

User Manual



Megwave Series Full Digital CO2/MAG/MIG Multifunctional Welding Machine

Megwave Series: Megwave 500S D/P/T (R)
 Megwave 350S D/P/T (R)
 Megwave 500H D/P/T (R)
 Megwave 350H D/P/T (R)

MEGMEET

Megwave Series Full Digital CO₂/MAG/MIG Multifunctional Welding Machine

User Manual

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Megmeet Welding Technology Co., Ltd. provides customers with comprehensive technical support, and users can contact its local distributors or headquarters.

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Preface

Thank you for purchasing Megwave full digital inverter CO2/MAG/MIG multifunctional welding machine (hereinafter referred to as the welding machine) produced by our company.

This user manual provides user installation wiring, parameter settings, error diagnosis troubleshooting, daily maintenance and related precautions. To ensure that the user can correctly install and operate the welding machine to maximize its superior performance, please read this user manual carefully before installation, and properly store and hand it over to the user of the welding machine.

Our company will continue to research and innovate our products. Therefore, if there are any differences between the content, parameters, or images in this user manual and the actual product, please refer to the actual product. The relevant changes will not be notified separately. Our company has the final right to interpret this user manual.

Safety Precautions

Safety Definition

In order to use the welding machine safely and correctly, and prevent harm to you or others and property damage, this manual adopts various warning signs for instructions. Please follow strictly after full understanding.



DANGER

Please do as directed, otherwise death or serious injury may result.



CAUTION

Please follow the instructions as otherwise you may cause moderate or minor injury or damage to property.

Please read this manual carefully before use in order to use it correctly.

Safety has been fully considered in design and manufacturing of welding machine. But in order to ensure your safe use of this welding machine, prevent you and others from being injured, and avoid major accidents, please be sure to follow the precautions in this manual when use.

Incorrect use of the welding machine may cause injury.

Installation Precautions



DANGER

- Before moving the welding machine, the input power of the distribution box switch must be cut off.
- When using a crane to transport the welding machine, it is necessary to confirm that the machine casing has been installed.
- Do not lift the welding machine with other objects at the same time.
- Please install on non-combustible objects, otherwise there is a risk of fire.
- Do not place combustible materials nearby, otherwise there is a risk of fire.
- Do not install in any environment containing explosive gases, otherwise there is a risk of explosion.
- Wiring operations must be carried out by personnel with professional qualifications, otherwise there is a risk of electric shock.
- Only when the input power supply is completely disconnected, then can wiring operations be carried out, otherwise there is a risk of electric shock.
- Before powering on, the grounding wire of welding machine must be reliably grounded, otherwise there is a risk of electric shock.
- Before powering on, the casing must be installed properly, otherwise there is a risk of electric shock.
- When powered on, do not touch the terminals with your hands, otherwise there is a risk of electric shock.
- Do not operate the welding machine with damp hands, otherwise there is a risk of electric shock.
- Maintenance operations should be carried out 5 minutes after disconnecting the power supply. At this time, the welding power indicator light should be completely extinguished, and the positive and negative bus voltage should be confirmed to be under 36V, otherwise there is a risk of electric shock.
- Parts must be replaced by professional personnel, and it is strictly prohibited to leave wire ends or metal objects inside the machine, otherwise there is a risk of fire.
- After replacing the control board, the parameters must be set correctly before operation, otherwise there is a risk of

damage to property.

- Wiring cable must be wrapped with insulating tapes and not exposed to the outside, otherwise there is a risk of electric shock.
- The power supply of water cooler power plug is high-voltage AC400V. Please turn off the welding power source when wiring, otherwise there is a risk of electric shock.



- When handling, do not let the operation panel and cover plate be stressed, otherwise there is a risk of injury or damage to property when dropped.
- When handling the welding machine with a forklift, the wheels should be fixed firmly.
- When installing, it should be installed in a place that can bear the weight of the welding machine, otherwise there is a risk of injury or damage to property when dropped.
- It is strictly forbidden to install it in water pipes and other sites where water droplets may splash, otherwise there is a risk of damage to property.
- Do not drop foreign objects such as screws, gaskets, and metal rods into the welder, otherwise there is a risk of fire and damage to property.
- If the welding machine is damaged or the parts are incomplete, please do not install and use, otherwise there is a risk of fire and injury.
- The main circuit terminal and the cable lugs must be firmly connected, otherwise there is a risk of damage to property.

Precautions for Use



- To ensure safety, welding operations must be conducted by personnel with safe operation knowledge and welding skills/qualification.
- Do not use the welding machine for purposes other than welding.
- The installation, commissioning and maintenance of the welding machine must be carried out by professionals.
- People who use pacemakers are not allowed to approach welding machines and welding workplaces without a doctor's permission.
- Do not touch the charged part, otherwise there is a risk of electric shock.
- Do not use cables with insufficient cross-sectional area, exposed conductors, and or damage cable.
- Do not remove the machine housing during use.
- Please use unbroken, well-insulated gloves.
- Please pay attention to safety protection when working at height.
- When not in use, please cut off the power supply of the welding machine and distribution box.
- When welding in a narrow or confined space, the operator should be supervised by an inspector in ensuring sufficient ventilation or use respiratory protection equipment, otherwise you may suffocate due to lack of oxygen.
- Harmful smoke and gases will be generated during the welding process, please provide full ventilation or use respiratory protection equipment, otherwise it is harmful to your health.
- Do not weld pressurized containers such as gas pipes and sealed tanks filled with gas.
- Do not place hot work-pieces near combustibles.
- Do not weld near combustibles.
- Provide a fire extinguisher near the welding operation site.

- The cylinder must be fixed with a special bracket, otherwise the cylinder falling may cause personal injury.
- Do not touch cylinder with electrode.
- Please use the pressure reducing valve correctly according to the requirements.
- The disassembly and maintenance of pressure reducing valve must be carried out by professionals.
- Do not touch the rotating parts such as fans and wire feeders at work, otherwise personal injury may be caused.
- When welding or supervising welding, please use protective equipment with sufficient shading to prevent arc damage to the eyes or skin.
- Please use protective gloves made of leather for welding, long-sleeved clothes, foot guards, aprons, glasses, etc. to prevent damage from arc light, splash, welding slag.
- Protective barriers must be set up around the welding site to prevent arc light from harming others.
- Please use soundproofing equipment to prevent noise hazards.



- It is forbidden to use this welding machine for operations other than welding.
- Do not place any heavy objects on the welding machine.
- Do not block the vents of the welding machine.
- Place it in a place where metal foreign objects such as spatter cannot be dropped inside the welding machines.
- Keep the distance between the welding machine and the wall or other welding machine at least 30cm.
- To prevent the wind blowing arc directly, some shield should be used.
- Please fix the wheels to avoid the welding machine from sliding.
- To prevent electromagnetic hazards, please perform electromagnetic shielding on cables or the welding operation site.
- The inclination angle of the welding machine placement plane should be less than 15 degrees to prevent the welding machine from tipping.
- The protection level of this welding machine is IP23S, and the environmental requirements are as follows:
 - Working environment temperature range: -1 0°C~+40°C
 - Transportation and storage temperature range: -40°C~+70°C
 - Working humidity range: at 40°C, not more than 75%RH; and at 20 °C, it does not exceed 95%RH
 - Altitude: not exceeding 2000m.
- There should be not any obvious mechanical vibration or mechanical shock in the working environment, and the tilt of the welding machine does not exceed 15°.
- The dust, metal dust and corrosive gases in the surrounding air do not exceed the normal content.
- Avoid rain dropping into the welding machine or the fan.
- When the ambient temperature is lower than 10 °C, please use antifreeze for the tank, otherwise there is a risk of damaging the tank.

Scrapping Attentions

When scrapping a welding machine, please note:

1. Please treat it as industrial waste;
2. The electrolytic capacitor in the main circuit and the electrolytic capacitor on the PCB may explode when burned;
3. Toxic gases will be produced when plastic parts such as front panels are burned.

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Chapter 1 Product Overview

1.1 Product Introduction

- Megwave welding power source is a fully digital multifunctional welding machine with CO2, MAG, MIG and other functions, including DC Super-low spatter, Quick pulse, high-speed welding and other processes. It can weld various materials such as carbon steel, stainless steel, aluminum alloy, etc.
- Three-level technology, with an inverter frequency up to 110KHz.
- Chopping control technology enables DC super-low spatter welding, reducing spatter by over 90%.
- Unique quick pulse process, combining pulse with DC short circuit, improves welding speed by more than 20% compared to standard pulse welding.
- Wide voltage matching range, high current and low voltage, lower heat input, higher deposition rate, suitable for thin plate welding.
- Equipped with arc starting withdrawal function, improving the success rate of arc starting.
- Touch sensing function, with sensing voltage range of 80-400V.
- Various communication interfaces that can quickly connect with robots and intelligent automation of different brands
- Reserved IOT interface that can be connected to the Megmeet SMARC IOT system
- The USB interface is available and supports remote upgrades, making it easy to enjoy Megmeet's cutting-edge welding technology.

1.2 Model Description

The model description of welding machine is shown in Figure 1-1.

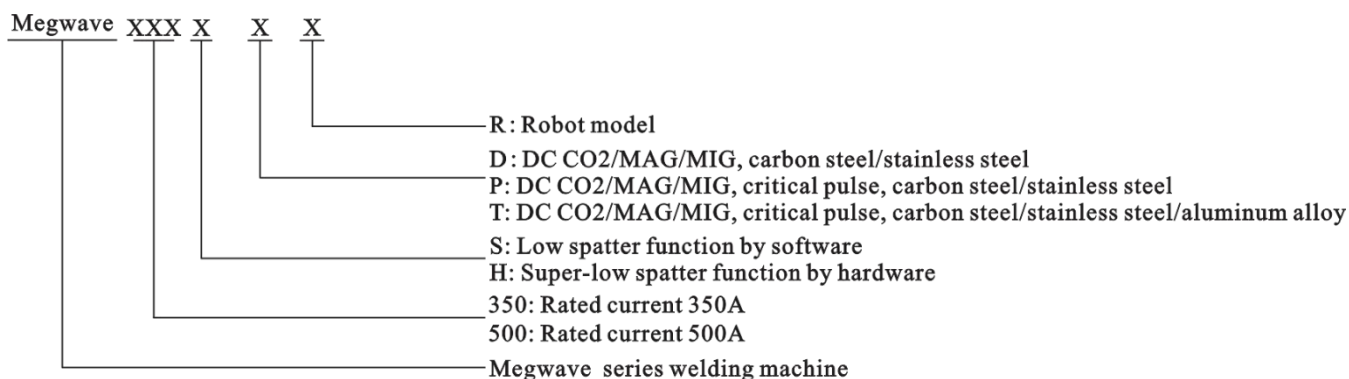


Figure 1-1 Model Description

• Example 1

Megwave 500SD indicates that welding program included is DC low spatter by software algorithm, CO2/MAG/MIG, weldable materials are carbon steel/stainless steel, and rated current is 500A.

Megwave 500HD indicates that welding program included are DC super low spatter realized by hardware, CO2/MAG/MIG, weldable materials are carbon steel/stainless steel, and rated current is 500A.

• **Example 2:**

Megwave 500SP indicates that welding program included are DC low spatter by software algorithm, CO2/MAG/MIG, quick pulse technology, weldable materials are carbon steel/stainless steel, and rated current is 500A.

Megwave 500HP indicates that welding program included are DC super low spatter realized by hardware, CO2/MAG/MIG, quick pulse technology, weldable materials are carbon steel/stainless steel, and rated current is 500A.

• **Example 3:**

Megwave 500ST indicates that welding program included are DC low spatter by software algorithm, CO2/MAG/MIG, quick pulse technology, weldable materials are carbon steel/stainless steel/aluminum alloy, and rated current is 500A.

Megwave 500HT indicates that welding program included are DC super low spatter realized by hardware, CO2/MAG/MIG, quick pulse technology, weldable materials are carbon steel/stainless steel/aluminum alloy, and rated current is 500A.

1.3 Dimensions and Net Weight

Appearance, size and net weight of welding power source are shown in Table 1-1 and Figure 1-2.

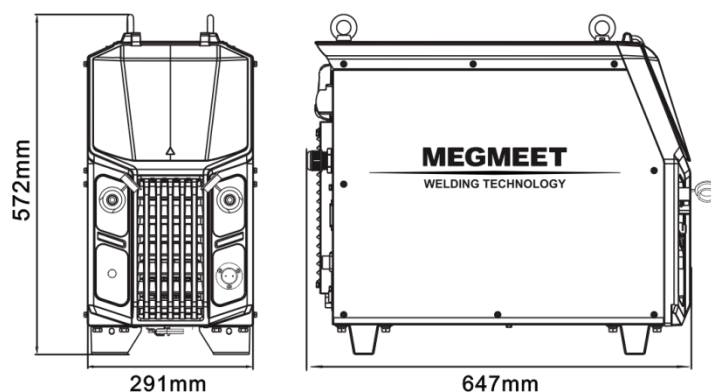


Figure 1-2 Exterior dimension drawing

Table 1-1 Dimensions and net weight of welding power source

Part name	Model	Overall dimensions (length * width * height) mm	Net weight (kg).
Welding power source	Megwave 350/500SD	647×291×572	37
	Megwave 350/500SP		
	Megwave 350/500ST		
	Megwave 350/500HD		40
	Megwave 350/500HP		
	Megwave 350/500HT		

Chapter 2 Installation and Wiring

This chapter describes the installation requirements of welding machine, as well as operating procedures and precautions for installation.

2.1 Unpacking Inspection

The machine is placed in a special designed durable package:

1. Before unpacking, please confirm the outer packaging of the product is in good condition;
2. After unpacking, please confirm whether the accessories and instructions of the welding machine are complete, and whether the model is consistent with the order (if you find that the accessories are missing or wrong, please contact the supplier in time);
3. Packaging materials can be recycled;
4. The serial number marked on the machine nameplate is unique and is very important when repairs or technical support are required!

2.2 Installation Requirements

- Installation environment requirements
 1. In places with good ventilation and vibration less than 5.9 m/s² (0.6 g);
 2. Avoid installation in dusty, metal powder places; It is strictly forbidden to install in places with corrosive and explosive gases;
 3. The ambient temperature is required to be within the range of -10 °C ~ +40 °C, and the altitude does not exceed 2000m;
 4. The humidity requirement is less than 95%, and there is no condensation of water droplets;
 5. The welding site should have windproof, and use wind deflectors if necessary, otherwise it will affect the welding performance;
 6. If there are special installation requirements, please consult and confirm in advance;
 7. Welding power source is at least 20cm away from the wall, and the interval should be more than 30cm when multiple machines are placed side by side, it is recommended to place the welding power source according to the reserved space in Table 2-1, otherwise the best air cooling effect will be affected.
- Installation space requirements

The welding power source should be at least 20cm away from the wall, and when multiple units are placed side by side, they should be spaced at least 30cm apart. It is recommended to place the welding power source according to the reserved space in Table 2-1.

Table 2-1 Reserved space for installation of welding power source

	Front	Top	Left	Right	Back
Reserved space	≥20cm	≥10cm	≥20cm	≥20cm	≥20cm

2.3 Handling Precautions

1. Before handling welding power source, be sure to cut off the input power supply of the distribution box;
2. When handling the welding power source with a forklift, be sure to fix the wheels firmly;
3. There is a certain danger when hoisting the welding power source , thus, hoisting is not recommended.

2.4 Electrical Connection

Electrical connection is shown in Figure 2-1.

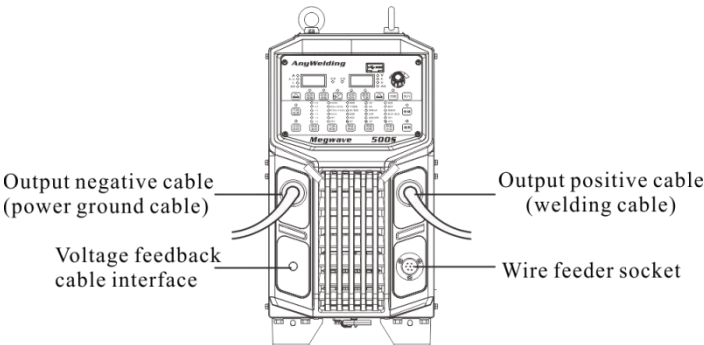


Figure 2-1 Electrical connection

2.4.2 Input Cable (400VAC)

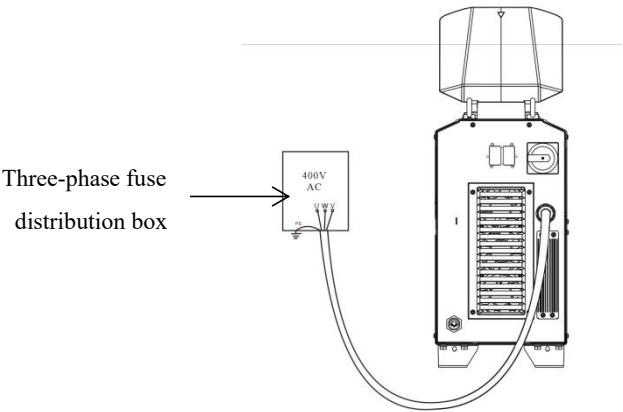


Figure 2-2 400VAC power input cable connection

Note

1. Be sure to ground the PE(yellow-green cable)of input power cable safely;
2. The welding power source has no special requirements for the three-phase of the grid,and the power input cable of Megwave 350 series should be 6mm² or above,Megwave 500 power input cable should be 10mm² or above.

● Three-phase fuse

To ensure safety, please use a three-phase fuse to protect the current which should be prepared by users. Please refer to the following table to select the specifications of the fuse.

1. Megwave 500 series

Table 2-2 Specification reference table

Output current	500A
Low voltage input / Input current at rated power output	50A
Recommended the specifications of the fuse	63A
Voltage tolerance	-28%~18%

2. Megwave 350 series

Table 2-3 Specification reference table

Output current	350A
Low voltage input / Input current at rated power output	28A
Recommended the specifications of the fuse	32A
Voltage tolerance	-28%~18%

2.4.3 Connection of Output Positive Power Cable (Welding Cable)

Steps

Connect output power cable to positive (+) terminal of welding machine and tighten it.

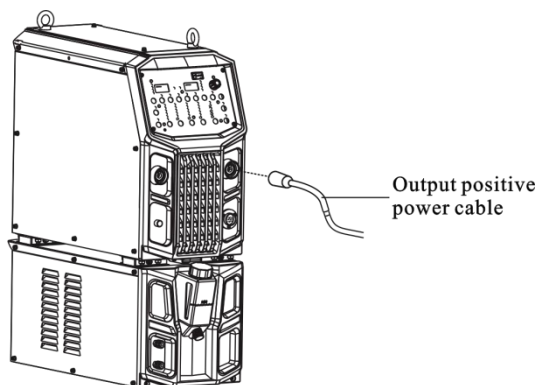


Figure 2-3 Connection of output positive power cable

2.4.4 Connection of Wire Feeders

Wire feeders include robotic wire feeder and manual wire feeder (Enclosed type/open type), connections are as shown in the following figure.

- Robotic wire feeder

Steps

1. Fix welding power positive cable with the wiring terminal at the tail of wire feeder;
2. Fix 7-pin aviation plug of wire feeder control cable with the corresponding socket;
3. Connect gas hose to the copper joint on the fixing plate of the wire feeder, and tighten the gas hose clamp, as shown in Figure 2-4.

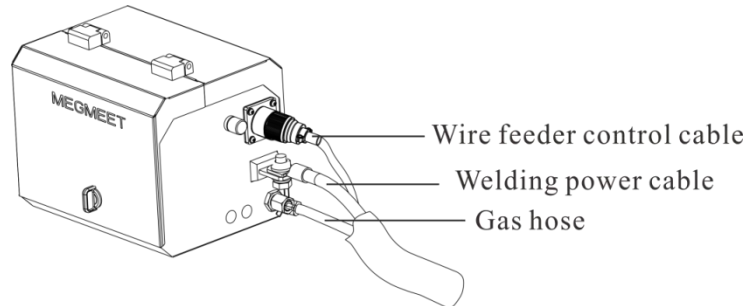


Figure 2-4 Connection of robotic wire feeder

- Manual wire feeder (Enclosed type)

Steps

1. Fix the 7-pin aviation plug of wire feeder control cable with the corresponding socket;
2. Connect the gas hose to the copper joint on the wire feeder, and tighten the gas hose clamp;
3. Insert the water outlet tube and inlet tube accordingly;
4. Use the tail buckle of wire feeder to fix the inter-connection cable with wire feeder casing.

