WISELASERS

Instruction Manual



WiseLaser EVO Handheld Fiber Laser Cleaning Machine - Water Cooled

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1. Introduction of Equipment Appearance and Components.

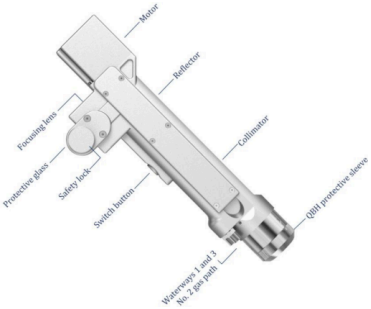
1.1.General look of the equipment



1.2.Assembly of equipment components



Operating area



Laser Gun



Chiller Laser

2. Equipment Operation Process

2.1 Pre-use Inspection

1. Review and understand the safety requirements for devices using Category 4 Lasers provided at the end of this manual. Do not operate the machine until you have fully understood the safety procedures.
2. Ensure that the external supply voltage and amperage match the specified requirements.
3. Confirm that there is a sufficient supply of inert gas, and that the gas pipeline is in proper working condition. Make sure the gas supply valve is open and ventilated. Use nitrogen or argon gas with an air pressure of 0.1-0.15 MPa. Failure to connect properly may result in lens damage and improper functioning of the cleaning gun head.

   The purpose of using gas is to keep the focus lens clean, blow away iron filings and dust in the air during work.
4. Ensure the water chiller pipeline is functioning correctly.
5. Check if the button or circuit breaker for the laser/chiller is switched on.

2.2 Start-up Sequence

1. Before use, check and then turn on the main power switch.



2. Turn the emergency stop button clockwise to release it.



3. Press the start button on the chiller. The chiller and the system board will power on simultaneously, and the display will turn on. If you're using the chiller for the first time, add coolant and purified deionized water to the water inlet in a 3:7 ratio to the standard level.



- Outfall
- Standard area
- Water inlet
- Switch



- Chiller button port

4. Press the laser start button when the chiller temperature exceeds 19.5℃.



- Laser Button

5. Choose the appropriate cleaning power for the application, as it will vary based on the material thickness and surface condition. Start with a lower setting and gradually increase the peak power wattage as needed, while considering the maximum wattage capacity of the laser source.
   Model: EVO-1500C = 100 - 1500W
   (See the following pages for touch screen settings)

