









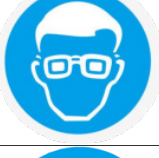



INTEGRATED LASER CLEANING MACHINE

SLC-2030B/3040B OPERATION MANUAL



Notice

Before using this product, please ensure that the following items are in compliance with the product safety operation requirements. Otherwise, it is forbidden to turn on the system and perform cleaning operations.

	<p>It is prohibited to use this product in places with flammable and explosive materials.</p>
	<p>When cleaning highly reflective materials (copper, aluminum, etc.), it is forbidden to have people stand around to avoid damage caused by reflected light.</p>
	<p>It is forbidden to aim the cleaning head at the human body to avoid injury.</p>
	<p>It is forbidden to make the tip of the cleaning head upward. Pay attention to the dustproof of the lens.</p>
	<p>Make sure that the equipment is reliably grounded.</p>
	<p>Clean combustible items carefully and equip with fire-fighting equipment.</p>
	<p>This product is a Class IV radiation laser. Goggles must be worn.</p>
	<p>Ensure that the dust-proof air blower works normally to keep the lens clean.</p>
	<p>The minimum bending radius of the integrated cable should be more than 200mm.</p>
	<p>Laser-specific antifreeze must be used when the temperature is below 2°C. If the laser freezes, it will cause high maintenance fees.</p>

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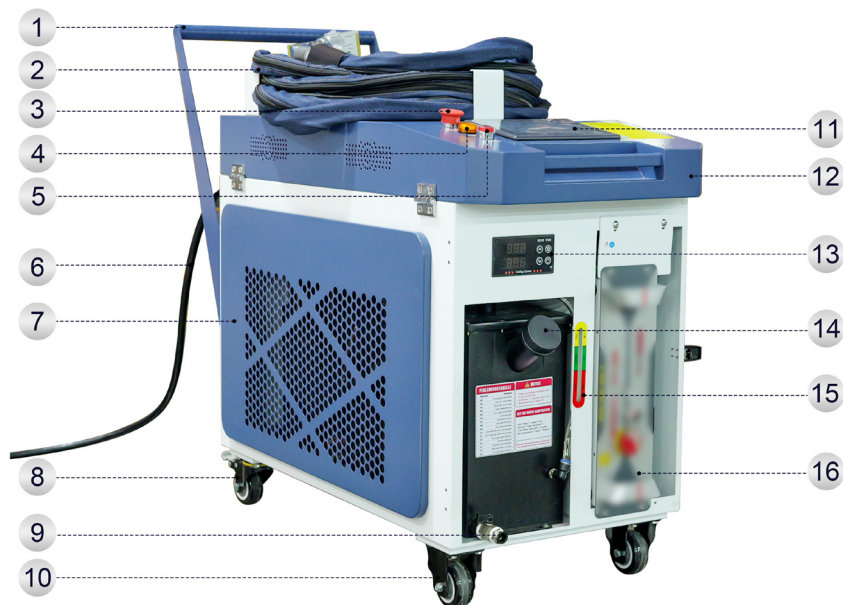
I Scope of application

This product can be used to remove attachments or coatings on the surface of objects, including rust, paint, oil stains, coatings, etc. (High-reflective materials need to be tested and verified). It has the advantages of non-contact, no chemical damage, mobility and no consumables, etc.

II Product Description

2.1. Equipment structure diagram

SLC-2030B



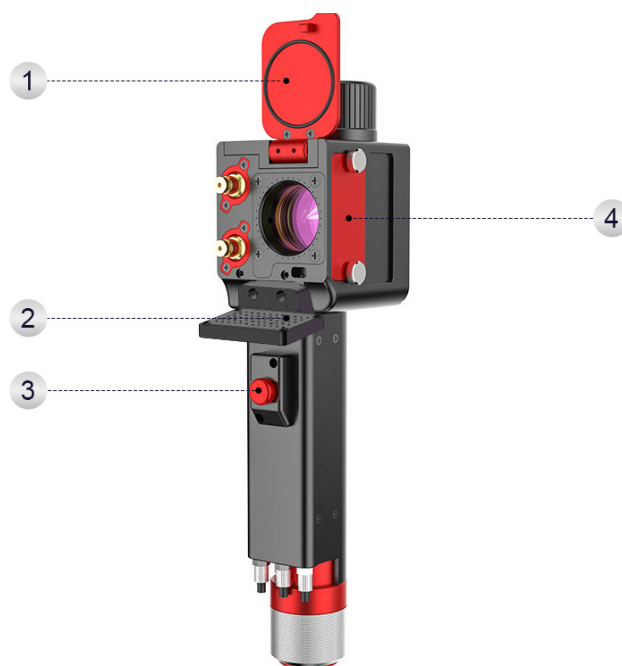
- 1.Handle 2. Integrated Cable 3. Emergency Stop 4. Power Indicator 5. Start 6. Power Cord
7. Side Cover 8. Caster 9. Chiller Drain Outlet 10. Steering Wheel 11. Control Panel 12. Top cover
13. Chiller Display 14. Chiller Water Inlet 15. Liquid Level Display 16. Laser Source

