Hz
Operating ambient temperature (°C)	10 to 40°C
Working environment humidity (%)	≤70
Cooling method	Water cooling
Applicable wavelengths	1080nm (±10nm)
Applicable power	≤3000W
Collimating mirror	D16T5F60
Focusing lens	D30T3,5Ff800
Protective goggles	D30T3
Recommended air flow	10 to 15L/min (0.15MPa at 20°C)
Focus vertical adjustment range	±10mm
Weight	0.9 kg
Compatible laser	The beam is collimated to $\phi \leq 14\text{mm}$

III. Product accessories and installation

3.1 Unpacking list

Taking the standard version as an example, the product factory list is shown in Table 3.1. The actual product may differ from Figures 3.1, 3.2 Please refer to the specific order.

Table 3.1 Factory Configuration List of Products

SUP32C packing list				
Number	Material code	Name	Specifications	Quantity
1	A01030013	Handheld laser cleaning head	SUP32C	1
2	A05010020	Laser cleaning system	SUP-LCS-D	1
3	K01092001	Eight-core system connection line	32C-10M	1
5	C04010006	Display screen	SUP-DW128 HJT	1
6	K04020001	Display 1-meter line	1M	1
7	C03020002	Switching power supply	100FGC-24	1
9	D01020008	Protective lenses	D30T3	5
10	D03020011	Focusing lens	D30T3. 5 f400	1
11	D02010012	Collimating lenses	D30T4. 5 f75	1
12	B03330200	Red light correction plate	32C-309	1