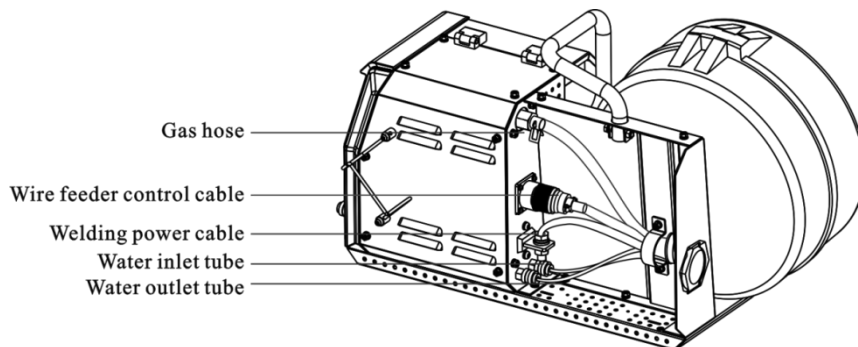


Figure 2-5 Connection of enclosed-type manual wire feeder

- Manual wire feeder (open type)

Steps

1. Fix the 7-pin aviation plug of wire feeder control cable with the corresponding socket;
2. Connect the gas hose to the copper joint on wire feeder, and tighten the gas hose clamp;
3. Fix the welding cable on the screw of wire feeder base plate and tighten the nut;
4. Use the tail buckle of wire feeder to fix the inter-connection cable with the wire feeder casing.

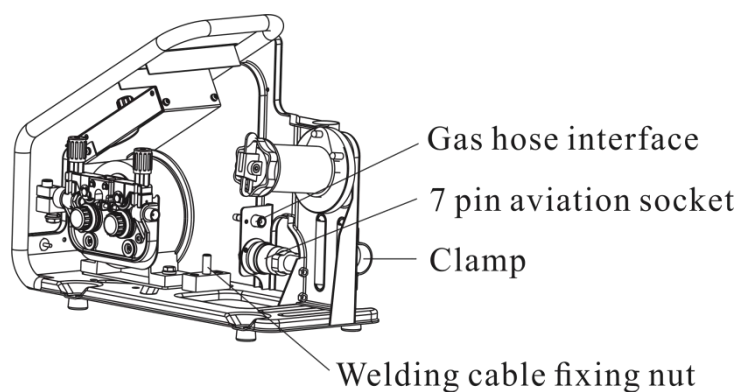


Figure 2-6 Connection of open type manual wire feeder

2.4.5 Connection of Welding Torch

Welding torch can be respectively connected with the robotic wire feeder and manual wire feeder (enclosed type, open type), as shown in the following figure.

- Robotic wire feeder

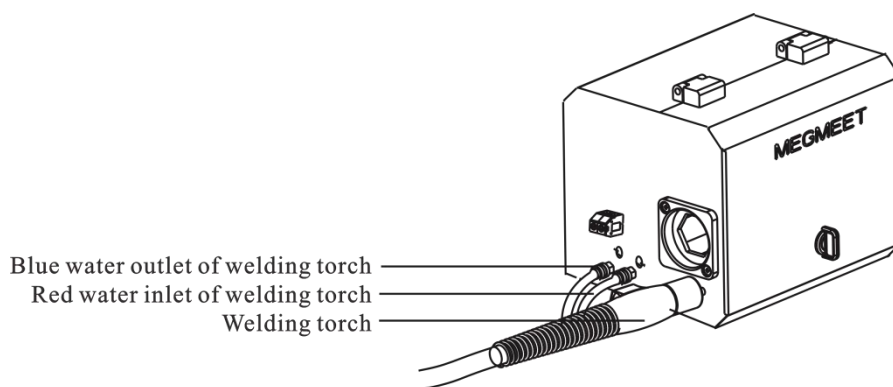


Figure 2-7 Connection of robotic welding gun

- Manual wire feeder (Enclosed type)

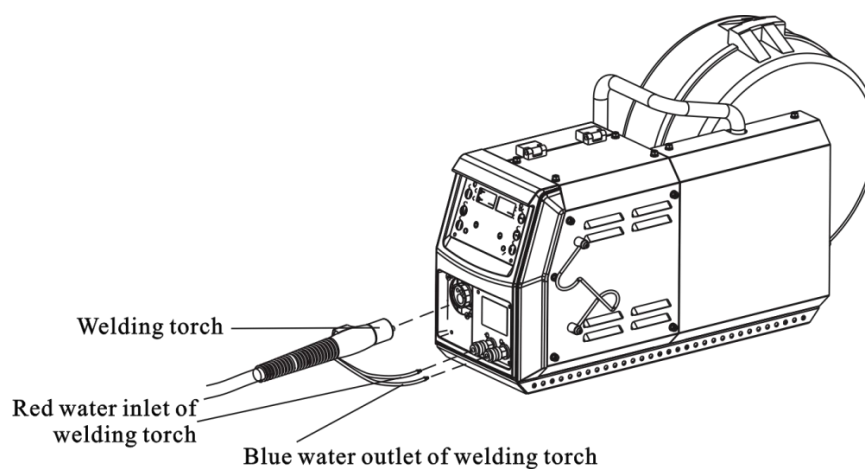


Figure 2-8 Connection of welding torch of enclosed type manual wire feeder

- Manual wire feeder (open type)

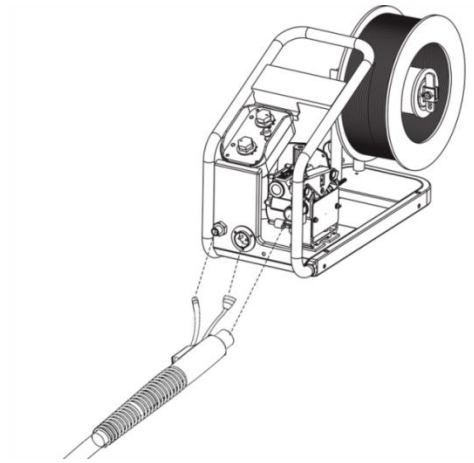


Figure 2-9 Connection of welding torch of open type manual wire feeder

2.4.6 Connection of Water Cooler

The working voltage of the water cooler is 400VAC, and it can be powered by welding machine. Connect the water cooler power cable to the welding machine at the position as shown in the figure.

When using the water cooler, it is necessary to activate the internal menu settings of welding machine:

Water cooling function: press F17 to turn on. It is defaulted as OFF;

Water flow switch detection function: press F18 to turn on. It is defaulted as OFF;

(For detailed operations, please refer to P28 (**Chapter 3 Internal Functions 3.12.19 Water cooler switch, 3.12.20 Water flow switch**))

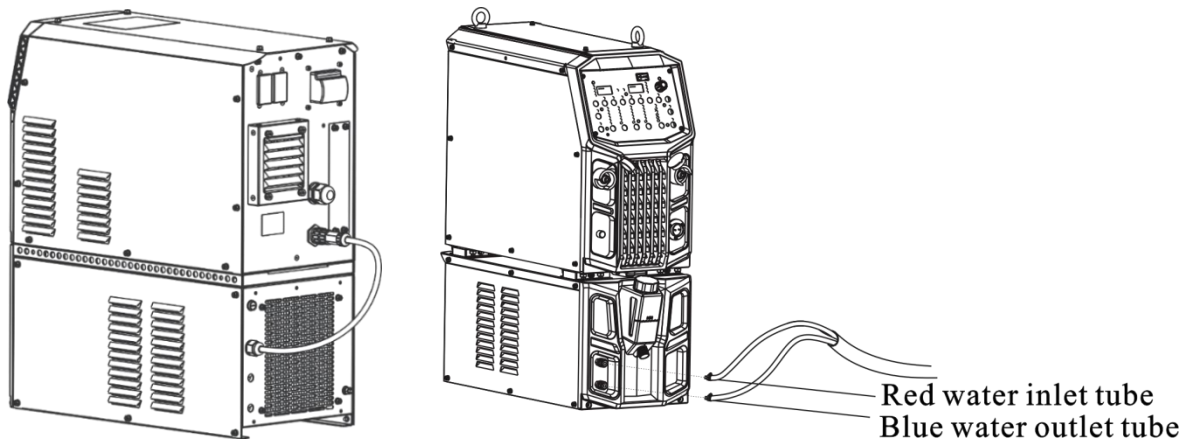


Figure 2-10 Water cooler connection

Safety Warning

1. The power supply of water cooler power plug is high-voltage 400VAC. Please turn off the welding power source when wiring, otherwise there is a risk of electric shock;
2. When the ambient temperature is below 10°C, please use organic antifreeze in the water cooler, otherwise there is a risk of damage to the water cooler.

Chapter 3 Function Description and Operation

3.1 Front Panel Description

The functional description of the welding machine panel is shown in Figure 3-1. Only the Megwave HD series model is taken as an example. The panel functions of other models are similar to those shown in Figure 3-1.

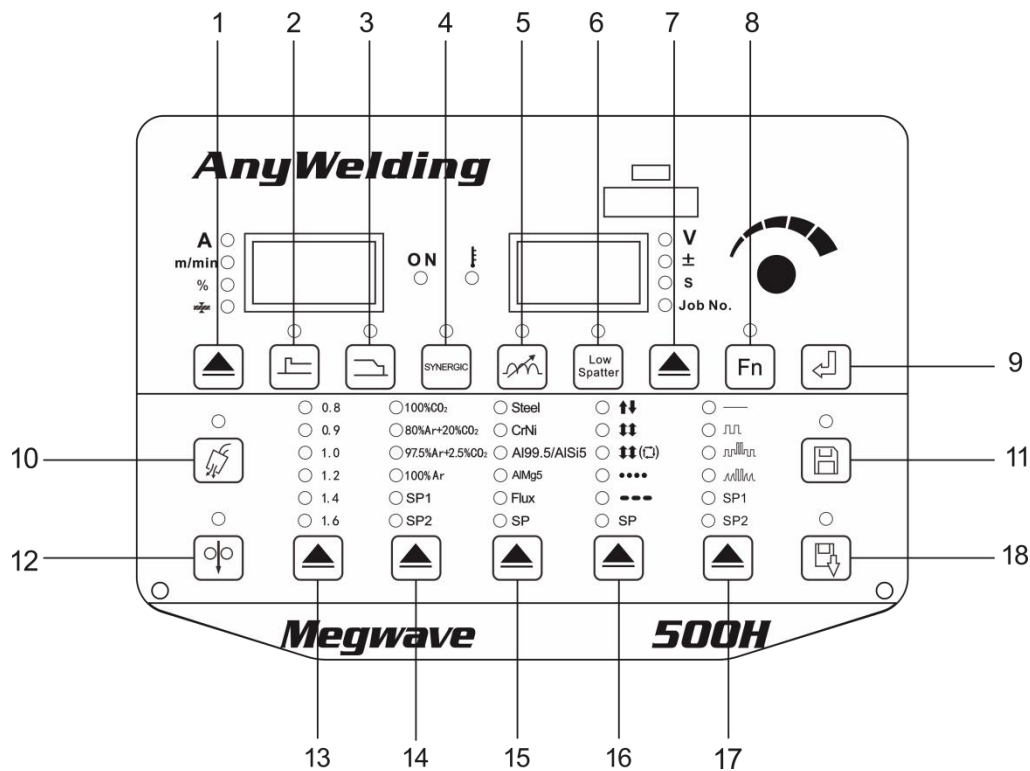


Figure 3-1 Panel functions

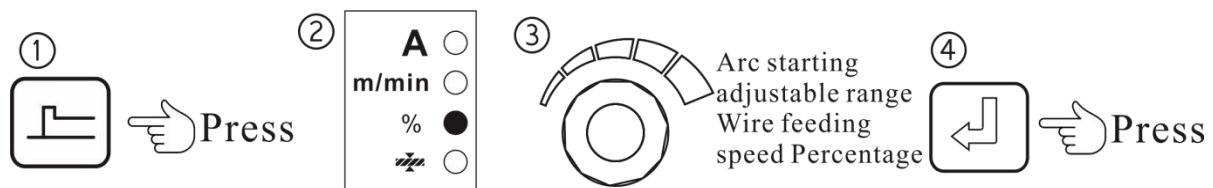
Table 3-1 Function description

Number	Name	Description of each function key
1	Left loop switch key	Used for switching current, wire feeding speed, percentage, and plate thickness
2	Arc starting parameter	View and adjust current arc starting current, voltage, and arc dynamics
3	Arc ending parameters	View and adjust current arc ending current, voltage, and arc dynamics
4	Synergic/separate	In the synergic mode, machine system will match corresponding voltage based on the current. In separate mode, the current and voltage are adjusted separately

5	Arc dynamics	Used to set arc hardness and softness
6	Super low spatter	Used to select Super low spatter welding program (Megwave H series only)
7	Right loop switch key	Used for switching voltage, voltage correction value, time, and JOB number
8	Function	Used for entering and exiting internal menus (long press for 3 seconds to enter, short press to exit)
9	Enter	Used for parameter confirmation and panel locking (long press for 3s to lock the panel, and then it is unable to operate. Long press for 3s again to unlock the panel)
10	Gas detection	Check whether there is gas
11	Save	Save and Store the selected welding parameters
12	Wire inching	Send the welding wire to the end of the welding torch in a non-welding state
13	Welding wire diameter	To select different welding wire diameters
14	Gas type	To select different gas type
15	Material selection	To select different welding materials. SP is used for customized welding materials
16	Trigger mode	Used for switching between different trigger modes (2 steps, 4 steps, special 4 steps, spot welding, continuous spot welding)
17	Welding method	T0 select different welding methods (switching between DC, pulse, double pulse, and pulse-DC) Remarks: Megwave SD series and Megwave HD series only have the direct current function
18	Recall	Recall the saved welding parameters

3.2 Arc Starting Parameters

In arc welding, the parameters involved when starting welding, including wire feeding speed, current, voltage, etc.



When F02 in internal menu is set to OFF which means proportional value, the relationship of the arc starting wire feeding speed is as follows:

$$\text{Arc starting wire feeding speed} = \text{given wire feeding speed} \times (\%)$$

Steps

1. Press "Arc starting parameter" key, and when arc starting parameter light and the "%" light are ON, it can set or view arc starting parameter;

2. When "%" light is ON and the left digital tube flashes, it can set the percentage of wire feeding speed in arc starting through the panel knob. After setting, press the **"Enter"** button to confirm;
3. The **absolute voltage value "V"** of arc starting section, **voltage correction value "±"**, and **arc starting time "s"** can be set or viewed through **"Right cycle switching"** key. When the corresponding light is ON and the digital tube is flashing, it can set the corresponding parameter by rotating the panel knob and pressing **"Enter"** button to confirm;
4. After adjusting arc starting parameter, press **"Arc starting parameter"** key, the arc starting parameter light is OFF, and it will exit from arc starting parameter setting.

Note

1. Arc starting parameter can be set in the trigger modes of 2-steps, 4 steps and special 4 steps;
2. Arc starting time is only valid in the trigger modes of 2-steps and 4 step;
3. When it is necessary to adjust the absolute value of arc starting parameter, it should switch the internal menu F02 to ON, as shown in P22 (**3.12.3 Arc Starting Current and Arc Ending Current, Voltage Given Mode Selection Switch**).

Table 3-2 Arc starting parameter

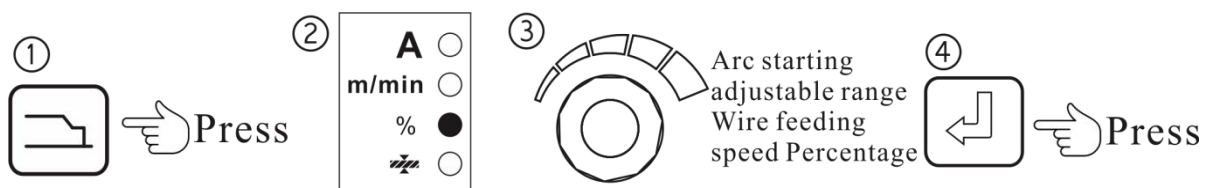
	Default value	Range	Step length
Arc starting current ratio value	100	1~200	1
Absolute value of arc starting current	30 (A)	30~500 (A)	1 (A)
Arc starting current time	0 (s)	0~25 (s)	0.1 (s)
Arc starting voltage deviation value	0	-30~+30	1

3.3 Arc Ending Parameter

In arc welding, the parameters involved before welding finished, include wire feeding speed, current, voltage, etc.

When F02 in internal menu is set to the OFF which means proportional value, the relationship of arc ending wire feeding speed is as follows:

$$\text{Arc ending wire feeding speed} = \text{current given wire feeding speed} \times (\)\%$$



Steps

1. Press **"Arc ending parameter"** button, when LED light and "%" light are on, it can set or view arc ending parameter;
2. When "%" light is ON and left digital tube is flashing, the percentage of wire feeding speed in the arc ending can be set by panel knob. After the setting, press the **"Enter"** button to confirm;
3. The **voltage correction value "±"** of arc ending, and **arc ending time "s"** can be set or viewed through the **"Right cycle switching"** button. When the corresponding indicator light is ON and

digital tube is flashing, the corresponding parameter can be set by rotating the panel knob, and confirmed by pressing "**Enter**" button;

- After adjusting arc ending parameter, press "Arc ending parameter" button, the arc ending parameter light will turn off, and it exits from setting of arc ending parameter.

Table 3-3 Arc ending parameter

	Default value	Range	Step length
Arc ending current ratio value	100	1~200	1
Absolute value of arc ending current	30 (A)	30~500 (A)	1 (A)
Arc ending current time	0 (s)	0~25 (s)	0.1 (s)
Arc ending voltage deviation value	0	-30~+30	1

Note

- The given current in arc ending parameters can only be proportionally adjusted according to the given welding current. The wire feeding speed and welding current are different representations of the same variable;
- The given voltage in arc ending parameters can only be adjusted uniformly according to the given current;
- The arc dynamics of arc ending and the arc dynamics of welding are independent and not related;
- The setting of arc ending time is only valid for 2-step mode, and is invalid for 4-step and special 4-step modes;
- When it is necessary to adjust the absolute value of arc starting parameter, it should switch the internal menu F02 to ON, as shown in P22 (3.12.3 Arc Starting and Ending Currents, Voltage Given Form Selection Switch).

3.4 Synergic Mode/Separate Mode

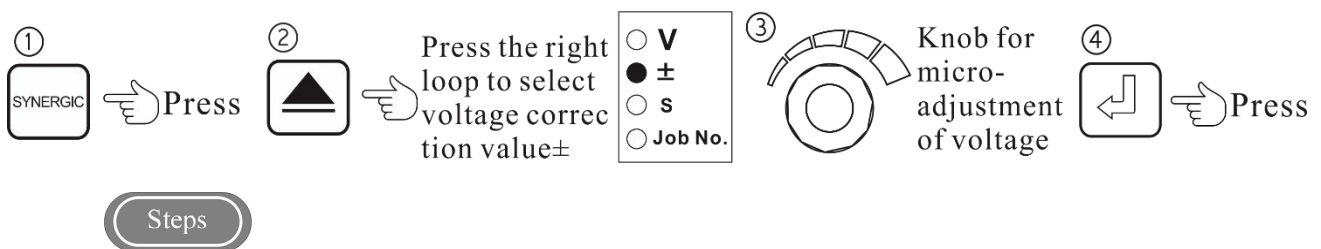
● Synergic Mode:

The system will automatically match the voltage based on the given current and the voltage correction value.

The default value for voltage correction in the synergic mode is 0, ranging from -30 to+30.

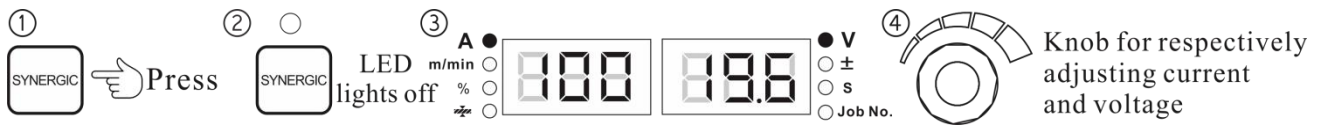
The given voltage relationship is as follows:

Given voltage= Standard synergic voltage value+(voltage correction value%) × (Standard synergic voltage value)



- Press the "Synergic/Separate" button, and when the LED light is ON, it enters the synergic mode;
- Switch the "Right loop switch" button to the synergic voltage correction value "±". When the indicator light flashes, the voltage knob on the wire feeder or the panel knob on the welding power source can be used to adjust the automatically matched voltage in the synergic mode;
- Press the "Enter" button and switch the "Right loop switch" button to view the matching voltage value and arc length correction value.

- Separate: adjust the current and voltage separately.



Steps

Press "Synergic/Separate" button, and when the LED light is OFF, it enters separate mode, and at this time, the welding given current and voltage are adjusted separately.

Note

Arc starting parameter and arc ending parameter can only be adjusted in synergic mode.

3.5 Arc Dynamic

Arc dynamic is used to adjust the hardness and softness of arc. Arc becomes hard when adjusting in positive direction; Arc becomes soft when adjusting in negative direction. Arc dynamic is described in Table 3-5 and Figure 3-2.

