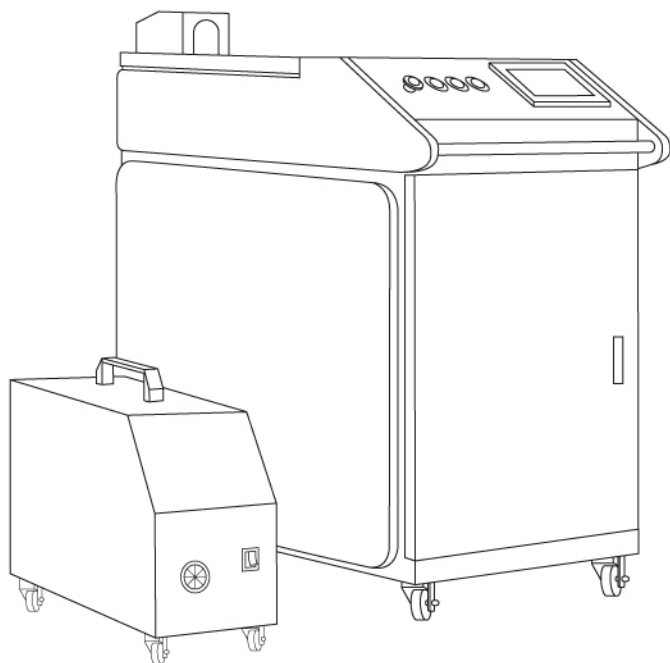




4 IN 1 LASER WELDING MACHINE

Instruction Manual



Preface

Thank you for purchasing our products. Please read the installation manual carefully before use and keep it properly.

This installation manual is not a quality guarantee. The correction of printing errors, errata of information errors, and product improvements are subject to interpretation by our company at any time without prior notice. The revised content will be included in the reprinted installation manual.

Company Profile

Jobon Laser is a high-tech enterprise integrating R&D, production and sales of laser application equipment, specializing in the production of laser welding machines, laser cleaning machines, laser marking machines, laser cutting machines and other laser equipment. Our company has been engaged in the laser field for more than 14 years, with sales services covering 120 countries around the world. We have our own factory, including neat warehouses, standardized workshops and exhibition halls. Welcome to visit us.

Our products are used in a variety of industries including cup and pot hardware, kitchen hardware, bathroom hardware, construction hardware, precision instruments, packaging materials, electronic circuits, instrumentation, computer manufacturing, mobile communications, auto parts, gold and silver jewelry, craft gifts, etc. Our advantage is not just the price, but also the reliable performance that allows us to win the market!

Perfect service network. Customer service response time is within 24 hours. We always pay attention to customer interests. Free training, free maintenance, free technical support, responsible for customers. A maintenance team with superb technology and first-class service solves customers' worries.

This manual details the installation and use of the Jobon handheld laser welding machine and related operations. Before you unpack, install and use this machine, please pay attention to the following points:

- The operator should have relevant technical training or be guided by a dedicated person ;
- This manual will help you understand this machine and please operate it according to the regulations ;
- This manual contains many important tips to help you operate safely, economically, adapt to local conditions, and common troubleshooting. If you can follow these tips, you can not only avoid dangerous accidents, reduce maintenance costs, and reduce downtime and maintenance time, but also effectively improve the working life of the machine and reduce the failure rate ;
- The manual should be kept next to the machine for reference at any time.

Security Requirements

- Improper use of lasers may cause personal injury, so please carefully understand the safety knowledge of laser use before use to avoid personal injury and prevent damage to this product or any other products connected to it. In order to avoid possible dangers, this product can only be used within the specified range;
- Never point the laser towards your own or other people's eyes at any time. Even if the laser is turned off, it may be turned on by mistake;
- Lasers are not toys and should not be used by children, mentally retarded people, or people who do not understand the characteristics of lasers. In such cases, it is very easy to cause harm;
- Since this type of laser is invisible light, it is strictly forbidden to place flammable or explosive items near the equipment to prevent fire caused by the laser being misplaced;
- Product grounding. This product is grounded through the power cord grounding wire. To prevent static electricity from hurting people, the grounding wire must be connected to the ground. Before using this product, make sure that the product is properly grounded;
- Because there are laser and high-voltage parts in the machine, non-professionals are strictly prohibited from disassembling the machine without authorization;
- Do not start the machine when the voltage is unstable, otherwise a voltage stabilizer must be used ;
- The water circulation must be kept clean and purified water must be used. Mineral water and tap water cannot be used;
- If the machine malfunctions or a fire occurs, please cut off the power supply immediately;
- If there is a suspected fault, please do not operate. If you suspect that this product has a fault, please contact our after-sales staff for inspection. Do not operate it privately;
- Do not operate in explosive atmospheres;
- Keep the product surface clean and dry;
- It is recommended that every person working with this machine should read this instruction manual;
- Please strictly follow the instructions and guidance of technical engineers, otherwise the product failure caused will no longer be covered by the warranty.