Figure 3.1 The first layer of packaging

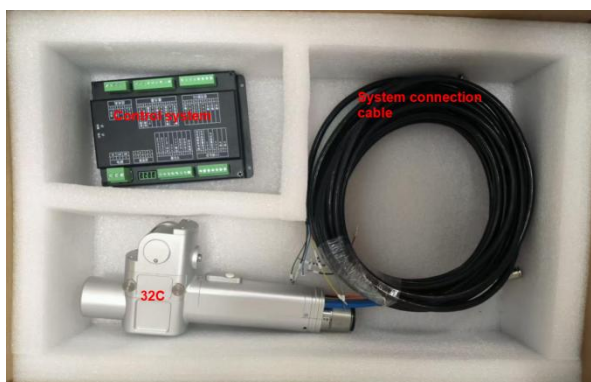


Figure 3.2 Packaging the second layer

3.2 Control box wiring and interface definitions

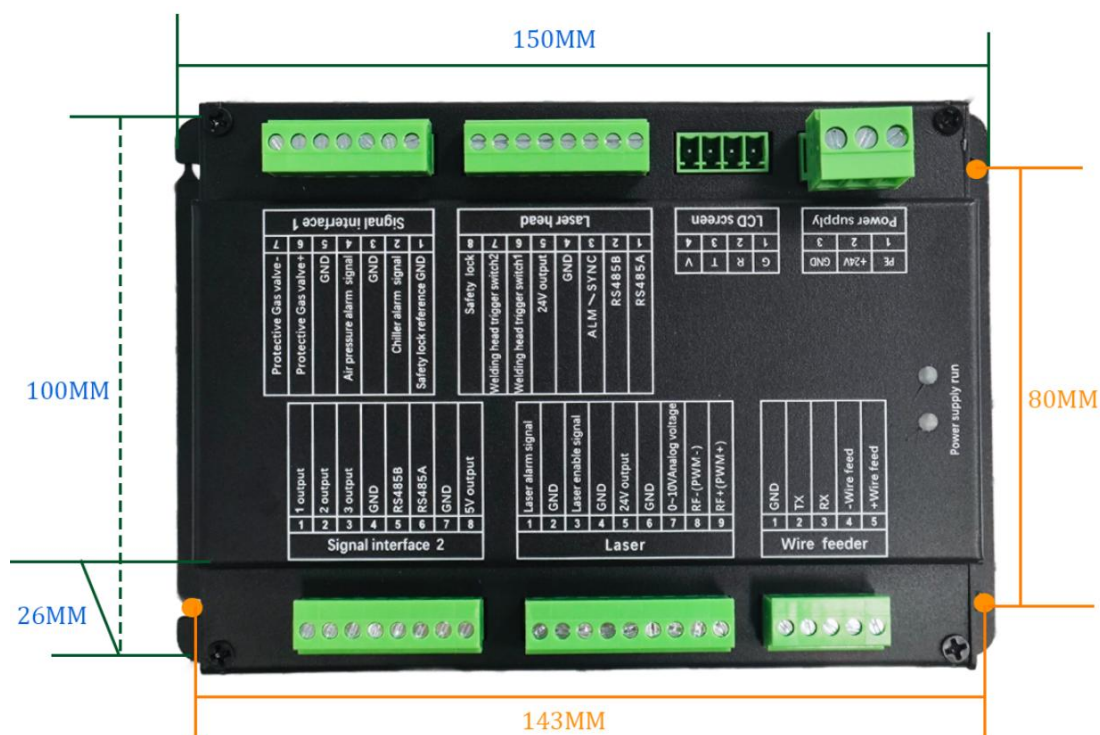


Figure 3.3 Control box

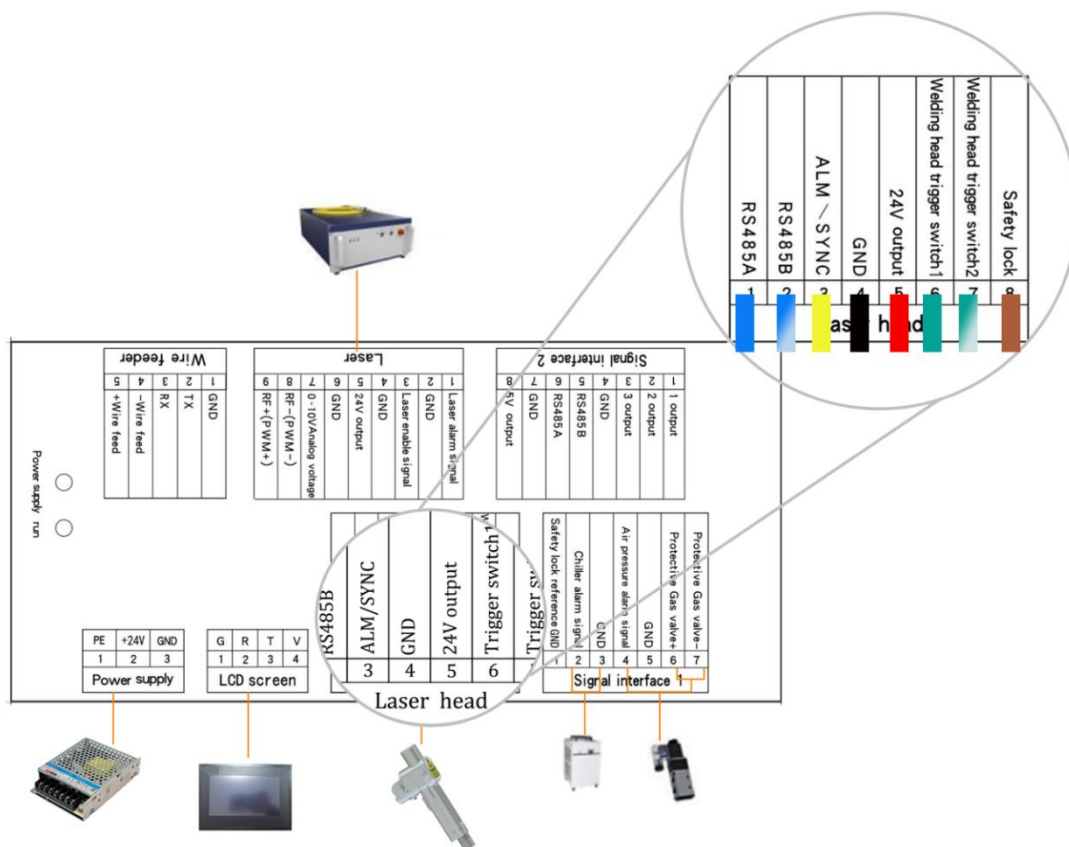


Figure 3.4 Wiring diagram

- ① To avoid abnormal power consumption of the product, the ground wire of the switching power supply must be effectively grounded! The product casing must be grounded!
- ② The ICONS used in Figure 3.4 refer only to a certain type of product and not specifically to the corresponding product.

3.2.1 Control Box - [Power Supply]

The Power Supply end uses a 3P interface (with terminals included randomly), please use the 24V switching power supply included randomly.

Note: The switching power supply must be grounded! The control box signal [power] interface is shown in Table 3.2. The size diagram of the power supply is shown in Figure 3.5.

