



MOBILE LASER CLEANING MACHINE

BLC SERIES







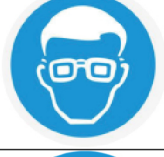



OPERATION MANUAL



LUOYANG XINCHENG PRECISION MACHINERY CO.,LTD.

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.

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

Content

Notice	1
I Scope of application	3
II Product Description	3
1.Main technical parameters	3
2.Equipment structure diagram	4
III Installation and use instructions	4
1.Installation and use requirements	4
2.Operation precautions	4
3.Protective lens replacement	5
IV Operation Process	5
V Laser controller interface description	6
1.User Management	6
2.Cleaning Management	7
VI Fault analysis and troubleshooting	9
VII Maintenance	9
VIII Transportation and storage	10
IX Warranty terms	10

I Scope of application

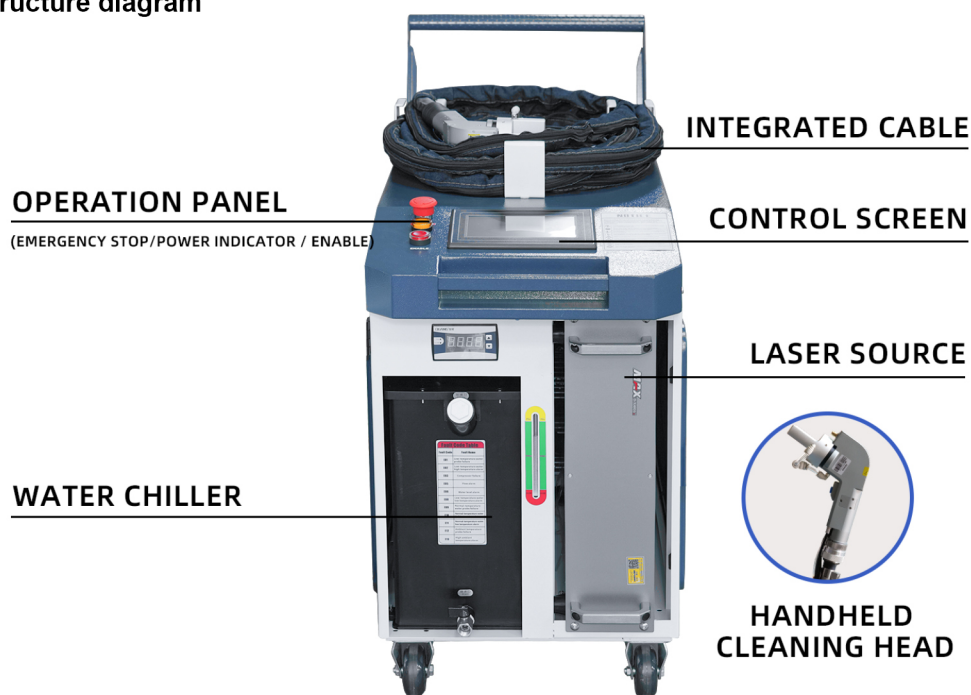
This product can be used to remove attachments or coatings on the surface of objects, including rust, paint, oil stains, coatings, etc. (High-reflective materials need to be tested and verified). It has the advantages of non-contact, no chemical damage, mobility and no consumables, etc.

II Product Description

1.Main technical parameters

Model	BLC-1000	BLC-1500	BLC-2000	BLC-3000
Laser Power	1000W	1500W	2000W	3000W
Laser Wavelength	1080±10nm			
Operating Mode	Continuous/Modulation			
Maximum Modulation Frequency	20KHz			
Integrated Cable Length	10m (customizable)			20m
Scanning Width	160±10mm			
Power Configuration	AC220V±10% 6kw	AC220V±10% 8kw	AC220V±10% 10kw	AC380V±7% 13kw
Cooling Method	Water cooling (distilled water , deionized water or pure water as medium)			
Water Tank Capacity	16L (14-15L water needs to be added)			
Machine Size	845*460*605mm		905*480*630mm	1240*584*1148mm
Package Size	1120*565*1050mm			1430*720*1220mm
Net Weight	106kg	113kg	137kg	225kg
Gross Weight	138kg	145kg	169kg	285kg

2.Equipment structure diagram



III Installation and use instructions

1.Installation and use requirements

Item	Requirements
Environment Temperature	2°C ~ 35°C
Environment Humidity	40%-80%
Power Configuration	Refer to II (1) technical parameters
Cooling Medium	Deionized, distilled or pure water
Grid Ground	Comply with the national standard

- 1.1 Ensure that the equipment is installed and used steadily to avoid damage caused by falling or tipping.
- 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.
- 1.3 During use, please pay attention to air blowing to avoid damage to the lens caused by dust.
- 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.
- 1.5 The hand-held cleaning head should be handled with care. Please put the tip of the cleaning head downward or lay flat when stored.

