Product description
SUP-AMF-P (V1.2)

Wu xi Super Laser Technology Co.Ltd

Catalogue

Copyright Statement

Update Record

Version	Updates	Time	Editor
V1.0	First Edition	24.4.19	Liu Chen
V1.1	Add a contrast between P1 and P2	24.5.15	Liu Chen
V1.2	The wire feeding direction can be modified	25.7.24	Liu Chen

I. Notes

This product belongs to welding wire feeding equipment. To ensure safe production and normal operation of the equipment, it is recommended that users post the following safety signs on the equipment to inform all personnel using, maintaining and approaching the equipment of the following safety matters.

1.1 Electrical Safety

① This device is powered by 24V DC. Users should pay attention to electrical safety and avoid electric shock.

② To ensure the normal operation of the equipment and to avoid static electricity damage and leakage of the equipment. The equipment should pay attention to safety grounding measures, that is, connect the easily conductive parts to the protective (grounding) wire in the fixed wiring of the product, so that the easily accessible conductive parts will not become live parts when the basic insulation fails. Additional safety measures (such as double insulation or reinforced insulation) may be added as appropriate.

③ This product does not contain accessories that require user operation on the inner side of the chassis. Any installation, maintenance or disassembly of this product should be carried out with the switch open and the power off.

Marking	Name
	Danger！High Voltage
	Must be grounded
	The plug must be pulled out.
	Do not close the circuit

1.2 Mechanical Safety

① This equipment contains motor-driven gear, rollers and other structures that should be protected from injury from touching during operation.
② In the process of replacing the wire reel of this equipment, avoid accidental startup and injury.

Marking	Name
	Beware of mechanical injuries
	Beware of pinching your hand
	Do not start

II. Product Overview

This series of products is an auxiliary wire feeding device for laser platform welding and can also be used in robot welding wire feeding and related fields. Compatible with carbon steel, stainless steel and aluminium welding wires. SUP-AMF-P1 is the first version, and SUP-AMF-P2 is the upgraded version.

III. Product Features

Main features and parameters:

- Speed range: 15 to 600cm/min;
- Maximum load: 20kg;
- Welding wire materials: carbon steel, stainless steel, aluminum;
- Operation mode: Touchscreen;
- Control system: Self-developed, supporting various custom expansion functions.
- Modify the wire feeding direction of the wire feeder: Switch the rotation direction of the motor through the toggle button on the home screen.

3.1 Product Appearance

The P1 mounting hole is 168mmx49mm, and the P2 mounting hole is 185mmx120mm. The actual product is as follows.

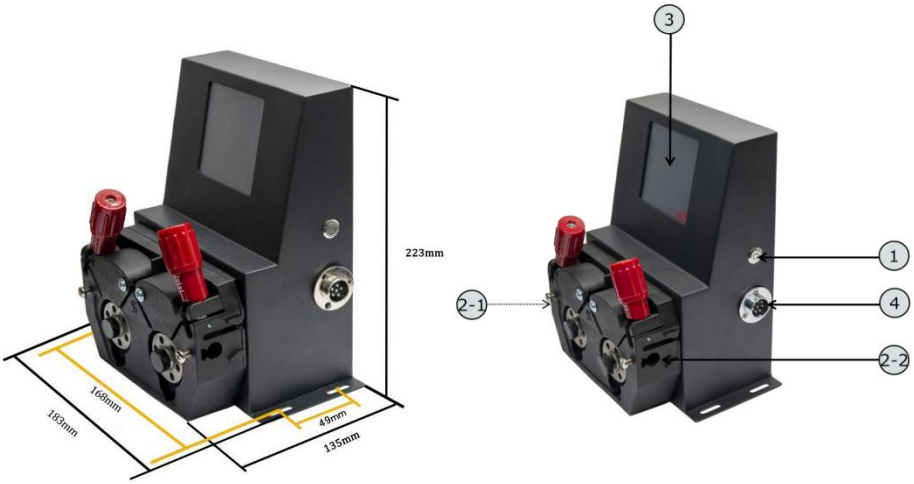


Figure 3.1-1 Appearance of P1 Figure 3.1-2 Components of P1

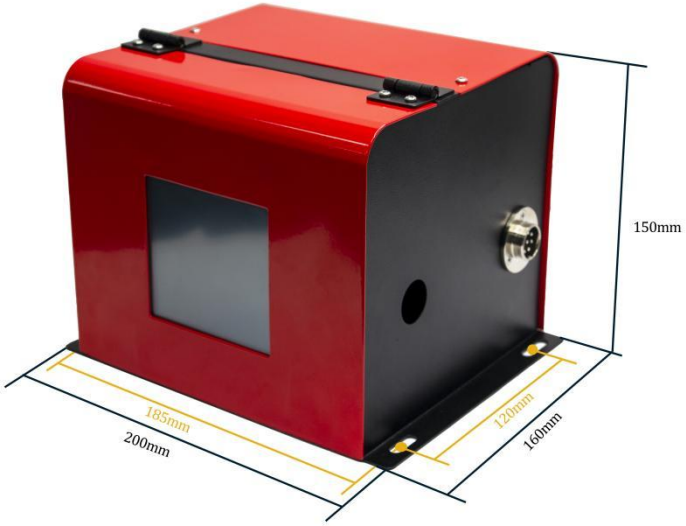


Figure 3.1-3 appearance of P2

Figure 3.1-4 P2 component

Table 3.1 List of components of the product

Number	Name	Notes
1	Switch	24V switch
2-1	Wire exit port	
2-2	Wire entry Port	
3	Screen	4 inches
4	Eight-core aviation socket	Power & Signal