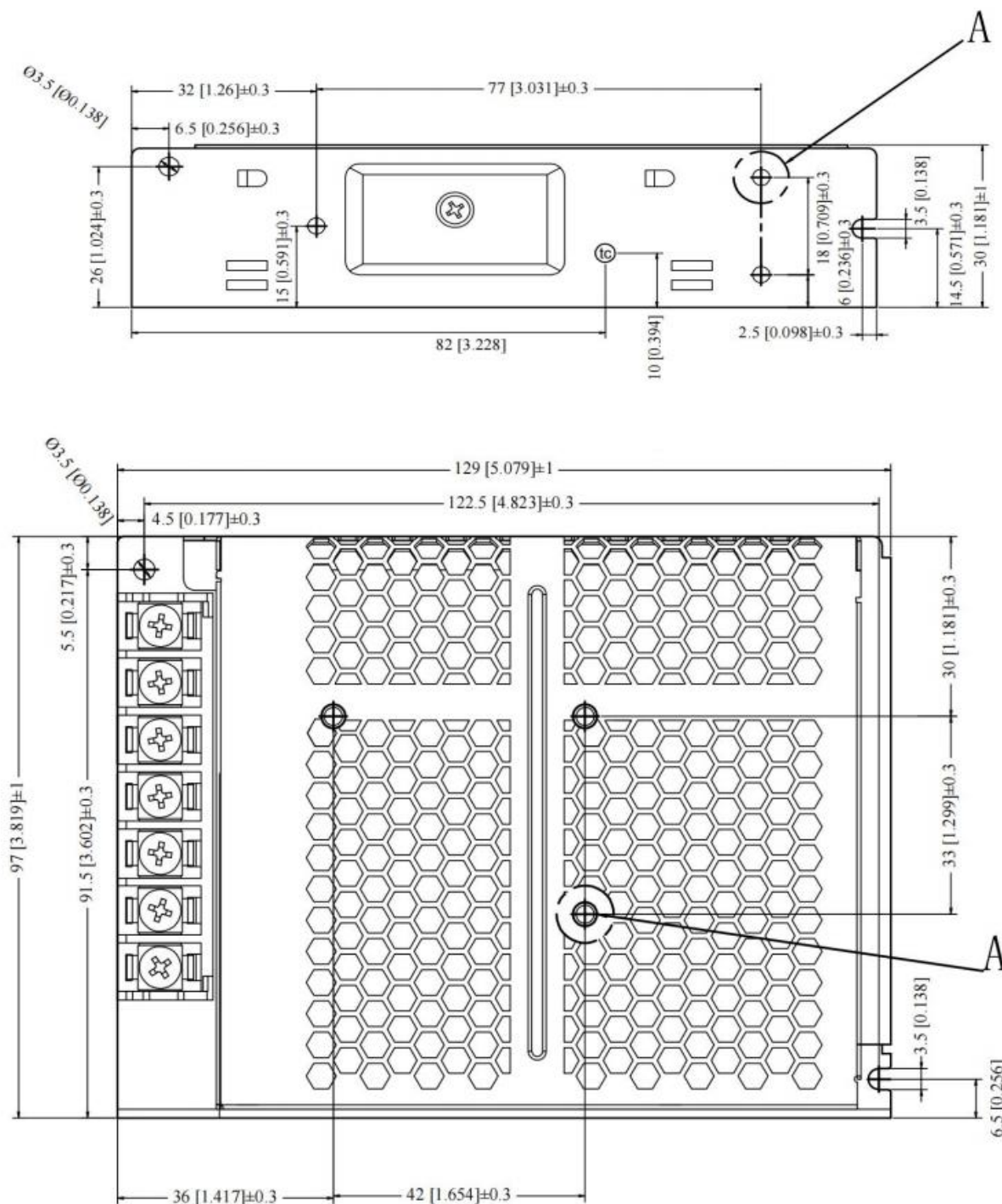


Figure 3.5 Power supply size diagram

Table 3.2 Description of Power Supply Interface Functions

Power Supply			
Number s	Signal Definition	Signal type	Feature Description
1	PE	Ground wire	Protective wire
2	+24V	Input	Connect to +V of the 24V switching power supply
3	GND	Reference ground	Connect to a 24V switching power supply -V

Note: The device must be effectively grounded. 1. Make sure the ground wire is conductive, there are no loose connections or open circuits; 2. The ground wire itself is stable and not electrified (that is, the AC and DC voltages between the live wire and the neutral wire and the PE wire are both less than 10V, preferably maintained at 0V).

3.2.2 Control Box - [LCD screen]

The wiring of the LCD screen is included. Just plug it into the corresponding interface. [LCD Screen] Interfaces are shown in Table 3.3. Screen appearance dimensions are shown in Figure 3.6 (A.A is the effective display area); The installation dimensions diagram is shown in Figure 3.7.