CONTENTS

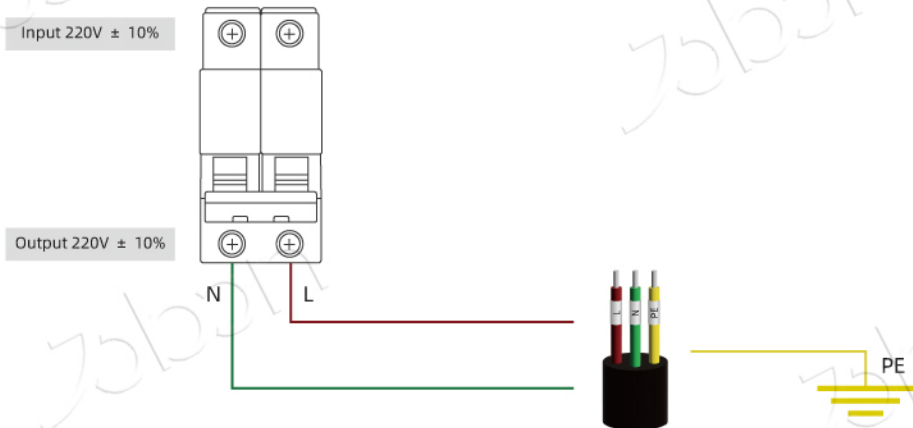
Electronic control system	01
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Electronic control system

Power	Voltage
1000-2000W	220V 1PH
3000-6000W	380V 3PH



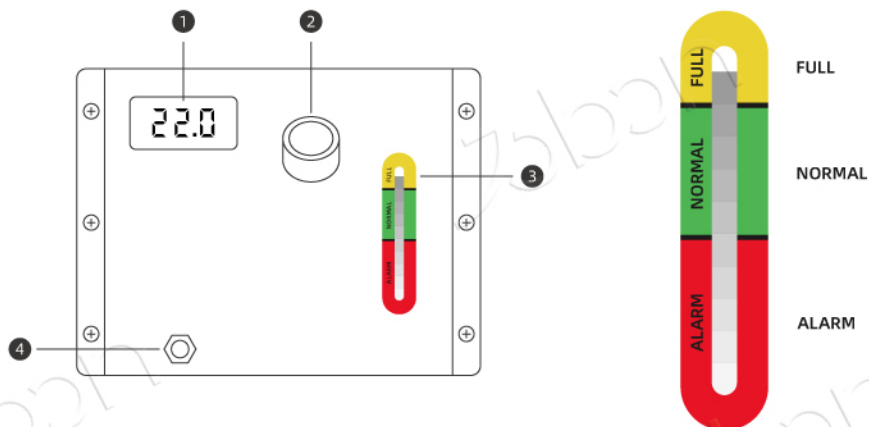
L: Live line
N: Neutral line
PE: Protective earth wire



Note: Please wear rubber gloves when turning the air switch upward after connecting the power to prevent electric shock.

- ⚠ The machine voltage is not within $(220/380) \pm 10$, or the fluctuation is large and a voltage stabilizer needs to be installed
- ⚠ The ground wire must be effectively grounded separately, and cannot be virtually or ineffectively grounded (industrial grounding requires burying a metal conductor copper block 5m deep in the ground, and then leading the wire out of the ground to complete the loop so that the equipment can meet the required grounding wire)

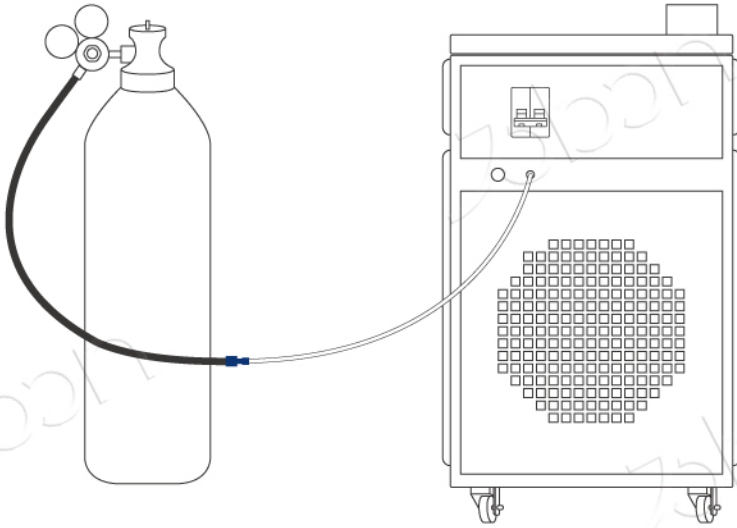
Water Cooling System



- ① Temperature control display: Temperature $\geq 22^\circ$ (need to wait for the water tank to heat up);
 - ② Water inlet: Only pure water or distilled water can be added (no mineral water can be added);
 - ③ Water level: Water needs to reach the overflow area and cannot be lower than the standard area;
 - ④ Drainage outlet: It is recommended to drain the water once every two months.
- ⚠ **Warning:** When the water temperature is $\leq 0^\circ$, you need to add laser professional antifreeze, not car antifreeze (adding car antifreeze will cause water pipe corrosion)
- ⚠ **Warning:** When the outdoor temperature is $>10^\circ$, the antifreeze needs to be replaced with purified water or distilled water.

Avoid abnormalities of laser source working at low temperature for a long time: the ratio of antifreeze	6:4 (60% antifreeze: 40% water) $-36^\circ \sim -45^\circ$
	5:5 (50% antifreeze: 50% water) $-26^\circ \sim -35^\circ$
	4:6 (40% antifreeze: 60% water) $-16^\circ \sim -25^\circ$
	3:7 (30% antifreeze: 70% water) $-6^\circ \sim -15^\circ$
	2:8 (20% antifreeze: 80% water) $0^\circ \sim -5^\circ$

Gas system



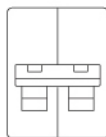
- The gas needs to be nitrogen or argon (high purity 99.99%);
- When using air, you need to install a three-stage filter and a cold dryer (to ensure that the gas is dust-free, oil-free, and water-free) and it can only be used in cleaning mode.

Function/Material		Air pressure
Welding	Stainless steel	0.2-0.5Mpa
	Carbon steel, Galvanized sheet, Aluminum sheet	0.3-0.5Mpa
Cutting		0.5-1.5Mpa
Remote cleaning		0.5-1.5Mpa

- ⚠ **Warning:** The air pressure valve must use a nitrogen pressure reducing valve, and cannot use an argon pressure reducing valve or an oxygen pressure reducing valve.
- ⚠ **Warning:** Be sure to use the specified gas strictly. Using other gases instead will cause damage to the lens inside the gun body and even burn the optical fiber.