SLC-3040B



1. Storage Box Cover 2. 3-phase transformer(only available for 3*220V equipment) 3. Nameplate
4. Side Cover 5. Laser Source 6. Power Cord 7. Caster 8. Steering Wheel 9. Storage Compartment
10. Control Panel 11. Front Handle 12. Start 13. Emergency Stop 14. Chiller Water Inlet
15. Chiller Display 16. Liquid Level Display 17. Front Door 18. Chiller Drain Outlet

Cleaning head



1. Protection cover 2. Dust-blowing air outlet 3. Laser output button 4. Protective lens drawer

2.2. Main technical parameters

Model	SLC-2030B	SLC-3040B(220V)	SLC-3040B(380V)
Laser Power	2000W	3000W	
Laser Wavelength	1070±10nm		
Operating Mode	Continuous		
Integrated Cable Length	10m(Customizable 20m)	20m	
Scanning Width	10-300mm	10-400mm	
Power Configuration	AC220V±10%	3-phase 220V	3-phase 380V±7%
Input Power	10KW	13KW	
Cooling Method	Water cooling (distilled water , deionized water or pure water as medium)		
Ambient Temperature	0℃ ~37℃		
Ambient Humidity	40%—80%		
Machine Size	900*490*662mm	1230*650*1070mm	1050*650*1070mm
Package Size	1120*565*1050mm	1430*720*1250mm	1220*720*1250mm
Net Weight	118kg	232kg	206kg
Gross Weight	150kg	262kg	241kg

III Installation and use instructions

3.1. Installation and use requirements

Item	Requirements
Environment Temperature	4°C ~ 35°C
Environment Humidity	40%-80%
Power Configuration	Refer to II 2.2 technical parameters
Cooling Medium	Deionized, distilled or pure water
Grid Ground	Comply with the national standard

- 3.1.1. Ensure that the equipment is installed and used steadily to avoid damage caused by falling or tipping.
- 3.1.2. Ensure good ventilation and keep at least 60cm of space around the equipment for heat dissipation to avoid affecting performance due to poor heat dissipation.
- 3.1.3. During use, please pay attention to air blowing to avoid damage to the lens caused by dust.
- 3.1.4. Check the protective lens before use. If it is dirty, please clean in time. (Use a lint-free cotton swab or swab dipped in absolute or isopropyl alcohol and scrub the protective lens counterclockwise from center to edge) When cleaning, pay attention to lens protection and avoid scratches.
- 3.1.5. The hand-held cleaning head should be handled with care. Keep the protection cover closed when storing. Please put the tip of the cleaning head downward or lay flat when stored.

3.2. Operation precautions

- 3.2.1. Please refer to the main technical parameter table for the operating voltage. If it does not meet the requirements, transformer is needed.
- 3.2.2. In the cold environment, please ensure that the cooling medium is not frozen. Please use special laser antifreeze when the temperature is below 2°C to avoid the abnormality of the cooling system.
- 3.2.3. Protect it from rain and water when outdoor use.
- 3.2.4. When the temperature of the water chiller is lower than 22°C, the laser low temperature alarm will occur, and it needs to be preheated. When the temperature reaches 22°C, please turn it off and then turn it on again to clear the alarm.
- 3.2.5. The laser has safety protection. If the cleaning is suspended for more than 2 minutes, please click "Laser" on the touch screen again to activate it and then it will emit light.