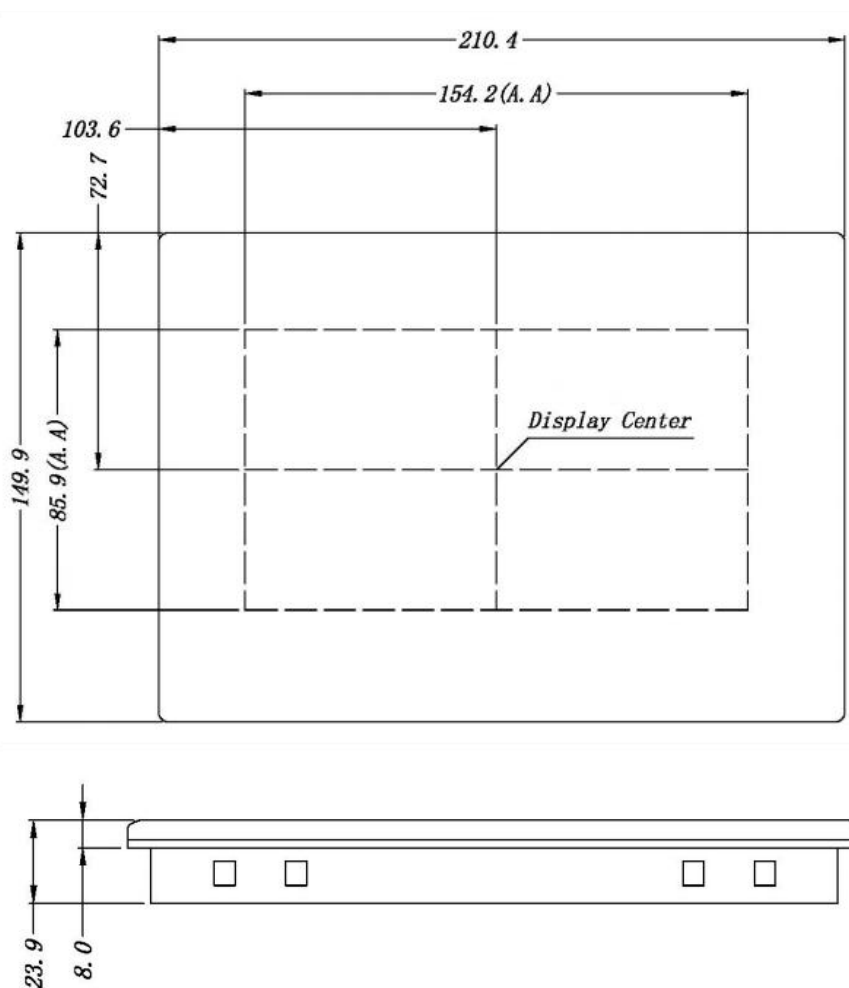


Figure 3.6 Display appearance dimensions

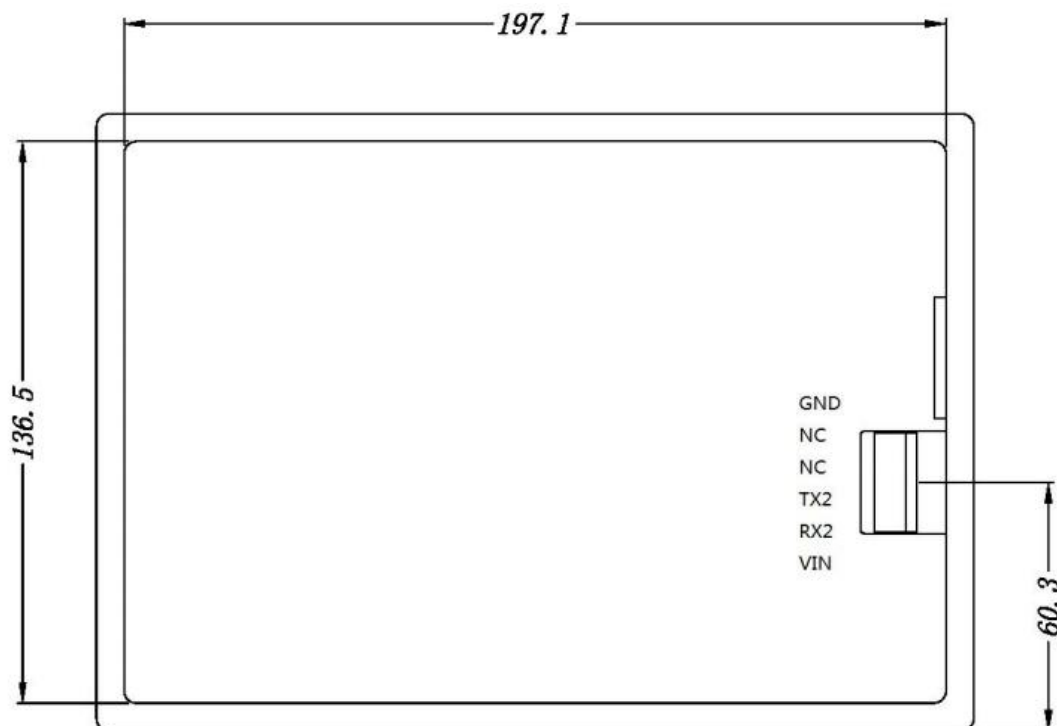


Figure 3.7 Display mounting dimensions

Table 3.3 [LCD Screen] Interface Function Description

LCD Screen		
Number	Signal Definition	Feature Description
1	G	White wire, two terminals [4P-1] -- [6P-G], 24V Power Supply negative and cable shield.
2	R	Black wire, terminals [4P-2] -- [6P-R], 232 signal.
3	T	Brown wire, terminals [4P-3] -- [6P-T], 232 signal.
4	V	Blue wire, two terminals [4P-4] -- [6P-V], 24V power positive.