3.2 Product Parameters

Key product parameters are shown in Table 3.2:

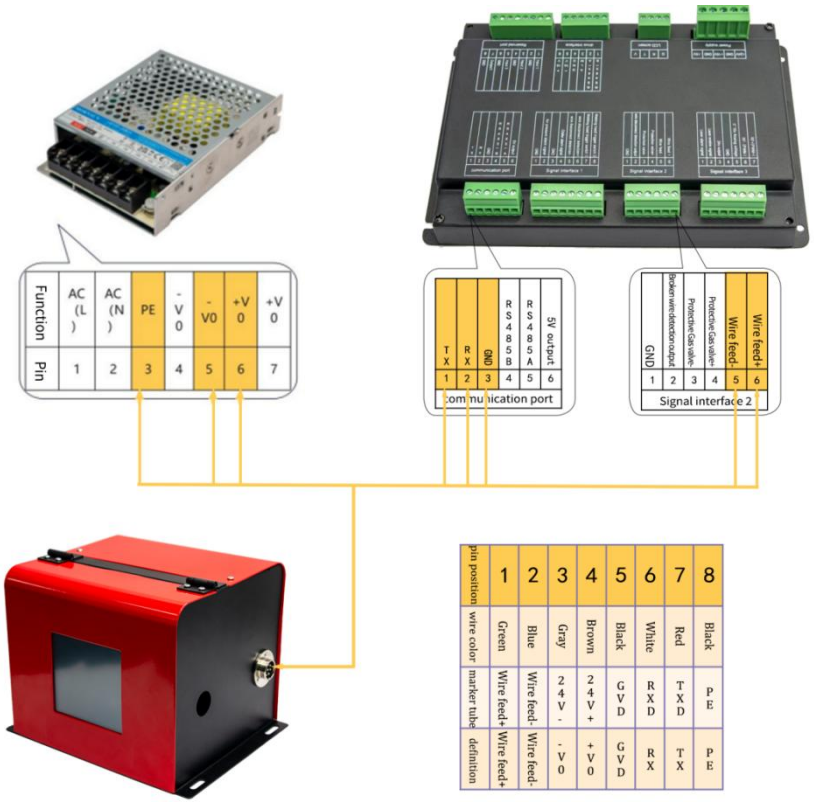
Table 3.2 List of Key Product Parameters

Supply voltage	24V DC
Operating ambient temperature	-10 to 50°C
Maximum power	60W
Feeding speed	15 to 600cm/min
Wire feeding mode	Continuous mode, pulse mode
Applicable to welding wire	Carbon steel solid core wire, stainless steel solid core wire, aluminium solid core wire
P2 weight	3.7 kg
Damping shaft maximum load	20kg

IV. Installation and Use

4.1 Equipment Wiring

P1 and P2 are connected in the same way. The following diagram takes P2 as an example. The wire feeder wiring uses an eight-core air plug. The specific wiring is as follows.



4.1.1 Wiring definition

P1 and P2 aviation plugs have the same definition, and the interface is defined as follows.

Figure 4.1 Diagram of the aviation plug-in interface

Table 4.1 Definition of Standard Version Aviation Plug-in Interface

Interface Definitions - Standard Edition				
Aviation socket	Corresponding attachment	Interface	Definition	Number tube
8-Core Aviation Signal Cable	8-core aviation socket	1	Wire feeder enable -START	Wire feeding +
		2	Wire feeder enable -GND	Wire feeding -
		3	24V +	24V+
		4	24V -	24V-
		5	GND	GND
		6	232-RXD	RX
		7	232-TXD	TX
		8	PE	PE

4.2 Equipment Installation

4.2.1 Selection of wire feeding tubes and wire feeding wheels

Please select the corresponding wire feeding wheel and wire feeding tube according to the wire material and diameter, and avoid bending the wire feeding tube when in use.

