

Scotle Raycus Air-cooled Laser Cleaning Machine Manual (ZBTK Control System)



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Foreword

Welcome to use the handheld laser cleaning products produced by Shenzhen Scotle Technology Group Ltd. For better use and maintain your laser equipment, please read this manual carefully before using this product. All laser operators must use personal protective equipment when using our laser machines. To avoid the hazards caused by lasers, please strictly follow all warnings and safety tips in this manual to prevent unnecessary risks. Our laser machines are safe and reliable by following this manual and applying reliable laser safety measures.

If the user has any comments and suggestions during use, please feel free to give us your advice to help us continue to revise and improve. Thank you again for using the products of Shenzhen Scotle Technology Group Ltd.!

During the operation, maintenance and service of this equipment, in order to ensure the safety of the operator, please do not disassemble the equipment privately. This product has no parts, components and assemblies that the user needs to repair by himself. Our company will not provide warranty service for damage to the equipment or accessories caused by the laser dismantled privately.

Our company certifies that this laser machine has been thoroughly tested and inspected. The inspection before shipment meets the published specifications. When you receive the machine, please check whether the packaging and parts are damaged. If so, it may have occurred during transportation. If the damage is obvious, please keep evidence and contact Shenzhen Scotle Technology Group Ltd.

1. Safety Tips

The laser level of this machine is class 4. To ensure the safety of the user, please read the safety tips carefully before using the machine.

1.1 Safety Instructions

- ① When using this machine, please use a suitable grounded power supply and corresponding voltage .
- ② Before operation, please wear special fiber laser protective glasses and gloves; do not look directly at the laser to avoid damage to the eyes or skin .
- ③ Before emitting the laser, the dust-proof cover of the field lens needs to be removed;
- ④ Make sure that all optical components are below eye level, and pay special attention to the height of the eyes when sitting on a chair.
- ⑤ Avoid operating this machine in a dark, humid, hot, and unventilated environment.
- ⑥ Do not turn on the laser without an optical coupling fiber or the optical output connector.
- ⑦ Make sure to operate the machine only after receiving safety training.
- ⑧ Keep the machine clean, maintain the machine regularly to prevent foreign matter from entering the cavity, otherwise it will cause functional contamination and functional impact of related parts; For technical support, please contact the corresponding after-sales service department.

1.2 Potential Hazards

① Radiation Hazards

The laser cleaning process will generate visible and invisible radiation. The high-energy laser beam of the pulse laser cleaning machine directly irradiates the human body, especially the eyes and skin, which may cause serious damage on eye includes retinal burns. To prevent these injuries, special laser protection glasses must be worn, the safety barriers and warning signs must be set up in the operating area.

② Skin Hazards

Exposure to infrared and ultraviolet radiation during laser cleaning can hurt the skin. Laser sparks can also cause burns. Laser processing can transfer a lot of energy into the parts to be cleaned, so the parts will be very hot even after cleaning. It is necessary to take precautions to prevent skin damage by wearing protective clothing such as flame-resistant gloves, hats, leather aprons, and other flame-resistant clothing, sleeves and collars should be buttoned too.

③ Fire Hazards

If flammable or combustible materials are close to the laser work area, the heat and sparks generated during the work process may cause a fire or explosion. Laser cleaning work can only be carried out when there are no flammable materials in the area. Fire extinguishers should be located nearby, easily accessible, and have personnel trained in their use.

④ Smoke Hazards

Laser cleaning "fumes" can consist of very fine particles and gases. Fumes and gases come from a combination of laser cleaning materials or shielding gases, paints, coatings, chemical reactions, and air pollutants. These fumes can adversely affect the lungs, heart, kidneys, and central nervous system. So better use this product in a ventilated environment and use a fume extraction system if necessary.

⑤ Machine Damage

Optical accessories relevant to the laser, such as light-sensitive elements that may be damaged from exposure to the laser light, video cameras, photo multipliers and photo diodes, need related protections.