2.Operation precautions

- 2.1 Please refer to the main technical parameter table for the operating voltage. If it does not meet the requirements, transformer is needed.

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.

2.3 Protect it from rain and water when outdoor use.

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.

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. Protective lens replacement

3.1 Loosen the screw on the dust-proof air outlet.

3.2 Press the air pipe to remove the dust-proof air outlet.

3.3 Unscrew the compression ring counterclockwise.

3.4 Replace the protective lens.

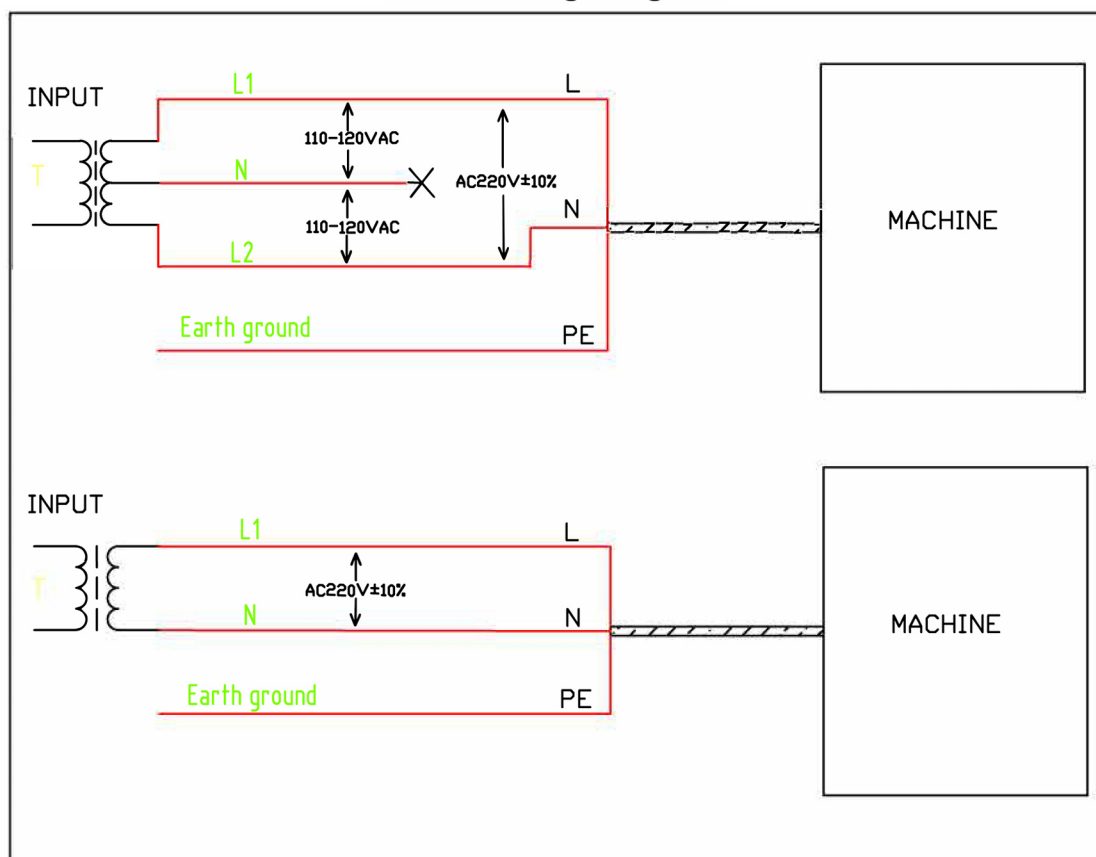
IV Operation Process

1. Start-up and preparation

1.1 Check the water level of the chiller to ensure that the water level is within the standard range.

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. (Built-in leakage protection, which is enabled by default when leaving the factory)

220V Wiring Diagram



1.3 Turn on emergency stop and power on.

2. Set the swing parameters and laser parameters according to the target requirements;

3. Turn on the enable. Take out the hand-held cleaning head and ensure that the minimum bending radius of the integrated cable is more than 200mm.

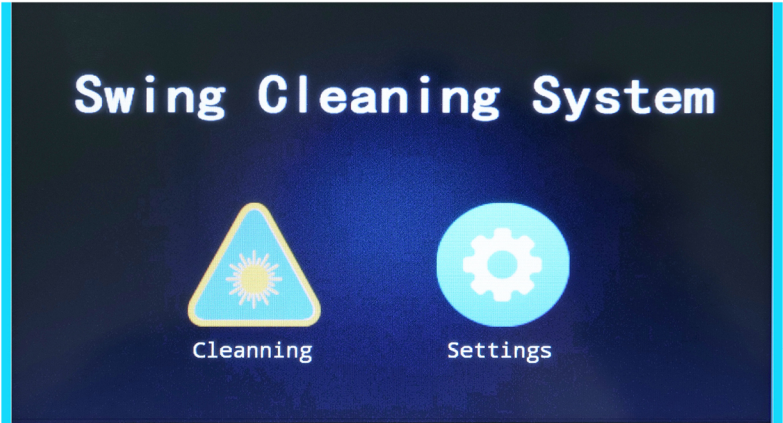
- 4.Aim the hand-held cleaning head to the target with an interval of 550-600mm (F500 lens). Double-click the cleaning head switch to start working.
 - 5.Shutdown operation: turn off the enable, press the emergency stop.
- For detailed steps, please watch the video tutorial.