Table 4.2 List of Wire Feeding wheel models

Wire feeding wheel model			
Suitable for welding wire	Material	Wire feeding wheel	Wire diameter
	Carbon steel, stainless steel	V-type	Φ0.8mm/1.0mm φ1.2mm/1.6mm (standard)
	aluminum	U-type	Φ0.8mm/1.0mm φ1.2mm/1.6mm (custom)

Figure 4.2-1 Schematic diagram of wire feeding tube and wire feeding wheel

4.2.2 Wire reel installation

When installing the wire reel, attention should be paid to:

- When choosing the wire reel, pay attention to the damping specification and do not exceed the maximum load;
- Select the wire according to the welding material;
- The wire reel positioning holes should be aligned with the positioning pins of the damping shaft so that the wire reel rotates smoothly with the damping shaft to avoid friction between the wire reel and the damping shaft, which may cause unstable wire feeding.

4.2.3 Installation of the wire feeding tube

When installing the wire feeder, note:

- Loosen the locking screw and insert the wire feeding tube so that the wire feeding tube does not rub against the wire feeding wheel and it is convenient to insert the welding wire;
- Standard set of two wire feeders (Fe0816-3 40150, Figure 4.2-3) to the wire outlet and the welding torch, (Fe0816-3 end joint at both ends) to the wire inlet and the wire reel holder, avoid mixing;
- Insert it into the proper position and then tighten the screw so that the hand-cranked wire feeding tube does not shake;
- The damping shaft is fixed with 3-M8 bolts at 120° distribution. See Figure 4.2-5 for detailed dimensions.

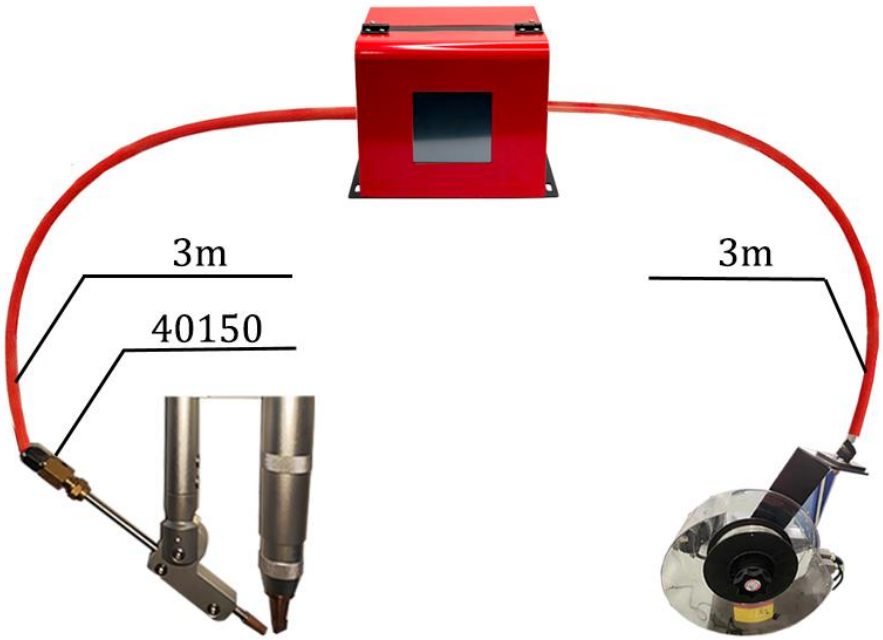


Figure 4.2-2 Illustration of wire feeding tube assembly

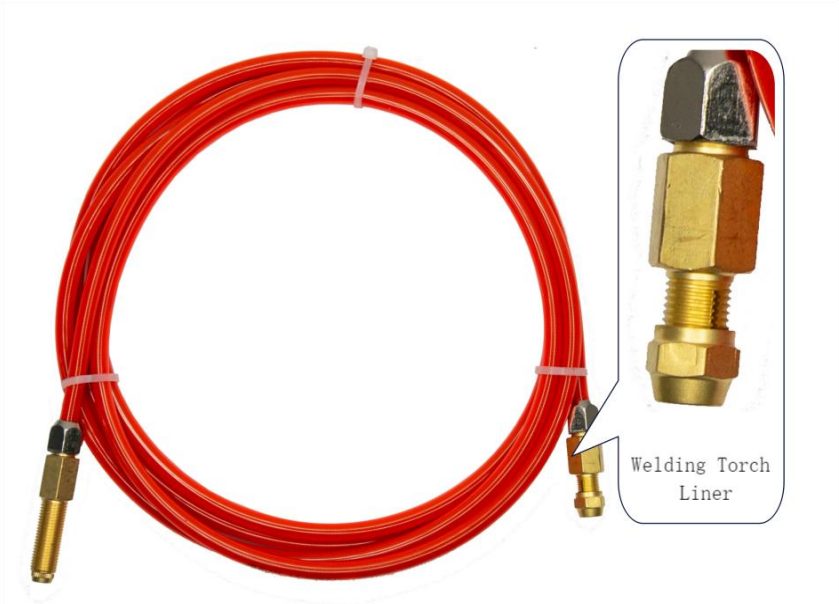


Figure 4.2-3 Wire feeder (Fe0816-3 40150)