Power on

- 1 Turn on the air switch to power the machine;
- 2 Rotating emergency stop switch;
- 3 Turn on the system;
- 4 Turn on water cooling (wait for the water tank to heat up to $\geq 22^{\circ}\text{C}$);
- 5 Turn on the laser.



⚠ Warning: After turning on the water cooling, you must wait until the water temperature rises above 22°C before turning on the laser

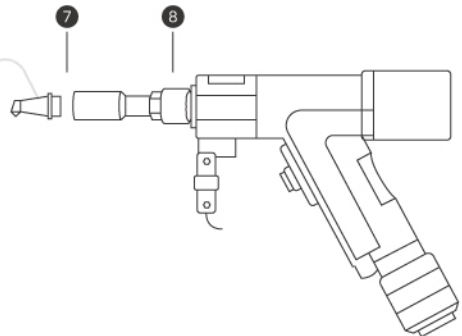


Adjust the focus

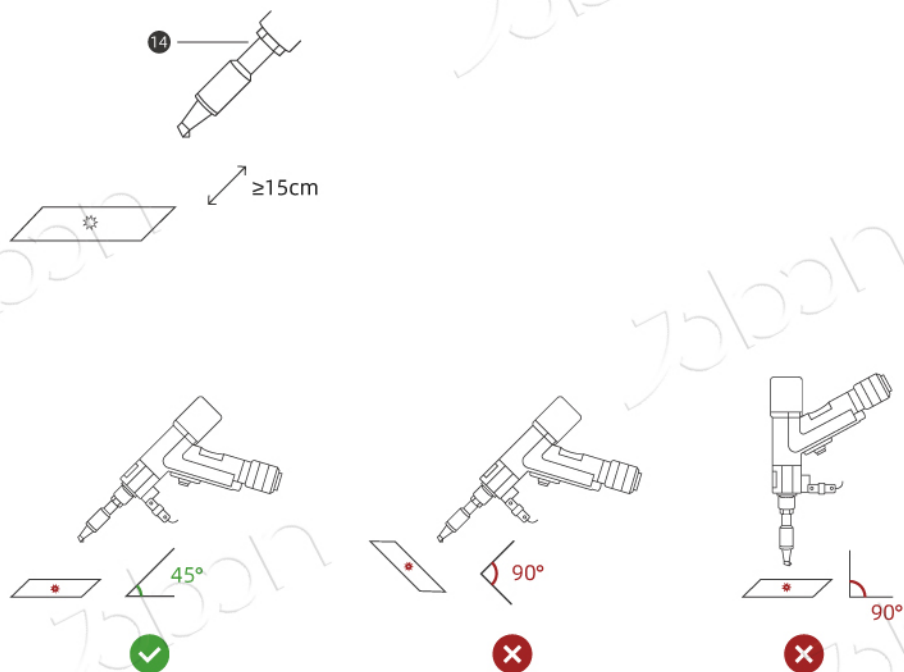
- 1 Adjust the laser power to 300W
- 2 Adjust the wobble freq to 35Hz
- 3 Adjust the laser freq to 3000Hz
- 4 Adjust the wobble length to 2mm
- 5 Adjust the laser duty to 100%
- 6 Tap laser disable



- 7 Attach the brass nozzle to the welding gun
- 8 Loosen the bolt and adjust the calibration tube to -10
- 9 Attach the safety clip to the welding gun



- 11 Find a 1.5~2mm stainless or iron plate
- 12 Align the plate $\geq 15\text{cm}$ position long press the trigger button to light
- 13 From far to near the light to find the strongest energy and the most spark point, this distance is positive focus of the welding gun
- 14 Adjust the scale of the calibration tube so that the copper nozzle has the strongest energy in contact with the surface of the material

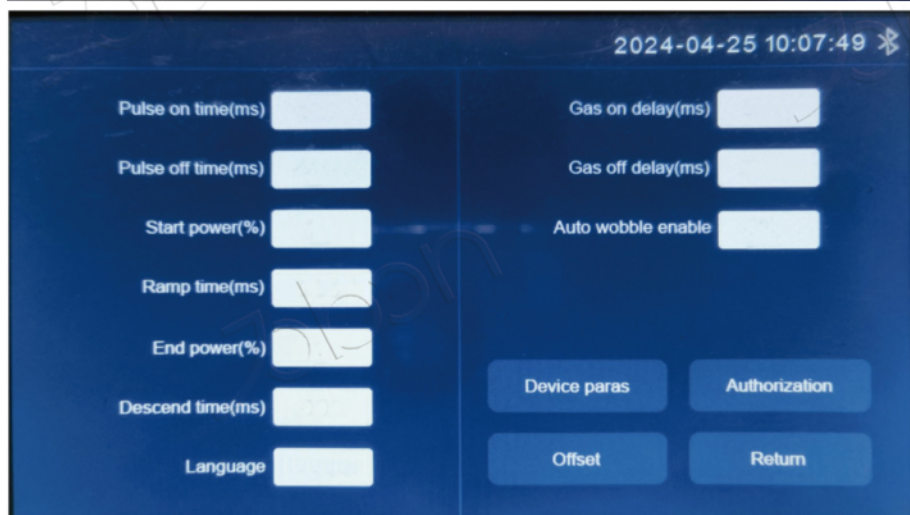
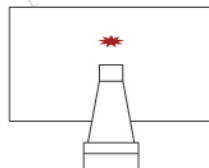


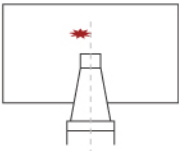
When using the welding function, the gun must remain constant at 45 degrees when looking for focus or performing routine work