V Laser controller interface description

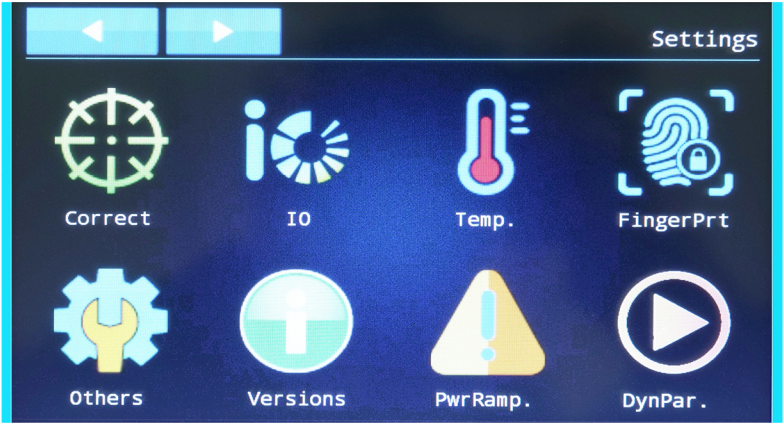
After powering it on, the control screen enters the main operation interface of the handheld laser cleaning system.

1.User management

Click "Settings" to enter the system setting interface (default password: 6), click "User Management", and set the user type, user name and password in sequence to complete the user creation (the system has created an account: admin, password: 1).



Main operation interface



System Setting



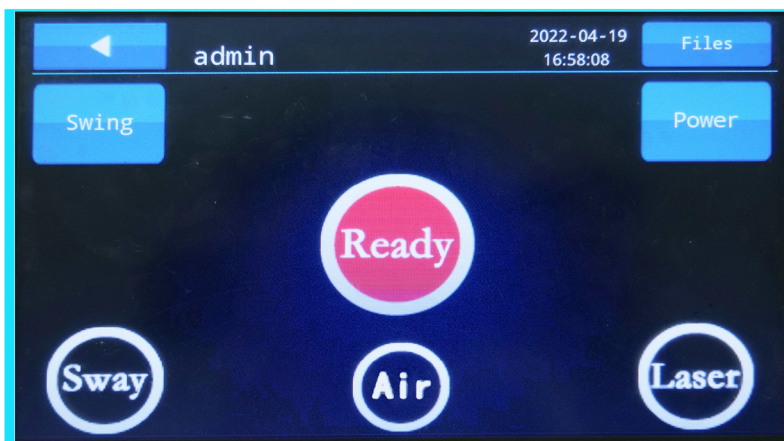
User Management

2.Cleaning Management

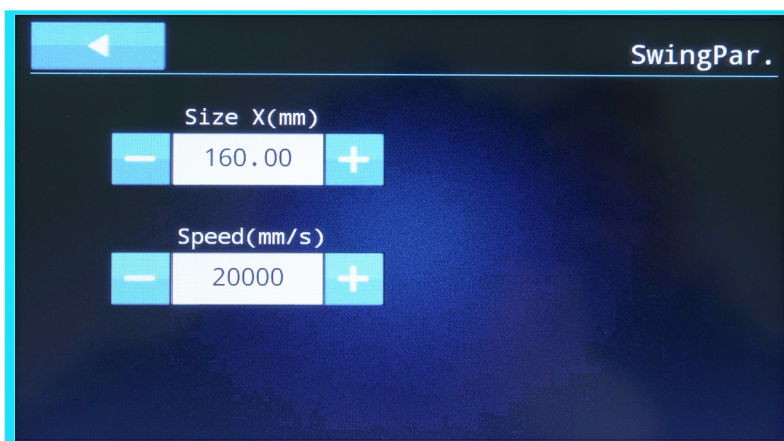
Click "Cleaning", enter the password to enter the interface. Click "Swing" and "Power" to set the parameters. Please refer to 2.2 and 2.3 for parameter setting.

Click "Sway" and "Laser" to enter the cleaning preparation state. "Air": it is used for air one-button test (external air source) and it will automatically turn on when cleaning .

Turn on the enable. Double-click the cleaning head switch to start working.



Cleaning Management



Swing Par.



Laser Par.

