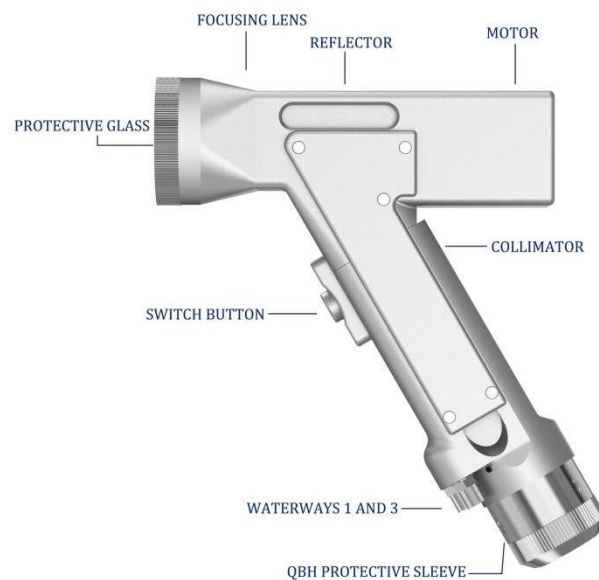


Thank you for choosing Chaoqiang Weiye Handheld Cleaning System. This user manual provides you with important safety, operation, maintenance and other information. Therefore, please read this user manual carefully before using this product.

In order to ensure safe operation and optimal operation of the product, please observe the following precautions and warnings and other information in this manual.

## 1. Overview

This manual covers the basic installation, factory setting, operation and maintenance service of SUP series cleaning head products. Super cleaning head is a hand-held cleaning head launched in 2021. The product covers hand-held cleaning guns and self-developed control systems, and is equipped with multiple safety alarms and active safety power off and light off settings. The product can be adapted to various brands of fiber lasers; the optimized optical and water-cooled design allows the laser head to work stably for a long time under 2000W.



1. Basic features: self-developed control system, with multiple security alarms, smaller size, flexible operation and easy to use.
2. More stable: all parameters are visible, real-time monitoring of the status of the whole machine, avoiding problems in advance, more convenient troubleshooting and solving problems, and ensuring stable operation of the cleaning head.
3. Process: All parameters are visible, the cleaning quality is more perfect, high penetration.
4. Stable parameters and high repeatability: the determined nozzle air pressure and lens state, as long as the laser power is stable, the process parameters must be repeatable. Greatly improve efficiency, while also reducing operator requirements.

## 1.1 Operating environment and parameters

|                                      |                              |
|--------------------------------------|------------------------------|
| Supply voltage (V)                   | 220±10%VVAC 50/60Hz          |
| Placement environment                | Flat, no vibration and shock |
| Working environment temperature (°C) | 10~40                        |
| Working environment humidity (%)     | <70                          |
| Cooling method                       | Water cooling                |
| Applicable wavelength                | 1064nm(±10nm)                |
| Applicable power                     | ≤2000W                       |
| Collimation                          | D20*5/F60                    |
| Focus                                | D20*4.5/F <b>400</b>         |
| Reflection                           | 30*14 T2                     |
| Protective lens specifications       | 18*2                         |
| Maximum support air pressure         | 10bar                        |
| Focus vertical adjustment range      | ±10mm                        |
| Spot adjustment range                | <b>0-150mm</b>               |
| Weight                               | <b>SUP20C 0.8KG</b>          |

### 1.2 Attention information

- 1) Ensure reliable grounding before power supply.
- 2) The laser output head is connected with the welding head. Please check the laser output head carefully when using it to prevent dust or other pollution. When cleaning the laser output head, please use special lens paper.
- 3) If the equipment is not used in accordance with the methods specified in this manual, it may be in abnormal working condition and cause damage.
- 4) When replacing the protective lens, please make sure to protect it.
- 5) Please note: When using for the first time, when the red light cannot come out of the copper mouth, be sure not to emit light