- ⚠ Warning: Ground clamp, clamped to the welding gun is now in the conduction state do not stand in front of**

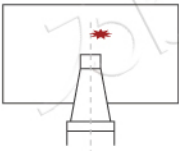
Adjust the red light

- 1 Find a piece of white paper and point the gun at the white paper to see if the red light is in the center, and if it is not in the center, it needs to be adjusted to the center
- 2 Click System paras
- 3 Click Offset
- 4 Adjust red light position

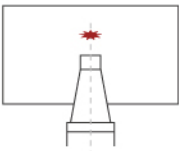




When the red light is biased to the left, the default red light offset parameter is 0, and the red light offset parameter should be adjusted to > 0



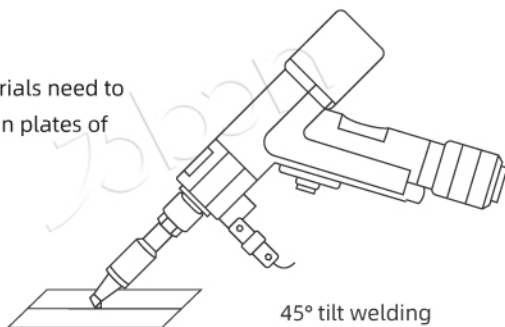
When the red light is biased to the right, the default red light offset parameter is 0, and the red light offset parameter should be adjusted to < 0



After adjustment, the red light is in the middle of the copper nozzle

Without wire welding

For welding without wire, the two materials need to fit tightly without gaps. Applicable to thin plates of 2mm and below.



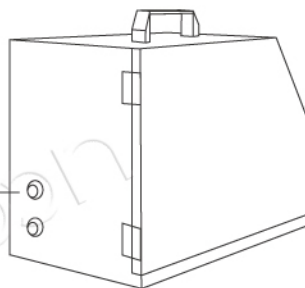
Function/Material		Air pressure
Welding	Stainless steel	0.2-0.5Mpa
	Carbon steel, Galvanized sheet, Aluminum sheet	0.3-0.5Mpa



With wire welding

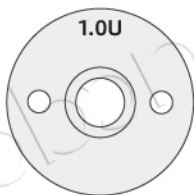
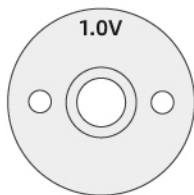
Material	Thickness (mm)	Scanning speed	Scanning width	Peak power	Duty cycle	Pulse frequency	Wire feeding speed	Welding wire
Carbon steel	1	300	3	350	100	2000	60	1
	2	300	3	700	100	2000	60	1.2
	3	300	3	1100	100	2000	60	1.2
	4	300	3	1500	100	2000	60	1.6
	5	220	3	1800	100	2000	50	1.6
	6	220	3	2200	100	2000	50	1.6
	8	220	3	3000	100	2000	40	2
Aluminum	1	300	3	500	100	2000	60	ER5356 1.0
	2	300	3	800	100	2000	60	ER5356 1.2
	3	300	3	1400	100	2000	60	ER5356 1.2
	4	300	3	1800	100	2000	60	ER5356 1.6
	5	220	3	2000	100	2000	50	ER5356 1.6
	6	-	-	-	-	-	-	-
	8	-	-	-	-	-	-	-
Stainless steel	0.5	300	2	260	100	2000	80	ER304 0.8
	0.8	300	2	300	100	2000	80	ER304 0.8
	1	300	2	350	100	2000	60	ER304 1.0
	2	300	3	700	100	2000	60	ER304 1.0
	3	300	3	1100	100	2000	60	ER304 1.2
	4	300	3	1500	100	2000	60	ER304 1.2
	5	220	3	1800	100	2000	50	ER304 1.6
	6	220	3	2200	100	2000	50	ER304 1.6
	8	220	3	3000	100	2000	40	ER304 2.0

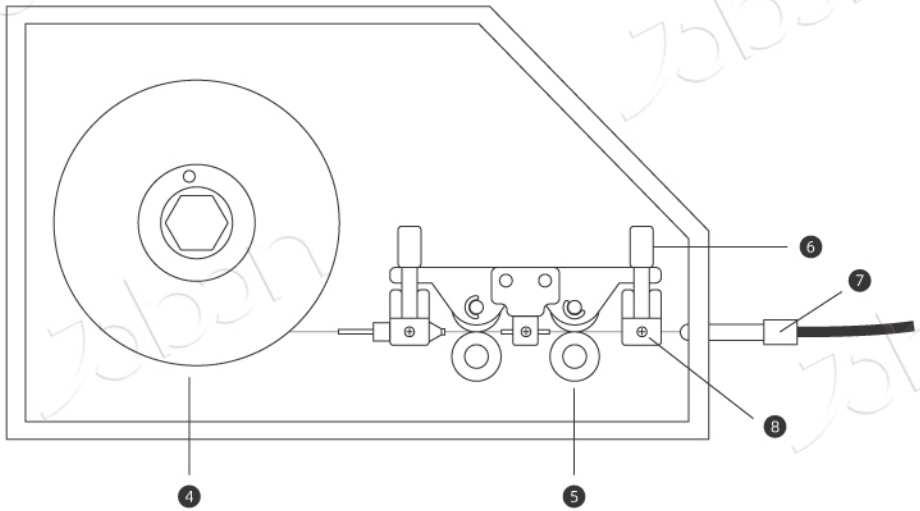
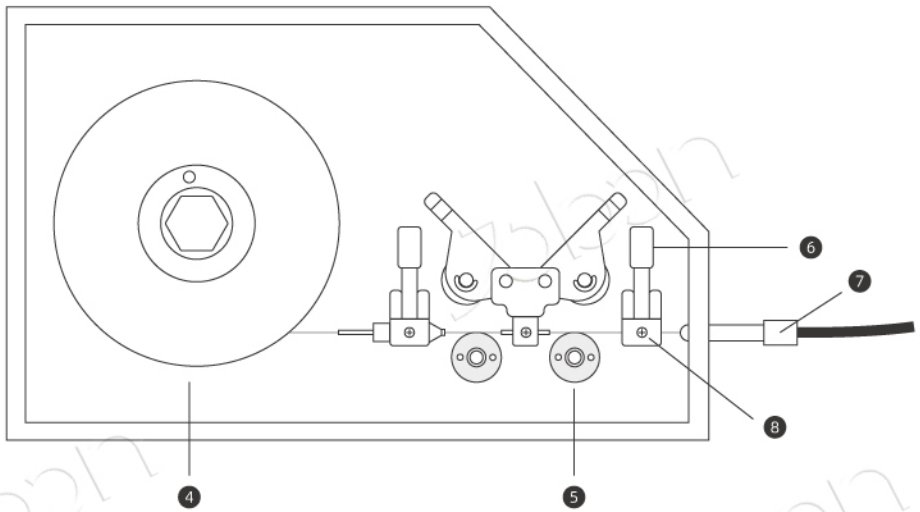
- ① Find the power cord and signal cord of the wire feeder from the machine
- ② Plug the two cords into the interface behind the wire feeder
- ③ Select the material and diameter of the welding wire, and then select the corresponding wire feed wheel according to the diameter of the welding wire



