Thank you for choosing Super Weiye Handheld Welding 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 cautions 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 welding head products.

Super welding head is a handheld welding cutting head launched in 2022. The product covers hand-held welding guns and self-developed control systems, and is equipped with multiple safety alarms and active safe power and light-off settings. This 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.



Basic features: Self-developed control system, multiple safety alarms, smaller size, flexible operation and easy to use.

More stable: All parameters are visible, real-time monitoring of the status of the whole machine, to avoid problems in advance, more convenient to troubleshoot and solve problems, to ensure the stable operation of the welding head.

Process: All parameters are visible, the cleaning quality is more perfect.

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.

220±10%V AC50/60Hz
Smooth,free from vibration and impact
10—40
<70
Water-Cooling
1064nm(±10nm)
≤2000W
D20*3.5 F50
D20 F400 concave cylindrical lenses
D20 F800 concave cylindrical lenses
20*15.2 T1.6
D20*2
15bar
Line0-300mm
0.7KG

1.1 Operating environment and parameters

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, Do not emit light when red light is not visible.

2, Install

2.1 Controller wiring definition

Plug		Definition	Signal Type	Detailed explanation
Power	1	-15V	Enter	V2 connected to 15V switching power supply
				provides 15V
	2	GND	Reference	Connect to any COM of 15V switching power
			place	supply
	3	+15V	Enter	V1 connected to 15V switching power supply
				provides 15V+
	4	GND	Reference	Connect to V-of 24V switching power supply
			place	
	5	+24V	Enter	Connect to V+of 24V switching power supply
Signal	1	G	Reference	Power ground
ground			place	
	2	R	Sender	Data exchange
	3	Т	Receiving	Data exchange
			end	
	4	V	Output	Output 24V,and (1)provide 24V to the serial
				port display
Signal	1	GND	Reference	Signal ground
interface			place	
1	2	Air pressure	Enter	Polarity can be set in the setting interface,set
		alarm signal		to low level when not in use
	3	GND	Reference	Signal ground/The white wire of the six-core
			place	wire that is connected to the connector
	4	Water tank	Enter	Polarity can be set in the setting interface, set to
	_	alarm signal		low level when not in use
	5	Securely lock the		The yellow wire of the six-core wire that is
		reference		connected to the connector
	(ground Safaly la als		The blue wine of the sin some wine that is
	0	Salely lock		sonnosted to the connector
	7	Wolding boad		The black wire of the six core wire that is
	[′]	light switch		connected to the connector
	8	Welding head		The brown wire of the six-core wire that is
		light switch		connected to the connector
Signal	1	Reserved	Reserved	Reserved
interface	2	Temperature	Reberveu	The red wire of the six-core wire that is
2	-	measurement		connected to the connector
	3	-Shielding gas	Reference	Signal ground, 2/4 is the reference ground-
		valve-	place	
	4	+Shielding gas	Output	Output 24V, current>2A, built-in relay, directly to
		valve+	^	the air valve
	5	-Wire feed-		Wire feeder wire feed switch
	6	+Wire feed+		Wire feeder wire feed switch
Signal	1	Laser abnormal	Enter	Laser alarm signal
interface		signal		
3	2	Laser enable+	Output	+Laser enable+
	3	24V	Output	24V power supply pin, output when power on
	4	GND	Reference	Reference ground (enable, DA, shared ground of
			place	3 feet)
	5	Analog+	Output	Connect to the analog quantity of the laser, DA+
	6	-(PWM-)	Output	Laser pulse width modulation signal-
		RF-(PWM-)		
	7	+(PWM+)	Output	Laser pulse width modulation signal+
		RF+(PWM+)		

2.1.1 Controller power supply terminal

The power supply uses the 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 LCD24/5000

The LCD cable is delivered with the device and can be connected directly. See the figure above for specific definitions.

2.1.3 Controller signal interface 1

8P interface is used at the end of signal interface 1 to prepare signal (1/2) pin is the air pressure alarm signal input. If it needs to be enabled (wiring is required), please set the air pressure alarm level to high in the background, otherwise it is low.

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

Please note that any one of (1) / (3) is connected to the white line of Six core wire of welding joint.

(5) is connected to the yellow line of Six core wire of welding joint.

(6) is connected to the blue line of Six core wire of welding joint.

 $\overline{(7)}$ is connected to the black line of Six core wire of welding joint.

(8) is the light output switch of the welding joint, which is connected to the brown line of Six core wire of welding joint.

2.1.4 Controller signal interface 2

6P interface is used at the end of signal interface 2 for air valve and wire feeding 1 Reserved.

(2)temperature measurement, which is connected to the red line of six-core wire of welding joint.

(3)/(4) pin is 24V output of air valve, and the control board has built-in relay,

which can be directly connected to the air valve.

(5)/(6) Reserved.