3.3. Protective lens replacement

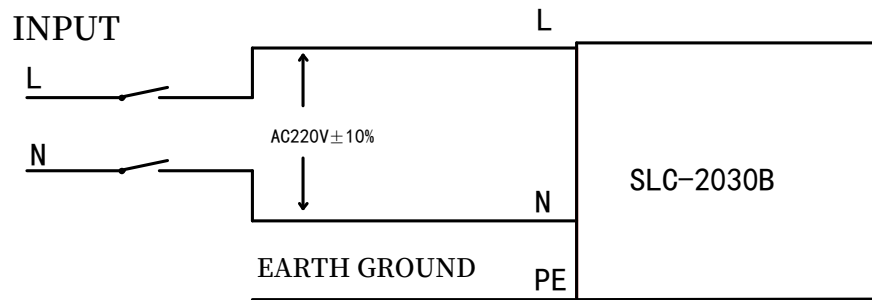
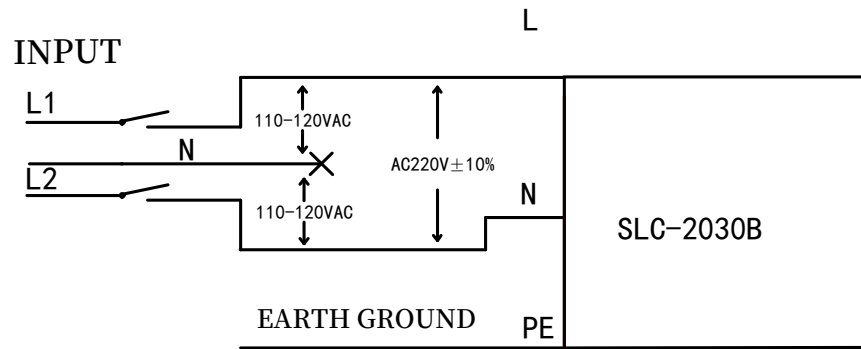
- 3.3.1. Remove the protective lens drawer.
- 3.3.2. Unscrew the clamping ring counterclockwise.
- 3.3.3. Replace the protective lens and wipe off the dust.

IV Operation Process

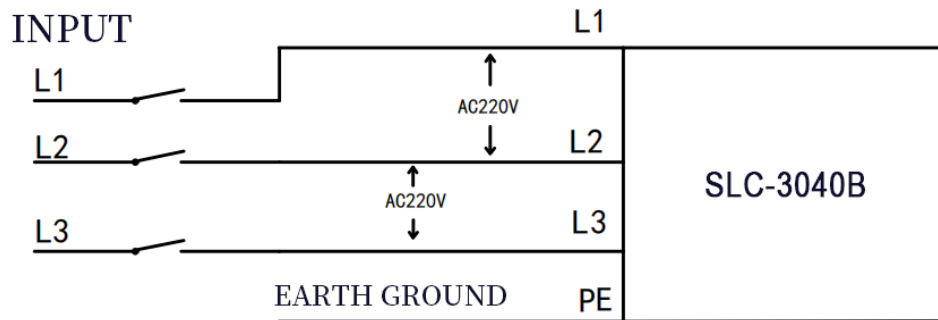
4.1. Start-up and preparation

- 4.1.1. Check the water level of the chiller to ensure that the water level is within the standard range.
- 4.1.2. Connect the power cord (pay attention to grounding). Connect the power wire L (220V live wire; 380V L1, L2 and L3 live wires), N (neutral wire) and PE (ground wire) to the corresponding terminals of the main power supply respectively. (For the first use, open the machine's upper cover and ensure the electrical protector is closed.)