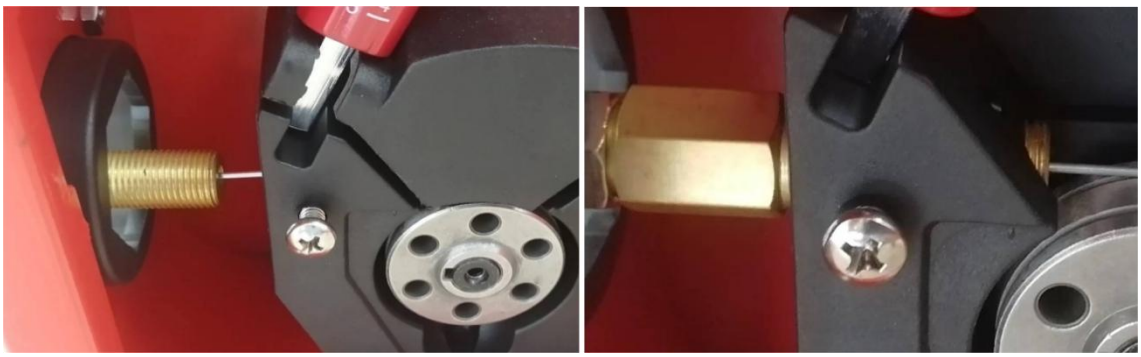


Figure 4.2-4 Installation details

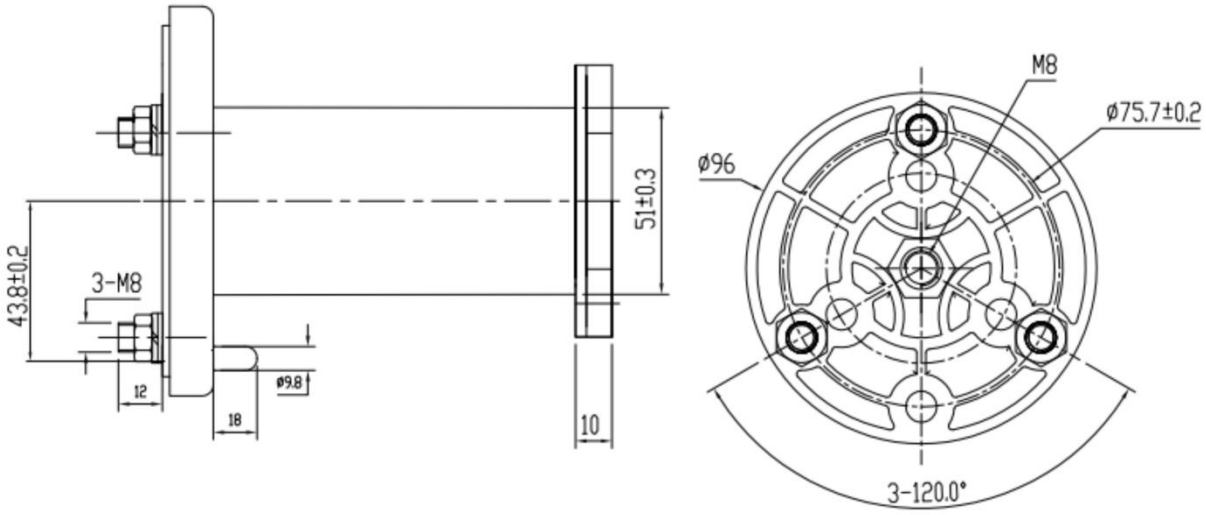


Figure 4.2-5 20KG damping shaft dimensions

4.2.4 Wire feeding tube with welding head assembly

In the case of the 25A and 26A type double swing welding guns, the wire feeding tube is assembled as shown in the following figure. Note:

- Select the corresponding connecting block according to the model of the welding head.
- Make sure the wire is stuck in the copper mouth slot and then tighten the hex socket screw.