2.1.5 Controller signal interface 3

(1)Pin is the laser alarm signal input +, if you need to enable it, please set the air pressure alarm level to high in the background

2)Pin is enable+, connect to laser enable+

③The pin is 24V output, directly output 24V+ after power on

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

(5) The number pin is analog quantity + output, the analog quantity is given

6 Pin is PWM-modulated signal

⑦The number pin is PWM+ modulation signal

2.2 Controller wiring diagram



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

2.3 Optical input interface

SUP welding head is suitable for most industrial laser generators. Commonly used optical fiber connectors include IPG, Ruike, Chuangxin, Fibo, Tottenham, Jept, Kaplin, etc. The optics must be kept clean and all dust must be removed before use

When the fiber is inserted, the cutting head must be rotated 90 degrees to be horizontal, and then the fiber is used to prevent dust from falling into the interface.

2.4 Shielding gas and water chiller interface

The water pipe and air pipe interface can be installed with hoses with an outer diameter of 6MM and an inner diameter of 4MM. The air path enters in the middle, and the two sides are Water inlet and outlet pipelines (regardless of the direction of inlet and outlet), As shown below:



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 Cleaning gun and control box connection interface

Three wires are used to connect the cleaning gun and the control box, including two motor power wires, five motor signal wires and six signal pins 2.51. The motor power / signal wires (two black) are directly connected to the motor part of the welding joint and can be removed (two options: 1. Open the motor cover and side plate of the hand-held welding gun; 2. Open the control box, both of which are plugs)

2.52. The six core signal corner uses a detachable aerial plug

3. Control panel and operation guide

	Laser cleaning system 🧭
Hz	Laser enable ON Home
mm	
w	Indication of LINE Technology
%	Technology
Hz	Secure lock
	Setting
	Monitor
	Hz mm W % Hz

P1-1 Home, Light out

(1)In this interface, you can see the current process parameters (the process cannot be modified on this page) and real-time alarm information.

(2)In the power on state, the enable is ON by default, and the red light is LINE by default.

When the enable is turned off, "off" is displayed, and the enable signal will not be sent to the laser, which can be used to test the air outlet function

Turn off the red light indication, display "dot", and the motor stops swinging. At this time, the red light is a point for adjusting the center

③"Safety lock", When the "safety lock" of the gun body is opened, it is displayed as green "on" and can emit light normally. When it is closed, it is red "off" and cannot emit light.

	Laser cleaning system 🥝
Hz	Laser enable
mm	
w	Indication of red light
%	rectinology
Hz	Secure lock
	Monitor
	Hz mm W % Hz

P1-2 Home,Light off

Technology	Laser cleaning system
Scanning frequency F	z C
Scan width	im 1
Peak power	on tec
Duty cycle	5 Technology
Frequency	z
	Patum (maart) Carra
	Keturn unport Save

P2 process interface

(1) The process interface contains the commissioning process parameters. Click the box (red) to modify them. After modification, click OK, and then save them in the shortcut process. When in use, click Import (modify save import).

(2) The scanning frequency range is 10-100Hz and the scanning width range is 0 ^ 300mm. (the most commonly used scanning speed is 50Hz and the width is

300mm. Please note that this width should match your focus.) .

(3) The peak power shall be less than or equal to the laser power on the parameter page (if the laser power is 1000W, this value shall not be higher than 1000).

(4) Duty cycle range: 0 ~ 100 (default: 100, usually no need to change).

(5) The pulse frequency range is recommended to be 5-5000Hz (the default is 2000, which usually does not need to be changed).

(6) Click the help button at the top right to get more explanations of relevant parameters.

⑦After modifying the parameters, you can check whether the import is successful on the home page.

(8) Refer to the process in the applet.

Gunhead	focal	, mm	Width	mm
model	lengt	n		
Laser power	w	Laser starting power	%	Trigger setting
Open gas delay	mS	Laser on progressive time	mS	Laser alarm level
Off gas delay	mS	Laser off power	%	Chiller alarm level
Scan correction		Laser off progressive time	mS	
Laser center offset	mm			Pressure alarm level
Temperature				\frown

P3-1 Setting interface

Enter the password 123456 to enter this interface (1)The laser power is the power of the laser used, please fill in it correctly.

(2) The delay of switching gas is 200ms by default, and the range is 200ms-3000ms.

③When the light is turned on, it gradually increases from N1% of the process power to 100%; When the light is turned off, it gradually decreases from 100% of the process power to N2; (as shown in the figure below).



P3-2 Setting interface, parameter specification

(4)Generally, the switching optical power is 20% and the switching optical progressive time is 200ms.

(5) The maximum temperature alarm threshold is 65 °C. When this value is set to 0, the temperature alarm will not be detected.

(6)Scan correction coefficient range is $0.01 \sim 4$, coefficient target line width / measured line width: the default is 1.0.

(7) The laser center is offset by - 75 ~ 75mm, which decreases to the left and increases to the right. It should be used to adjust the red light center.
(8) The alarm level signal of air pressure / water cooler / laser is low by default. When using this alarm signal, if an external air pressure alarm is installed, it will be changed to high level, otherwise an abnormal alarm will appear, and other alarm signals are the same.

(9) Click the "Chinese" button to switch to other languages in the language selection column. At present, the standard version supports eight languages: Simplified Chinese, traditional Chinese, English, Japanese, Korean, Russian, German and French. If you need other language versions, please contact us.