Note: The full screen cable comes with it, plug and play.

3.2.3 Control Box - [Signal Interface 1]

[Signal Interface 1] The interface is shown in Table 3.4.

Table 3.4 [Signal Interface 1] Function Description

Signal Interface 1		
Number	Signal Definition	Feature Description
1	Lock the reference ground safely	Suspended
2	Water cooler alarm signal	Input port. Connect the water chiller alarm signal and set the [water chiller alarm level] according to the water chiller alarm output voltage. The 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 air valve alarm output voltage.
5	GND	Signal ground
6	Air valve +	Air valve open: [Air valve +] output 24V; Air valve closed: [Air valve -] No output.
7	Air valve -	Signal ground

3.2.4 Control Box - [Signal Interface 2]

[Signal Interface 2] The interfaces are shown in Table 3.5.

Table 3.5 [Signal Interface 2] Function Description

Signal Interface 2		
Number	Signal Definition	Feature Description
1	Output 1	Reserve the output port for controlling the tricolor light. The tricolor lights need a common anode. It is recommended that the positive terminal be connected to 24V, and the tricolor wires be connected to pins 1, 2, and 3 respectively. 1. In standby mode, the [output 1] interface is connected to [GND] 2. In working mode, the [output 2] interface is connected to [GND] 3. In alarm mode, the [Output 3] interface is connected to [GND]
2	Output 2	
3	Output 3	
4	GND	Signal ground
5	RS485B	485 communications
6	RS485A	
7	GND	Signal ground
8	5V output	Normal 5V output

3.2.5 Control Box - [Laser]

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

Table 3.6 Description of Functions of the [Laser] Interface

Laser		
Number	Signal Definition	Feature Description
1	Laser Anomaly 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 enabling	Connect the laser enable + and output 24V when light comes out
4	GND	Signal ground
5	24V output	Normal 24V output
6	GND	Signal ground
7	0 to 10V analog quantity	Analog output (default 0-10V analog voltage).
8	RF -(PWM -)	PWM - Modulate the signal
9	RF+(PWM+)	PWM+ modulates the signal

3.2.6 Control Box - [Wire Feeder]

[Wire feeder] This interface is used when using the welding system, and the cleaning system is suspended.

Table 3.8 [Wire Feeder] Interface Function Description

Wire feeder		
Pin numbers	Signal Definition	Feature Description
1	GND	Suspended
2	TX	
3	RX	
4	Wire feeding +	
5	Wire feeding -	

3.3 Gun body interface

The gun body interface, as shown in Figure 3.8, mainly includes the gas line interface, QBH, and system connection line interface.



Black	Transparent	Red, Blue
Eight-core system connection cable	Trachea	Water pipe

Figure 3.8 Diagram of the cleaning head interface

3.4 Fiber optic head connection

Product [QBH] interface for most industrial laser installations should be noted:

- ① Keep the device clean;
- ② Install the fiber head horizontally with [QBH];
- ③ According to the [Lock] and [Unlock] marks in Figure 3.9, rotate and release QBH first, insert the fiber head and then lock it. After locking, the fiber head is placed inside the QBH without shaking.



Figure 3.9 QBH [unlocked] and [Locked] status

IV. Interface Operations

4.1 Home Page

A switch used to display the current process and adjust the main output signal, as shown in Figure 4.1.



Figure 4.1 Home Page

- ① [Laser Enable - ON/OFF] : Controls, indicates whether to output [Laser output enable signal].
- ② [Indicator red light - point/line] : Controls, indicates whether the galvanometer motor swings, adjusts the red light to [●] or [▬] without affecting the presence or absence of the red light.
- ③ [Manual Air Blowing] : Control, indicating whether the air valve is opened.
- ④ [☀️/🔒] : Indicates whether the gun body [safety lock] is open.
- ⑤ [🔑/🔒] : Indicates whether the [Switch button] of the gun body is open.

4.2 Process Page



Figure 4.2 Process Page

- ① [Peak power] : The maximum power output, or processing power, cleaning power.
- ② [Scanning frequency]: The number of periods the focused spot scans back and forth within one second, which affects the precision or fineness of the cleaned surface. It is usually set at 30 to 100Hz.
- ③ [Scan Width] : The theoretical width corresponding to the spot, controlling the spot size. Adjust according to the size of the weld.
 - When the laser head is focused at 800, the maximum Scan width is 300mm;
 - When the scanning frequency is 0 to 100Hz, the maximum scanning width is 300mm;
 - At a scanning frequency of 150Hz, the maximum scanning width is around 200mm;
 - When the correction factor is greater than 1.0 and the center offset is not equal to 0, the system will intelligently adjust the scanning width to ensure that the laser work trajectory does not exceed the laser head's light outlet in any case.
- ④ [Duty Cycle, pulse Frequency] : Typically 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, but usually no adjustment is made.
- ⑤ [Endpoint point optimization] : Range -30 to 30 can eliminate the uneven light output at both ends of the cleaning trajectory, with different scanning frequencies corresponding to different optimal parameters. The default is 0. Adjust to the ideal state according to the actual situation.