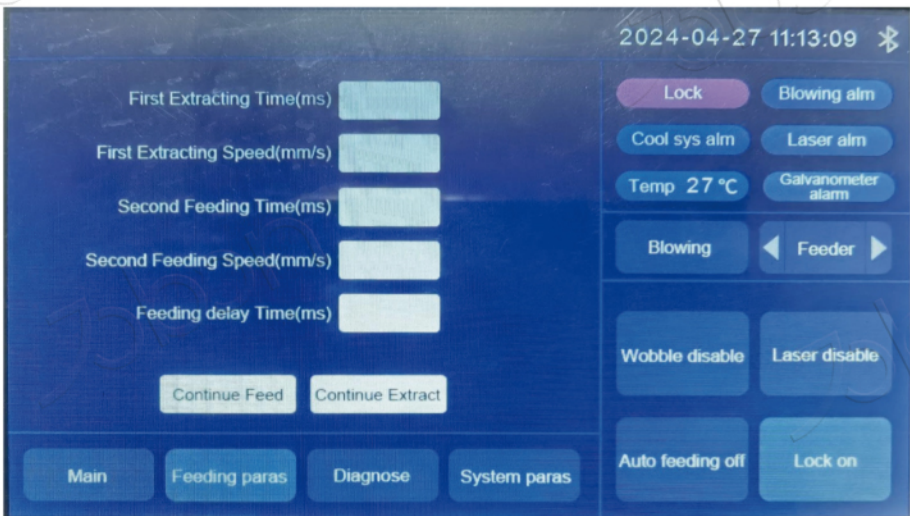
Welding materials	Welding wire	Welding wire diameter(mm)	Wire feed wheel	Wire feed tube
Stainless steel	Stainless steel wire	0.8	0.8V	Ordinary wire feed tube
		1.0	1.0V	
		1.2	1.2V	
		1.6	1.6V	
Carbon steel	iron wire	0.8	0.8V	Ordinary wire feed tube
		1.0	1.0V	
		1.2	1.2V	
		1.6	1.6V	
Aluminum	Aluminum-magnesium alloy wire	0.8	0.8U	Graphene wire feed tub
		1.0	1.0U	
		1.2	1.2U	
		1.6	1.6U	

⚠ Warning: When welding aluminum, you should choose a welding wire with higher hardness, such as 5356 aluminum-magnesium alloy wire

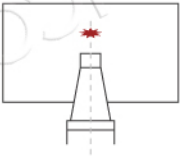
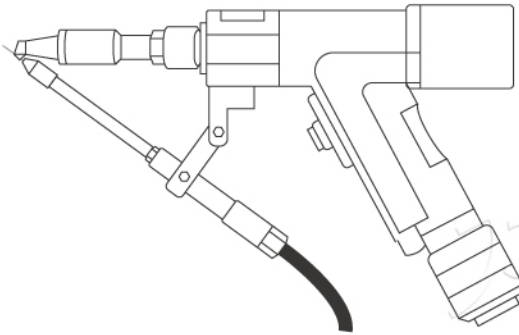




- ④ Install the wire reel
- ⑤ Install the wire feed wheel
- ⑥ Break off the pressure rod and lock the welding wire through the pressure wheel
- ⑦ After locking, put on the wire feed guide tube
- ⑧ Loosen the screw here, insert the wire feed guide tube and tighten the screw

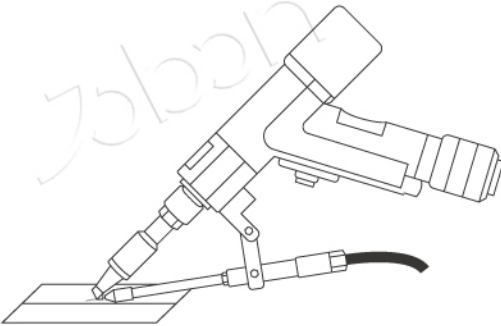


- 9 Click Feeding params
- 10 Click Continue Feed to allow the welding wire to be fed out of the wire feed tube
- 11 After the welding wire comes out, install the wire guide tube and wire nozzle (the wire nozzle is selected according to the welding wire diameter)
- 12 After the wire feeding fixture is installed, the red light position needs to be adjusted



When the red light is biased to the left, the default red light offset parameter is 0, and the red light offset parameter should be adjusted to > 0 ;

When the red light is biased to the right, the default red light offset parameter is 0, and the red light offset parameter should be adjusted to < 0 .