Table 3-4 Description of Arc dynamic

Arc dynamic	Function
0 (Default value)	For common use, the default value of Arc dynamic
0~32 (Hard arc)	Welding seam has a big fusion depth and it is easy to penetrate, suitable for all position welding and high-speed welding. When extending the cable, it can also ensure arc stability
0~-32 (Soft arc)	Welding seam has a shallow fusion depth and is not easy to penetrate, making it suitable for thin plate welding

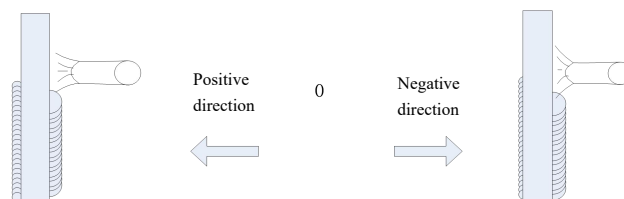


Figure 3-2 Arc Dynamic



Steps

1. Press the "Arc Dynamic" button, LED light will be ON, and arc dynamic function will be turned ON;
2. Rotate the panel knob to adjust the arc dynamic value range: -32~0~+32.

3.6 Super-low Spatter

Special control algorithms are used to match hardware designing could significantly reduce spatter during welding.

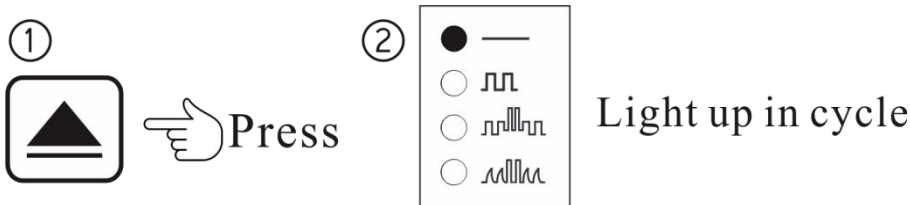
Steps

1. Press the "**Super-low spatter**" button, and the LED light will be ON;
2. The super-low spatter function is turned on.

Note

To achieve super-low spatter in DC model, the droplet transfer method must be short-circuit transfer, and the short-circuit transfer current range of different wire diameters should be considered.

3.7 Welding Method



Steps

1. Press "**Welding method**" button, and the LED light will be ON;
2. Every time the "**Welding method**" button is pressed, the light will cycle from DC - pulse - double pulse - pulse&DC to light up;
3. When the light is selected, the corresponding function can be operated.

● DC

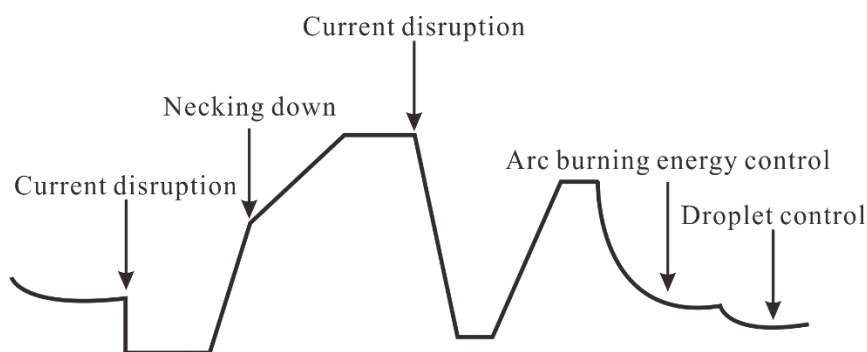


Figure 3-3 DC welding method

● Pulse

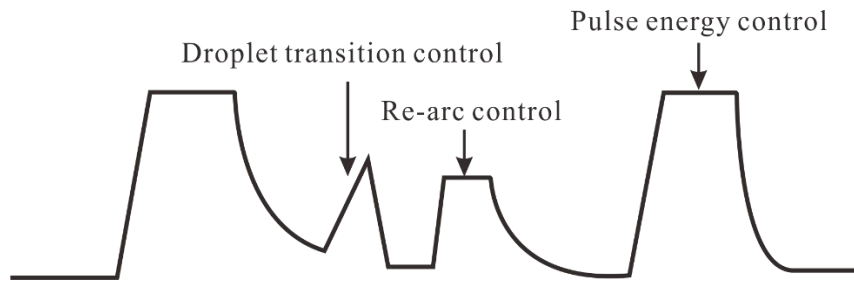


Figure 3-4 Pulse welding method

- Double pulse

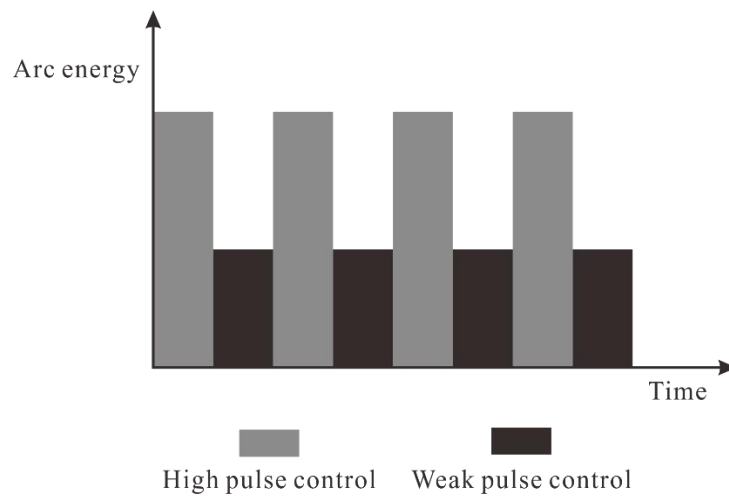


Figure 3-5 Double pulse welding method

- Pulse&DC

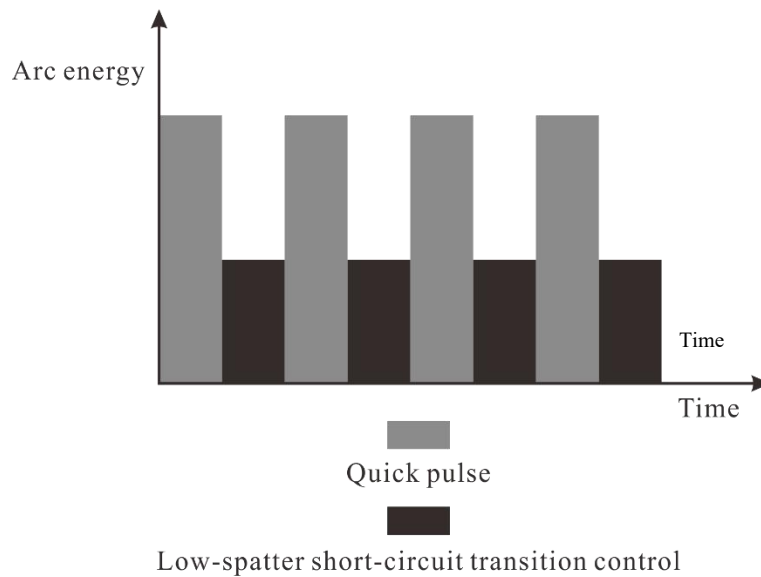
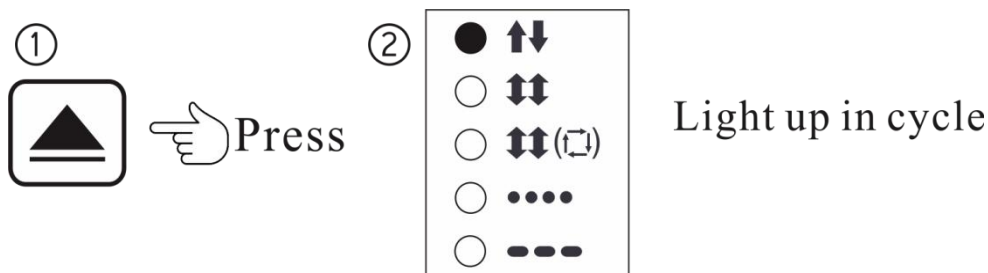


Figure 3-6 Pulse& DC welding method

3.8 Trigger Mode



Each time you press it, the indicator light will light up in sequence. As shown in the figure above, light means selected.

3.8.1 2-steps

The 2-step mode is synchronized with the ON/OFF operation of the welding torch switch. Press and hold the welding torch switch to start welding and release the welding torch switch to stop welding.

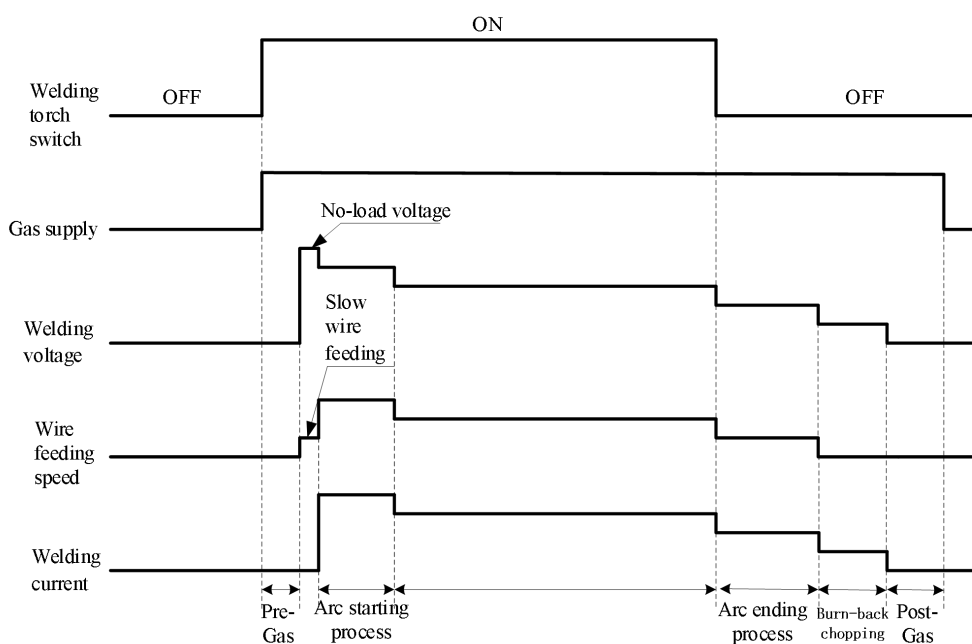


Figure 3-7 2-step logic figure

3.8.2 4-steps

Arc starting parameter time of 4-step mode is determined by arc starting time set on the welding machine panel. Arc ending parameter time is determined by the time that welding torch switch is held down.



1. Press the welding torch switch, release it after arc starting, after the arc starting time ends, it will automatically enter the welding current;
2. Press the welding torch switch again to enter the arc ending current;
3. Release the welding torch switch to stop welding.

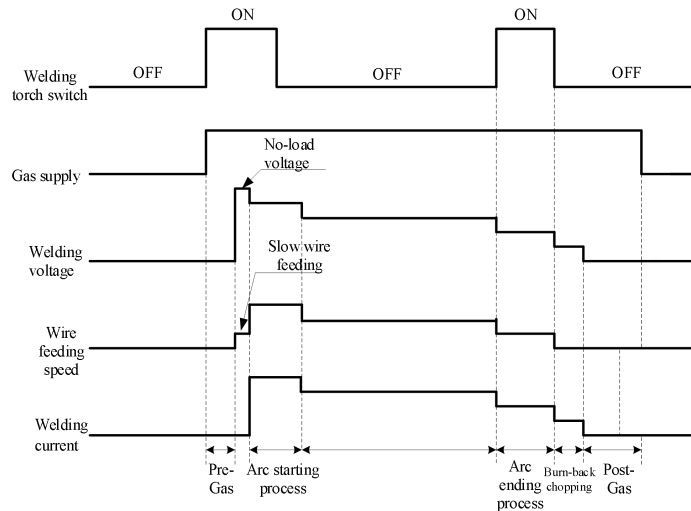


Figure 3-8 4-step logic figure

3.8.3 Special 4-step

Both arc starting current time and arc ending current time of special 4-step mode are determined by the time that the welding torch switch is held down.

Steps

1. Press the welding torch switch to start arc, release the welding torch, then it enters welding current state;
2. Press welding torch switch again to enter arc ending current;
3. Release the welding torch switch to stop welding.

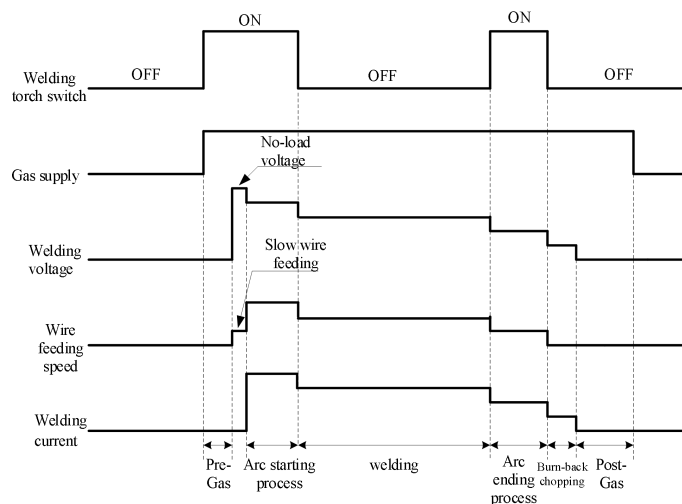


Figure 3-9 Special 4-step logic figure

3.8.4 Spot Welding

Steps

1. Press "trigger mode" button and switch to **spot welding** mode;
2. Press the right loop switch button to set the spot welding time, -press welding torch switch to start welding;
3. If the welding torch is released within the pre-set spot welding time, arc breaking can still be continued.

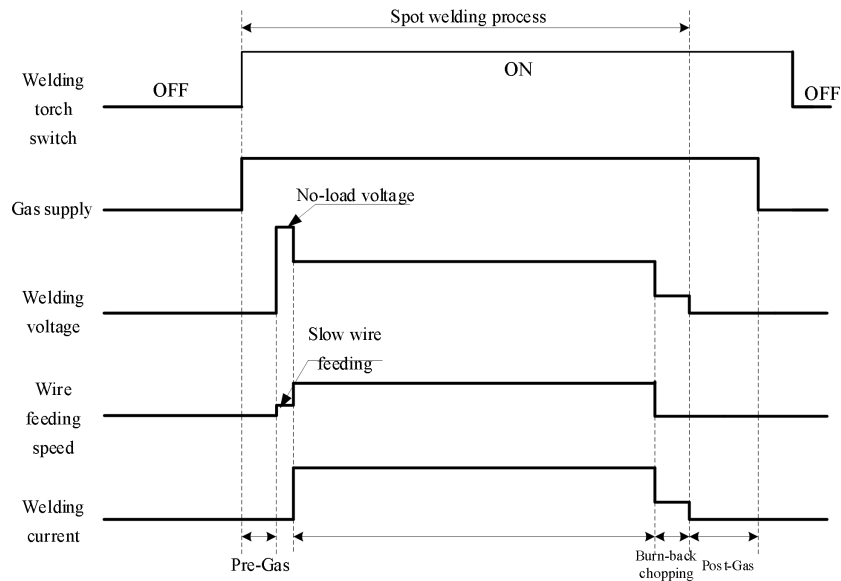


Figure 3-10 Spot welding logic figure

3.8.5 Continuous Spot Welding

Steps

1. Press the "trigger mode" button to switch to **spot welding** mode;
2. Press the right loop switch button to set the spot welding time, press the welding torch switch to start welding;
3. If the welding torch is released within the pre-set spot welding time, arc breaking can still be continued.

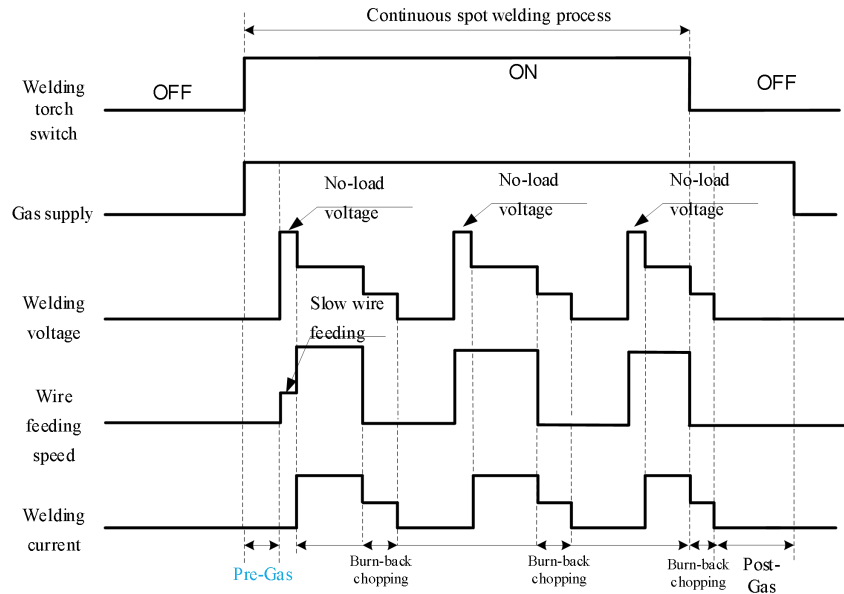


Figure 3-11 Continuous spot welding logic figure

3.9 Wire Inching

Welding wire is feed to the end of the welding torch in a non-welding state.

Steps

1. Press and hold "Wire Inching" button, the LED light will be ON;
2. The inching feeding speed is the currently given inching wire feeding speed, up to 8m/min;
3. Release this key, the LED light will be OFF, the wire feeding will stop.

3.10 Gas Detection

Checking for the presence of gas and gas flow.

Steps

1. Press and hold the "gas detection" button, the LED light will turn on. The gas starts to flow, and the gas flow rate can be checked at this time;
2. Press this key again within 30 seconds, the LED light will turn off and gas detection will stop. If there is no action, the gas detection will automatically turn off after 30 seconds.

3.11 Save and Recall



- Save

Save the set welding parameters.

Steps

1. Set the welding parameters, press the "Save" button, the indicator light will flash and the JOB indicator light will be ON. After that, it will enter the JOB saving selection;
2. Use panel knob to select JOB number (0-49), press the "Enter" button to confirm, then the JOB saving is completed.

Note

1. After the welding power source is restored to its factory settings, the stored parameters are not reset;
2. When the Enter button is not pressed for confirmation during the storage process, the parameters will not be saved;
3. When the saved JOB is full, the newly saved JOB number will overwrite the original JOB number;
4. When the saved JOB are the same JOB, the original JOB number parameter will be overwritten.

● Re-Call

Recall the saved welding parameters.



Steps

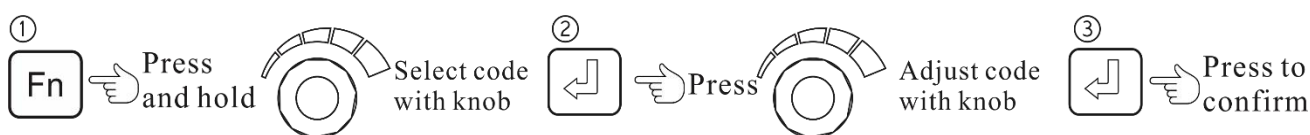
1. Press and hold 'Recall' button, and the LED indicator light will flash, while the JOB indicator light will be ON, entering the parameter recall mode;
2. Use panel knob to select the JOB number (0-49) to be recalled and press the "Enter" button to confirm;
3. When parameter is recall, it can only use the recalled parameter for welding. The parameters of the panel and wire feeder cannot be adjusted. Press the recall button again to exit the parameter recall.

3.12 Internal Menu

Set the internal menu parameters of welding machine.

The adjustment steps for the internal functions (N00~N18) of robot are shown in P41 (**Chapter 4 Robot and Automation Application**).

● F01~F26, D00~D08, T0A~T0F



Steps

1. Press and hold "Function" button for 3s to enter the internal menu,-then use the panel knob to select the function code;
2. After pressing "Enter" button, the digital tube on right flashes. The panel knob can be used to adjust the parameter corresponding to the function code;
3. Press the "Enter" button to confirm and complete the settings;
4. Press the 'Function' button to exit.

● P00~P13

Please refer to chapters 3.12.38 to 3.12.50 for specific operation steps.