Settin	g		Laser	cleaning s	system help
Gunhead model	SUP21C	中文简体 中文	Width	300 mm	
Laser power	2000	English 英语	0 %	Trigger setting	Double
Open gas delay	200	中文繁體 中文繁体	00 ms	Laser alarm level	Low
Off gas delay	200	日本語 日文	0 %	Chiller alarm level	
Scan correction	1.00	한국어 韩语	00 mS	Designed	
Laser center offse	t (0	РУССКИЙ ЯЗЫК 俄文		level	Low
Temperature alarm threshold	65.0	DEUTSCH 德语			
Language	English	FRANÇAIS 法语		Save	Return

P3-3 Setting interface-language switch

(10) This page is the help page of the setting page. Long press "restore factory settings" for 3 seconds to restore all the setting parameters to "factory parameters". Long press "save as factory settings" for 3 seconds to set the current setting parameters to "factory parameters".

Laser cleaning system nep

1. Please set the maximum scan width according to the actual gun head model and focal length of the focusing lens.

2. "Laser power" refers to the maximum power of the laser, please fill in the actual laser power value.

3. The range of "Gas Opening delay" is 0~3000ms, and 200~500ms is recommended.

4. The range of "Gas off delay" is 0~3000ms, and 200~500ms is recommended.

5. The scanning correction coefficient=target linewidth / measured linewidth, range is from 0.01 to 4.

6. The laser center is shifted by -75 \sim 75mm, the negative value moves to the left and the positive value moves to the right.

7. The maximum temperature alarm threshold is 70 $^{\circ}$ C, and when the value is set to 0, the temperature alarm is not detected;

8. Trigger setting: set the trigger to emit light by single-click or double-click.

P3-4 Setting interface-help

Click the "gun head model" area to select the scanning width corresponding to different



P3-5 Setting interface-switch between different focal lengths

Monitor		La	ser c	leanir	ng syste	m
Laser trigger signal		PWM signal		Equipmer Authoriza	nt D	н
Laser alarm signal		Laser enable signal		Equipmer number	nt	
Secure lock signal						
Water cooler alarm signal		Gas valve enable signal		Manufact number	urer	
Pressure alarm signal		Analog voltage	V	System Version	<u> </u>	
Motor temperature	°C					
					Return	
		P4 Monitor interfa	ce			

This page displays the status and equipment information of each signal Laser trigger signal: this status changes from gray to green after pulling the trigger.

Laser / water cooler / air pressure alarm signal: monitor its set high and low levels.

The output signal is displayed in the middle of the page. When the signal is output, it is gray and green.

Equipment authorization: you can authorize the use time of the equipment. When the equipment is used for more than its set time, the authorization will be terminated.

Light out time: click "device authorization", enter " FFFFFBB001" on the password page to start the timing, enter " FFFFFBB000" to clear the data and stop the timing.

System version: three groups of numbers. The first group is the hardware version, the second group is the program version of MCU, and the third group is the touch screen version.

输出信号	理论输出值	检测值	开关控制	
PWM (V)				
激光使能 (V)				
气阀使能 (V)				
模拟量 (V)				

P4 Diagnosis interface

Click the "diagnosis" button to enter the diagnosis page.On this page,the laser will not emit light. You can independently output "PWM", "laser enable", "air valve enable" and "analog quantity" through "switch control". Compare the detected value with the theoretical value to judge whether the function of the control box is normal.

4. Maintenance

4.1 Maintenance and replacement methods of protective lenses:

①Before operation, wash your hands with detergent and dry them, and wipe your hands again with cotton pasted with alcohol.

⁽²⁾Remove the screws of the protective lens cover at a relatively dust-free place, pull out the protective lens support, protect it (covered with masking paper), and check the protective lens (if there is obvious burning point on the surface of the protective lens, it should be replaced directly.)

③Then check the white power storage sealing ring under the protective lens. (if the accumulator seal ring is scratched or deformed, it cannot be used and must be replaced immediately.

④Wipe the warehouse opening and the inside of the warehouse cover with a cotton ball dipped in alcohol, quickly insert the protective mirror support into the protective mirror warehouse, and lock 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 levels of the alarm signal are set incorrectly.

5.2. The screen is not lit / there is no response when clicking

(1)the screen is not work. if the controller is powered on (the fan is running), check whether the four core wire between the controller and the screen is correctly wired and whether the 24V voltage of the first pin and the fourth pin is normal

(2)If the click fails during normal use, check whether the whole machine is caused by too high temperature.

③Click action cannot be entered, Check whether the four core wires between the controller and the screen are wired correctly, and whether the second pin and the third pin are normal, See 2.1.2 LCD of controller for details

(4) There is no response when clicking on the newly installed equipment. It may be that the system version does not match. Just brush the program again. For SD card, please ask our company

5.3. Sudden stop of light during processing

Check whether the trigger button and other alarms are normal on the monitoring interface

Three phase power supply wiring reference of laser welding machine

Note: the two-phase or three-phase power supply depends on the power supply required by the laser and chiller, not the harness quantity