4.3 Settings Page



Figure 4.3 Settings Page

The page shown in Figure 4.3 is used to set factory parameters, including the product's power and alarm level, etc.

- ① [Laser Power] : Based on the actual laser.
- ② [Temperature alarm threshold] : Maximum temperature of the lens group 100 ° C, maximum temperature of the driver and motor 80 ° C. When this value is set to 0, no temperature alarm is detected.
- ③ [Alarm Level - High/Low] : Set to low when not in use, depending on the external product Settings.
- ④ [Trigger Settings - Click on/Double-click] : In clean mode, control the trigger mode. It is usually set to [Double-click].
- ⑤ [Open gas delay] : Release air in advance before turning off the light.
- ⑥ [Off gas delay] : After turning off the light, postpone turning off the air.
- ⑦ [Center Offset] : [-] indicates a left shift of the light spot, and [+] indicates a right shift of the light spot. Used to adjust the light spot to be centered. At 800mm focus, the range is -15mm to 15mm.
- ⑧ [Scan Correction] : Range 0.01 to 1.50.
- ⑨ [Maximum Width] : Switch the maximum scanning width when using different focusing lenses.
- ⑩ [Laser starting /Laser off Power][Laser on /Laser off progressive time] : As shown in Figure 4.4, [Laser on progressive time] represents the time it takes to increase from [Laser starting power] to [peak power], and [Laser off progressive time] represents the time it takes to decrease from [peak power] to [Laser off power].

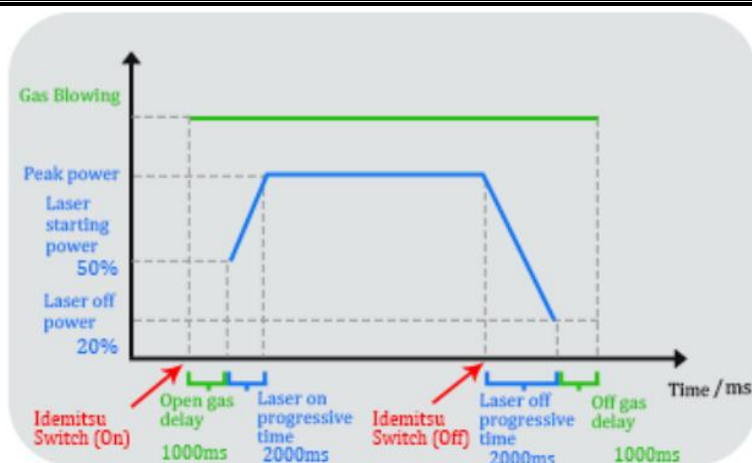


Figure 4.4 Power-to-time relationship

4.4 Monitoring Page



Figure 4.5 Monitoring Page

The page shown in Figure 4.5 shows the actual machine information monitored.

① Among them, [Input] [Output] [power supply] are real-time monitoring signals used to determine whether the product is working properly.

② [Equipment] :

- "Device Authorization" can be clicked to perform the operation and is used for product encryption.
- [Equipment number][Manufacturer ID][System version][Driver ID][driver version] are simply displayed information to be provided to technicians in after-sales work.
- [Light Time] is the cumulative luminous time of the product.

③ [Temperature] :

- [Temperature] is the measured temperature. The system alarms when it exceeds the [Temperature Alarm Threshold] corresponding to the Settings page.