2.1 Function description for swing parameter and laser parameter:

Item	Name	Function	Note
Swing Par.	Size (mm)	Set the laser width when cleaning	160±10
	Speed (mm/s)	Set the laser cleaning speed	1-25000
Laser Par.	Power (%)	Set laser power percentage	10-100%
	Duty (%)	Sets the duty cycle of the modulation signal period	0-100%
	Frequency (KHz)	Set the frequency of the modulating signal	0.001-20
	AirOn Delay (ms)	Set the air blowing time in advance before cleaning starts	External air source
	AirOff Delay (ms)	Set the time to keep blowing after cleaning	

2.2 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
140	17500
150	18500
160	20000

Note: The scan width is proportional to the scan speed. The narrower the scan width, the lower the corresponding scan speed. At this time, the cleaning intensity will increase. It is recommended to adjust the scanning width and scanning speed according to the above table, otherwise it may cause the whistle of the galvanometer motor and even cause damage.

2.3 Laser parameter setting instructions:

2.3.1 Power: Adjust the laser output power. The higher the power, the higher the output energy.

2.3.2 Duty cycle: The larger the percentage, the higher the output energy, and vice versa.

2.3.3 Frequency: the higher the frequency, the lower the energy of the fixed area per unit time. When the duty cycle is 100%, the frequency adjustment has no effect.

2.3.4 Generally the duty cycle is 100% and the frequency is 20KHZ. You only need to adjust the power. For thin materials, it is easy to deform due to the heat caused by cleaning. You can decrease the duty cycle and increase the frequency if the power reduction cannot meet the demand.

VI Fault analysis and troubleshooting

Fault phenomenon	Cause Analysis	Troubleshooting method
The spot does not swing	1. The control cable connector of the cleaning head is loose. 2. The motor or control card is damaged.	1. Tighten loose joints 2. Please contact us
Cleaning power gets weak or cleaning head gets hot	1. There are foreign objects or damage to the optical lens. 2. Optical path deflection	1. Check the optical path, clean the lens or replace it. 2. Please contact us.
The cleaning head motor whistles	1. The scanning width is narrow and the scanning speed is too fast. 2. The galvanometer motor is damaged	1. Refer to 2.2 parameter table to set the parameters. 2. Please contact us.
Chiller Alarm	Refer to the chiller code to determine the cause	1. Solve the problem accordingly. 2. Please contact us.
Red light is normal but no laser	1. The enable switch of the operation panel or the switch of the cleaning head is damaged. 2. Laser damage	1. Click the switch repeatedly to observe the response of the laser or controller. 2. Install the laser detection software on the computer to check the cause of the failure. 3. Please contact us.

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.

1. Handheld cleaning head

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.

1.2 Regular inspection: When the machine is used or not used for some time(every week is recommend), 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.

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.

2. Water chiller

2.1 The dust on the condenser and the dust filter needs to be cleaned regularly.

2.2 When the machine is transported or not used for a long time, the coolant should be drained.

2.3 When the temperature is lower than 2°C, please check and ensure that the chiller is working properly before using the machine to avoid damaging the laser tube, output head, and water chiller due to the solidification of the coolant.

2.4 The coolant must be replaced in the following cases

2.4.1 The filter element has been replaced.

2.4.2 After 3 months of use.

2.4.3 Use again after long-term non-use(3 months is recommended)

VIII Transportation and storage

1. Before moving the equipment, please remove the power cord and drain the coolant inside the system. Do not move or transport it with liquid inside.

2. When transporting or handling the equipment, please do not bump it up and down or excessively tilt it (not more than 45°) to avoid bumping, impacting and overturning.

3. When storing the equipment, drain the cooling liquid in the chiller, and drain the remaining cooling liquid in the water pump, filter, and pipeline. Wipe off the water and oil stains, pack the equipment with a wrapping film to prevent dust and water, and place it in a cool and ventilated place without direct sunlight and dust accumulation.

IX Warranty terms

1. The warranty period of this product is one year for the whole machine, and the warranty period for the laser source is two years:

1.1 From the date of purchasing this product, our company provides free warranty within one year. If the machine need to be returned to the factory for repair, the user only needs to bear the cost of two-way transportation.

1.2 This product is repaired free of charge for life, and the user only needs to bear the cost of spare parts and two-way transportation.

2. The following scopes are not covered by warranty:

2.1 Damage caused by improper use such as violent bumping, bending, etc.

2.2 Human-caused damage.

2.3 Disassemble or assemble ,replace electrical accessories, or adjust electrical circuits without permission.

2.4 Laser source, chiller and other accessories are damaged by freezing (mainly manifested as water leakage).

2.5 Consumable items such as optical accessories are not covered by the warranty (optical parts such as collimating lenses, galvanometers, field lenses, optical fibers, etc. are not covered by the warranty).

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