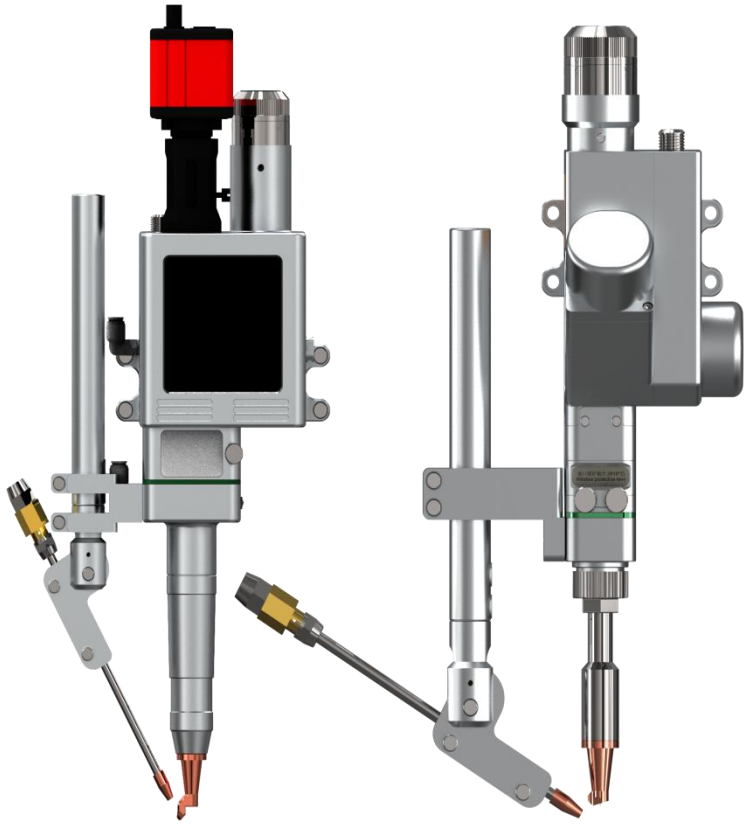
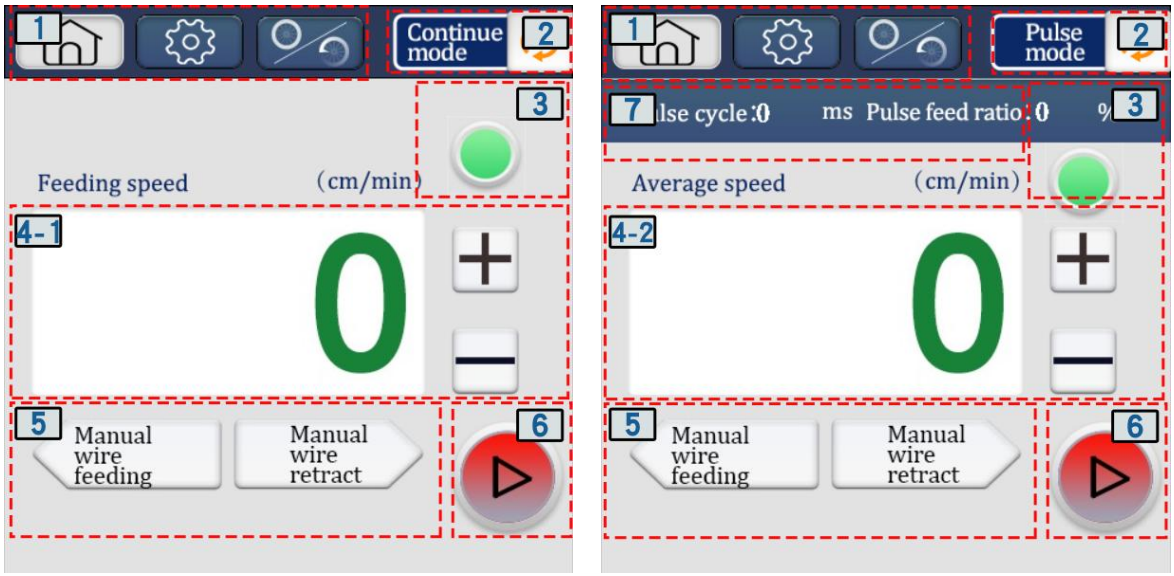


Figure 4.2.4

4.3 Operation Interface

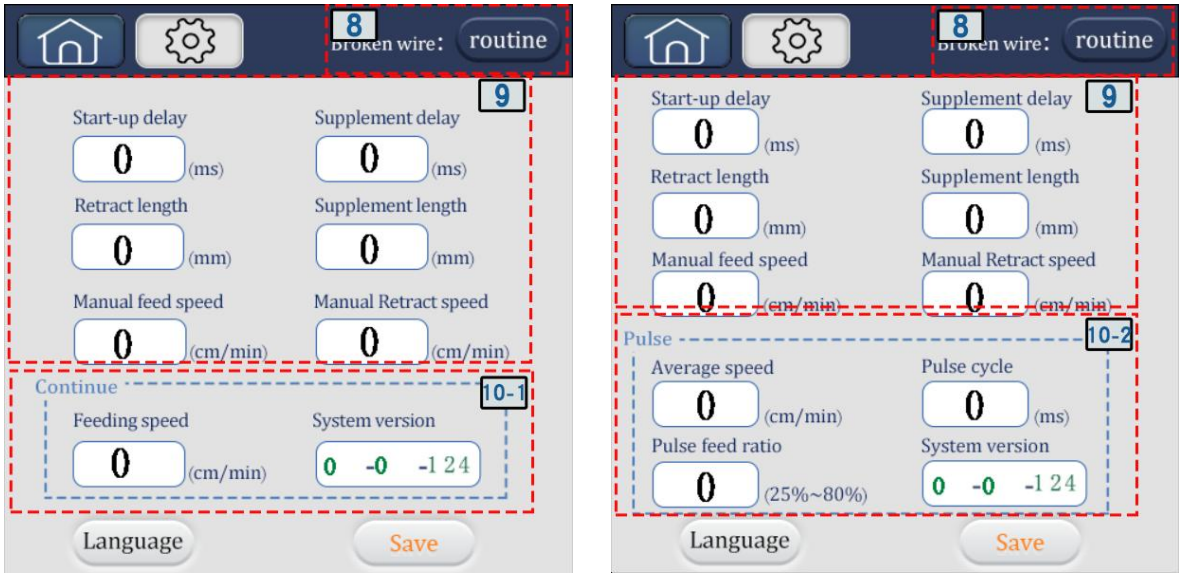
Both P1 and P2 Wire feed are equipped with 4-inch touch screens with a resolution of 480×480.