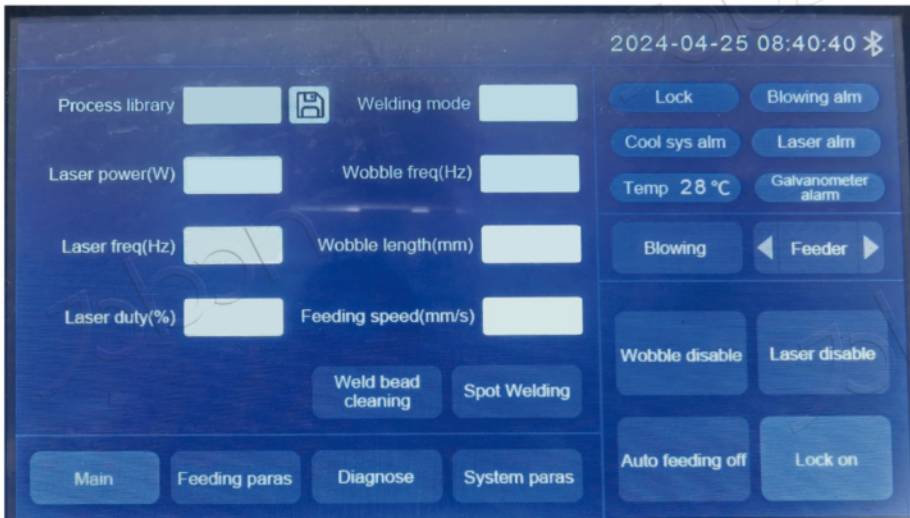
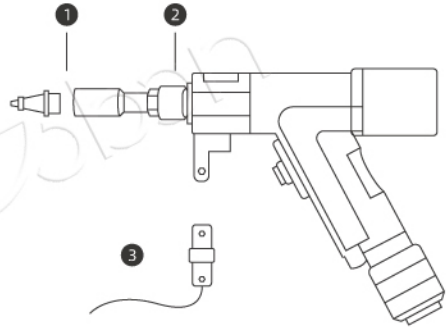


Tilt 45° welding

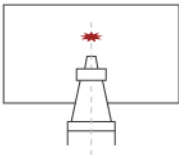
Function/Material		Air pressure
Welding	Stainless steel	0.2-0.5Mpa
	Carbon steel, Galvanized sheet, Aluminum sheet	0.3-0.5Mpa

Cutting

- 1 Replace the cutting nozzle
- 2 The focal length is the same as the welding focal length and does not need to be changed
- 3 Cutting requires clamping the ground wire onto the workbench for easy cutting
- 4 Adjust the Laser power to the maximum power of the machine
- 5 Adjust Wobble freq to 1 Hz
- 6 Adjust the Wobble length to 0.1 mm



- 7 Adjust the red light position



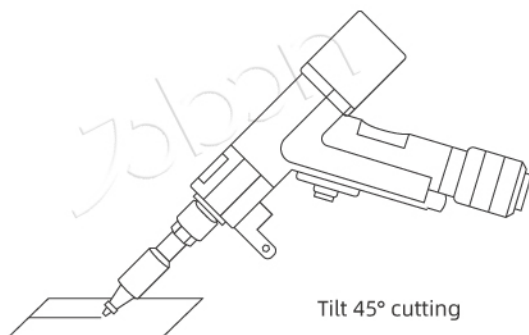
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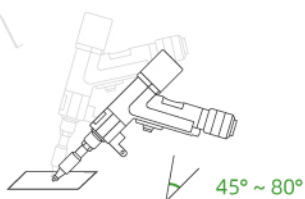
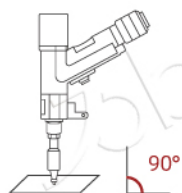
⚠ Warning: If the red light is not completely refracted, it cannot be used to avoid damage to the accessories

- 8 Turn off Lock on
- 9 Turn off Laser disable

Cutting 0-6mm plate



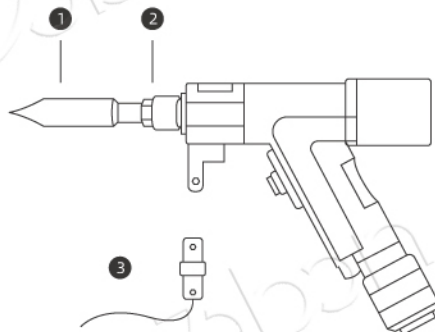
Note: The thicker the plate, the more burrs there will be (there is no way to avoid it)



Cutting	Air pressure
	0.5-1.5Mpa

Weld bead cleaning

- 1 Replace the special copper nozzle for cleaning the weld bead
- 2 The focus of laser welding, cutting and weld cleaning does not need to be adjusted
- 3 To clean the weld, you need to clamp the ground wire clip to the workbench to facilitate the cleaning of the weld
- 4 Click Weld bead cleaning
- 5 Adjust the Laser power to 300~400 W
- 6 Adjust Wobble freq to 100 Hz
- 7 Adjust the Laser freq to 3000~5000 Hz
- 8 Adjust the Wobble length to 3~12 mm
- 9 Adjust Laser duty to 100 %



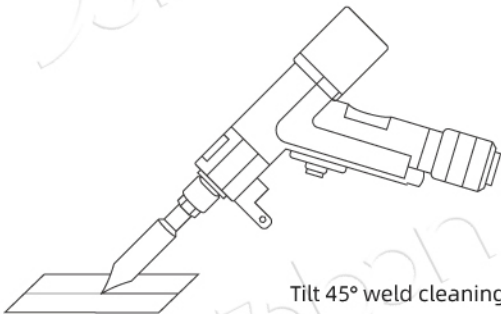
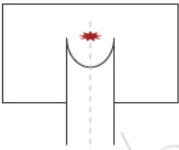
- 1 Close Lock on
- 2 Turn off Laser disable