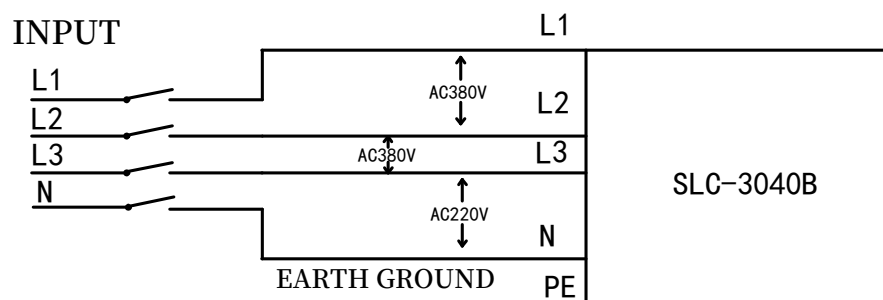
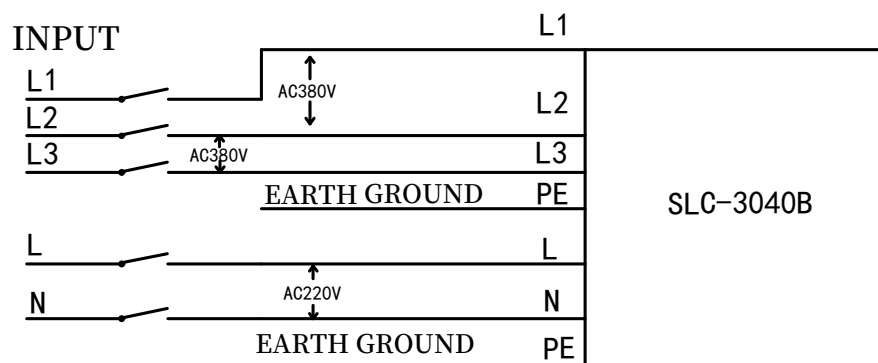
SLC-2030B





SLC-3040B: 3-phase 220V




SLC-3040B: 3-phase 380V



- 4.1.3. After turning on the "Emergency" button,press the "Start" button, the device starts, and the screen powers on.
- 4.2. Set the swing parameters and laser parameters according to the target requirements;
- 4.3. Click "Start". "Laser". and "Enable",Take out the hand-held cleaning head and ensure that the minimum bending radius of the integrated cable is more than 200mm.Turn the dust protection knob on the cleaning head to the "On" position.
- 4.4. Aim the hand-held cleaning head to the target with an interval of 600-650mm (F500 focal lens) for SLC-2030B and 750-800mm(F800 focal lens) for SLC-3040B. Double-click the cleaning head switch to start working.
- 4.5. Shutdown operation: Turn off "Laser""Start""Enable"  , click "Return"  and "Shutdown" to execute the shutdown procedure.Close the protection cover. (If the ambient temperature is below 1 5°C, the device will activate the antifreeze function. The shutdown time is about 20seconds.)
- 4.6. Disconnect the machine from the power supply if it will not be used for an extended period.
- For detailed steps, please watch the video tutorial.

V Laser controller interface description

After powering on, the control screen performs a self-test, which takes approximately 20 seconds. Then the system will display the "Prompt Interface." Please read the prompt content carefully, then click  to proceed to the cleaning system main operation interface.



Main operation interface

Click "Cleaning" to access the cleaning parameter settings interface.(Default Password: 1)

Click "Setting" to access the system settings interface. (Default Password: 6)

Click "Shutdown" to initiate the shutdown process. If the ambient temperature is below 15°C, the device will activate the anti-freeze function, extending the shutdown time to approximately 20 seconds

5.1. Cleaning Management



Cleaning management

Click “Cleaning” and enter the password to access the interface. Select Swing and Power to set the parameters. Click Start (the red dot will switch to the set trajectory), then click Laser and Enable to prepare the device for cleaning.

Aim the cleaning head at the cleaning area, then double-click the button (hold on the second press) to trigger the laser and begin cleaning.

For parameter settings, refer to sections 5.1.2 and 5.1.3.

Note: During laser cleaning, use a vacuum to remove dust and smoke to prevent lens damage.

5.1.2. Function description for swing parameter and laser parameter:

Item	Parameter	Function	Range
Power	Power (%)	Controls the laser output power. Higher power produces greater energy.	0-100
	Frequency (kHz)	Sets the frequency of the modulation signal.	0.001-20
	Duty Cycle(%)	Sets the duty cycle of the modulation signal.	0-100%
	LaserOn Delay(μs)	Delays laser activation at the start of cleaning. Setting an appropriate value can eliminate the “match head” phenomenon. However, too high a value may cause missing laser output at the beginning of the cleaning segment.	0-100
	LaserOff Delay(μs)	Delays laser deactivation at the end of cleaning. An appropriate value can eliminate the bright spot that appears at the end of cleaning.	
	Corner Delay(μs)	Delays between cleaning segments. An appropriate value can prevent rounded corners when cleaning right angles. However, too high a value can increase cleaning time.	
Swing Parameters	Size X (mm)	X-Direction Width of the cleaning head scanning track.	SLC-2030B: 10-300mm SLC-3040B: 10-400mm
	C	Y-Direction Width of the cleaning head scanning track.	
	Speed (mm/s)	Speed of the cleaning head scanning track. Different tracks have different speed limits. Faster speeds increase cleaning frequency per unit time.	1-25000mm/s
	Spacing (mm)	Fill Line Spacing.Denser spacing improves cleaning results but reduces efficiency.	
	Radius(mm)	Sets the fill radius at the center of the pattern.	
	Angle (°)	Sets the overall rotation of the scanned pattern (excluding the fill line angle).	0-180