4.3.1 Interface Home Page



Number	Key names	Functions	Notes
1	Home Page/Settings	Page switching	
2	Continuous/Pulse mode	Switch wire feeding mode	Pulse mode is used for fish-scale welding
3	Status indication	A green light indicates that the motor is rotating	
4-1	Feeding speed	Adjust the Feeding speed during welding	Effective in continuous mode
4-2	Average speed		It takes effect in Pulse mode
5	Manual wire feeding/manual wire retract	Click the motor forward/reverse	Manual Feeding speed is not equal to Feeding speed
6	Run/Stop	Click to switch to the corresponding state	[Stop] The motor is not running

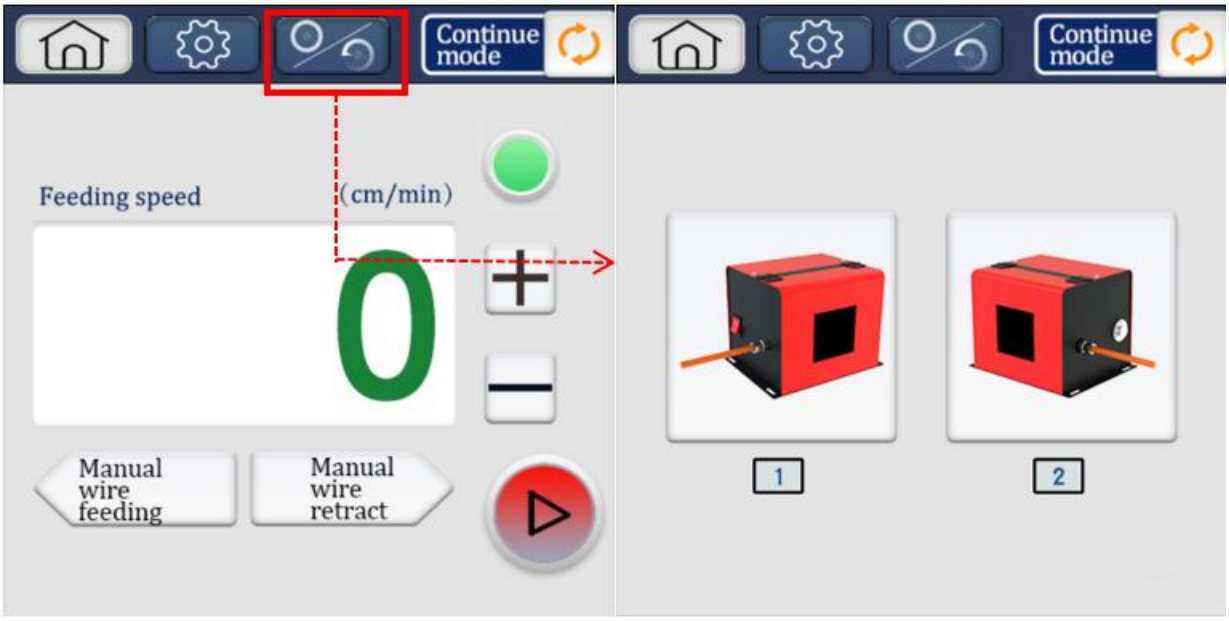
4.3.2 Interface Settings page



Number	Key names	Functions	Remarks
8	Broken wire	Switch the motor speed when the wire breaks	
9	Start-up delay	Delay wire ejection relative to the light signal of the welding head	Global effect
	Retraction length	When the wire breaks, the motor reverses to assist in breaking the wire	
	Supplement delay	The interval between threading and redrawing to avoid threading too fast and sticking	
	Supplement length	Supplement the length of the retraction	
	Manual feeding speed	The wire feeding speed for the forward rotation of the motor, for manual debugging	
	Manual Retraction speed	Motor reverse retraction speed for manual debugging	
10-1	feeding speed	Wire ejection speed during welding	Continuous mode takes effect
	System version	The software and hardware versions of the wire feeder	
10-2	Average speed	Adjust the overall wire feeding speed during welding	Pulse mode takes effect
	Pulse cycle	Adjust the length of individual fish scales	
	Pulse feed ratio	Adjust the visibility of the fish-scale pattern, the smaller the more noticeable	

4.3.3 Switch the filament direction page

The wire feeder may modify the wire feeding direction according to the installation requirements of the equipment. Click the [Home] toggle button to enter the toggle interface. Click [1] and the motor will run counterclockwise when the wire is fed. Click [2] and the motor will run clockwise when the wire is fed.