6. Be sure that the laser is facing down in a direct that will not harm the operator or anyone in the screened area

7. Press the green laser on / off button

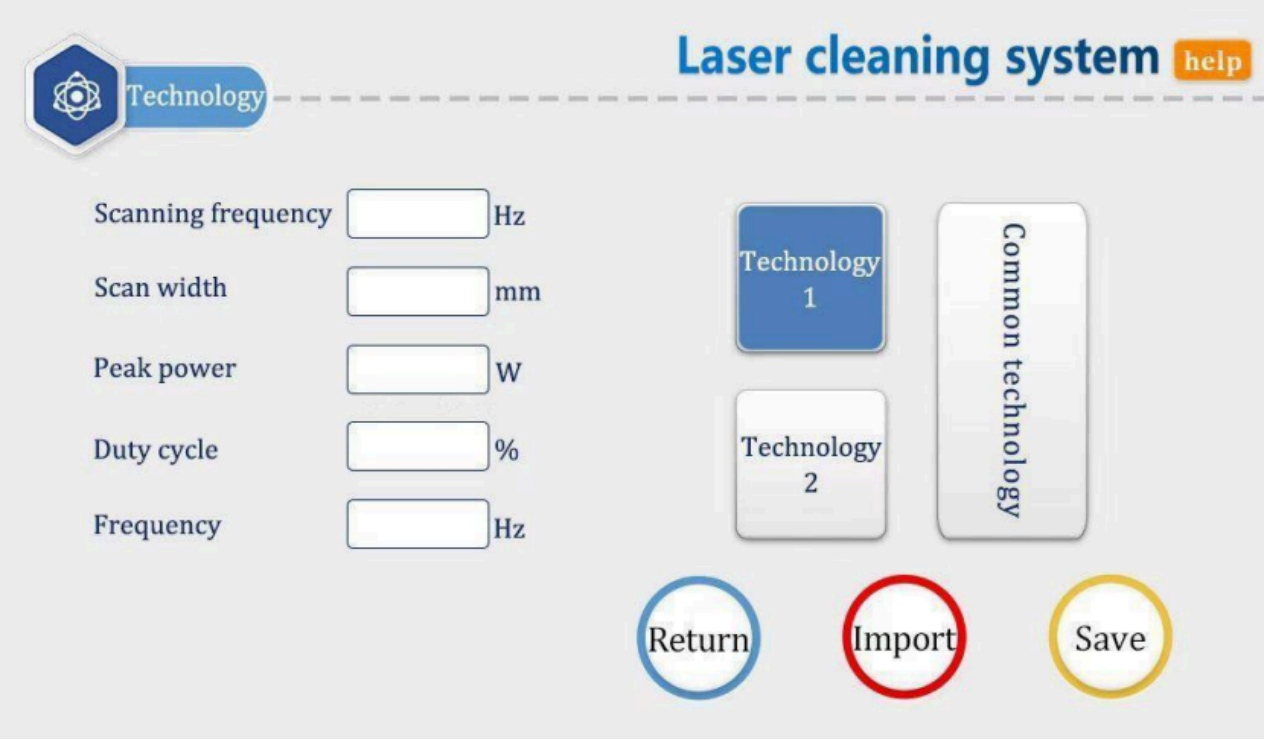
8. Point the laser at the workpiece, keeping within the specified focus distance.

   Model EVO-1500C = 35 - 400 cm

9. Press the trigger button on the laser cleaning head and move it across the surface at a consistent speed to remove rust or coating effectively.

10. After completing the cleaning process, ensure the green laser on/off button is switched off before placing the cleaning head in the storage holster.

2.3 Instructions and Operation for the Touch Screen





1. Scanning frequency: Motor swing speed ranges from 10-100 Hz, with 60 Hz recommended.
2. Scanning width: Spot scanning width ranges from 0-300 mm. Choose based on actual focus lens specifications in system settings.
3. Peak power: Typically set to the laser's maximum power by default.
4. Duty cycle: Set to 100% by default.
5. Pulse frequency: Default is 2000.
6. After setting the parameters, import them and return to see the process on the left side of the home page.

Laser Power	EVO-1000C	EVO-1500C	EVO-2000C
Cleaning Surface			
Rust(20μm)	20㎡/h	40㎡/h	60㎡/h
Paint(120μm)	8㎡/h	12㎡/h	16㎡/h
Rust(100μm)	5㎡/h	8㎡/h	10㎡/h