1.3 Protective Housing and Interlocking System

① The structure and layout of the shield should be designed to ensure that the human body cannot directly enter the dangerous area. Shields should be closed mechanisms, meeting specific safety distance and opening size requirements when a mesh structure is required.

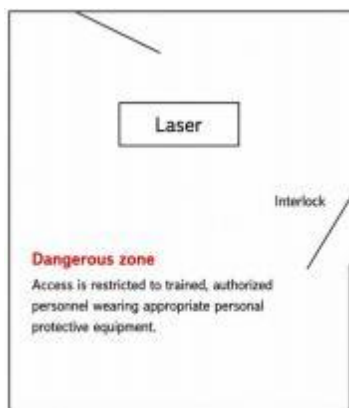
② For the installation of the laser room, should follow the guidance of the professional design, installation team, in accordance with the drawings.

③ The installation of the laser room also includes components such as the house body, internal frame, maintenance door, observation window, safety door, lighting, optical fiber hanging device, monitoring, dust removal, light source room, air conditioning, anti-collision fence.

④ The safety door of the laser room should be connected with the product remote control chain connector. When an external person intervenes and opens the door, the terminal of the connector opens and the laser machine stops launching. Prevent external personnel or unauthorized personnel from exposure to dangerous radiation.

⑤ Use of interlocking system:

In the laser control zone, walls and doors can limit the hazard of laser radiation. The interlocking system connected to the door can actually operate to restrict access when a hazard occurs, allowing only trained, authorized and appropriately protective equipment to enter.



1.4 Safety Labels

As shown in the following table, all safety warning signs during the operation of the handheld laser cleaning machine (not limited to the signs on the laser body) include:

		
<p>Warning label - Hazard symbol</p>	<p>Explanatory label (Take 1000W as example)</p>	<p>Alternative label for laser aperture</p>
		
<p>Alternative label for Class 4</p>	<p>Must be grounded</p>	<p>Electrical Hazard</p>

1.5 EU Agency Information

<p>E-CrossStu GmbH Felix-Dahn-Str 4 Stuttgart 70597 E-CrossStu@web.de +49 71191222069</p>		
		
<p>Product name : 4 IN 1 Laser Welding Machine Model : LWM-YHY Rated voltage : 220V Rated current : 15A Manufacturer : Shenzhen Yuhaiyuan Technology Co., Ltd Address: Longgang District Yayuan Road Chuangyiyuan Y1-2-14 Shenzhen China</p> <p style="text-align: right;">Made in China</p>		

1.6 Product Nameplate

huizhoushiyunshengshukongshebeiyouxiangongsi	
Laser Cleaning machine	
Product Name: 1500W laser Cleaner	Model NO: LC-1500
Rating Voltage : 220V	Rating Frequency: 50Hz
Laser Power:1500W	Rating Power: 3000W
Phase:L+N+PE	Class 4 Laser
Origin:China	Mfg year : 2026 . 4
Address: huizhoushiyangguoqiugiangjiedaoxihucunweipang tianhaichuangxinkejiyuanAdong5lou,516000,China	
	

1.7 Compliance to Standards for CE Marking

This product complies with the European Union Harmonized legislation, only complies with the above directives and standards when installed in accordance with the manufacturer's specifications.

The European Community requirements for product safety in the 2006/42/ EC Machinery (MD)

This Directive requires that lasers comply with the standard:

EN ISO 12100:2010

EN 60204-1:2018

EN ISO 11553-1:2020/A11:2020

EN ISO 11553-2:2008

EN 60825-1:2014/A11:2021

2. Machine Information

2.1 Overall Display





2.2 Laser Source Introduction

In order to guarantee the fiber laser is operated safely (including personnel safety, equipment safety, production safety), ensure the product remain its best condition for a long time.