V. Maintenance and servicing

5.1 Daily Maintenance

Daily usage precautions

- The equipment should be effectively grounded;
- Protect the touchscreen from being crushed or smashed;
- Properly install the welding wire, regularly inspect and unclog to avoid friction caused by improper assembly, which can lead to metal shavings blocking the wire feed wheel box and wire feed pipe;
- When working in harsh conditions, pay attention to waterproofing and dustproofing, and do not immerse the equipment in water.

5.2 Troubleshooting

5.2.1 Control Logic

The Wire feed is connected to pin 5/6 of signal interface 2 on the control box (marked as Wire feed +/-) through the eight-core plug signal line at the tail to control the wire output. When the welding light comes out, the main board of the control box gives the wire feeding enable signal, and the main control board of the Wire feed drives the single machine to operate, and the Wire feed starts to work.

5.2.2 Motherboard interface

The SUP-AMF-P1 motherboard is V1.2, and the SUP-AMF-P2 motherboard is V1.3, with

consistent pin customization. For details refer to Table 5.1, where V1.3 changes the [J7] terminal from DB7 to 7P phoenix on the basis of V1.2.

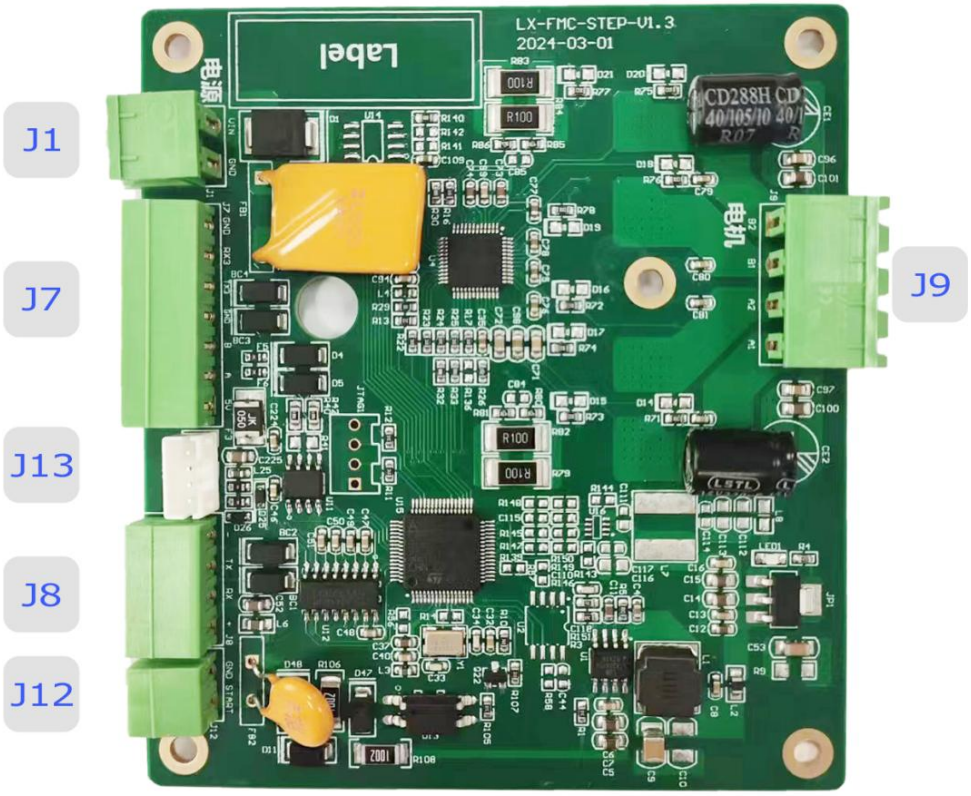


Figure 5.2.2 -V1.3 Main control board

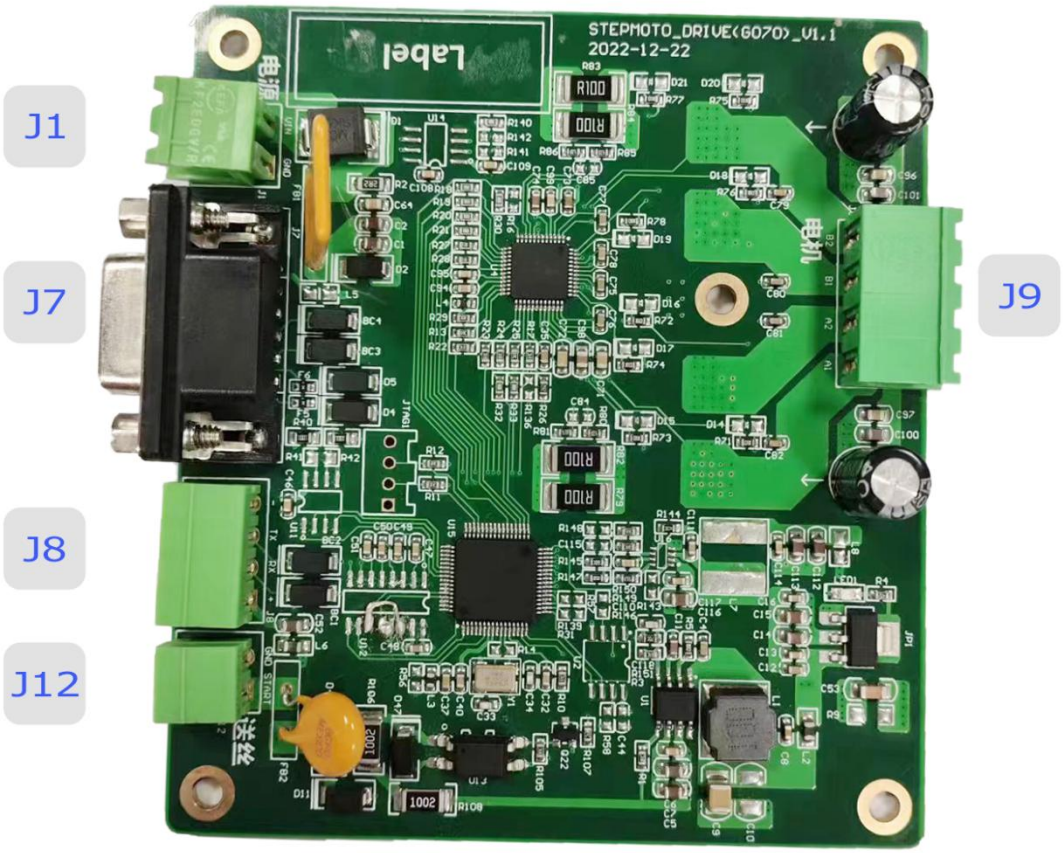


Figure 5.2.V1.2 Master board

Table 5.1 Master Board Pin Definition Table

Interface Silk-screen	Interface Definition	Interface pins	Pin definition	Corresponding interface	
J1	24V power interface	1	WIN	Switching power supply	+V0
		2	GND		-V0
J7	Communication port	1	GND	Control box - communication port	GND
		2	RX-3		TX
		3	TX-3		RX
		4	GND	Reserve 485	
		5	B		
		6	A		
		7	5V	Normal output	
J8	Screen interface	1	-	Screen	GND
		2	T		RXD
		3	R		TXD
		4	+		VCC
J9	Stepper motor interface	1	B-2	Stepper motor	B-
		2	B-1		B+
		3	A-2		A-
		4	A-1		A+
J12	Wire feeding enable interface	1	GND	2-core aviation plug	2
		2	START		1
J13	Screen interface	1	+	Reserve TTL interface	
		2	RX		
		3	TX		
		4	-		

5.2.3 Common Anomalies and Handling

1. Wire feeding anomaly