2. Focused Confirmation

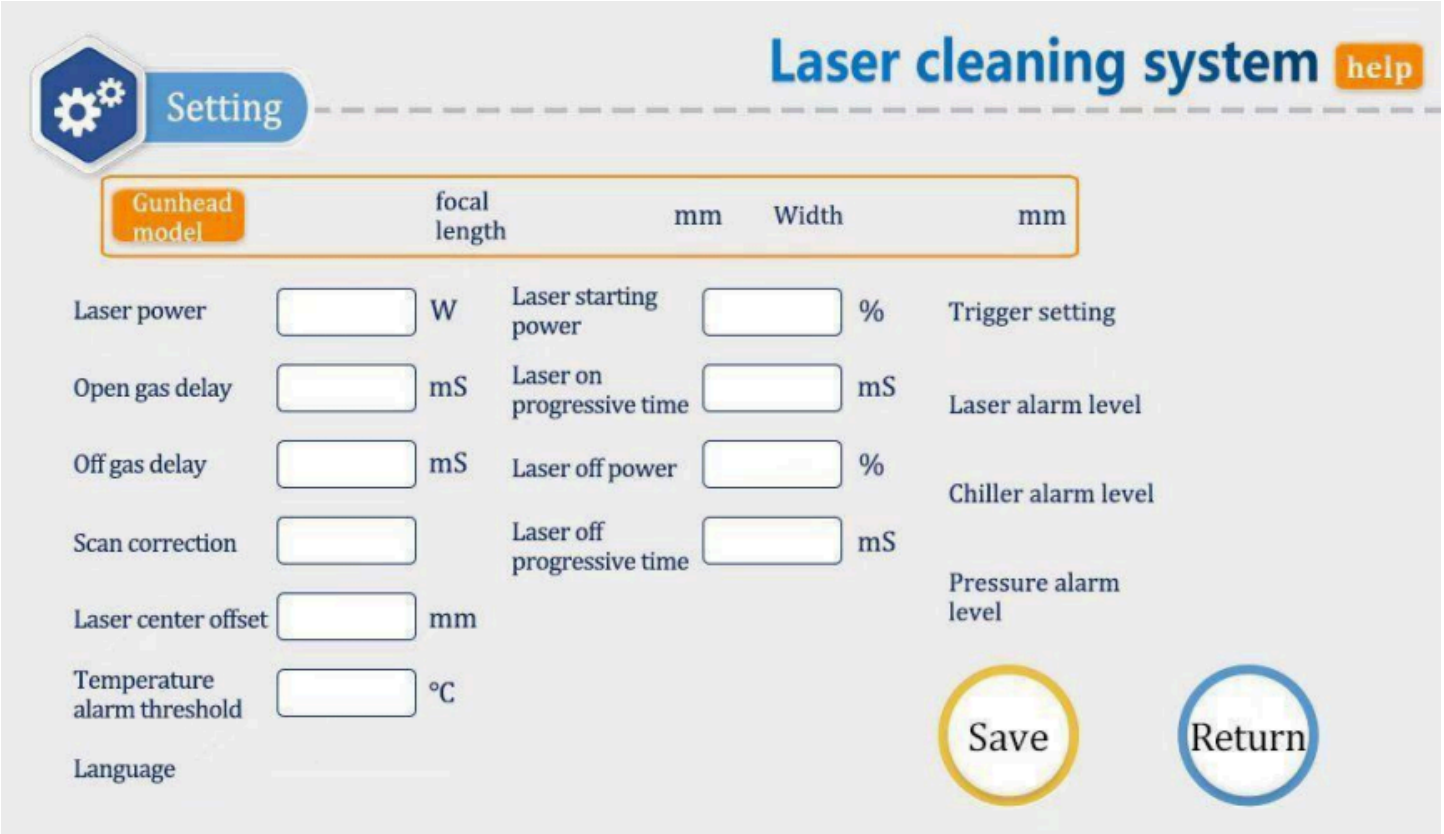
During the back-and-forth short-distance scanning process, the point at which the sound and spark are the most intense indicates the focus. At this point, cleaning should be performed at this specific distance to ensure maximum energy efficiency.

For reference based on different focal settings:

F400 focusing (the distance between the gun head and the plate is approximately 35-40 cm, providing the strongest energy)

F800 focusing (the distance between the gun head and the plate is approximately 65-75 cm, providing the strongest energy)

3. Settings



Use the password 123456, and remember to click save after adjusting each setting.

1. Please enter the correct laser power used.
2. The switch gas delay is set to 80ms by default, with a range of 200ms to 3000ms.
3. When the light is turned on, it increases from N1% to 100% of the process power; when turned off, it decreases from 100% to N2% (as shown in the figure below).
4. The maximum temperature alarm threshold is set at 65°C. If set to 0, no temperature alarm is triggered.
   The default alarm signal level for air pressure, water chiller, and laser is low. If an external air pressure alarm is installed, change it to a high level to avoid abnormal alarms. This applies to other alarm signals as well.

Click the HELP button in the upper right for more explanations on related parameters.