5.1.3. Swing parameter reference table:

Scanning Width(mm)	Scanning Speed(mm/s)
20	2500
30	3500
40	5000
50	6000
60	7500
70	8500
80	10000
90	11000
100	12500
110	13500
120	15000
130	16000
150	18000
200	20000
300	25000
400	25000

Laser Energy Level Reference Table				
Size X	Speed	Power	Frequency	Duty Cycle
50	6000	100	20	100
100	12500	90	20	100
150	15000	80	20	100
200	17000	70	20	100
250	18500	60	20	100
300	20000	50	20	100
350	22500	50	20	100
400	25000	50	20	100








Note: Scan width and scan speed are directly proportional. As the scan width narrows, the scan speed should be reduced accordingly, increasing the cleaning intensity. It is recommended that the scan width and scan speed be adjusted according to the table above. Failure to do so may cause the galvanometer motor to whine or even damage it.

5.2. Laser Parameter Settings

5.2.1. Normally, the duty cycle is set to 100% and the frequency to 20 kHz (factory settings, no need to change). The output energy is controlled by adjusting the power level; higher power levels increase the output energy.

5.2.2. Thinner materials are prone to deformation when cleaning. If reducing the power level is not sufficient, adjust the duty cycle and frequency.

5.2.3. A higher duty cycle increases the output energy, and vice versa. Frequency adjustment does not work when the duty cycle is 100%.

Image	Name	Function
	Sine	Increases scanning density for more uniform cleaning, ideal for complex shapes or surfaces needing even coverage. Ensures refined cleaning on intricate geometries.
	Straight Line	Concentrates energy along a straight path, suitable for hard-to-clean areas requiring focused treatment.
	Cross Filling	Cross-filling uses bidirectional or multi-directional scanning paths (90° cross) to create grid-like coverage, effectively preventing streaks or uneven cleaning that can occur with single-directional scanning.
	Round - trip Filling	Uses bidirectional scanning where the laser cleans both forward and backward in one stroke, cutting down unnecessary return movements and saving time.
	Square Filling	Follows the outline of square or rectangular objects, filling inward to outward in a looped path. Balances uniformity, efficiency, and surface protection—great for square/rectangular parts, deep grooves, and large polluted areas.
	Circle Line Filling	Fits curved surfaces like cylinders or spheres by using circular trajectories combined with linear filling to ensure even coverage.
	Circle Ring Filling	Cycles inward to outward along the circular outline, perfect for cleaning ring-shaped or curved parts (e.g., tire molds, gears, pipes). Avoids seams left by linear filling by covering layer by layer circumferentially.

Note: High-density coverage can be achieved by adjusting parameters such as fill spacing. Filling ensures uniform laser energy distribution and reduces shadowing, making it especially suitable for complex contaminant patterns. (Reducing fill spacing can improve the removal of stubborn stains, but avoid excessively small spacing, which can cause heat buildup and damage the substrate.)

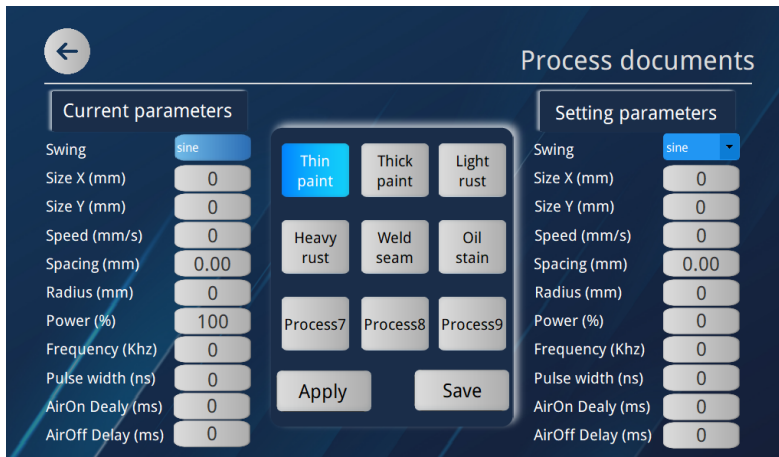
5.2.4 With fixed power and duty cycle, higher frequencies result in lower energy per unit time for a given area.