The final wire output is affected by various factors such as the bending of the wire feeding tube and the assembly of the welding wire.

For example: Insufficient wire feeding thrust, significant wire ejection delay. It is usually necessary to adjust the wire feeding tube to reduce bending and keep it straight;

Wire feeding jamming, wire feeding noise. Check if the wire feeding wheel is properly fitted and if the related components are worn.

2. Abnormal wire breakage effect

Optimization is achieved by separately adjusting the "Retract length", "Supplement length", and "wire feeding delay".

For example, if the retraction force is relatively small or there is too much redundant welding wire in the wire feeding pipe, then increase the "Retract length", and at the same time increase the "Supplement length" accordingly.

After the wire breaks and gets stuck for the second time, the "wire feeding delay" can be appropriately increased.

3. Motor abnormality

It could be an abnormality at the main control board port, a motor failure, or loose wiring. Normal and abnormal motors can be cross-tested, as shown in "J1", "J9", "J12" in Figure 5.2.2. Further identify the point of failure.

4. The Wire feed does not feed wire as a whole

It may be a main control board failure or a line failure.

When troubleshooting the Wire feed, it is necessary to ensure that the wire feeding enable signal of the welding control box is normal.

The normal operation of the Wire feed can be initially determined by observing the "Wire Feeding Enable Signal" on the "Monitoring Page" or "Diagnosis Page" of the welding system.

If the trigger is pressed, the "Wire Feeding Enable Signal" indicator light on the "Monitoring Page" of the welding system lights up (green), but the Wire feed does not actually feed wire. Or enter the "Diagnosis Page" of the welding system, turn on the "Wire Feeding Enable" switch, and the theoretical output status light will be on (green). However, if the Wire feed does not actually feed wire, it is initially determined that the Wire feed is not working properly.