Table 3-5 Internal Menu

		Default value	Range	Step length
F00	Restore factory settings			
F01	F parameter open	OFF (hidden)	OFF (hidden)-ON (unfolded)	
F02	Arc starting and ending currents, voltage given form selection	OFF (Current proportional value, voltage synergic)	OFF (Current proportional value, voltage synergic)-ON (Absolute value of current and absolute value of voltage)	
F03	Pre-Gas time	0.2 (s)	0-25 (s)	0.1 (s)
F04	Post-Gas time	0.2 (s)	0-25 (s)	0.1 (s)
F05	Arc starting withdrawal time	15 (m/min)	5-25 (m/min)	1 (m/min)
F06	Continuous spot welding off time	0.1 (s)	0.1-10 (s)	0.1 (s)
F07	Minimum speed	0.6 (m/min)	0.1-2 (m/min)	0.1 (m/min)
F08	Speed compensation	0	Negative 30 to positive 30	1
F09	Arc start wire feeding speed	2 (m/min)	1-25 (m/min)	0.1 (m/min)
F10	Step length of arc start wire feeding speed	0 (s)	0-10 (s)	0.1 (s)
F11	Wire inching speed	ADP (self-adaption) (m/min)	1-18 (m/min)	0.1 (m/min)
F12	Step length of wire inching speed	1 (s)	0-10 (s)	0.1 (s)
F13	Wire withdraw speed	2 (m/min)	1-18 (m/min)	0.1 (m/min)
F14	Wire withdraw time	ADP (self-adaption) (s)	0-2 (s)	0.1 (s)
F15	Robot communication polling cycle selection	500	500-650-400-550	500
F16	Robot feedback current filtering coefficient	63	0-63	1
F17	Intelligent fan	ON (open)	OFF (not open)-ON (open)	
F18	Water cooler switch	OFF (not open)	OFF (not open)-ON (open)	
F19	Water flow switch	OFF (not open)	OFF (not open)-ON (open)	
F20	Constant penetration switch	OFF (not open)	OFF (not open)-ON (open)	

F21	Arc starting energy regulation	0	Negative 3 to 30	1
F22	Burn-back parameters	0	Negative 20 to 20	1
F23	Motor control selection	ADP (self-adaption)	ADP (self-adaption)-BEF (back electromotive force)-ENC (encoding disk)	
F24	Push-pull torch selection	OFF (not open)	OFF (not open)--TBI-RSn(ROSHI_A)-RSb(ROSHI_B)-RnK(ROSHI_K)-DIS(DISEL)-PAr(PARWELD)-trn(TE RMA)	
F25	Open wire feeder	ADP (self-adaption)	ADP(Self-adaption)-OFF(no display board)-ON(with display board)	
F26	Open the push-pull welding torch head adjustment function	OFF (not open)	OFF (not open)-ON (open)	
F27	Master-slave selection	OFF(not open)	OFF(not open)-ON(open)	
F28	MACID selection	0	0-63	1
D00	D parameter open	OFF (hidden)	OFF (hidden)-ON (unfolded)	
D01	Step length of arc starting speed	0.1 (s)	0-2 (s)	0.01 (s)
D02	Step length of speed from arc starting to welding	0.1 (s)	0-10 (s)	0.1 (s)
D03	Step length of speed from welding to arc ending	0.05 (s)	0-2 (s)	0.01 (s)
D04	Root welding switch	OFF (not open)	OFF (not open)-ON (open)	
D05	Low-spatter threshold	20	0-255	1
D06	DC arc dynamic	0	Negative 30 to positive 30	1
D07	DC turning point	0	Negative 30 to positive 30	1
D08	DC short-circuit rise slope	0	Negative 30 to positive 30	1
P00	P parameter Open	OFF (hidden)	OFF (hidden)-ON (unfolded)	
P01	Al-mg program selection	0	0-2	1
P02	Pulse arc dynamic	0	Negative20to positive 20	1
P03	Double pulse frequency	1.5 (Hz)	0.1-10 (Hz)	0.1 (Hz)
P04	Double pulse duty cycle	50	0-100	1
P05	Double pulse current intensity	50	1-100	1
P06	Correction value of weak pulse voltage	0	Negative30 to positive 30	1
P07	Correction value of high pulse voltage	0	Negative30 to positive 30	1
P08	Slope of weak pulse to high pulse	0.06 (s)	0-0.2 (s)	0.01 (s)
P09	Slope of high pulse to weak pulse	0.06 (s)	0-0.2 (s)	0.01 (s)
P10	Weak pulse welding method	PU (pulse)	DC -PU (pulse)-PUN (Super pulse)	
P11	Arc starting welding method	DC	DC-PU (pulse)	

P12	Arc ending welding method	DC	DC-PU (pulse)	
P13	High pulse welding method	PU (pulse)	DC-PU (pulse)	
N00	N parameter Open	OFF (hidden)	OFF (hidden)-ON (unfolded)	
N01	Local control mode open	OFF (not open)	OFF (not open)-ON (open)	
N02	JOB switching time	0.1 (s)	0.01-9.99 (s)	0.01 (s)
N03	Welding machine MACID	ADP (self-adaption)	0-63	1
N04	Touch sensing success signal switch	OFF (not open)	OFF (not open)-ON (open)	
N05	Welding machine readiness signal switch	OFF (not open)	OFF (not open)-ON (open)	
N06	Robot readiness signal switch	OFF (not open)	OFF (not open)-ON (open)	
N07	Switch for successful arc starting signal of welding machine	OFF (not open)	OFF (not open)-ON (open)	
N08	Robot speed, current given method	CUR	CUR-SPD	
N09	Sensing voltage	200 (V)	80-400 (V)	1 (V)
N10	Communication protocol	Ang	Ang-FAn-Abb-kUk-yAS-kAS-CrP-Hyd-SIA-gSk-kEb-tUr-ES-tE-EFt-goo-CHF	
N11	Baud rate	125	125-250-500	
N12	Network communication module selection switch	OFF (not open)	OFF (not open)-ON (open)	
N13	Robot welding mode selection	OFF(not open)	OFF(not open)-DC-PU-DPU-DCP	
N14	Simulation robot given filter coefficient	0-12	4	1
N15	Robot issues welding control function is open	OFF(not open)	OFF(not open)-ON(open)	
N16	Manual machine local control switch	OFF (not open)	OFF (not open)-ON (open)	
N18	SMARC IoT control switch	OFF (not open)	OFF (not open)-ON (open)	
N19	Welding machine factory barcode			
FB0	Welding machine internal board software version			
FB1	Welding machine error record			
FB2	Welding machine model			
T0A	Motor selection	0	0-3	1
T0B	Initial value superposition for arc tracking current feedback	0	Negative 50 to positive 50	1
T0D	Pulse transition selection	0	0-1	1
T0E	Quick pulse selection	0	Negative 30 to positive 30	1
T0F	Wire pushing motor compensation	0	Negative 50 to positive 50	1

3.12.1 Restore Factory Settings (F00)

Steps

Press and hold “Enter” button for 3s until the digital tube display '**good**' and flash, which means successfully restoring the factory settings.

Reminder

After restoring the factory settings, save and recall parameters. Except for the locked password that cannot be cleared, all other parameters are restored to their factory settings. Please use this function with caution.

3.12.2 F Parameter Open (F01)

ON for unfolding internal functions F01-F26 and OFF is hidden state.

Reminder

To adjust F01-F26 parameters, F01 must be set to ON.

3.12.3 Arc Starting and Ending Current, Given Voltage Selection (F02)

ON represents arc starting and ending currents are given in absolute values, OFF represents arc starting and ending currents are given in proportional values. It is defaulted as OFF.

3.12.4 Pre-Gas Time (F03)

The gas supply time before arc starting is used to evacuate residual air in the pipeline and prevent the formation of welding porosity.

Table 3-6 Parameters of Pre-gas time

Name	Unit	Adjustment range	Step length	Default value
F03	s	0~25s	0.1s	0.2s

3.12.5 Post-Gas Time (F04)

Delayed gas time after arc ending, it protects the high-temperature molten pool from air oxidation.

Table 3-7 Parameters of Post-gas time

Name	Unit	Adjustment range	Step length	Default value parameter
F04	s	0~25s	0.1s	0.2s

3.12.6 Arc Starting Withdrawal Time (F05)

Speed of arc starting withdrawal wire.

Table 3-8 Arc starting withdrawal time

Name	Unit	Adjustment range	Step length	Default value parameter
F05	m/min	5-25 (m/min)	1 (m/min)	15 (m/min)

3.12.7 Continuous Spot Welding OFF Time (F06)

Arc break-off time in the continuous spot welding mode.

Table 3-9 Parameters of continuous spot welding OFF time

Name	Unit	Adjustment range	Step length	Default value parameter
F06	s	0.1~10s	0.1s	0.1s

3.12.8 Minimum Speed (F07)

When weak pulse welding method (P10) selects super pulse (PUN), weak pulse welding is performed at the minimum wire feeding speed. When super pulse (PUN) mode is selected, detailed operation can be seen in P35 (Chapter 3 Internal Function 3.12.47 Weak Pulse Welding Method (P10)).

Table 3-10 Minimum speed parameters

Name	Unit	Adjustment range	Step length	Default value parameter
F07	m/min	0.1~2m/min	0.1m/min	0.6m/min

3.12.9 Speed Compensation (F08)

Motor speed compensation: when the wire extension is long or welding wire diameter is not up to standard, resulting in a significant difference in actual current compared to given current, speed compensation can be used to reduce the difference between the two.

Table 3-11 Speed compensation parameters

Name	Unit	Adjustment range	Step length	Default value parameter
F08	/	-30~+30	1	0

3.12.10 Arc Starting Wire Feeding Speed (F09)

It is the wire feeding speed before arc starting.

By adjusting the wire feeding speed, arc starting quality and arc starting success rate can be improved. When arc starting is poor, wire feeding speed can be reduced to improve arc starting quality. If arc starting is not poor at the default wire speed, welding cycle time can be shortened and welding efficiency can be improved by increasing the wire feeding speed.

Table 3-12 Arc starting wire feeding speed parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
F09	m/min	1~25m/min	0.1m/min	2m/min

3.12.11 Step Length of Arc Starting Wire Feeding Speed (F10)

The time length for wire feeding speed to transition from a stationary state to a arc starting wire feeding speed.

Table 3-13 Arc starting wire feeding speed parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
F10	s	0~10s	0.1s	0s

3.12.12 Wire Inching Speed (F11)

The speed at which the wire is fed to the end of the welding torch in a non-welding state.

Table 3-14 Arc starting wire feeding speed parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
F11	m/min	1~18m/min	0.1m/min	ADP self-adaption (consistent with welding speed)

3.12.13 Step Length Of Wire Inching Speed (F12)

The length of time it takes for the wire feeding speed to transition from a static state to a wire inching speed.

Table 3-15 Arc starting wire feeding speed parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
F12	s	0~10s	0.1s	0.1s

3.12.14 Wire Withdrawing Speed (F13)

Under the robot model, the wire reversing speed in the non-welding state prevents welding wire from sticking to the molten pool.

Table 3-16 Wire withdrawing speed parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
F13	m/min	1~18m/min	0.1m/min	2m/min

3.12.15 Wire Withdrawing Time (F14)

Under the robot model, the duration of wire withdrawing.

Table 3-17 Wire withdrawing time parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
F14	s	0~2s	0.1s	ADP self-adaption

3.12.16 Robot communication current curve range selection (F15)

For the Analog, FANUC, Kawasaki, CRP and other protocols, selection of robot sends down the given current curve range .

Table 3-18 Robot communication polling cycle parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
F15	/	500-650-400-550	/	500

3.12.17 Feedback Current Filtering Coefficient of Robot (F16)

In the robot model, welding machine feeds back the filter coefficient of actual voltage and current to robot. The larger the filter coefficient, the smoother the output and the greater the delay; the smaller the filter coefficient, the sharper the output and the smaller the delay.

Table 3-19 Feedback current filtering coefficient of robot

Function name	Unit	Adjustment range	Step length	Default value parameter
F16	/	0~63	1	63

3.12.18 Intelligent Fan (F17)

Intelligent fan switch. After being ON, fan automatically turns off after six minutes of stopping welding. The default is ON.

3.12.19 Water Cooler Switch (F18)

The water cooling switch, defaulted as OFF.

3.12.20 Water Flow Switch (F19)

Water flow detection switch, defaulted as OFF.

3.12.21 Constant Penetration Switch (F20)

The constant penetration switch, defaulted as OFF.

3.12.22 Arc Starting Energy Control (F21)

Adjust arc starting energy, improve arc starting quality, and prevent the occurrence of wire failing to contact workpiece and other phenomena. Arc starting energy in the positive direction is large, and the arc starting energy in the negative direction is small.

Table 3-20 Arc starting energy control parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
F21	/	-30~+30	1	0

3.12.23 Burn-back Parameter (F22)

Adjust burn-back effect to prevent welding wire from sticking to fusion pool, and adjust chopping effect of wire end after arc end. In order to remove the excess wire coming out of the torch nozzle due to the inertia of the wire feeding motor after welding finished, the larger the adjustment value, the more wire is removed.

Table 3-21 Burn-back parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
F22	/	-20~+20	1	0

3.12.24 Motor Control Selection (F23)

Match actual motor which is used.

Table 3-22 Motor control selection parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
F23	/	ADP (self-adaption)-BEF (counter electromotive force)-ENC (encoding disk)	/	ADP (self-adaption)

3.12.25 Push-pull torch selection (F24)

Match push-pull torch brands, default is OFF and select TBI push-pull welding torch

Table 3-23 Push-pull welding torch selection parameters

Name	Unit	Adjustment range	Step length	Defaulted
F24	/	OFF(not open)-TBI-RSn(ROSHI_A)-RSb(ROSHI_B)-RnK(ROSHI_K)-DIS(DISEL)-PAr(PARWELD)-trn(TERMA)	/	OFF

3.12.26 Master Slave Selection (F25)

Master slave selection switch, defaulted as OFF.

3.12.27 MACID Selection (F26)

Table 3-23 MACID selection parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
F26	/	0~63	1	0

3.12.28 D Parameter Open (D00)

ON means unfolded internal function D01-D08, and OFF is hidden state.

Reminder

To adjust D01-D08 parameters, D01 must be set to ON.

3.12.29 Step Length of Arc Starting Speed (D01)

The duration of transition from wire feeding speed to arc start wire feeding speed.

Table 3-24 Parameters of step length of arc starting speed

Function name	Unit	Adjustment range	Step length	Default value parameter
D01	s	0~2s	0.1s	0.01s

3.12.30 Step Length from Arc Starting to Welding Speed (D02)

Wire feeding speed transition time from arc starting to welding current.

Table 3-25 Parameters of step length from arc starting to welding speed

Function name	Unit	Adjustment range	Step length	Default value parameter
D02	s	0~10s	0.1s	0.1s

3.12.31 Step Length from Welding to Arc Ending Speed (D03)

The time for wire feeding speed to transition from welding current to arc ending.

Table 3-26 Parameters of step length from welding to arc ending speed

Function name	Unit	Adjustment range	Step length	Default value parameter
D03	s	0~2s	0.1s	0.05s

3.12.32 Root Welding Switch (D04)

Root welding switch, defaulted is OFF. It is commonly used in single sided welding and dual sided forming process for V-shaped grooves with low spatter, strong bridging ability, and good back forming.

3.12.33 Low spatter threshold (D05)

To adjust low spatter sensitivity.

The smaller the threshold, the more obvious the low spatter effect is and the less spatter is.

Table 3-27 Low spatter threshold parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
D05	/	0~500	1	80

3.12.34 DC Arc Dynamic(D06)

Adjust the shape of DC arc.

The arc in positive direction is concentrated and has good stiffness, while the arc in negative direction is divergent.

Table 3-28 DC arc dynamic parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
D06	/	-30~+30	1	0

3.12.35 DC Turning Point (D07)

Adjust the turning point of short-circuit process of DC current.

Adjust the arc in positive direction to make it harder, arc stiffness is good and it will be stronger. In the scenario of fast welding, increasing it can make arc more stable. Adjust in negative direction, the arc will be softer and can also effectively reduce spatter.

Table 3-29 DC turning point parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
D07	/	-30~+30	1	0

3.12.36 DC Short-circuit Rise Slope (D08)

Adjust DC short-circuit rise slope.

Table 3-30 DC short-circuit rise slope parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
D08	/	-30~+30	1	0

3.12.37 P Parameter Open (P00)

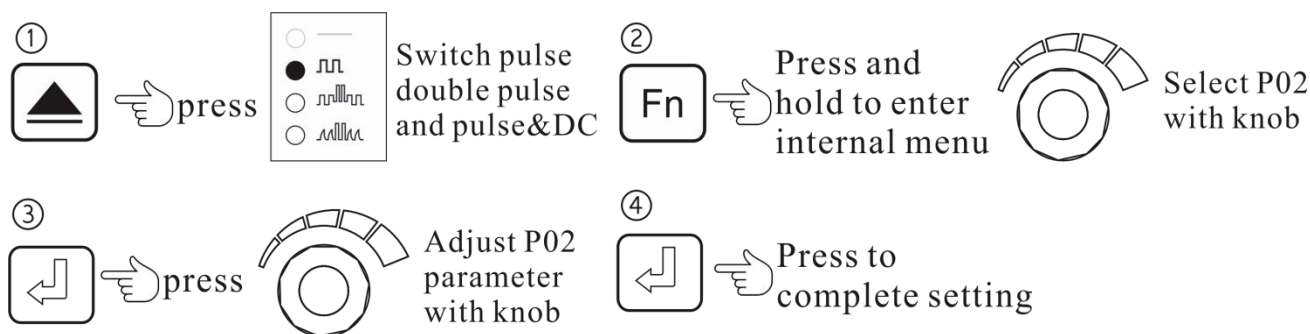
ON is for unfolding internal functions P01-P13, OFF is for hidden and it is defaulted as OFF. The P parameter is mainly used to adjust pulse and double pulse related parameters.

Reminder

To adjust P01-P13 parameters, P00 must be set to ON.

3.12.38 Pulse Arc Dynamic (P02)

Adjust the pulse arc dynamic.



Steps

1. Press "Welding method" button to switch to pulse/double pulse/pulse-DC;
2. Press and hold "Function" button to enter internal menu, and use the panel knob to select P02;
3. Press "Enter" button and the digital tube on the right will flash. Use the panel knob to adjust P02 parameter;

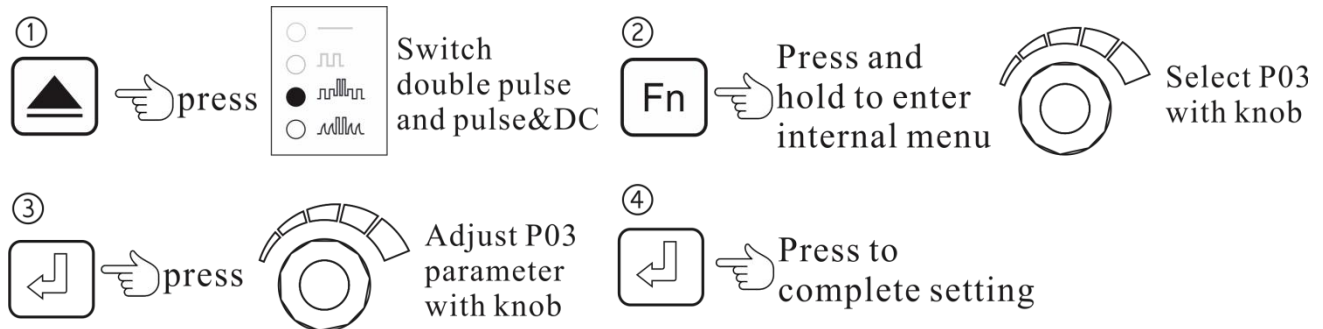
4. Press “Enter” button to confirm and complete the settings.

Table 3-31 Pulse arc dynamic parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
P02	/	-20~+20	1	0

3.12.39 Double Pulse Frequency (P03)

Adjust double pulse current frequency. f (Frequency) = $\frac{1}{T(\text{Time})}$



Steps

1. Press "Welding method" button to switch to double pulse/pulse - DC;
2. Press and hold "Function" button to enter the internal menu, and use the panel knob to select P03;
3. Press "Enter" button and the digital tube on the right will flash. Use the panel knob to adjust P03 parameter;
4. Press 'Enter' button to confirm and complete the settings.

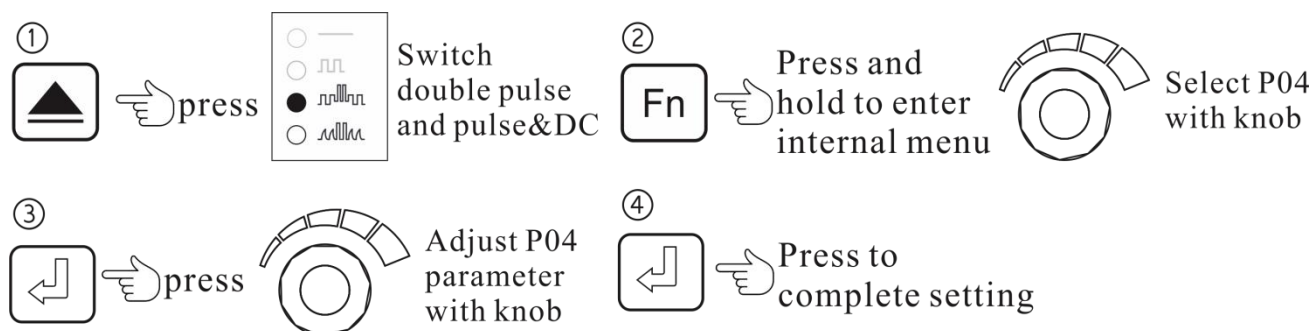
Table 3-32 Double pulse frequency parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
P03	Hz	0.1~10Hz	0.1Hz	1.5Hz

3.12.40 Double Pulse Duty Cycle (P04)

The duration ratio of strong pulses in a cycle (T).

When strong pulse ratio is large, welding energy is strong and poor melting can be prevented, but when it is too large, it is easy to cause defects such as burn-through of base material. When weak pulse ratio is large, welding energy is low, which makes molten pool temperature relatively low to prevent burn-through, but when it is too large, it is easy to cause poor weld fusion.