We compile this document with important safety, operating, maintaining and other information. Please take time to read and understand this User's Guide and familiarize yourself with the operating and maintenance instructions before using the product.

2.2.1 Laser Source Safety Signs:

SYMBOLS	DESCRIPTION
	<p>WARNING :</p> <p><i>Refers to a potential hazard that may lead to a personal injury or death.</i></p>
	<p>CAUTION :</p> <p><i>Refers to a potential hazard on product, or a potential physical injury on personnel</i></p>
<p>NO SYMBOL</p>	<p>IMPORTANT :</p> <p><i>Refers to any information regarding the operation of the product. Please do not overlook this information.</i></p>

2.2.2 Laser Classification

This series of lasers emit invisible laser radiation around a wavelength of $1080 \pm 3 \text{ nm}$.

The average power of the products is ranged from 10% to 100% at a maximum power range from 1000W to 4000W , which classifies the series of lasers Class 4 laser instrument.

Direct or indirect exposure of this level of light intensity may cause very serious damage to the eyes or skin.

In view of this, appropriate and approved laser safety protective glasses must be worn all the time while the laser is operating.

At the same time, no directly or reflectively emit on your skin.

**WARNING :**

The laser safetyprotective glasses are selected according to the wavelengths ofthe output laser. The users must ensure that the laser

safetyprotective glasses covered the entire range of wavelengths of the laser emission.

**CAUTION:**

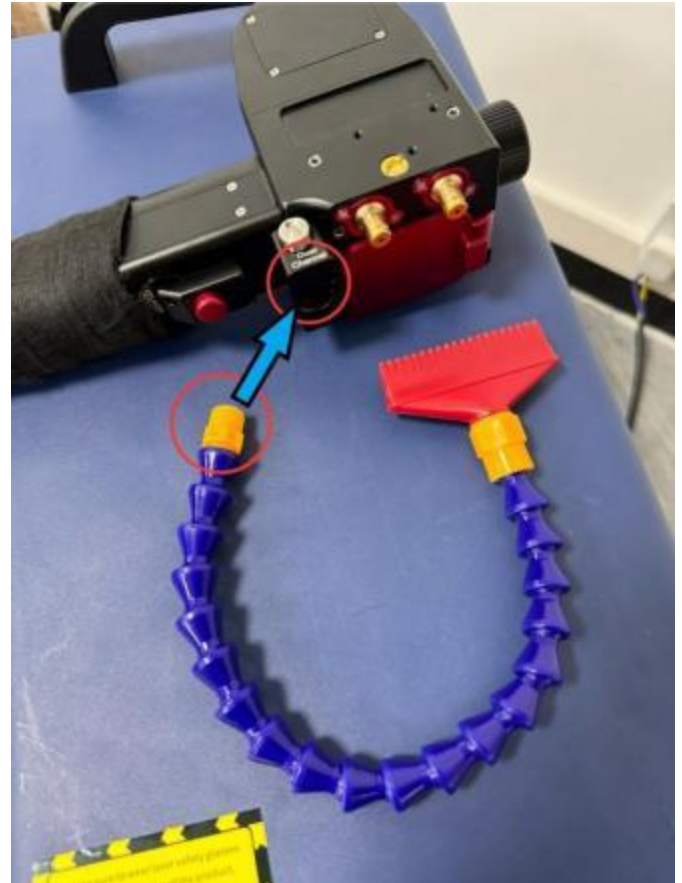
(1)Never make thisproduct work in high humidity (> 95%) ,though theproduct shave an excellent adaptability to the high humidity environment

(2)Never let thisproduct work below the ambient dew point temperature(like the table 2.2)