4.5 Diagnostic Page

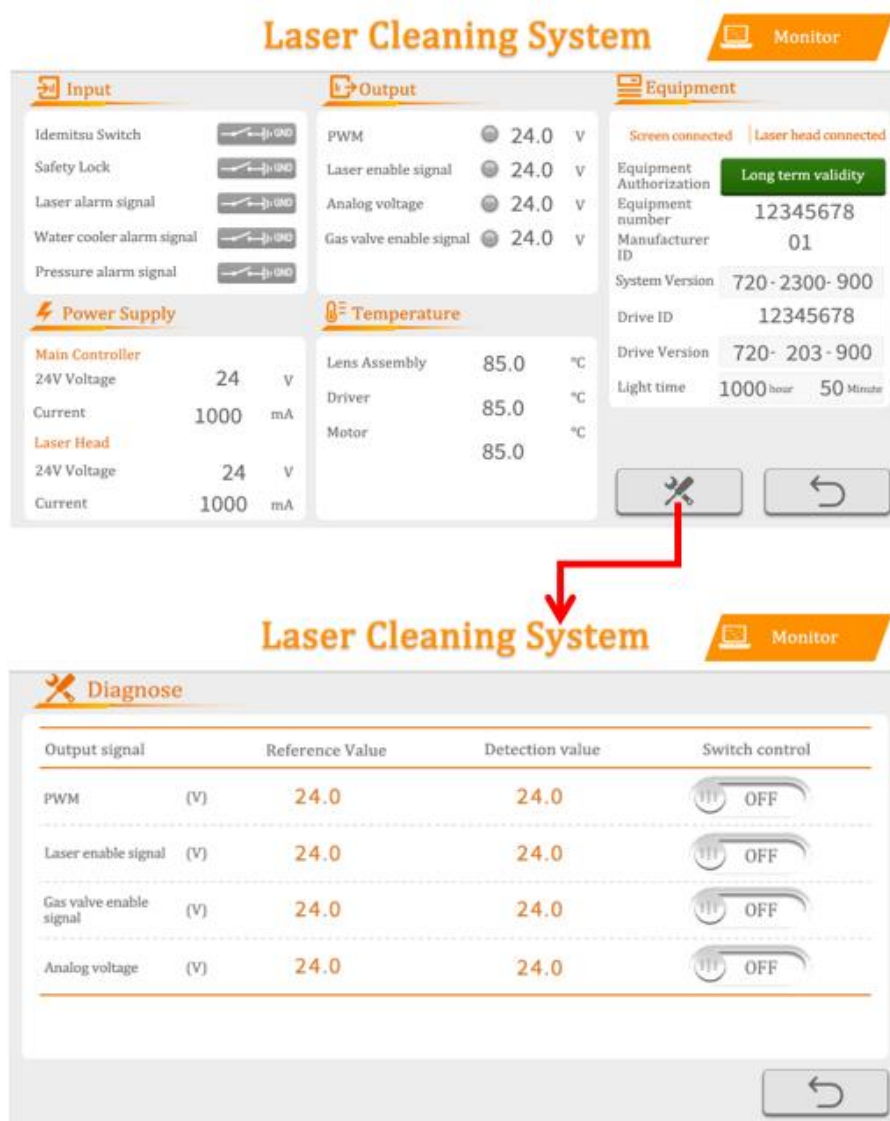


Figure 4.6 Diagnostic Page

The page shown in Figure 4.6 is the diagnostic page for the laser cleaning system. Enter the diagnostic page from the monitoring page. This mode only shows the detection value of the output signal, which is used to determine whether the output signals of the main control board are normal in a safe situation. No light is emitted in this mode.