Steps

1. Press "Welding method" button to switch to double pulse/pulse - DC;
2. Press and hold the "Function" button to enter the internal menu, and use the panel knob to select P04;
3. Press "Enter" button and the digital tube on the right will flash. Use the panel knob to adjust P04 parameter;
4. Press "Enter" button to confirm and complete the settings.

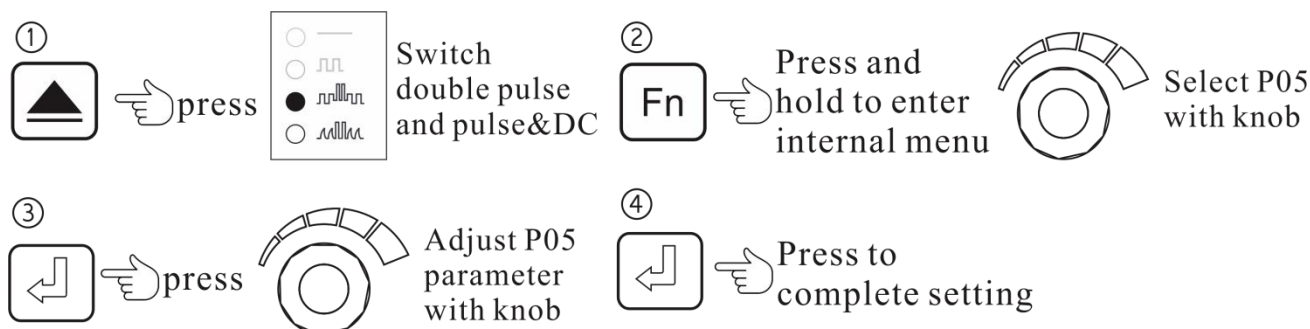
Table 3-33 Double pulse duty cycle parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
P04	/	0~100	1	50

3.12.41 Double Pulse Current Intensity (P05)

Adjust double pulse current intensity.

As the intensity increases, wire feeding speed corresponding with the strong pulse increases, while the wire feeding speed of weak pulse decreases.



Steps

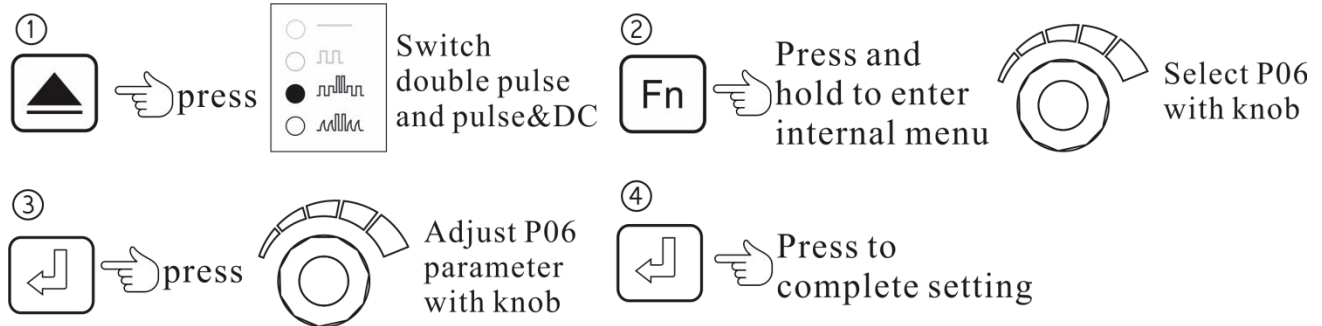
1. Press "Welding method" button to switch to double pulse/pulse - DC;
2. Press and hold the "Function" button to enter the internal menu, and use the panel knob to select P05;
3. Press "Enter" button and the digital tube on the right will flash. Use the panel knob to adjust P05 parameter;
4. Press "Enter" button to confirm and complete the settings.

Table 3-34 Double pulse current intensity parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
P05	/	1~100	1	50

3.12.42 Correction Value of Weak Pulse Voltage (P06)

Adjust the correction value of weak pulse voltage.



Steps

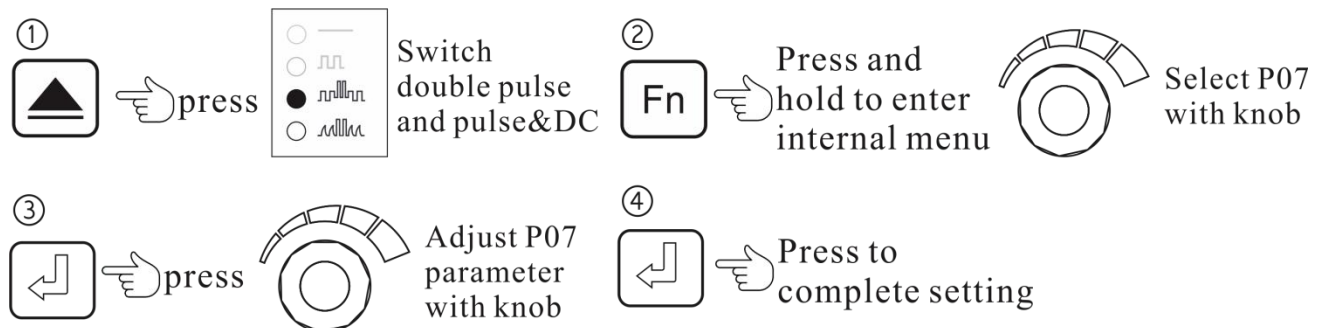
1. Press "Welding method" button to switch to double pulse/pulse - DC;
2. Press and hold "Function" button to enter the internal menu, and use the panel knob to select P06;
3. Press "Enter" button and the digital tube on right will flash. Use the panel knob to adjust P06 parameter;
4. Press "Enter" button to confirm and complete the settings.

Table 3-35 High pulse intensity parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
P06	/	-30~+30	1	0

3.12.43 Correction Value of Strong Pulse Voltage (P07)

Adjust the correction value of strong pulse voltage.



Steps

1. Press "Welding method" button to switch to double pulse/pulse - DC;

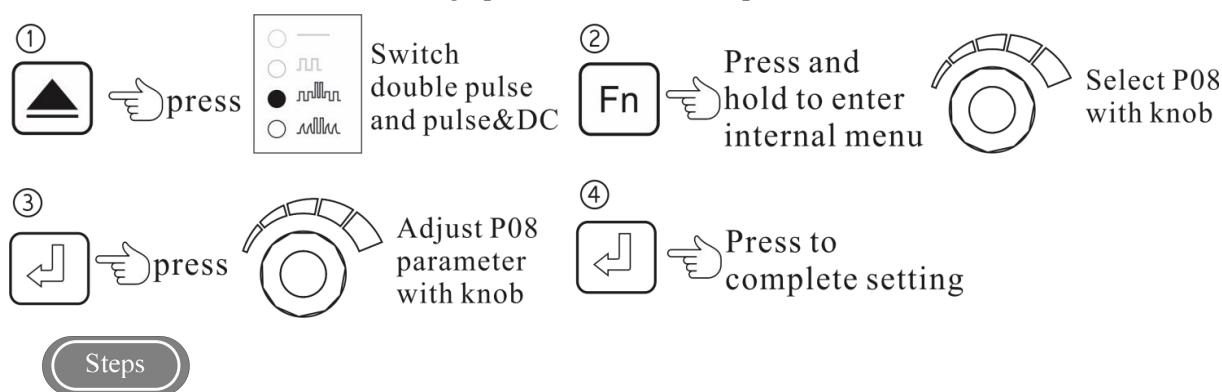
2. Press and hold "Function" button to enter the internal menu, and use the panel knob to select P07;
3. Press the "Enter" button and the digital tube on right will flash. Use the panel knob to adjust P07 parameter;
4. Press "Enter" button to confirm and complete the settings.

Table 3-36 Weak pulse intensity parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
P07	/	-30~+30	1	0

3.12.44 Slope of High Pulse to Weak Pulse (P08)

The duration of the transition from high pulse current to weak pulse current.



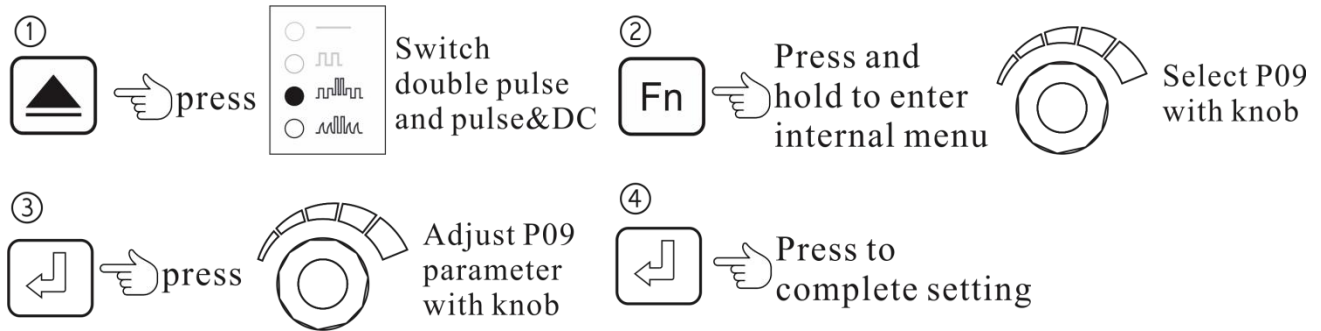
1. Press "Welding method" button to switch to double pulse/pulse - DC;
2. Press and hold the "Function" button to enter the internal menu, and use the panel knob to select P08;
3. Press the "Enter" button and the digital tube on the right will flash. Use the panel knob to adjust P08 parameters;
4. Press "Enter" button to confirm and complete the settings.

Table 3-37 Parameters of slope of high pulse to weak pulse

Function name	Unit	Adjustment range	Step length	Default value parameter
P08	s	0~0.2s	0.01s	0.06s

3.12.45 Slope of Weak Pulse to High Pulse (P09)

The duration of the transition from weak pulse current to high pulse current.



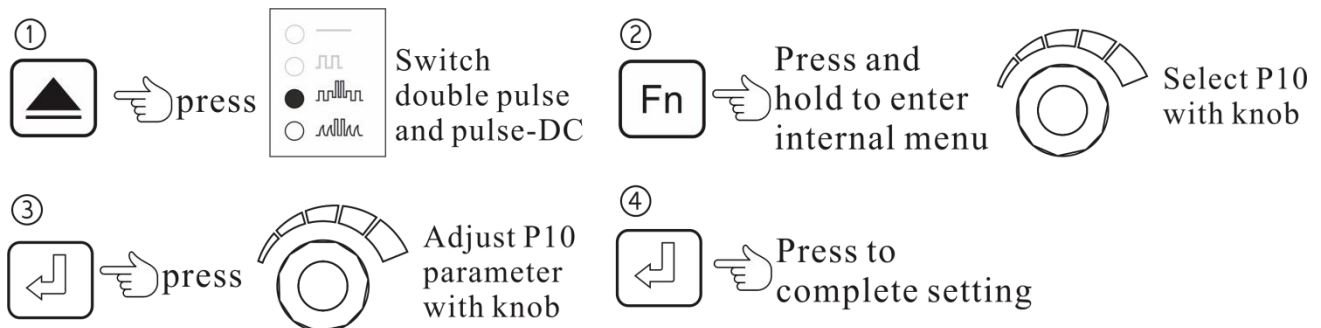
Steps

1. Press "Welding method" button to switch to double pulse/pulse -DC;
2. Press and hold the "Function" button to enter the internal menu, and use the panel knob to select P09;
3. Press the "Enter " button and the digital tube on right will flash. Use the panel knob to adjust P09 parameter;
4. Press "Enter" button to confirm and complete the settings.

Table 3-38 Parameters of slope of weak pulse to high pulse

Function name	Unit	Adjustment range	Step length	Default value parameter
P09	s	0~0.2s	0.01s	0.06s

3.12.46 Weak Pulse Welding Method (P10)



Steps

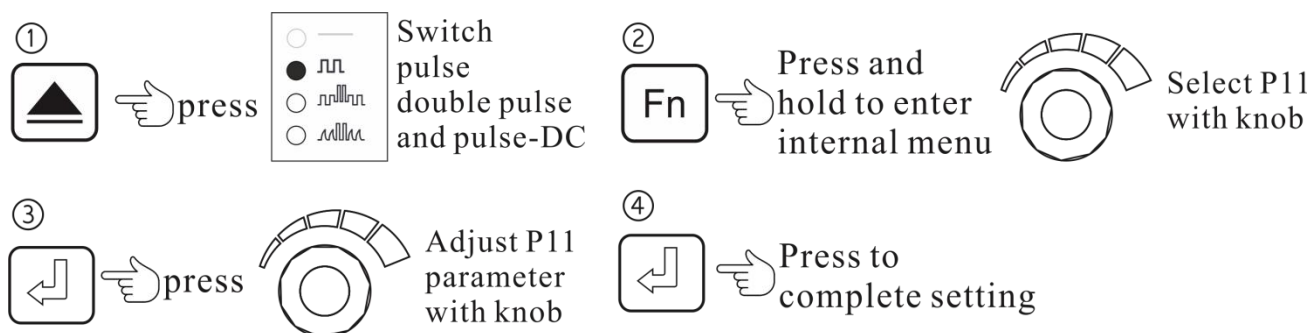
1. Press the "Welding method" button to switch to DC /pulse/ double pulse/pulse -DC;
2. Press and hold the "Function" button to enter the internal menu, and use the panel knob to select P10;
3. Press "Enter" button and the digital tube on right will flash. Use the panel knob to adjust P10 parameter;
4. Press "Enter" button to confirm and complete the settings.

Table 3-39 Parameters of weak pulse welding method

Function name	Unit	Adjustment range	Step length	Default value parameter
P10	/	DC (direct current)-PU (pulse)-PUN (super pulse)	/	PU (pulse)

3.12.47 Arc Starting Welding Method (P11)

When selecting DC as welding method, arc starting welding method defaults to DC; and when the welding method is pulse, double pulse, or pulse-DC, arc starting welding method defaults to pulse.



Steps

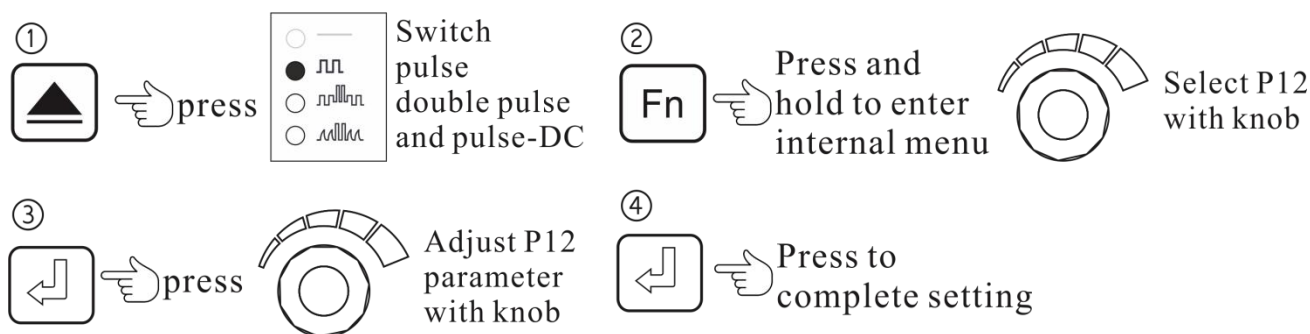
1. Press "Welding method" button to switch to pulse/ double pulse/pulse -DC;
2. Press and hold "Function" button to enter internal menu, and use panel knob to select P11;
3. Press "Enter" button and the digital tube on the right will flash. Use the panel knob to adjust P11 parameter;
4. Press 'Enter' button to confirm and complete the settings.

Table 3-40 Arc starting welding method parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
P11	/	DC (direct current)-PU (pulse)	/	DC (direct current)

3.12.48 Arc Ending Welding Method (P12)

When selecting DC as the welding method, arc ending welding method defaults to DC; and when selecting pulse, double pulse, or pulse-DC as welding method, arc ending welding method defaults to pulse.



Steps

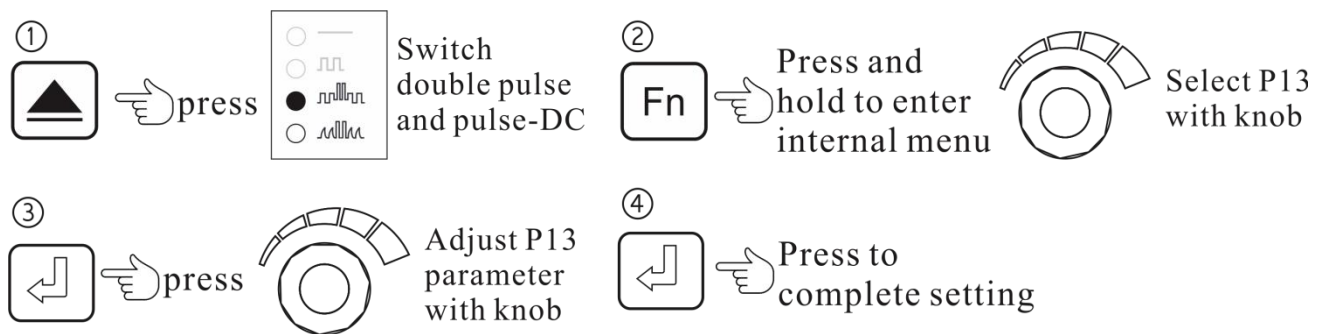
1. Press the "Welding method" button to switch to pulse/ double pulse/pulse -DC;
2. Press and hold "Function" button to enter the internal menu, and use panel knob to select P12;

- Press "Enter" button and the right digital tube will flash. Use panel knob to adjust P12 parameter;
- Press "Enter" button to confirm and complete the settings.

Table 3-41 Parameters of arc ending welding method

Function name	Unit	Adjustment range	Step length	Default value parameter
P12	/	DC (direct current)-PU (pulse)	/	DC (direct current)

3.12.49 High Pulse Welding Method (P13)



Steps

- Press the "Welding method" button to switch to double pulse/pulse-DC;
- Press and hold "Function" button to enter the internal menu, and use the panel knob to select P13;
- Press "Enter" button and the right digital tube will flash. Use panel knob to adjust P13 parameter;
- Press "Enter" button to confirm and complete the settings.

Table 3-42 Parameters of high pulse welding method

Function name	Unit	Adjustment range	Step length	Default value parameter
P13	/	DC (direct current)-PU (pulse)	/	PU (pulse)

3.12.50 Motor Selection (T0A)

Match the actual motor which is used.

Select 0 as printing motor, select 1 as worm gear, and the default is 1 (worm gear).

When a push-pull welding torch is selected, current and voltage can be adjusted directly on the welding torch.

Table 3-43 Motor selection parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
T0A	/	0-3	1	1

3.12.51 Arc tracking current feedback initial value superposition (T0B)

At the beginning of arc tracking, by adjusting the superposition of initial value of current tracking feedback, welding current can be quickly and accurately fed back to robot after arcing, avoiding tracking deviation caused by feedback delay.

Table 1-1 Arc tracking current feedback initial value superposition parameter

Function name	Unit	Adjustment range	Step length	defaulted
T0B	/	-50-+50	1	0

3.12.52 Pulse Transition Selection (T0D)

Pulse transition selection: select 0 for high transition frequency and 1 for low transition frequency. The default is 1 (high transition frequency).

Table 3-44 Pulse transition selection parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
T0D	/	0-1	1	0

3.12.53 Quick Pulse Selection (T0E)

Selection of quick pulse parameter: A negative value indicates that the quick pulse effect is not obvious, and a positive value means the quick pulse effect is obvious.

Table 3-45 Quick pulse selection parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
T0E	/	-30-+30	1	0

3.12.54 Wire pushing Motor Speed Compensation (T0F)

Compensate the speed of wire pushing motor, increase the speed in the positive direction, and decrease the speed in the negative direction.

When wire pushing motor feeds wire too slowly, wire may shake up and down, spin, etc. during welding, resulting in welding abnormalities. In this case, the speed of wire pushing motor can be increased.

When wire pushing motor feeds wire too fast, the front and rear wire feeding speeds are inconsistent, causing the wire to slip, resulting in welding abnormalities. In this case, the speed of wire pushing motor can be reduced.

Table 3-46 Push pull motor speed compensation parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
T0F	/	-50-+50	1	10

3.12.55 Welding Machine Internal Board Software Version (FB0)

To query the welding power source software version .

3.12.56 Welding Machine Error Record (FB1)

There are 200 sets of error records during the use of the welding power source, with "F00" indicating power on self-inspection.

3.12.57 Welding Machine Model (FB2)

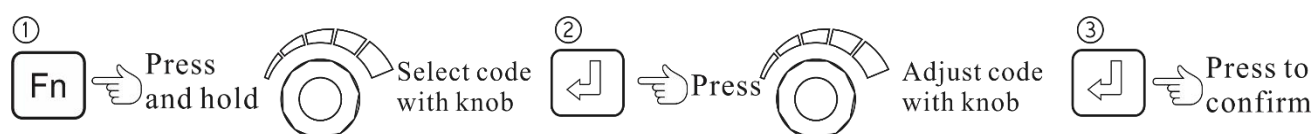
Check the welding machine model.