## 2. Installation and connection

### 2.1 General definition of controller wiring (see below for detailed definition explanation)

| Plug              | Definition | Signal type                  | Detailed explanation |  |
|-------------------|------------|------------------------------|----------------------|--|
| Power supply      | 1          | -15V                         | enter                | V2 connected to 15V switching power supply provides 15V-                   |
|                   | 2          | GND                          | reference place      | Connect to any COM of 15V switching power supply                           |
|                   | 3          | +15V                         | enter                | V1 connected to 15V switching power supply provides 15V+                   |
|                   | 4          | GND                          | reference place      | V- connected to 24V switching power supply                                 |
|                   | 5          | +24V                         | enter                | Connect to V+ of 24V switching power supply                                |
| LCD screen        | 1          | G                            | reference place      | Power ground   |
|                   | 2          | R                            | sender               | Data exchange  |
|                   | 3          | T                            | receiving end        | Data exchange  |
|                   | 4          | V                            | output               | Output 24V, and ① provide 24V to the serial port display                   |
| Signal interface1 | 1          | GND                          | reference place      | Signal ground  |
|                   | 2          | Air pressure alarm signal    | enter                | Polarity can be set in the setting interface, set to low level when not in |
|                   | 3          | GND                          | reference place      | Signal ground  |
|                   | 4          | Water tank alarm signal      | enter                | Polarity can be set in the setting interface, set to low level when not in |
|                   | 5          | Safety Ground lock Reference |                      | Connect the processed workpiece to form a loop with 6 feet to prevent      |
|                   | 6          | Safety Ground lock           |                      | The blue wire of the three-core wire connected to the welding head         |
|                   | 7          | Welding head light switch    |                      | The brown wire of the three-core wire connected to the welding head        |
|                   | 8          | Welding head light switch    |                      | The black wire of the three-core wire connected to the welding head        |
| Signal interface2 | 1          | Reserved                     | reserved             | Reserved   |
|                   | 2          | Reserved                     | output               | Reserved (synchronized with 4 foot air valve signal)                       |
|                   | 3          | Shielding gas valve-         | reference place      | Signal ground. 2/4 pin reference ground-                                   |
|                   | 4          | Protect other valves+        | output               | Output 24V, current>2A, built-in relay, directly to the air valve          |
|                   | 5          | Wire feed-                   |                      | Wire feeder wire feed switch   |
|                   | 6          | Wire feeding+                |                      | Wire feeder wire feed switch   |
| Signal interface3 | 1          | Laser abnormal signal        | enter                | Laser alarm signal   |
|                   | 2          | Laser enable+                | output               | Laser enable+  |
|                   | 3          | 24V                          | output               | 24V power supply pin, output when power on                                 |
|                   | 4          | GND                          | reference place      | Reference ground (enable, DA, shared ground for pin 3)                     |
|                   | 5          | Analog +                     | output               | Connect to the analog quantity of the laser, DA+                           |
|                   | 6          | RF-(PWM-)                    | output               | Laser pulse width modulation signal-                                       |
|                   | 7          | RF+(PWM+)                    | output               | Laser pulse width modulation signal+                                       |

### 2.1.1 Controller power supply terminal

The power supply uses a 5P interface, and the supplied 24V switching power supply and 15V switching power supply are used for power supply.

Please note that the 15V switching power supply distinguishes the positive and negative poles, V1 is connected to 15V+, V2 is connected to 15V-, and any COM on the 15V switching power supply is connected to pin 2 GND!

Please note that the switching power supply must be grounded!

### 2.1.2 Controller LCD screen

The LCD screen wiring is included with the machine, just connect directly, see the figure above for the specific definition

### 2.1.3 Controller signal interface 1

Signal interface 1 end uses 8P interface, ready for signal related

①/②Pin is the air pressure alarm signal input, if you need to enable (wiring required), please set the air pressure alarm level in the background as high, otherwise it is low

The ③/④ pin is the water tank alarm signal input. If you need to enable (wiring is required), please set the water tank alarm level to high in the background, otherwise it is low