4.6 Alarm Prompt Page

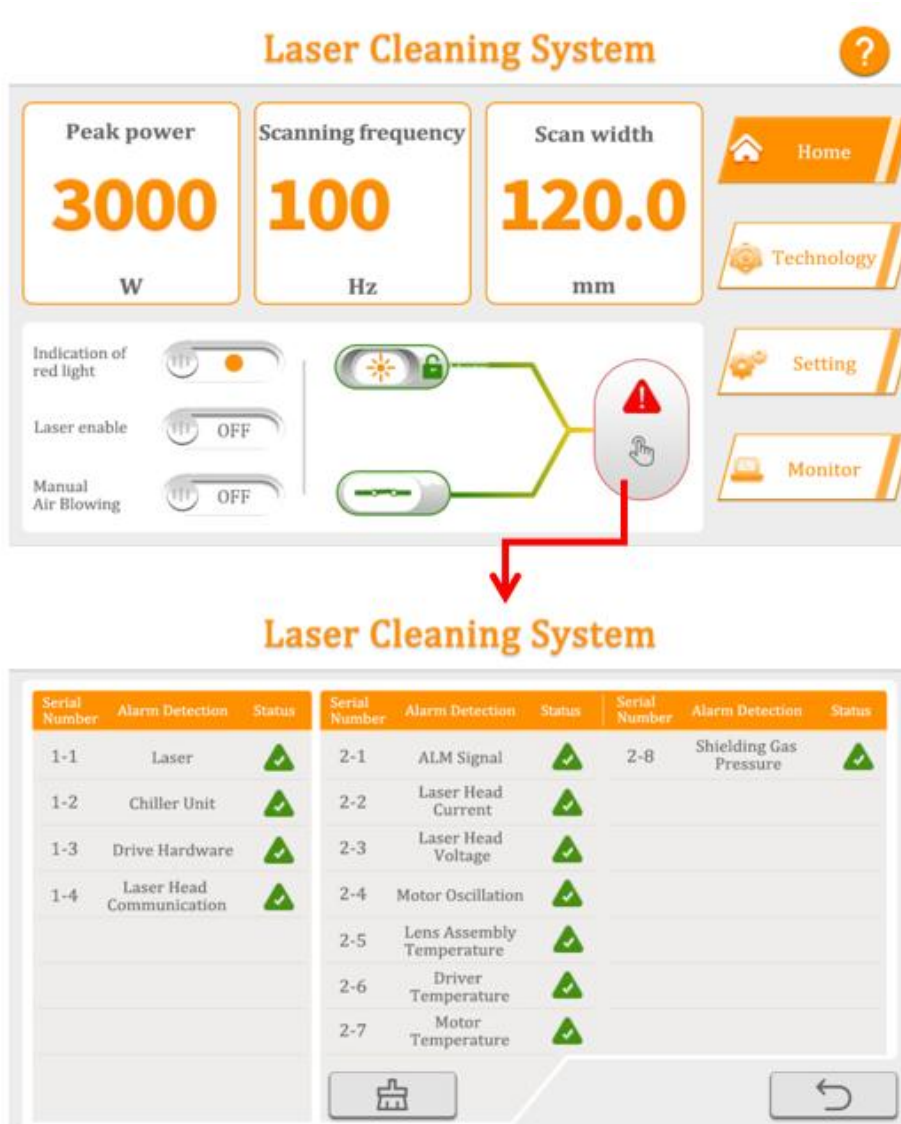


Figure 4.7 Alarm Page

Figure 4.7 shows the alarm display interface. Enter the alarm details page through the alarm prompt icon on the Home. When the system malfunctions, a dynamic alarm prompt will appear on the Home. Click the icon to enter the alarm display page to view the anomaly.

- [1-1 to 1-4] When an alarm detects an anomaly, the status icon is [⚠]. When the alarm status is cleared, the icon automatically changes to [✓].
- [2-1 to 2-8] When an alarm detects an anomaly, the status icon changes to [⚠🔒]. After the alarm status is cleared, the icon does not change color automatically. You need to click the delete button below to clear the alarm.

V. Daily maintenance of the product

1. It is recommended that users change the water in the chiller once a month to prevent clogging of the water pipes inside the gun body. The water quality should be pure water or distilled water, and antifreeze should be added in low-temperature conditions.

2. Maintenance and replacement of the lenses should be carried out in a relatively clean on-site environment. When performing open operations such as opening the protective lens, focusing lens compartment cover, and pulling out the lens holder, protective measures should be taken (cover with masking tape). The replacement methods for different lenses corresponding to all gun types can be found in the Wechat mini-program → Super Laser → Lens Installation.

3. Please handle with care when in use. For complex production environments, please clean the dust promptly.



VI. Common Product Issues and Solutions

Warnings! All power must be cut off before dealing with any problem to avoid any danger!!

Repair and maintenance of this product must be carried out by professionals! Do not operate without training! If you have any problems, contact your dealer and have a professional handle it!

Once there is any appearance damage to the product, it will no longer be repaired and will be scrapped directly.

Common alarm instructions and solutions to problems are as follows:

Problem items	Phenomena	Solutions
Temperature alarm, indicating that all kinds of temperatures are too high	The Home prompts that the temperature of XXX is too high	For general lens temperature alerts, usually first check if the lens is damaged and replace the damaged one. If the lens is normal, you need to directly block this alarm on the Settings page. Set the corresponding lens temperature alarm threshold to 0 on the Settings page and save it.
Chiller/laser/air pressure alarm	The alarm page shows the chiller/laser/air pressure alarm	Level alarm logic: The system will compare the wiring method of the corresponding product with the set level on the Settings page and alarm if they are different. Usually, alarms occur due to incorrect alarm level Settings. Simply change the corresponding alarm level. If an alarm occurs when an alarm signal is connected and the alarm is triggered regardless of how it is set, unplug the alarm signal line and set it to low level.
Screen issue	The screen doesn't light up/the screen doesn't respond when clicked	If the screen does not light up, make sure the controller is powered on. Check whether the four-core wires of the controller and the screen are connected correctly and whether the 24V voltage at 1 and pin 4 is normal. If clicking doesn't work during normal use, check if the whole machine is overheating. If clicking fails to input, check if the four-core wires of the controller and the screen are properly connected, and if pins 2 and 3 are functioning properly. See 3.2.2 Control box display end. If a new device has no response when clicked, it may be a system version mismatch. Re-flash the program using the SD card. For the specific version, please inquire with our company.
Light output	No light output	Check if there are any alarm prompts on the Home and whether the laser enable is on. Check if the trigger signal and safety lock signal on the monitoring page are displayed in green; Check if the monitoring page's PWM, laser enable, and



		analog output are functioning properly. If all of the above states are normal, check the laser for abnormal alarms.
	Suddenly stop emitting light while working	Check if the safety lock and other alarms on the monitoring interface are functioning properly.

For more problem-solving solutions, please refer to the "Problem Handling" page of the wechat Mini Program



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