3.12.58 Welding Machine Factory Barcode (N19)

To query the welding machine factory barcode.

Chapter 4 Robots and Automation Application

4.1 Robot internal functions



Steps

1. Press and hold "Function" button for 3s to enter internal menu, and use panel knob to select the function code;
2. Press "Enter" button and the digital tube on the right will flash. Use the panel knob to adjust the corresponding parameter of the function code;
3. Press "Enter" button to confirm and complete the settings.
4. Press Function key to exit.

4.2 N Parameter Open (N00)

ON means to open robot function, unfolding the internal functions N01-N13, OFF is close robot function, and the default is OFF.

4.3 Local Control Mode Open(N01)

Local control switch, defaulted as OFF.

4.4 JOB Switching Time (N02)

Used to control the transition time of current and voltage when switching JOB.

Table 4-1 JOB switching time parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
N02	s	0.01-9.99s	0.01s	0.1s

4.5 Welding Machine MACID (N03)

Communication address set in the welding machine according to the communication protocol between both parties.

Table 4-2 Welding machine MACID parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
N03	/	0-63	1	ADP (self-adaption)

4.6 Touch Sensing Success Signal Switch (N04)

Defaulted is OFF.

4.7 Welding Machine Readiness Signal Switch (N05)

Defaulted is OFF.

4.8 Robot Readiness Signal Switch (N06)

Defaulted is OFF.

4.9 Welding Machine Successful Arc Starting Signal Switch (N07)

Defaulted as OFF.

4.10 Robot Given Method of Current and Voltage(N08)

CUR is robot current given, SPD is the robot speed given, and default is CUR robot current given.

4.11 Touch Sensing Voltage (N09)

When the robot is touch sensing, the output touch sensing voltage is adjusted.

Table 4-3 Touch sensing voltage parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
N09	V	80-400V	1V	200V

4.12 Communication Protocol (N10)

Select a matching communication protocol based on the communication methods of robots.

Table 4-4 Corresponding robot communication protocols

Protocol number	Robot Name	Application Layer Protocol
ANG	/	Analog port
FAN	Fanuc	DeviceNet/EtherNetIP
ABB	ABB	DeviceNet/EtherNetIP/ProfiNet
KUK	Kuka	DeviceNet/EtherCAT
YAS	Yaskawa	DeviceNet/EtherNetIP
KAS	Kawasaki	DeviceNet/EtherNetIP
CRP	CRP	DeviceNet

HYD	Hyundai	DeviceNet
SIA	Siasun	DeviceNet
GSK	CSR	DeviceNet
KEB	KEBA	CanOpen
TUR	Turing	CanOpen
EST	Estun	CanOpen
STE	STEP	CanOpen
EFT	EFORT	CanOpen
GOO	GOOGOL	Can
CHF	Chaifu	Can

4.13 Baud Rate (N11)

When communicating with the robot through Can, Can baud rate is selected as below.

Table 4-5 Baud rate parameters

Function name	Unit	Adjustment range	Step length	Default value parameter
N11	bps	125-250-500	/	125

4.14 Network Communication Module Selection Switch (N12)

Select ON to open, and an external communication module is required; select OFF to close, and use the built-in communication board of welding machine, and it is defaulted as OFF.

4.15 Robot welding mode selection (N13)

When the robot issues pulse in synergic mode, you can choose pulse, double pulse, pulse-DC mode.

When issuing separate mode, you can choose DC, pulse, and pulse-DC mode.

Table 4-6 Robot welding mode selection table

Function Name	Unit	Adjustment range	Step length	Defaulted
N13	/	OFF(not open)-DC-PU-DPU-DCP	/	OFF

4.16 Stimulation robot given filter coefficient (N14)

In Simulation robot mode, robotic given voltage and current filter coefficients.

Table 4-7 Analog robot given filter coefficient table

Function Name	Unit	Adjustment range	Step length	Defaulted
N14	/	0-12	1	4

4.17 Function of Robot issues welding control (N15)

The switch for robot issues welding control . Select ON to turn it on, select OFF to turn it off, and default is OFF.

4.18 Local Control Switch of Manual Welding Machine (N16)

It is panel control when ON; it is wire feeder control when it is OFF; and default is OFF.

4.19 SMARC IOT Switch (N18)

Defaulted is OFF.

4.20 Robot Communication Interface

Megwave robot models can choose communication protocols such as analog, DeviceNet, EtherNet/IP, EtherCAT, etc. The Megwave welding power sources are all reserved with CAN communication interfaces for automation customization and backend software upgrades.

4.21 Robot Analog Interface

DB25 terminal pin sequence on the analog communication module is shown in Figure 4-1, and the pin definition is shown in Table 4-6.

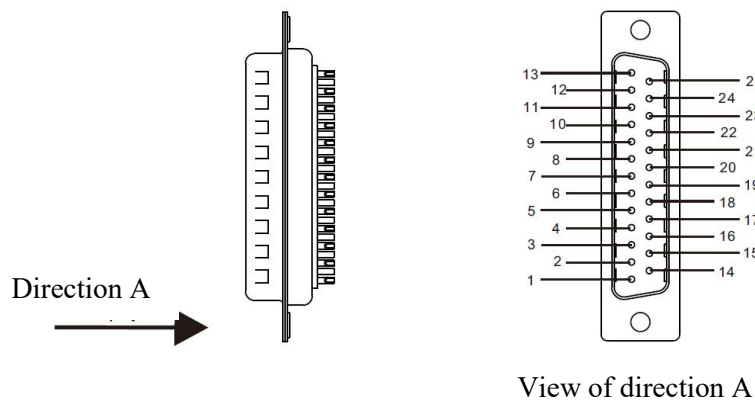


Figure 4-1 DB25 communication pin sequence

Table 4-8 Definition of DB25 communication pin

Pin No.	Communication cable color	Signal name	Function	Remarks
1	Black 1	24V power supply	The positive pole of the direct current power supply is provided by the robot to welding power source. If welding power source has a 24V output, this power cable is not connected	Note 1
2	Black 2	Arc starting signal	Output from the robot to the welding power source, effective at low levels (default)	Note 2
3	Black 3	Reverse wire feeding signal	Output from the robot to the welding power source, effective at low levels (default)	Note 2

4	Brown 1	Successful arc starting signal	Output from welding power source to robot, effective at low level (default)	Note 3
5	Brown 2	Readiness signal	Output from welding power source to robot, effective at low level (default)	Note 3
6	Brown 3	I/O signal common ground	I/O signal common ground of 1, 2, 3, 4, 5, 7, 8, 9 and 10 pins	
7	Orange 1	Wire Inching signal	Output from the robot to welding power source, effective at low levels (default)	Note 2
8	Orange 2	Robot emergency stop signal	Output from the robot to welding power source, effective at low levels (default)	Note 2
9	Orange 3	Gas detection signal	Output from the robot to the welding power source, effective at low levels (default)	Note 2
10	Purple 1	Successful touch sensing signal	Output from welding power source to robot, effective at low level (default)	Note 3
11	Purple 2	Welding current signal	Analog signal, output from welding power source to robot, feed back actual welding current value	Note 4
12	Purple 3	Given current signal	Analog signal, output by the robot to the welding power source with a given current value	Note 6, Note 7
13	Blue 1	Analog signal common ground	Common ground for analog signals at pins 11, 12, 14 and 15	
14	Blue 2	Welding voltage signal	Analog signal, output from welding power source to robot, feed back actual welding voltage value	Note 5
15	Blue 3	Given voltage signal	Analog signal, output by robot to welding power source with a given voltage value	Note 8, Note 9
16	Null	Reserved		
17	Null	Reserved		
18	Pink1	JOB input port 1	Output to the welding power source by an automation device or robot, with corresponding JOB numbers shown in Table 3-37	Note 2
19	Pink 2	JOB input port 2	Output to the welding power source by an automation device or robot, with corresponding JOB numbers shown in Table 3-37	Note 2
20	Pink 3	JOB input port 3	Output to the welding power source by an automation device or robot, with corresponding JOB numbers shown in Table 3-37	Note 2
21	Grey 1	I/O signal common ground	Common ground for analog signals at pins 18, 19, 20, 22 and 23	
22	Grey 2	Touch sensing open signal	Output from the robot to the welding power source, effective at low levels (default)	Note 2
23	Null	Reserved		
24	Null	Reserved		
25	Null	Reserved		

Table 4-9 True values of JOB

JOB input port 3	JOB input port 2	JOB input port 1	Channel number
0	0	0	Channel 0
0	0	1	Channel 1
0	1	0	Channel 2
0	1	1	Channel 3
1	0	0	Channel 4
1	0	1	Channel 5
1	1	0	Channel 6
1	1	1	Channel 7

Remarks: in the true value table, 0 indicates that JOB input port is disconnected from ground, and 1 indicates that JOB input port is shorted to ground. If you need to enter the analog port JOB mode, the welding power source needs to be in recalling state.

- Color definition of communication cables

The colors of communication cables are defined as shown in Figure 4-2. Black 3 means that there are three points on the black cable.

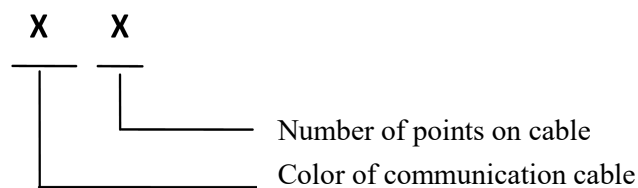


Figure 4-2 Examples of description of color definition of communication cables

- Remarks of pin definition

Note 1: a 24VDC power supply supplied by a robot or an automation device for welding. Its voltage range is limited to 20-30V. If the welding power source has a 24V output, this power cable is not connected.

Note 2: the equivalent circuit for transmitting I/O signals output by robot to the welding power source is shown in Figure 4-3, which is effective at low levels. When the voltage between the I/O signal + and - terminals in the figure is 0-5V, it is considered as a low level, and the welding machine operates. When the voltage between I/O signal + and - terminals is 18-24V, it is at a high level and welding machine does not operate. The voltage range of I/O signal is limited to 0-30V.

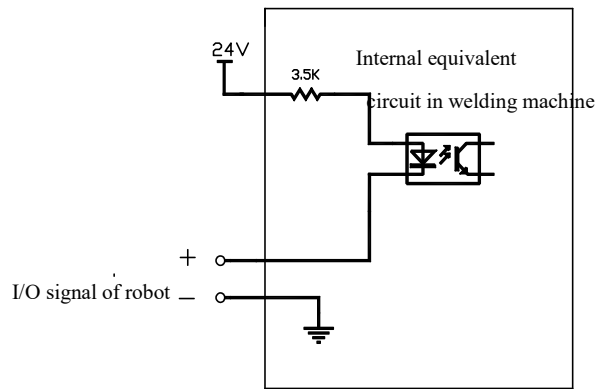


Figure 4-3 Signal equivalent circuit

Note 3: the equivalent circuit for transmitting I/O signals from welding power source to robot is shown in Figure 4-4, which is effective at low levels. When I/O signal output is low, the robot operates. When I/O signal output is high, the robot does not operate. The maximum load capacity of the I/O signal is 200mA.

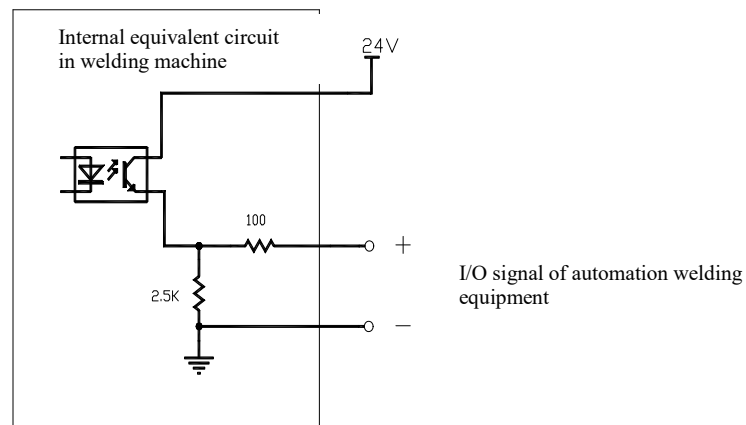


Figure 4-4 Signal equivalent circuit

1. The corresponding relationship between actual displayed current value of welding machine and analog output current value of welding machine, as shown in Figure 4-5;

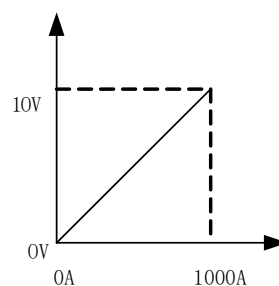


Figure 4-5 Signal equivalent circuit

2. The corresponding relationship between actual displayed voltage value of the welding machine and analog output voltage value of the welding machine, as shown in Figure 4-6;

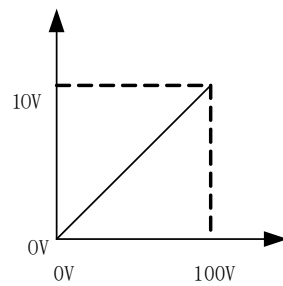


Figure 4-6 Signal equivalent circuit

3. The corresponding relationship between actual set current value of welding machine and analog receiving value of welding machine, as shown in Figure 4-7;

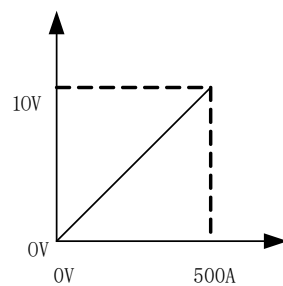


Figure 4-7 Signal equivalent circuit

4. The corresponding relationship between actual set wire feeding speed value of welding machine and the analog receiving value of welding machine, as shown in Figure 4-8;

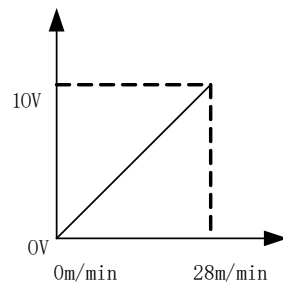


Figure 4-8 Signal equivalent circuit

5. The corresponding relationship between actual set voltage value of welding machine in separate mode and the analog receiving value of welding machine, as shown in Figure 4-9;

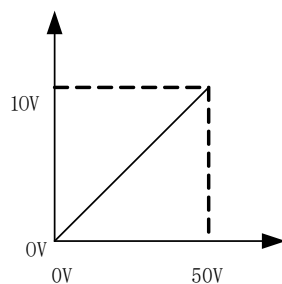


Figure 4-9 Signal equivalent circuit

6. The corresponding relationship between actual set voltage correction value of welding machine in synergic mode and analog receiving value of welding machine, as shown in Figure 4-10.

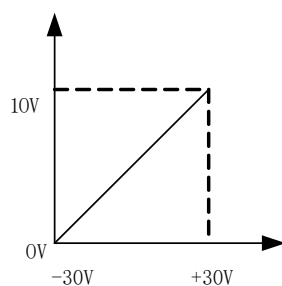


Figure 4-10 Signal equivalent circuit

4.22 Robot DeviceNet Interface

4.22.1 Definition of Aviation Pins

The aviation pin sequence of robot DeviceNet interface is shown in Figure 4-11, and the pin definition is shown in Table 4-8.

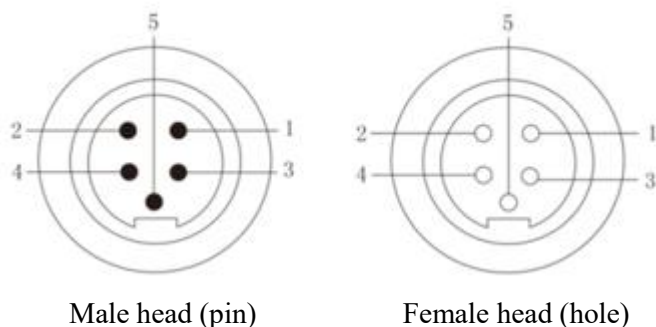


Figure 4-11 Aviation pin sequence

Table 4-10 Definition of aviation pins

Pin No.	Color	Signal name	Function
1	Red (18AWG)	24V power supply	power supply signal of robot
2	White (22AWG)	CAN_H signal cable	Communication cable CAN_H
3	Black (18AWG)	Ground wire	Power ground cable of robot

4	Blue (22AWG)	CAN_L signal cable	Communication cable CAN_L
5	Shielded cable(18AWG)	Shielded cable	Casing PE

Reminder

1. The welding power source provides 24V voltage. If robot has a 24V voltage, this power supply is not connected;
2. It is required to connect a 120 Ω resistor in parallel between high and low levels of DeviceNet port. If robot already has this resistor, there is no need to add the resistor;
3. The robot CANOpen communication shares the robot DeviceNet interface on the DeviceNet communication module, and pin definition is the same as Table 4-8.

4.22.2 Communication Configuration Information

The communication configuration information of DeviceNet interface is shown in Table 4-9.

Table 4-11 DeviceNet communication configuration information

Setting item	Setting content	Setting value	Remarks
1	Baud rate	125Kbps (default)	250Kbps, 500Kbps optional
2	Polling area master station sends data length	12byte	Robot sends data length
3	Polling area slave station replies data	13byte	Welding power source replies data length

4.22.3 Parameter Configuration Curve

MEGMEET and Fanuc DeviceNet parameter configuration curves.

- Given curve settings

1. The corresponding relationship of given current is shown in Figures 4-12;

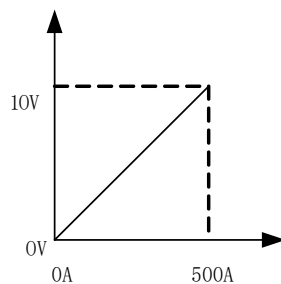


Figure 4-12 Corresponding relationship of given current

2. The corresponding relationship between synergic given voltage deviation values is shown in Figures 4-13;

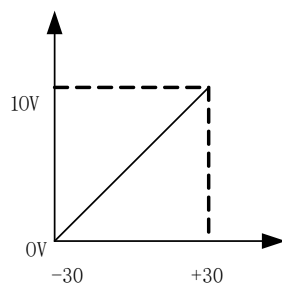


Figure 4-13 Corresponding relationship between synergic voltage deviation values

3. The corresponding relationship of given voltage in separate mode is shown in Figure 4-14;

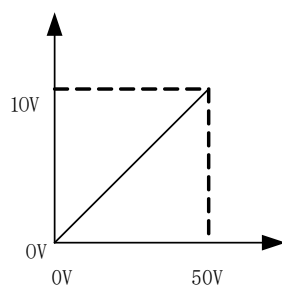


Figure 4-14 Corresponding relationship of given voltages in separate mode

- Feedback curve setting

1. Corresponding relationship of real time current feedback, as shown in Figure 4-15;

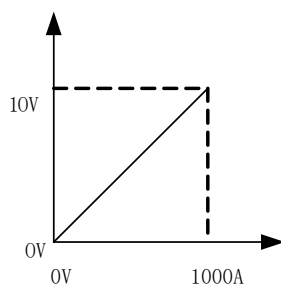


Figure 4-15 Corresponding relationship of real time current feedback

2. The corresponding relationship of real time voltage feedback is shown in Figure 4-16.

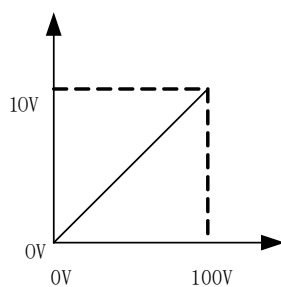


Figure 4-16 Corresponding relationship of real time voltage feedback

4.23 Robot EtherNet/IP Interface

4.23.1 Communication Configuration Information

The communication configuration information of EtherNet/IP communication interface is shown in Table 4-10.

Table 4-12 EtherNet/IP communication configuration information

Setting item	Setting content	Setting value	Remarks
1	Name/IP address	192.168.0.2 (default)	192.168.0.2-192.168.0.63 (the IP addresses of master and slave stations must be in the same segment)
2	Input size (bytes)	37	
3	Output size (bytes)	37	
4	RPI	20	
5	Assembly instance (input)	100	
6	Assembly instance (output)	150	
7	Configuration instance	1	
8	Manufacturer ID	90	
9	Equipment type	43	
10	Product code	55	

Reminder

1. The IP address of master station is the IP address of robot, which must be in the same segment as the IP address of the welding power source and cannot be duplicated with IP address of the welding power source;
2. The IP address of slave station is the IP address of welding power source, which defaults to 192.168.0.2. It can be set arbitrarily within the range of 1-63 through network parameter N01 in internal menu of the welding power source, without duplicates with the robot IP address;
3. The EtherNet/IP communication type is SCN (scanner). After EtherNet/IP communication configuration is completed, if the welding power source and the robot still cannot establish a connection, it is necessary to ping the IPs of master station (robot) and slave station (welding power source) on robot Teach Pendant page to ensure the normal link.