⑤The number pin is the reference ground for the safety ground lock

⑥The No. pin is a safety ground lock of the welding head, and it is shorted with the No. ⑤

pin

⑦ The number pin is the switch of the welding head, connected to the brown wire of the three-core wire

⑧ Pin No. is the light switch of the welding head, connected to the black wire of the three-core wire, when the trigger is pulled, the trigger button is on

Please note that only when there is no alarm, and the signal of the safe lock and trigger button signal is on, the output signal of the subsequent port will be sent out

#### 2.1.4 Controller signal interface 2

The 2 end of the signal interface uses a 6P interface, and the air valve is related to the wire feeding

① Reserved feet

② Reserved feet

③/④ The foot is for the valve 24V output, the control board has built-in relays, which can be directly connected to the valve

⑤/⑥ The pin is the signal line of the wire feeder, the signal port of the wire transfer machine, regardless of positive or negative

#### 2.1.5 Controller signal interface 3

Signal interface 3 uses 7P interface, laser related

① Pin is the laser alarm signal input +. If you need to enable it (wiring is required), please set the alarm level to high in the background, otherwise it is low

② Pin is enable+, connect to laser enable+

③ Pin is 24V output, directly output 24V+ after power on

④ Pin is a common ground (reference ground for No. 1/2/3/5)

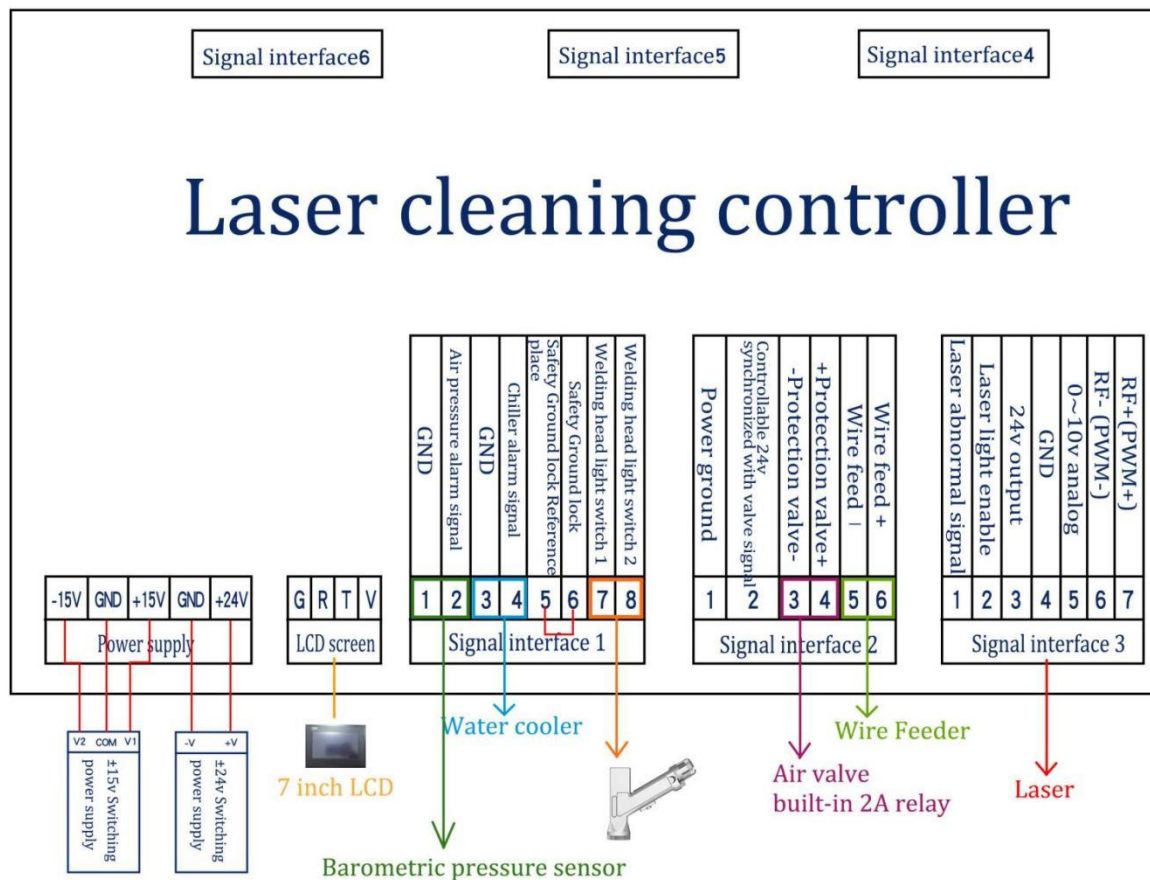
⑤ Pin is analog quantity + output, the analog quantity is given