5.3. Process Files

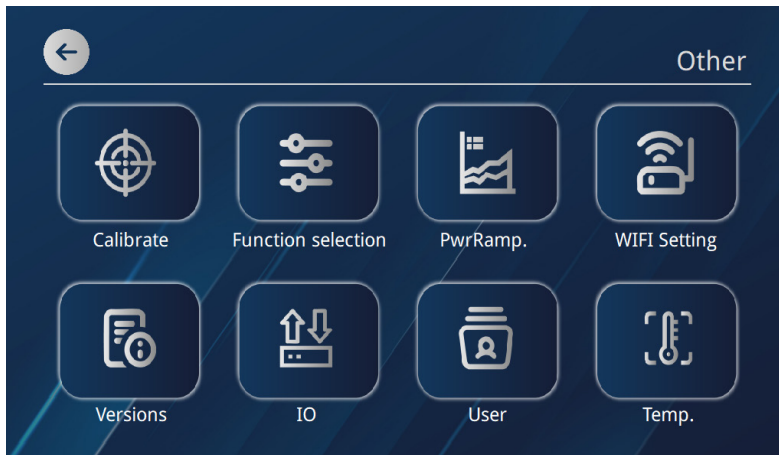
The Process button opens the process page. Six process parameters are preset (non-modifiable), and three custom parameters are available (modifiable).

To apply a preset process: Click the desired process button (e.g., Thin paint). The detailed parameters will appear in the process settings on the right. Click Apply to load the preset parameters.



To customize a process: Click a custom button (e.g., Process 7) and enter the tested parameters in the process settings on the right. Click Save to store the process. Next time, select it and click Apply to use it directly.









5.4. Setting



System Settings

Item	Parameter	Function	Description
	Calibrate	When replacing the field lens specifications, calibrate the scan width of each axis.	When the cleaning head is in focus, if the entered scan width value differs from the actual beam width, calibration can be performed. (This calibration is done at the factory and does not require customer adjustment.)
	Function selection	Selected Function Switch Settings	<p>Exchg XY: Factory default is off.</p> <p>RemLsron: Enable by connecting an external signal cable to the control box and configuring it via the on-screen settings.</p> <p>Cold Water Flow Alarm Status: Displays the chiller flow status (green = normal, red = alarm).</p> <p>Operation Status of Chiller: Shows the chiller's overall status (running, standby, or fault). If in standby mode, start the chiller using the operation button. If a fault occurs, check the alarm code on the chiller panel.</p> <p>Chiller Operation Switch: Manually turn the chiller on or off without unplugging the power cord. Ensure the chiller is running before operating the device.</p> <p>Ambient Temperature: Displays the device's current ambient temperature.</p>

Item	Parameter	Function	Description
	PwrRamp.	The strong light spots on both sides of the laser have been optimized and eliminated.	Power ramping is set to off by default and does not require adjustment.
	WIFI Setting	Connect to Wi-Fi for remote diagnostics and operation.	(This allows the device to connect to the internet. Customers can download the app to remotely monitor and control the device's operation; beam output cannot be controlled remotely.) Click Scanning. A pop-up will appear on the left showing available Wi-Fi networks. Select the desired network, enter the password, click Set up, and wait a few seconds for the status window to display "Connect successfully."
	Versions	Displays the device version number and expiration date.	Displays the device's unique ID, version information, authorization status, and system language.
	IO	Monitor and test the input and output signals of port IO on the control board.	DI0 is the key-activated light output linked to the gun head button; pressing it provides status feedback. DI2 is the remote light output and must be used with the external light output signal cable in function selection. DO0 is the enable port corresponding to the enable button on the main screen; pressing it provides status feedback. The remaining input and output ports are spare and do not require configuration.
	User	Set the user account and password.	Contact the manufacturer to add account permissions if needed.
	Temp.	Detect the real-time temperature of the cleaning head and set the alarm value.	Switch: Enables or disables the cleaning head temperature alarm; it should normally be on. Alarm Threshold: Sets the upper limit for the cleaning head alarm, defaulting to 60°C. Cleaning Head: Displays the current real-time temperature of the cleaning head.