4.23.2 Advanced Configuration

Advanced communication configuration information of EtherNet/IP is shown in Table 4-11.

Table 4-13 EtherNet/IP advanced communication configuration information

Setting item	Setting content	Setting value	Remarks
1	I/O data type	8 bytes	
2	Timeout multiplier	4	
3	Re-connect	Invalid	
4	Main version	1	
5	Minor version	35	
6	Alarm severity	Cease	

7	Quick link	Invalid	
8	Originating end to target RPI	20	
9	Transmission type from target to initiator	Unicast	
10	RPI from target to initiator	20	
11	Connection type: type O=>T format	Running/idle data	
12	Connection type: Type O=>T format	Non-modal	
13	Configuration string status size (bytes)	0	

4.23.3 Parameter Configuration curve

Configuration of MEGMEET and Fanuc EtherNetIP parameter curves.

- Given curve settings

1. The corresponding relationship of given currents is shown in Figure 4-17;

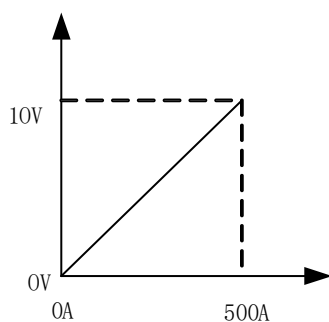


Figure 4-17 Corresponding relationship of given currents

2. The corresponding relationship between synergic given voltage deviation values is shown in Figure 4-18;

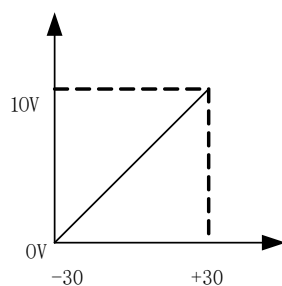


Figure 4-18 Corresponding relationship between synergic voltage deviation values

3. The corresponding relationship of given voltage in separate mode is shown in Figure 4-19;

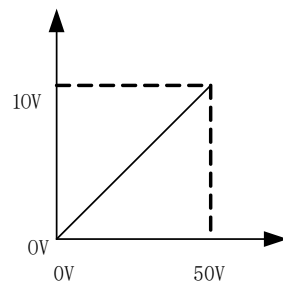


Figure 4-19 Corresponding relationship of given voltage in separate mode

- Feedback curve setting

1. Real time current feedback corresponding relationship, as shown in Figure 4-20;

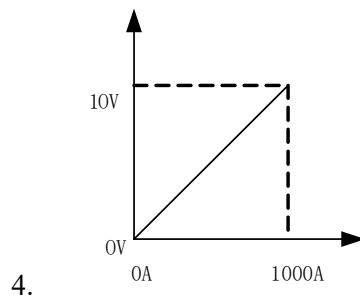


Figure 4-20 Real time current feedback corresponding relationship

2. The corresponding relationship of real-time voltage feedback is shown in Figure 4-21.

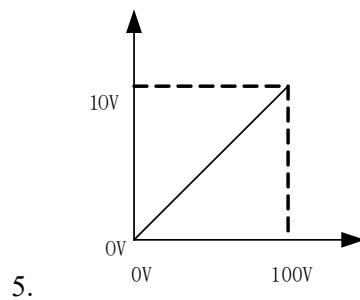


Figure 4-21 Real-time voltage feedback corresponding relationship

4.24 Robot Operation Steps

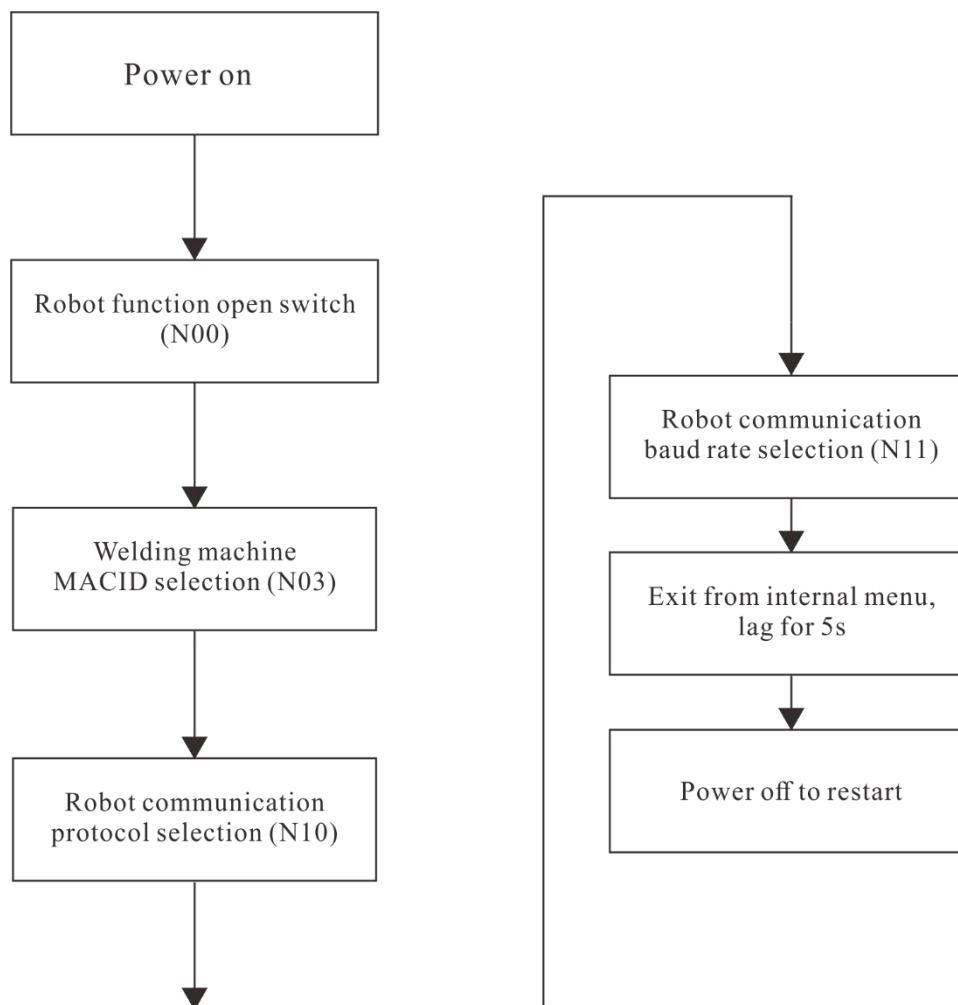


Figure 4-22 Robot operation steps

Note

1. In JOB re-calling mode, if you need to modify JOB parameters, you need to first exit JOB recalling mode, enter display panel control mode, and change (N parameter). After the modification, be sure to save parameter first, and then switch JOB number;
2. After robot's readiness signal is reset, the welding power source will first enter the arc ending state;
3. For the given curve and feedback curve, please refer to the description of each communication protocol.

Chapter 5 Error and Solution

5.1 Welding Power Source Error Indications

When there is an internal fault in welding machine, the red indicator light on the front panel will light up.

Note

When there is a deviation between current and voltage values displayed on LED digital tube and the set values during welding process, it is not necessarily an error, it may be caused by differences in the gas, welding wire, wire extension, welding methods, etc.

5.2 Welding Power Source Error Codes and Solutions

The error code display is as shown in Figure 5-1.

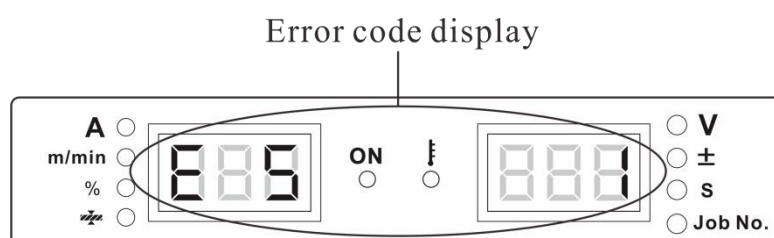


Figure 5-1 Error code display

The error codes and solutions for welding power source are shown in Table 5-1 below.

Table 5-1 Welding power source error codes and solutions

Fault code	Displayed content		Error content	Cause	Solution
	Left 3-digit tube	Right 3-digit tube			
E1	E1		Abnormal combination fault of main power board and auxiliary power board in series and parallel connection, and fan fault	Main power boards in series, auxiliary power boards in parallel	According to machine model, connect the main power boards and auxiliary power boards in series or parallel to maintain consistent status
E2	E2			Main power boards in parallel, auxiliary power boards in series	
E3	E3		Software and hardware mismatch fault	Software and hardware mismatch	Contact Megmeet
E4	E4				
E5	E5				
E6	E6		Abnormal input power supply Bus voltage overvoltage	Bus voltage overvoltage	1. Check if the input cable is connected correctly 2. Check if the input power supply is normal 3. M1 board damaged, replace the main power board
E7	E7			Input three-phase voltage overvoltage	
E8	E8			Input three-phase voltage undervoltage	
E9	E9			Input three-phase voltage phase loss	
E10	E10		15V power supply undervoltage fault of main control board	Abnormal auxiliary power supply on the main control board of the welding machine	Contact Megmeet

Fault code	Displayed content		Error content	Cause	Solution
	Left 3-digit tube	Right 3-digit tube			
E12	E12		Auxiliary power board fault	Output short circuit of auxiliary power supply board 1	
E13	E13			Output short circuit of auxiliary power supply board 2	
E14	E14	1~18	Button error	The display board button of machine stuck	Check if the relevant buttons are stuck, please check according to the corresponding panel number
E15	E15	1~6		The display board button of wire feeder stuck	
E16	E16		Illegal welding machine board	Welding machine display board illegal	Contact Megmeet
E17	E17			Welding machine main control board illegal	
E18	E18			Wire feeder control board illegal	
E19	E19			Welding machine robot communication board illegal	
E20	E20		Communication error	Internal communication error	Check if the terminals of LCD display board and its base plate are loose
E21	E21				Check if terminals on the display board and main control board are loose
E22	E22				Check if terminals on the main control board and wire feeder control board are loose
E23	E23				Check if the terminals on main control board and robot communication board are loose
E24	E24				Check if the terminals on control board and display board of the wire feeder are loose
E25	E25		EEPROM fault	Welding machine main control EEPROM fault	1. Power off and restart 2. Fault not recovered, contact the manufacturer
E28	E28		Current Hall not inserted	Current Hall connector not inserted	Check the current Hall connector
E29	E29		Welding torch error	When the welding power source is turned on, the welding torch switch is closed or damaged	Place the welding torch switch in the OFF state or replace the welding gun switch
E31	E31		Primary side over-current	1. The main transformer is damaged 2. The output diode module is damaged 3. The main power board is damaged	1. Check the main transformer 2. Check the output diode module 3. Check the main power board After inspection, restarting the welding machine to restore
E32	E32				
E33	E33		Output over-current	1. Output short circuit or excessive current 2. The output diode module is damaged	1. Check if the output is short circuited (whether there is adhesion between nozzle and conductive nozzle, and whether the welding wire

Fault code	Displayed content		Error content	Cause	Solution
	Left 3-digit tube	Right 3-digit tube			
					is short circuited with the workpiece) 2. After inspection, press the welding torch switch again to resume operation 3. Check if output diode module is damaged
E38	E38		Wire feeder error	Master wire feeder (pushing wire feeder) motor over-current	Check if welding wire is blocked or stuck
E39	E39			Slave wire feeder (pulling wire feeder) motor over-current	
E40	E40		Encoding disk error	The signal terminal of master wire feeder (pushing wire feeder) encoding disk is not securely connected	Check if the signal terminal of the encoding disk is securely connected
E41	E41			The signal terminal of master wire feeder (pushing wire feeder) encoding disk is not securely connected	
E42	E42		15V power supply under-voltage error of wire feeder	Abnormal auxiliary power supply on control board of welding machine wire feeder	Contact Megmeet
E44	E44		Over-temperature	Auxiliary power board 1 is abnormal (due to short circuit, over-current, etc.), causing it to over-temperature	Check if the auxiliary power board is abnormal
E45	E45			Auxiliary power board 2 is abnormal (due to short circuits, over-current, etc.), causing it to over-temperature	
E46	E46			Secondary side over-temperature	1. Strictly follow the rated load duration range for use 2. Check if the welding power source vent is blocked 3. Clean the radiator 4. Check if the fan is working properly
E47	E47			Primary radiator over-temperature	
E48	E48			Output terminal over-temperature	
E53	E53		Robot communication related errors	The short circuit time of high-voltage touch sensing function of robot board is too long	Check if output is consistently short circuited
E54	E54			Abnormal master station (robot, etc.)	Check if master station has entered a fault state
E55	E55			Abnormal communication the master station (robot, etc.)	Check if communication cable between master station and welding machine is disturbed
E56	E56			Communication with master station (robot, etc.) not established	Check communication configuration between master station and welding machine, and check if the communication cable is disturbed
E57	E57			MACID mismatch	Match the MACID of master station

Fault code	Displayed content		Error content	Cause	Solution
	Left 3-digit tube	Right 3-digit tube			
					and welding machine
E61	E61		Water cooler related faults	Water cooler water flow switch fault	Check water flow switch of the water cooler
E62	E62			Water cooler start switch fault	Check if water cooler switch relay is damaged
E65	E65		Long idle time fault	Output no-load voltage time too long	1. Check if negative electrode of the welding machine is connected to the workpiece 2. Check if output power of the welding machine is normal
E71	E71		SMARC IoT related error	SMARC IoT communication error	Check if the terminals on the display board and SMARC IoT module are loose
E73	E73			Abnormal card swiping	Please check if open the switch 'Abnormal card swiping, not allowed for welding' is turned on in the SMARC IoT platform - production specification, and if the card swiping operation is not performed correctly. If you do not need to use this function, please turn off this switch. If you need to use this function, please perform the card swiping operation correctly to resolve the error.
E76	E76			Working instruction issuing and JOB number error	1. Please check if the single specification JOB number exceeds the range 2. Please check if data is stored in the single specification JOB. Please resend the correct single specification JOB or return to free mode to resolve the error
E77	E77			SMARC IoT storage and operation error	Please check if the welding machine is in the standard state of panel recall, panel storage, and SMARC IoT. Please ensure that welding machine exits the above state and re-do the save operation to resolve the error
E78	E78			SMARC IoT storage and data error	1. Please check if the stored JOB number exceeds the range 2. Please check if the parameters stored in the JOB exceed the range 3. Please check if the process configuration stored in the JOB is incorrect Please resend the correct parameters to resolve the error.

Chapter 6 Maintenance

6.1 Daily Inspection

Safety Warning

Daily inspections must be carried out after disconnecting the power supply of the user's distribution box and turning off the power supply of the machine (except for appearance inspections that do not require contact with conductive materials) to avoid personal injury accidents such as electric shock and burns.

- Notices for use

1. Adherence to daily inspections is essential to maintain the high performance and safe operation of this welding equipment.
2. Daily inspections shall be carried out according to the items in the list below, and cleaning or replacement should be carried out when appropriate.
3. To ensure the high performance of this product, please use the parts provided or recommended by Shenzhen Megmeet Welding Technology Co., Ltd.

- Welding machine

Table 6-1 Daily inspection contents of welding machine

Item	Main inspection points	Remarks
Front panel	Whether each mechanical appliance is damaged or loose Whether the quick cable connector is tight Observe if the fault indicator light is flashing	The quick cable connector is a regular inspection item. If there is any unqualified situation, it is necessary to conduct internal inspection of the welding machine, supplement fastening or replace components
Back panel	Check if the input power supply cable is loose or damaged Check if the air inlet is unobstructed and free of foreign objects	
Top board	Check if the bolts are loose	If there is an unqualified situation, it is necessary to supplement and tighten or replace the components
Back board	Check if the feet are damaged or loose (optional)	
Side panel	Check if the side panel is loose	
Routine	Check for discoloration or overheating of the casing Check if the noise of the fan is normal when the welding machine is running Check if there is any odor, abnormal vibration or noise during the operation of the welding machine	If any abnormalities occur, internal inspection of the welding machine is required

- Cable

Table 6-2 Daily inspection content of cable

Item	Main inspection points	Remarks
Ground cable	Check the workpiece grounding cable.	If there is any unqualified situation, it is necessary to supplement and tighten or replace the components.
Welding cable	Check whether the insulation layer of the cable is worn or otherwise damaged, and whether there are exposed conductive parts. Check whether the cable is subjected to abnormal external force stretching. Check if the cable connecting the workpiece is securely connected to the workpiece	In order to ensure safe and normal welding, appropriate methods should be used for inspection based on the situation at the work site.

- Other accessories

Table 6-3 Inspection content of other accessories

Item	Main inspection points	Remarks
Welding torch	It should carry out daily inspection according to the requirements of the user manual of welding torch	/
Wire feeder	It should carry out daily inspection according to the requirements of the user manual of wire feeder	/
Water cooler	It should carry out daily inspection according to the requirements of the user manual of water cooler	
Gas meter	It should carry out daily inspection according to the requirements of the user manual of gas meter	/
Gas hose	It should check if the connection is secure. When using a soft clamp, it should be checked for looseness and whether the hose is worn or leaking	If there is an unqualified situation, it is necessary to supplement and tighten or replace the gas hose.

6.2 Regular inspection

Safety Warning

1. To ensure safety, regular inspections require professionally qualified personnel to carry out.
2. Periodic inspections must be carried out after turning off the power of user's distribution box and turning off the power of the welding machine. Avoid personal injury accidents such as electric shock and burns.
3. Due to the capacitor discharge, the inspection operation must be carried out after welding power source is block-out for 5 minutes.

- Instructions for operation

1. In order to prevent electrostatic damage to semiconductor parts and circuit boards, wear an antistatic device before touching the conductors and circuit boards inside the machine, or remove static electricity in advance by touching the metal parts of the machine casing with your hands.
2. When cleaning plastic parts, do not use solvents other than neutral detergents for household use.

- Regular inspection plan

1. In order to ensure the long-term normal use of this equipment, regular inspections must be carried out.
2. Regular inspections should be meticulous, including internal inspection and cleaning of the equipment.
3. Periodic inspection is generally carried out once every 6 months, but if there is more dust at the welding site, or if the oil smoke is large, the regular inspection time should be shortened to once every 3 months.

The recommended regular inspection schedule is shown in Table 6-4.

Table 6-4 Regular inspection schedule (year: XXXX)

No.	Planned inspection date	Actual inspection date	Inspector
1	XXXX-XX-XX		
2	XXXX-XX-XX		
3	XXXX-XX-XX		
...	...		

- Regular inspection content

(In addition to the following items, the user can add inspection items according to actual situation)

1. Internal dust removal of welding machine

By disassembling the side panels of welding machine, the splash and dust accumulated inside the welding machine can be blown away with dry compressed air, and then the dirt and foreign matter that are difficult to blow out can be removed.

Note

Too much dust accumulation on the radiator will affect the heat dissipation and easily cause over-temperature protection.

2. Welding machine inspection

Disassemble the side panel of welding machine, check whether the welding machine has signs of odor, discoloration, overheating damage, and check whether the connection part is loose.

3. Inspection of cable and gas hose

Check safety grounding cables, cables, gas hose, etc. It requires more detailed inspection on the basis of the daily inspection items, and routine supplemental tightening.

● Voltage withstand test and insulation test

Voltage withstand test and insulation test should be carried out by Megmeet after-sales service personnel, and can also be carried out by personnel with expertise in electrical and welding power sources.

Steps

1. Turn off the power supply of distribution box;
2. Remove all casing safety grounding wires;
3. Connect the three input power cables into one (excluding yellow and green cables) to short-circuit them;
4. Place the power supply switch of welding machine in the "ON" position;
5. On the secondary side, connect the positive output terminal and negative output terminal together with wires to short-circuit them;
6. On the control side, connect the communication connection terminal DB9, and pin 3 and pin 8 with wires to form a whole and short-circuit them;
7. The short-circuit connecting cables used above should be of the same model and have a cross-sectional area of no less than 1.25mm².

Note

All changes and treatments used for voltage withstand testing must be restored after completing the voltage withstand test.

6.3 After-sales Service

● Warranty card

Each welding power source has a warranty card, please fill in the warranty card related content.

Please read the contents of warranty card carefully and keep it properly.

● Maintenance

Please check according to 5.2 Welding power source error code and solutions, and preliminarily eliminate the error or record the error information.

Contact your local distributor if you need to repair or replace a part. Please use the parts and accessories provided or recommended by Shenzhen Megmeet Welding Technology Co., Ltd.

Megmeet has a 24 months warranty. The warranty period begins with the time of purchase recorded on the warranty card or purchase invoice.

If the product is damaged by the user due to abnormal use, it cannot be guaranteed, but it can be handled according to the repair method.