9 Adjust the red light position

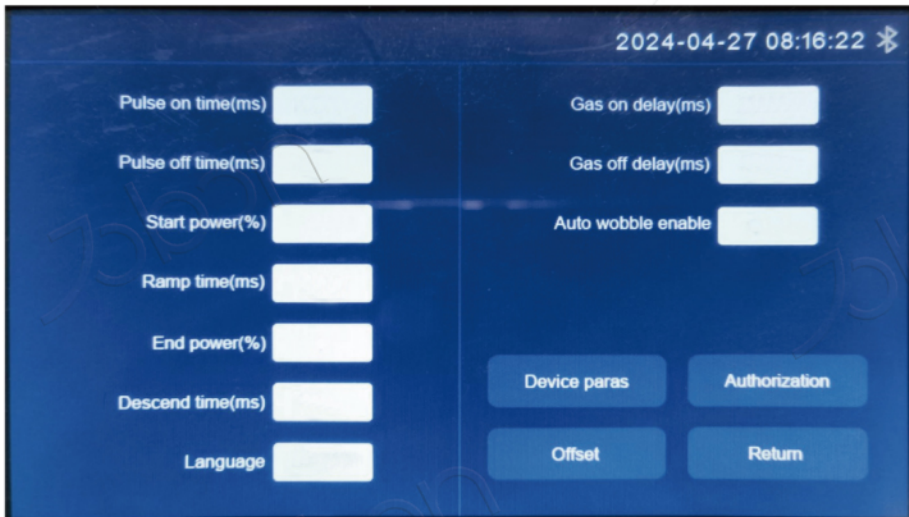
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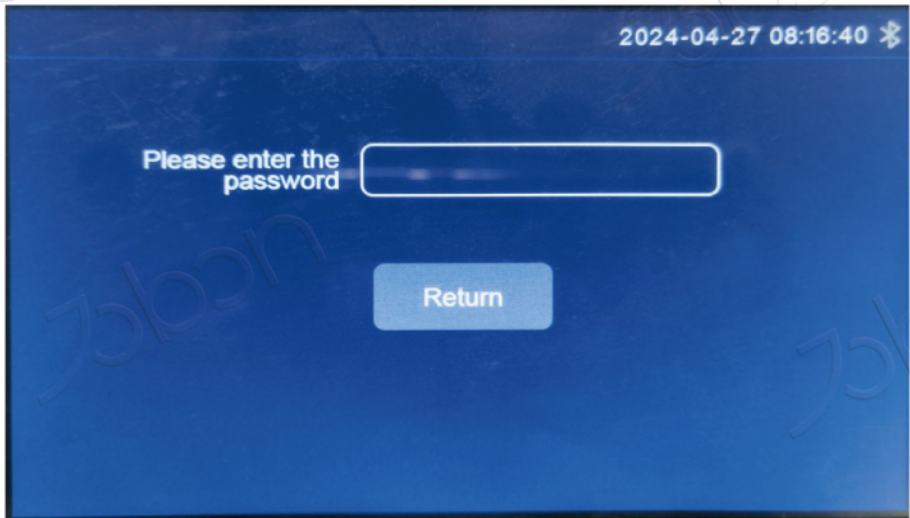
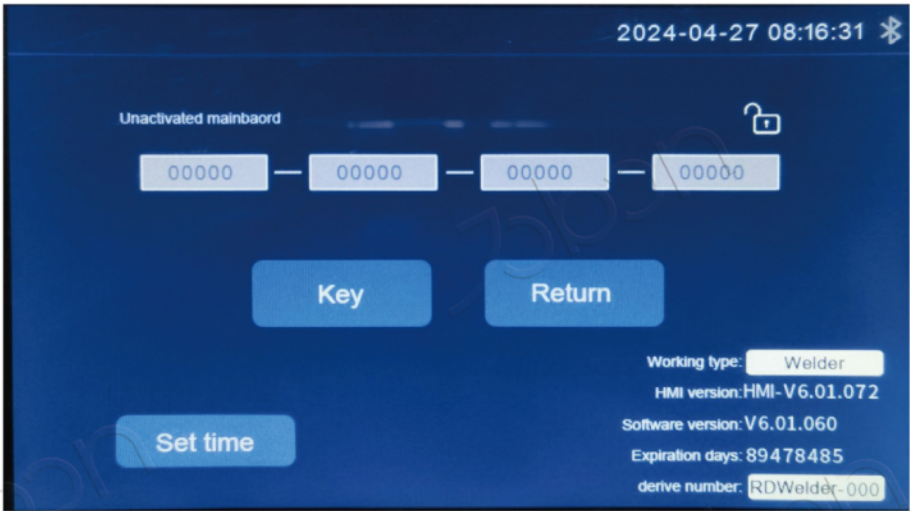


Weld cleaning	Air pressure
	0.2-0.5Mpa

Remote cleaning



- 1 Turn off the laser
- 2 Click System parameters
- 3 Click Authorization



④ Click Welder

⑤ Password 666666

⑥ Choose Clean-80mm

⚠ **Warning:** Clean-150mm is a parameter for professional cleaning machines. To avoid damage to the gun tip, Clean-150mm cannot be selected for 4-in-1 cleaning

2024-04-27 08:16:51

Please select the working type :

Welder

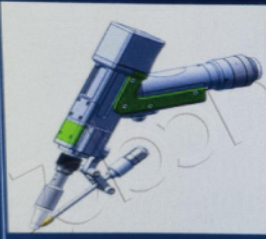
Clean-80mm

Clean-150mm

Cancel

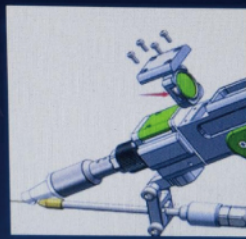
Please confirm to replace the following components:

1. Change the type of
FWH20-S10A

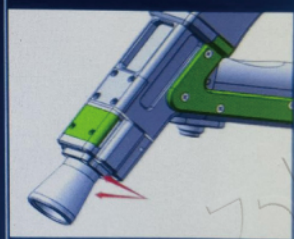


Confirm

2. D20*F600
Focus components

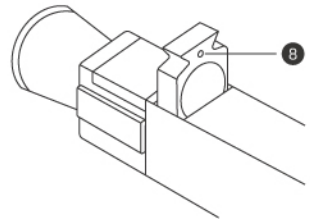


3. gas circuit components



Cancel

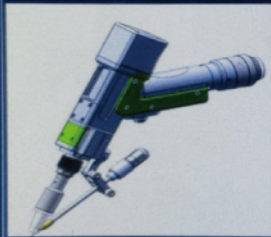
- 7 Follow the on-screen instructions to replace the cleaning and focusing components
- 8 The circular hole of the focusing component faces backwards
- 9 After replacing the cleaning and focusing components, click Confirm



- ⚠ Warning: Do not touch the mirror surface with your hands when replacing the lens or focusing**

Please confirm to replace the following components:

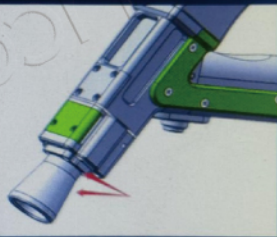
1. Change the type of
FWH20-S10A



2. D20°F600
Focus components



3. gas circuit components

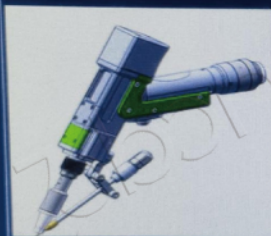


Confirm

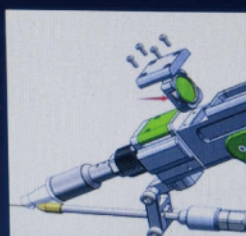
Cancel

Please confirm to replace the following components:

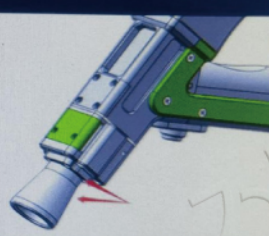
1. Change the type of
FWH20-S10A



2. D20°F600
Focus components



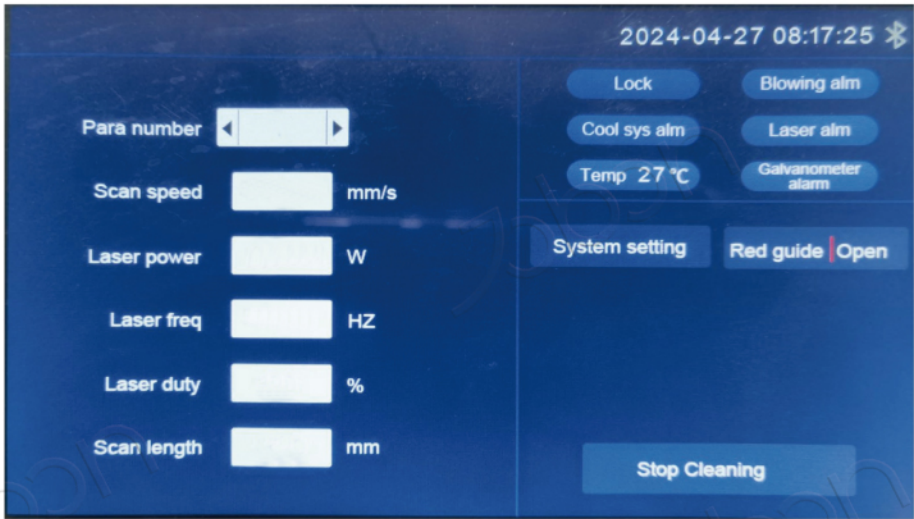
3. gas circuit components



Confirm

Cancel

- 10 Press the SYSTEM button on the machine (to restart the system)
- 11 Click Confirm

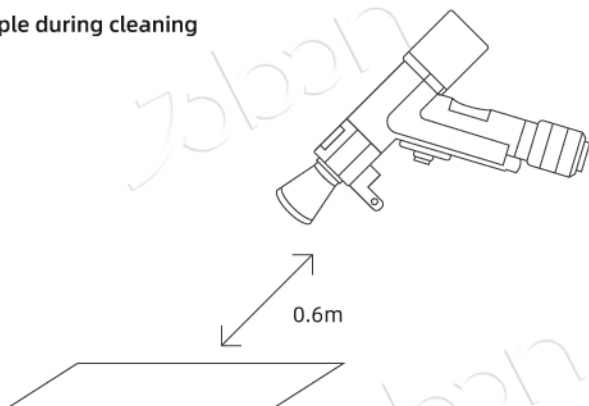


- 1 Adjust Scan speed to 10000~20000 mm/s
- 2 Adjust Laser power to 100~2000 W
- 3 Adjust Laser freq to 5000 Hz
- 4 Adjust Laser duty to 100%
- 5 Adjust Scan length to 10~80 mm
- 6 Press the LASER button (turn on the laser)
- 7 Click Stop Cleaning
- 8 Click Ready for cleaning



- 9 Wait for the red light to appear at the muzzle
- 10 Double-click the trigger button (long-press the trigger button the second time) and the light will come out normally

⚠ Warning: Do not touch people during cleaning



Remote cleaning	Air pressure
	0.5-1.5Mpa



Shutdown

- 1 Turn off the laser;
- 2 Turn off water chiller;
- 3 Turn off system;
- 4 Press emergency stop.



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