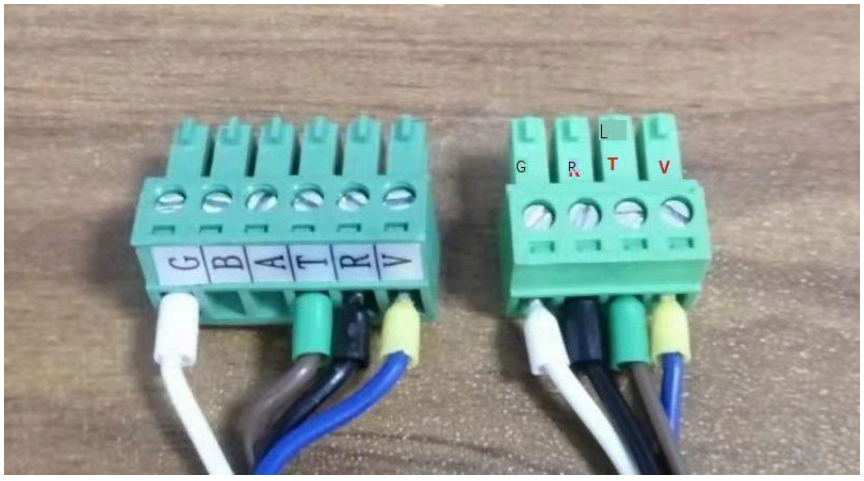
2.4 Shutdown Instructions

Initiate the startup sequence in reverse order.

3. Faults and Consumables

3.1 Troubleshooting

1. If the light fluctuates from strong to weak, protect the lens by replacing it promptly to prevent damage to the focusing, collimating, or reflecting lens.
2. No trigger signal: Check if the aviation plug of the gray signal line is disconnected 50cm behind the gun head. Verify if the button is in an open circuit or if the 7/8 horn of the system board is disconnected.
3. Gas present but no light: check if the laser is on, ensure the chiller temperature is above 19.5°C, and verify the connection of signal interface 3 on the system board.
4. Easily damaged protective lens: adjust the focal length and confirm that the inert gas flow (pure argon or pure nitrogen) is normal. Also, inspect the focusing lens for any damage.
5. Intermittent light output: ensure the safety lock has good contact with the workpiece, and verify the trigger button's contact. Check if pins 5, 6, 7, and 8 on signal interface 2 of the system board are making a solid connection.
6. Abnormal display screen: ensure that the connection plug is secure and the power supply to the power box is functioning properly.



7. Gun Nozzle Overheating: Check for a red light, inspect for lens damage, and verify the cleaning angle.
8. Abnormal Red Light Oscillation: Ensure the 15V power supply is functioning properly and check if the click plug behind the gun head is secure.

3.2 Consumables

1. Protect the lens: Replace it promptly if damaged, adjust the focal length correctly, and clean it regularly.

Specifications

Model	EVO1500C
Laser Type	Continuous Fiber Laser
Output Laser Power	1500W
Power Regulation Range	0%-100%
Cleaning Torch Cable Length	10m
Optical Fiber Wire Length	10mm
Collimating Focal Length	60mm
Focused Focas Length	400mm/800mm
Cleaning Width	0-350mm
Cleaning Depth	40m²/h
Whole Machine Power	<8KW
Amperage	＜36A
Operating Voltage	Single Phase 240VAC
Packing Size	1450 x 700 x 1290mm
Gross Weight	240 kgs

Additional Details

Laser Central WaveLength	1080nm±5nm
Output Mode	Continuous/Modulation
Max. Modulation Frequency	50-50kHz
Power Instability	±1.5%
Optical Fiber Output Interface	QBH
Indicating System	Red Laser
Type of Cleaning Gun	Left and Right Oscillating Galvanometer Cleaning Head
Protective Gas Mode	Coaxial Protection
Operating Ambient Temperature	-10 – 40°C
Working Environment Humidity	<70%

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CLASS 4 LASER WARNING

Understanding and Managing Safety Risks

Laser cleaning machines typically use **Class 4 lasers**. Class 4 lasers are the highest risk category of lasers and are capable of causing serious injury to the eyes and skin. They can also pose fire hazards, especially when used in industrial cleaning processes.