⑥ Pin is PWM - modulation signal

⑦ Pin is PWM + modulation signal

Click for details: [Laser wiring definition logic](#)

## 2.2 Controller wiring diagram



**Note:** The ground wire of the switching power supply must be effectively grounded! .

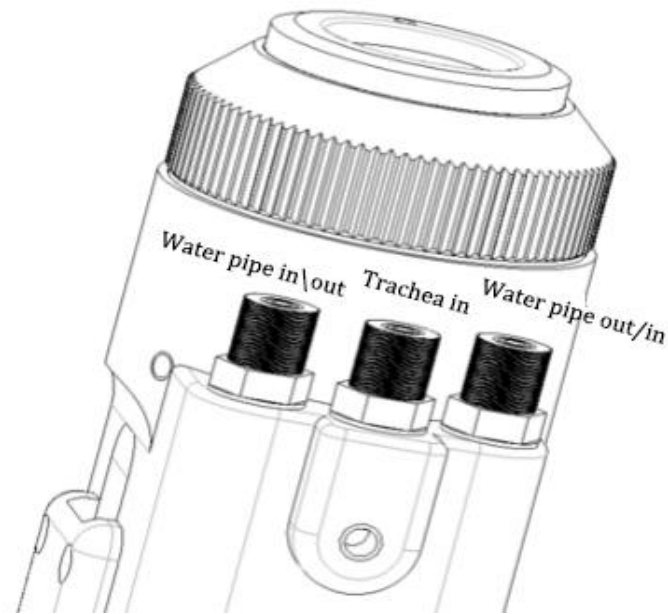
## 2.3 Optical input interface

SUP cleaning head is suitable for most industrial laser generators. Commonly used fiber connectors include IPG, Ruike, Chuangxin, Fibo, Tottenham, Jept, Kaplin, etc. The optics must be kept clean, before use, all dust must be removed. When the fiber is inserted, the cutting head must be rotated 90 degrees to a horizontal position, and then the fiber is to prevent dust from falling into the interface.