3. Hardware Installation and Power-On

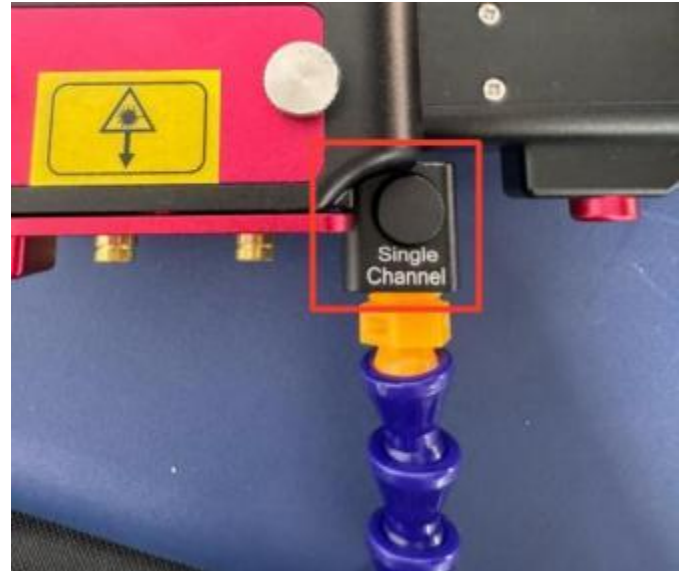
3.1 Device connection





The upper gas connection adapter connects to the air compressor outlet/air tank outlet.

The lower power cable socket connects to the power supply.



Dual Channel is for gas in the open channel; Single Channel is for gas in the closed channel.

3.2 Power on

Power-on procedure: Turn the emergency stop switch on the right clockwise up, and turn the key switch on the left clockwise to turn it on.



4. Feature Introduction

4.1 Change Language



Click "Setting", enter "6" as the password, and press Enter to unlock and enter the interface.



After making your selection, click the exit button in the upper left corner to return to the main interface.

4.2 Cleaning function introduction



Click "Cleaning" to enter the cleaning interface.



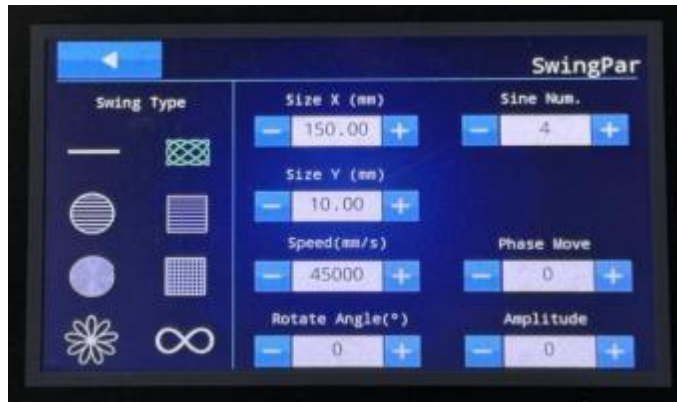
User: admin

Password: 1


Enter the password to unlock and enter the cleaning interface.



Click "Swing" to enter the Swing interface.



There are eight Swing Types to choose from, which can be modified as needed. Parameters such as Size and Speed can be adjusted on the right side.

Click  "Files" to enter the Files interface.



There are 9 process files to choose from, allowing you to select different process parameters depending on the scenario.

You can also modify and save them for easy access next time.



Click Power to enter the Power interface.

Laser parameters can be adjusted according to requirements.

5. Cleaning working ready

5.1 cleaning work ready



Turn on both Sway and Laser, so that it looks like the image below.





Next, open the protective cap of the handheld cleaning head.



CRITICAL:The laser is active **ONLY** while the red button is held during the second click of a double-click sequence.

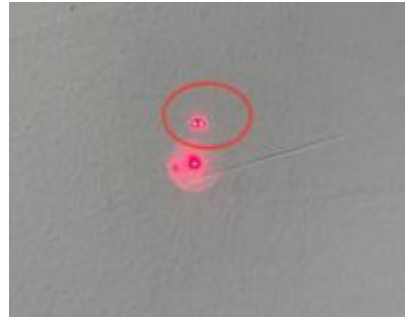
5.2 Dual Red Light Focusing Introduction



This is a dual red light device. When you press the red light-emitting button on your hand, it will emit two red lights simultaneously. When the two red lights converge or are close to converging, that is the laser focus. If they do not converge, then it is not the focus. You need to move the gun head closer or further away to adjust the distance until the two red lights are close to overlapping before you can start cleaning, as shown in the picture below.