Here are some reasons why laser cleaning machines are classified as Class 4:

- **High Power Output:** Laser cleaning machines use high-powered lasers, often in the range of thousands of watts, to ablate materials such as rust, paint, or contaminants from surfaces.
- **Risk of Direct and Reflected Beam Exposure:** Both direct and reflected beams from Class 4 lasers can cause serious damage to human tissue, including the retina of the eye.
- **Potential for Fire Hazards:** The high energy of the laser beam can ignite flammable materials, leading to a fire hazard.

Given the risks, strict safety protocols must be followed, including the use of personal protective equipment (PPE) such as laser safety goggles, restricted access to the area of operation, and proper training for operators.

Class 4 lasers are the most hazardous laser classification, capable of causing serious eye and skin injuries and presenting fire hazards. Therefore, strict safety procedures must be implemented to minimize risks. Here are common safety procedures for Class 4 lasers:

General Safety Procedures

1. **Laser Safety Officer (LSO):**
   - Assign a trained Laser Safety Officer responsible for ensuring that all safety protocols are followed.
2. **Controlled Access:**
   - Limit access to the laser area to authorized and trained personnel only.
   - Use interlocked doors or warning lights to indicate when the laser is in operation.
3. **Warning Signs:**
   - Post clearly visible "Laser Warning" signs near the entrance of the laser-controlled area (LCA), indicating the hazard level.

- Ensure signs are compliant with the ANSI Z136.1 or other relevant standards.

4. **Laser-Resistant Barriers:**
   - Install barriers that can absorb or block scattered or reflected laser beams to protect individuals from accidental exposure.
5. **Personal Protective Equipment (PPE):**
   - **Eye protection:** Ensure everyone in the vicinity wears appropriate laser safety goggles that match the wavelength of the laser.
   - **Skin protection:** If there is a risk of skin exposure, use protective clothing, gloves, and face shields.
6. **Beam Control:**
   - **Beam Enclosures:** Fully enclose the beam path to contain the laser radiation whenever possible.
   - **Beam Stops:** Use non-reflective, flame-resistant beam stops to absorb stray beams and prevent unintended reflections.
   - **Avoid Direct Viewing:** Never look directly at the laser beam or its reflections.
7. **Beam Alignment:**
   - Use low-power settings or an alignment laser (Class 1 or 2) during setup and alignment procedures.
   - Ensure beam alignment is only done by trained personnel following strict protocols.
8. **Fire Safety:**
   - Keep flammable materials away from the laser and beam path.
   - Have appropriate fire extinguishers readily available near the laser setup.
9. **Remote Operation:**
   - Where possible, use remote controls to operate the laser, keeping operators outside the direct beam exposure area.
10. **Training:**
    - Provide comprehensive training for all personnel on Class 4 laser hazards, safety controls, and emergency procedures.
11. **Laser Safety Audits:**
    - Conduct regular audits and inspections to ensure compliance with safety protocols and the condition of laser equipment and safety devices.

Emergency Procedures

1. **Accident Response:**
   - Establish a protocol for immediate medical attention if there is any eye or skin exposure to laser radiation.
   - Report any incidents to the Laser Safety Officer and complete an incident report for evaluation.
2. **First Aid:**
   - Ensure first aid kits are available and that personnel are trained to provide immediate care for laser-related injuries until medical help arrives.
3. **Power Shut-Off:**
   - Install emergency shut-off buttons to quickly deactivate the laser in case of an emergency.

These safety procedures, when followed, can significantly reduce the risks associated with using Class 4 lasers, protecting both personnel and the facility.

It is recommended that the owner and operators of this device stay informed about the most recent regulations and safety standards.

By signing below, you acknowledge that you understand and agree to these terms.

_____ _____

Signature Date Signed