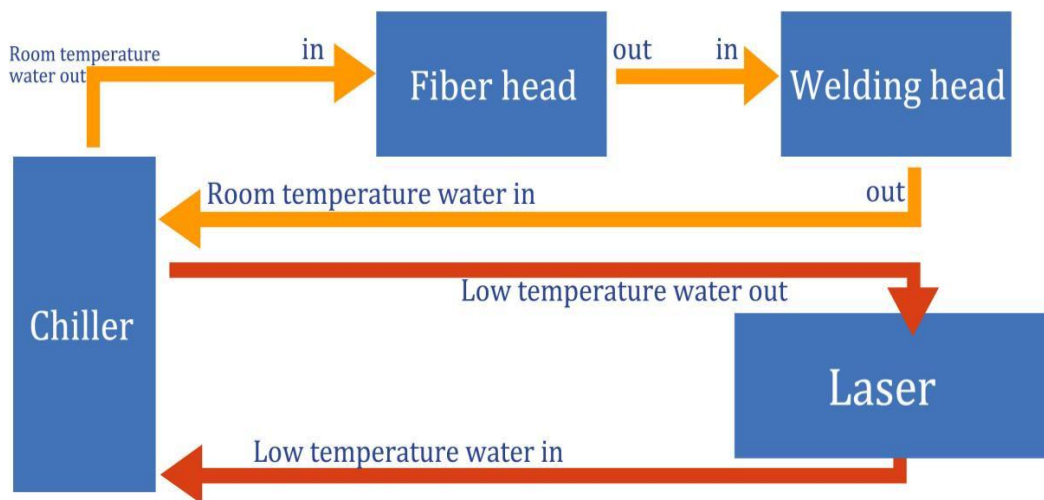
Installation method

## 2.4 Shielding gas and water chiller interface

The water pipe and air pipe interface can be installed with a hose with an outer diameter of 6MM and an inner diameter of 4MM. The middle is the gas inlet, and the two sides are the water inlet and outlet pipelines (regardless of the direction of inlet and outlet), as shown in the following figure:



The cooling system is divided into the water circuit part of the welding head and the water circuit part of the optical fiber head, which are connected in series, as shown in the figure below:



### 2.5 Welding gun and control box connection interface

The cleaning gun and the control box use three wires to connect, including: two-core motor power line, five-core motor signal line, three-core safety lock and trigger button line

The motor power/signal wires (two black wires) are directly connected to the motor part of the welding head and can be disassembled (two options are available:

1. Open the motor cover and side plate of the hand-held welding gun
2. Open the control box, both are plugs)

Safely lock and trigger button three-core wire used detachable aerial plug: safe lock and

button cable, of which 1 blue, 2 black, 3 brown (connected to 6/7/8 pins of signal interface 1, see the wiring definition of the control box above)

### 3. Control Panel and Operation Guide

Please refer to the software description section of the applet

### 4. Maintenance

#### 4.1 Protective lens maintenance and replacement method:

- ① Before operation, wash your hands with detergent and wipe dry, and wipe your hands again with alcohol-sticky cotton.
- ② Remove the screws of the protective lens compartment cover in a relatively dust-free place, pull out the protective lens holder, and protect it (cover with masking paper), and check the protective lens (If there are obvious burning spots on the surface of the protective lens, it should be replaced directly)
- ③ Then check the white accumulating seal under the protective lens. (If there is any scratch or deformation of the accumulating sealing ring, it cannot be used and must be replaced immediately.
- ④ Use a cotton ball dipped in alcohol to wipe the mouth of the compartment and the inside of the compartment cover, quickly insert the protective lens holder into the protective lens compartment, and tighten the screws.

### 5. Common exception handling

#### 5.1. Prompt laser/water cooler/air pressure alarm

- ① If the above alarm occurs without using the alarm signal, please change the alarm level.
- ② If the above alarm occurs when the alarm signal is used, check whether the alarm of the corresponding equipment or the high and low level of the alarm signal is set incorrectly.

#### 5.2. The screen doesn't light up/click no response

- ① The screen does not light up. If the controller is powered on (the fan is rotating), check whether the four-core wire between the controller and the screen is correctly wired, and whether the 24V voltage of pin 1 and pin 4 is normal
- ② If the click does not work in normal use, check whether the temperature of the whole machine is too high.
- ③ Tap to fail to input, check whether the four-core wire between the controller and the screen is correctly wired, and whether the second and third pins are normal. For details, see 2.1.2 Controller LCD screen end
- ④ If the newly installed equipment clicks and there is no response, it may be that the system version does not match, just re-swipe the program. Please ask our company for the SD card.

### 5.3.No light

① The monitoring interface can exclude other alarms. When the welding head touches the workpiece to be processed, the safety lock is displayed in green, and it can be processed at this time. If it is gray, check whether the connection of the safety lock is normal.

That is, check whether all the ready signals are normal

Normally, the failure of the air outlet and the wire to emit light is due to the laser failure or the wiring problem.If there is no venting or wire feeding, it may be a signal preparation problem. For details, please refer to: 2.1.3 Controller signal interface 1

### 5.4.Suddenly stop emitting light during processing

The monitoring interface checks whether the safety lock and other alarms are normal, and at the same time checks whether the temperature exceeds the temperature alarm threshold.

Note: Two-phase or three-phase power depends on the power supply required by the laser and chiller, not the amount of wiring harness