Red light beams separated (out of focus)



Red light beams overlapped (at focus)

6. Handheld screen function introduction



Rotary knob screen: Rotate to adjust the corresponding function. Press the rotary knob screen to enter the adjustment function interface. In the adjustment function interface, rotate the rotary knob screen again to adjust the parameters.

7. Replace the focusing and protective lens

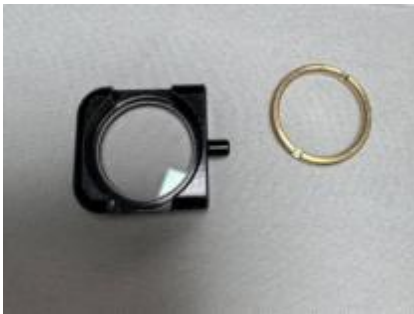
7.1 Replace the focusing lens



Remove the six Phillips head screws from the protective cover, and remove the focusing lens module.



Tighten the retaining ring counterclockwise until the arrow on the lens points downwards (convex side). The circular part of the lens module is the convex side; these two must match.



Replace with a lens with a different focal range and tighten clockwise.



Replacement is complete after placing the module back and tightening the 6 fixing screws.



Click "Setting", enter "6" as the password, and press Enter to unlock and enter the interface.





Follow the steps to enter the interface and select the corresponding new focusing lens size and type. After selection, the focusing lens replacement is complete.

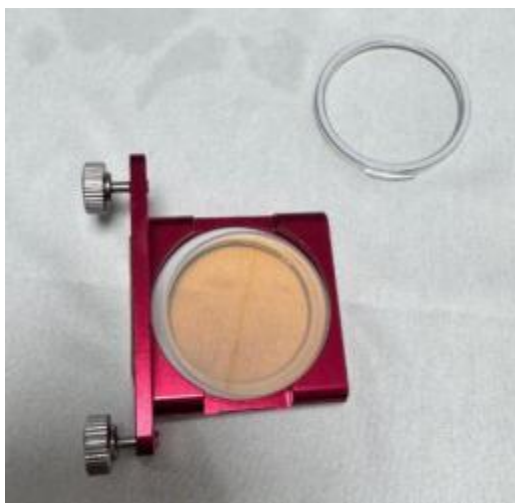
7.2 Replace protective lens



Tighten the two fixing screws halfway to remove the protective lens module.



Turn the knob to the edge of the white part to remove it, and then remove the damaged protective lens, Replace with new protective lens



The replacement is complete once the fixed module is reinstalled.



Remove the screws from module 2 of the protective lens, and then remove the fixing module counterclockwise before replacing it with a new lens.



Replace the protective lens 2 and tighten the fixing screws.



Then reinstall the protective lens 1 into the module and tighten the fixing screws. Replacement complete

8. precautionary note

This device has an output wavelength of 1064nm (invisible light) and an average output power of over 200W. It is classified as a Class IV laser, which not only poses great harm to the eyes but also burns the skin. Its reflected and scattered light may also cause harm to the human body. Therefore, please wear OD4+grade laser protective goggles throughout use.

The irradiance that may incident on the surface of the goggles is 0.01W/m². Do not directly observe the laser output head. It is recommended to wear laser protective goggles throughout the operation!

We prepare this protective goggles for the device, Optical density test results:

wavelength (nm)	optical density
1064	>6



When you don't need this device to work, be sure to keep the laser switch off and inform children to stay away from the device, avoid accidental contact with the danger laser.