VI Fault analysis and troubleshooting

Fault Symptom	Cause Analysis	Troubleshooting Method
Light Spot No Swing	Cleaning Head Connector Loose	Check the Cleaning Head connector for looseness.
	Control Board Cable Loose	Check the board quick connector for looseness.
	No 24V or 15V Power Output	Check if the 24V and 15V power module outputs are operating normally.
	Motor or Control Card Damaged	Confirm connectors are secure. After verifying 24V and 15V power supply is normal, power off and restart. Observe if the motor's red light automatically centers.
Cleaning Energy Weakened or Cleaning Head is Hot	Optical Lens Dirty or Damaged	Inspect the optical path; clean or replace the lens as needed.
	Optical Path Deflection	Contact customer service.
Cleaning Head Motor Whistles	Scan width too narrow or scan speed too fast	Adjust parameters according to the trajectory table and restart.
	Galvanometer Motor Damaged	Contact customer service.
Chiller Alarm	Refer to the chiller code for cause.	Troubleshoot accordingly.
Red Light is Normal, No Laser	Cleaning Head Switch Damaged	Repeatedly press the switch button and observe if DI1 in the IO status on screen changes.
	Operation Panel Enable Switch Off	Open the chassis cover and press the enable button on the screen. Check if the electrical relay energizes or de-energizes.
	Are the laser parameters set correctly?	Set the parameters according to the recommended table, then operate the laser.
	No Analog Output	Operate the machine to generate the laser beam, and measure the analog voltage output between DA1 and GND on the upper left side of the control box.
	Laser Source Malfunction	Check if the laser source status indicator "Alarm" is red. If it is, install the laser software on your computer to diagnose the cause of the malfunction.

VII Maintenance

Note: In order to avoid personal injury and man-made damage, the maintenance of the handheld laser cleaning machine must be carried out by professionals.

7.1. Handheld cleaning head

7.1.1. Daily inspection: Check the protective lens. If there is foreign matter, clean with a lint-free cotton swab or wiper dipped in absolute alcohol or isopropyl alcohol. If there is coating damage or lens damage, please replace the protective lens in time to avoid other optical lenses being burned.

7.1.2. Regular inspection: When the machine is used or not used for some time (every week is recommended), first check the laser module, and make sure that each optical component is free from dust pollution, mildew, and other abnormal phenomena before turning it on.

7.1.3. Observing the light spot: The operator can check the laser output light spot with black image paper. Once the spot is found to be uneven or skewed, it should be repaired in time.

VIII Warranty terms

8.1. The warranty for the entire machine is 1 year, and the warranty for the laser is 2 years.

8.1.1. From the date of purchase, we offer a one-year free warranty (excluding non-warranty items). If it is required to return to the factory, the user is responsible for round-trip transportation costs.

8.1.2. The product is repaired for free lifetime, with users only responsible for the cost of spare parts and round-trip transportation.

Note: The purchase date is based on the invoice date or the product delivery date.

Exclusions: The warranty for the entire machine does not cover optical accessories, including laser fiber cable, output head, collimator, galvanometer, lens, etc.

8.2. The following are not covered under the warranty and may require paid repair:

8.2.1. Damage caused by improper installation, use, storage, or self-transportation.

8.2.2. Damage from external factors such as abnormal voltage, fire, etc.

8.2.3. Unauthorized disassembly, replacement of electrical components, or modification of electrical circuits.

8.2.4. Damage to laser sources, chillers, or other accessories due to frostbite (e.g., water leakage).

8.2.5. Optical accessories and consumables (including laser fiber cable, output head, collimator, galvanometer, lens, etc.) are not covered by the warranty.

8.2.6. Failure due to improper use contrary to instructions, labels, or precautions.

8.2.7. Force majeure events (e.g., earthquakes, floods, typhoons) causing product damage.

8.2.8. If a product fails due to user error or requires repair after the warranty has expired, Party B will repair it free of charge, while Party A will bear the cost of spare parts and round-trip transportation.

※ The relevant technical parameters listed in this manual are for reference only. The relevant product information is subject to change without prior notice. All technical parameters and agreements are subject to the terms of the sales contract.



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