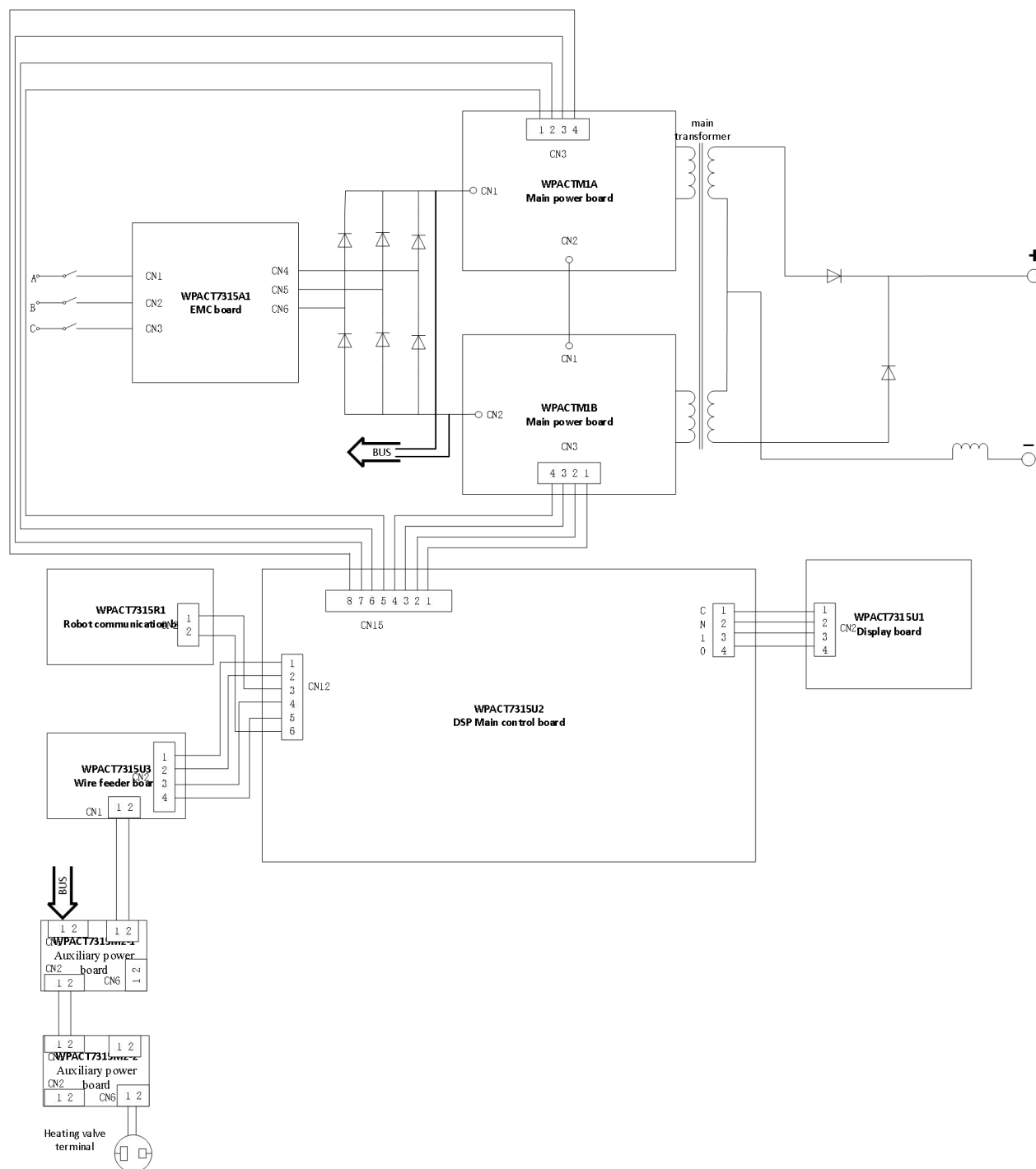
Appendix I Technical Specification

Attached table1-1 Technical specification of Megwave S&H series

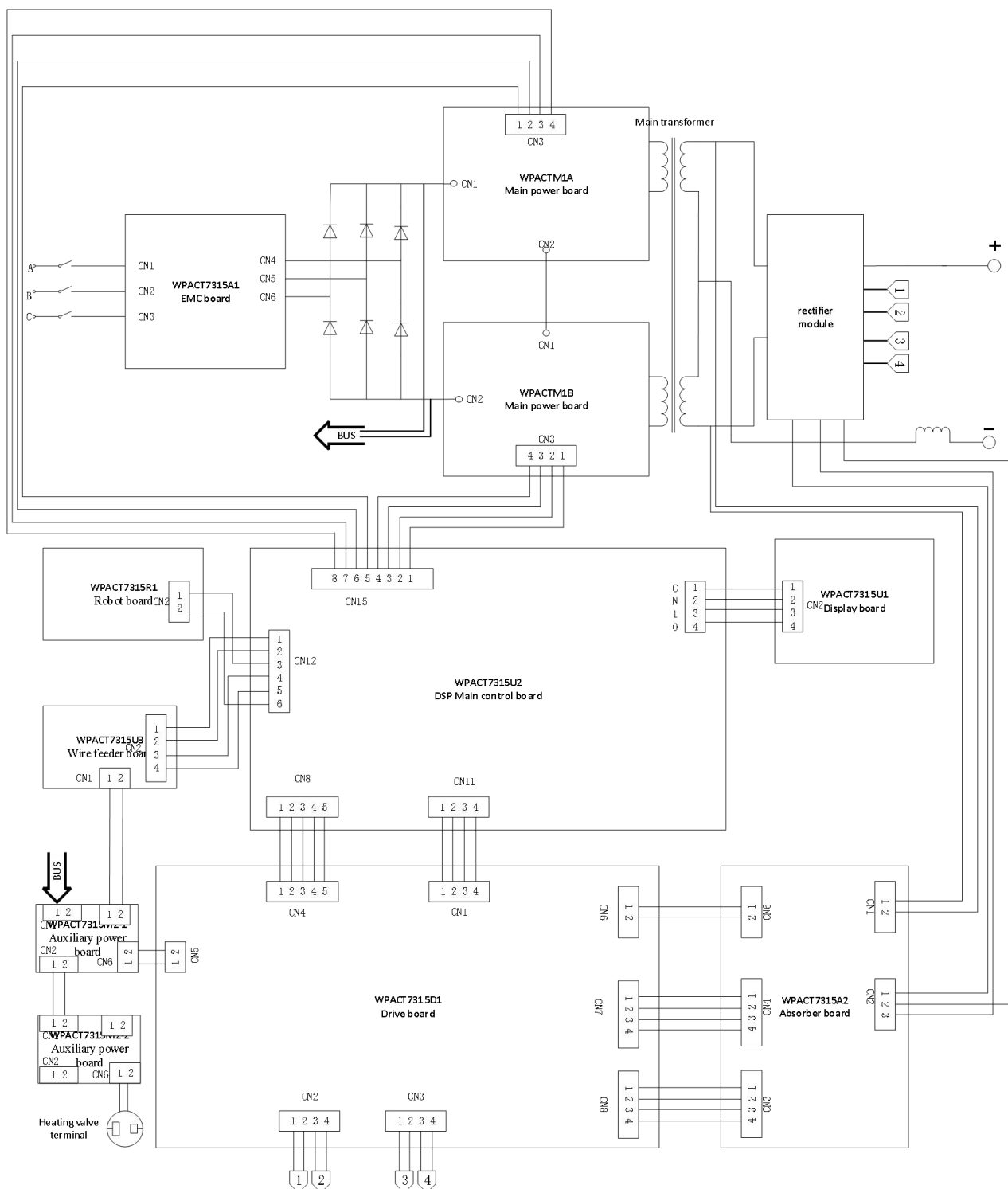
Welding power source	Megwave 500SD/P/T(R)	Megwave 350SD/P/T(R)	Megwave 500HD/P/T(R)	Megwave 350HD/P/T(R)
Control mode	Digital IGBT control			
Input voltage	3-phase AC 400 V(-28%～18%)			
Input frequency	40～70Hz			
Inverter switching frequency	110Khz			
Rated input capacity	23.3KVA/21.4KW	13.4KVA/12.3KW	24.1KVA/22.1KW	13.7KVA/12.6KW
No-load voltage	78V			
Rated output current	500A	350A	500A	350A
Rated output voltage	39V	31.5V	39V	31.5V
Temporary load rate	60%@500A 390A@100%	100%@350A	30%@500A 60%@400A 100%@350A	100%@350A
Power factor	0.92			
Efficiency	91%@500A	89%@350A	88%@500A	87%@350A
Output characteristic	CV			
Wire feeding speed	0.5～28 m/min			
Parameter JOB	50 sets			
Working temperature	-10℃～40℃ (welding power source-39℃ startup is available)			
Appearance size	L*W*H (mm) 647*291*572			
Weight	37KG		40KG	
Casing protection level	IP23 S			
Insulation level	H			
Cooling method	Forced air cooling			

Appendix II Electrical connection

Attached figure 2- 1 Electrical connection of Megwave 500/350S series

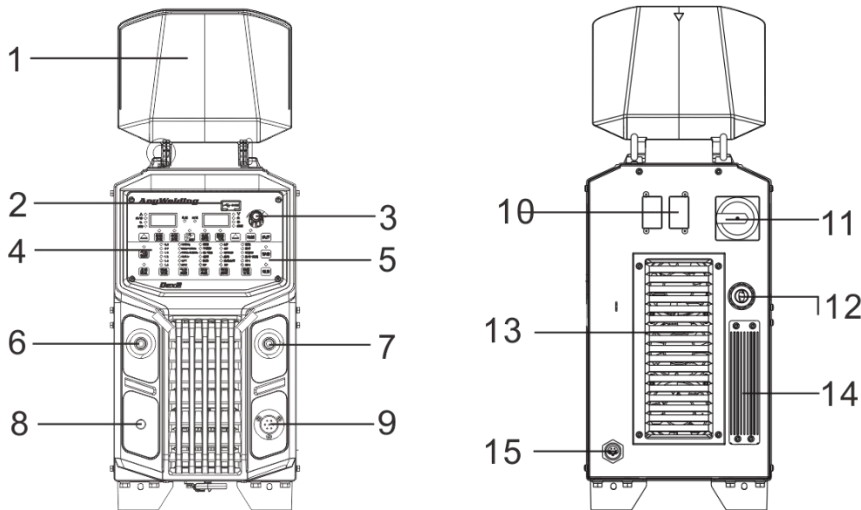


Attached figure 2- 2 Electrical connection of Megwave 500/350 H series

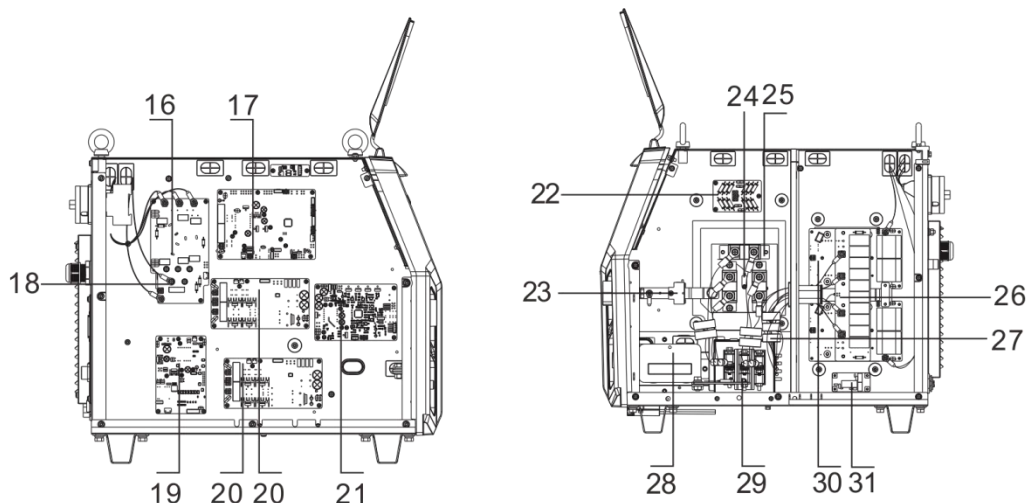


Appendix III Structural Details

Attached figure 3-1 Structural details of Megwave Megwave 500/350S series



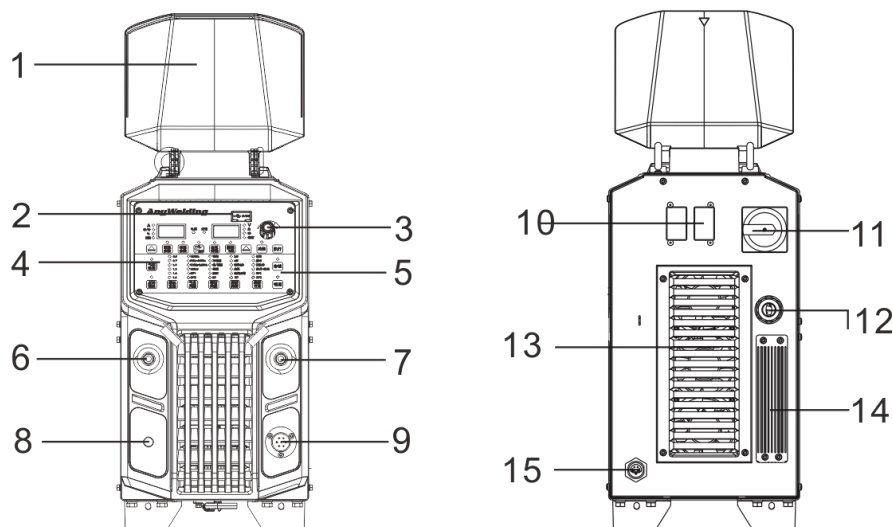
1	Dex transparent cover	R29061941	8	Sampling terminal	R30043235
2	USB waterproof rubber plug	R29160389	9	Seven-pin aerial socket	30040937
3	Panel knob of welding power source	R29140623	10	Internal communication interface	R30040881
4	WPACT7315-U1LED display panel	R111100VE	11	Air switch	R34011118
5	Magwave 500S surface film	R29106490	12	Three-phase input cable	R30072378
	Magwave 350S surface film	R29106506	13	DC fans	R34020311
6	Negative electrode of cable connection base	R30040912	14	Flashing	R29061869
7	Positive electrode of cable connection base	R30040911	15	Water tank socket	R30042738



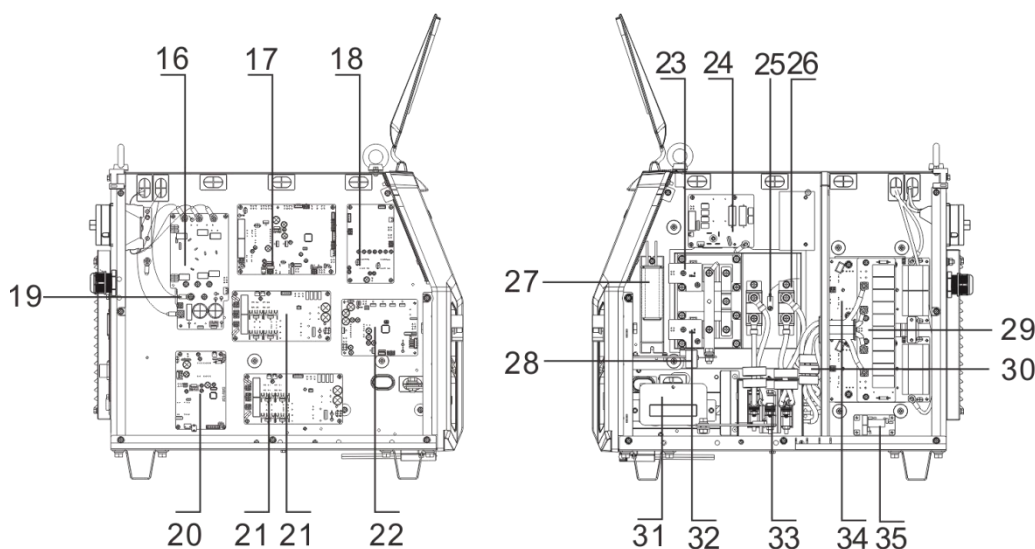
16	WPPM7315-A1 EMC filter board	R111100Y0	24	Temperature sensor	R27050274
17	WPACT7315-U1 main control board	R111100VT	25	Fast recovery diode module	R26060476
18	Bridge rectifier	R26060292	26	WPACT7315-C1 DC isolation capacitor board	R111100VY
19	WPACT7315-R1 robot board	R111100UJ	27	Transformer input magnetic core	R24010434
20	WPACT7315-M2 auxiliary power board	R111100VD	28	WPACT7315-L2 output inductor	R22041839
21	WPACT7315-U3 Wire feeder control board	R111100UY	29	WPACT7315-T1-2 Main transformer	R23013664
22	WPACT7315A4/AC Absorption board	R111104RN	30	WPACT7315-M1 main power board	R111100VU
23	Hall sensor	R27060058	31	WPPM2315-A2 water tank relay control board	R11112096

Appendix III Structural Details

Attached figure 3-2 Structural details of Megwave Megwave 500/350 H series



1	Dex transparent cover	R29061941	8	Sampling terminal	R30043235
2	USB waterproof rubber plug	R29160389	9	Seven-pin aerial socket	30040937
3	Panel knob of welding power source	R29140623	10	Internal communication interface	R30040881
4	WPACT7315-U1LED display panel	R111100VE	11	Air switch	R34011118
5	Magwave 500H surface film	R29106491	12	Three-phase input cable	R30072378
	Magwave 350H surface film	R29106507	13	DC fans	R34020311
6	Negative electrode of cable connection base	R30040912	14	Flashing	R29061869
7	Positive electrode of cable connection base	R30040911	15	Water tank socket	R30042738



16	WPPM7315-A1 EMC filter board	R1111025P	26	Fast recovery diode module	R26060476
17	WPACT7315-U1 main control board	R111100VT	27	WPACT7315 L5 inductor	R22041840
18	WPACT7315-D1 IGBT driving board	R111100UK	28	Hall sensor	R27060058
19	Bridge rectifier	R26060292	29	WPACT7315-C1 DC isolation capacitor board	R111100VY
20	WPACT7315R1 robot board	R111100UJ	30	Transformer input magnetic core	R24010434
21	WPACT7315M2 auxiliary power board	R111100VD	31	WPACT7315-L2 output inductor	R22041839
22	WPACT7315U3 wire feeder control board	R111100UY	32	WPACT7315D3/STT Module driver board	R111100YB
23	IGBT power module	R26060800	33	WPACT7315-T1-2 main transformer	R23013664
24	WPACT7315A2 STT absorption board	R111100VS	34	WPACT7315-M1 main power board	R111100VU
25	Temperature sensor	R27050274	35	WPPM2315-A2 water tank relay control board	R11112096

MEGMEET Shenzhen Megmeet Welding Technology Co., Ltd.

Warranty Form for Welding Power Source

User Company Name:	
Detailed address:	
Postcode:	Contact person:
TEL:	Fax:
Model:	
Power:	Device No.:
Contract No.:	Date of purchase:
Service unit:	
Contact person:	TEL:
Repair personnel:	TEL:
Date of repair:	
User evaluation of service quality: ☐ A ☐ B ☐ C ☐ D Other opinions: User signature: MM/DD/YY	
Follow-up record of customer service center : ☐ Telephone follow-up ☐ Letter follow-up Other: Signature of technical support engineer: Date: MM/DD/YY	

Note : this form will be invalidated when the user cannot be followed up.

MEGMEET Shenzhen Megmeet Welding Technology Co., Ltd.

Warranty Form for Welding Power Source

User company name:	
Detailed address:	
Postcode:	Contact person:
TEL:	Fax:
Model:	
Power:	Device No.:
Contract No.:	Date of purchase:
Service unit:	
Contact person:	TEL:
Repair personnel:	TEL:
Date of repair:	
User evaluation of service quality: ☐ A ☐ B ☐ C ☐ D Other opinions: User signature: MM/DD/YY	
Follow-up record of customer service center : ☐ Telephone follow-up ☐ Letter follow-up Other: Signature of technical support engineer: Date: MM/DD/YY	

Note : this form will be invalidated when the user cannot be followed up.

Notices to User

1. The warranty scope is limited to the welding power source body.
2. The warranty period is 24 months. Under normal use, any welding power source failure or damage that occurs during the warranty period will be repaired free of charge by our company.
3. The warranty period starts from the manufacturing date of the welding power source. The welding power source code shown on the nameplate is the only basis for determining warranty period. The machine without code shall be treated as expired of warranty period.
4. During the warranty period, certain repair fees will be charged for the following situations:
 - Any welding power source failure caused by not following the user manual;
 - Any welding power source damage caused by fire, flood, abnormal voltage, etc.;
 - Any damage caused by that welding power source is used for abnormal purposes.
5. The service fee is calculated based on the actual cost. If there is any separated contract, it should be treated according to the principle of contract priority.
6. Please make sure to keep this form and show it to the repair company during warranty.
7. If you have any questions, please contact our distributor or directly contact our company.

Shenzhen Megmeet Welding Technology Co., Ltd.
Customer Service Center

Address: 4-5th Floor, Block 2, New Materials Industrial Park, No28, Langshan Road,
Nanshan District, Shenzhen, Guangdong Province, China
Post code: 518057
Customer service hotline: 400-666-2163

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Nanshan District, Shenzhen, Guangdong Province, China, 518057