

User Manual



MetaTig Series Full-digital Inverter DC TIG&AC/DC TIG Welding Power Source

DC argon arc welding series: MetaTig 500/400/315DC

AC/DC argon arc welding series: MetaTig 500/400/315ACDC

MEGMEET

MetaTig Series Full-digital Inverter DC TIG&AC/DC TIG Welding Power Source User Manual

Version: V1.0

Code: R33011103

Megmeet Welding Technology Co.,Ltd. provides customers with all-around technical support, users can contact local dealers or company headquarters.

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Preface

Thank you for purchasing MetaTig series full-digital Inverter AC/DC Welding Power Source(hereinafter referred to as the welding power source)produced by **Megmeet Welding Technology Co.,Ltd.**

This manual gives precaution related to installation and wiring,parameter setting,fault diagnosis and troubleshooting,and daily maintenance.To ensure the correct installation and operation of the welding power source and give full play to its superior performance,please read through this user manual before installing the power source,and keep properly and give it to the user of the welding power source.

Megmeet Welding Technology Co.,Ltd.keeps researching,developing and innovating products.In case of any discrepancy between the contents,parameters and figures in this user manual and those of actual products,the actual products shall prevail.The manual is subject to change without prior notice.The company has the final right to interpret this user manual.

Safety Precautions

Safety Definition

In order to use the machine safely and correctly to prevent harm to you or others and damage to property, this manual uses various warning signs to explain it, and must be strictly followed on the basis of full understanding.

The following signs are classified according to the degree of danger or damage and warned.



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.

Installation Precautions



DANGER

- Before handling and moving the welding machine, the input power of distribution box switch must be cut off.
- When using a crane to handle the welding machine, it must be confirmed that the machine shell is installed.
- The welding machine shall not be hoisted at the same time as other objects.
- Please install on non-combustible objects, otherwise there is a risk of fire.
- Do not put combustibles nearby, otherwise there is a risk of fire.
- Do not install in an environment containing explosive gases, otherwise there is a risk of explosion.
- Wiring work must be carried out by a professionally qualified person, otherwise there is a risk of electric shock.
- Confirm that the input power supply is completely disconnected before wiring, otherwise there is a risk of electric shock.
- Before powering on, the ground cable of the welding machine must be reliably grounded, otherwise there is a risk of electric shock.
- The housing of machine must be installed before powering on, otherwise there is a risk of electric shock.
- When power is on, do not touch the terminal with your hands, otherwise there is a risk of electric shock.
- Do not operate the welding machine with wet hands, otherwise there is a risk of electric shock.
- Maintenance operations should be carried out after 5 minutes of disconnecting the power source, at which point the welding power indicator is completely extinguished and confirm that the positive and negative bus voltages are at 36V, otherwise there is a risk of electric shock.
- The parts must be replaced by professional personnel, and it is strictly forbidden to leave the thread or metal objects in the machine, otherwise there is a risk of fire.
- After replacing control board, the parameters must be set correctly before it can be operated, otherwise there is a risk of damage to property.
- The wiring cable must be wrapped with insulating tape and must not be exposed, otherwise there is a risk of electric shock.
- The power supply of the water cooler power plug is high-voltage AC380V, 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 and strong.
- 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 occasions 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 wire nose must be firmly connected, otherwise there is a risk of damage to property.

Precautions for use



- In order to ensure safety, personnel with safe operation knowledge and welding skills are invited to perform welding operations.
- 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 professional personnel.
- 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 damage.
- Do not remove the case 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, please be supervised by an inspector and fully ventilate 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 ventilate fully or use respiratory protection equipment, otherwise it will endanger your health.
- Do not weld pressure vessels such as gas pipes and sealed tanks filled with gas.
- Do not place hot work-pieces near combustibles.
- Do not weld near combustibles.
- Please place a fire extinguisher near the welding operation site.
- The cylinder must be fixed with a special bracket, otherwise the cylinder dumping may cause personal injury.
- Do not touch the electrode with the cylinder.
- Please use the pressure reducing valve correctly according to the requirements.

- The disassembly and maintenance of the 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. Prevent damage from arc light, spatter, welding slag.



- It is forbidden to use this welding machine for operations other than welding.
- Do not place 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 machine.
- Keep the distance between it and the wall or other welding machine at least 30cm.
- To prevent the wind from blowing the arc directly, please use a screen to block it.
- Please fix the wheels to avoid the welding machine from coasting.
- In order to prevent electromagnetic hazards, please shield the cable or 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: $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$
 - Transportation and storage temperature range: $-40^{\circ}\text{C} \sim +70^{\circ}\text{C}$
 - Working humidity range: at 40°C , not more than 75%RH; At 20°C , it does not exceed 95%RH
 - There is no 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 on the welder or rain on 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 printed circuit board 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

MetaTig Series Full-digital Inverter DC TIG&AC/DC TIG Welding Power Source has the following characteristics:

- Multiple waveform:sine wave,triangle wave,trapezoidal wave,square wave
- 110KHz high-frequency inverter switching frequency brings ultra-low output ripple current
- Adopting a unique arc stabilizing circuit to ensure arc is almost continuous under any waveform
- High frequency AC output,high dynamic response,zero-crossing arc stability
- AC TIG:AC frequency can reach 300Hz,and arc can start and weld at 10A
- DC Pulse TIG:Pulse frequency can reach 3000Hz,3A can stabilize arc starting and welding

1.2 Model Description

Model description of welding machine is shown in Figure 1-1.

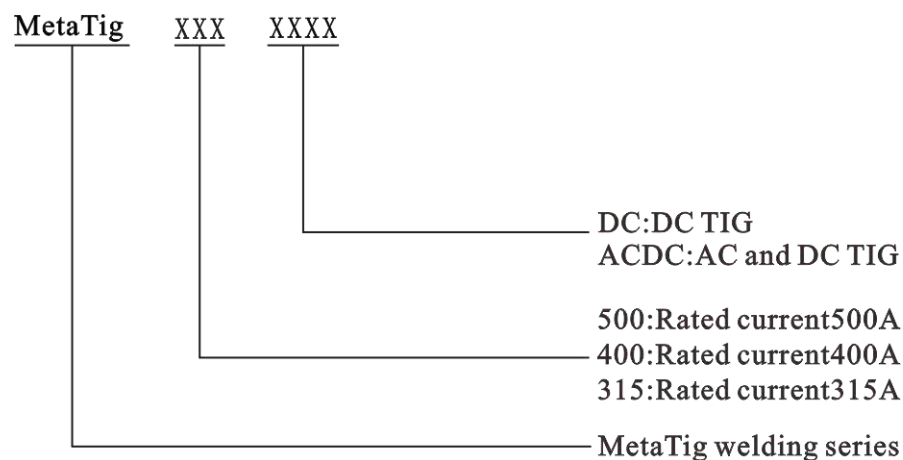


Figure 1-1 Model description

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.

Table 1-1 Welding power source dimensions and net weight table

Part name	Model	Overall dimensions(length*width*height)mm	Net weight(kg).
Welding Power Source	MetaTig 500DC MetaTig 400DC MetaTig 315DC	647*291.5*572	37
	MetaTig 500ACDC MetaTig 400ACDC MetaTig 315ACDC		40

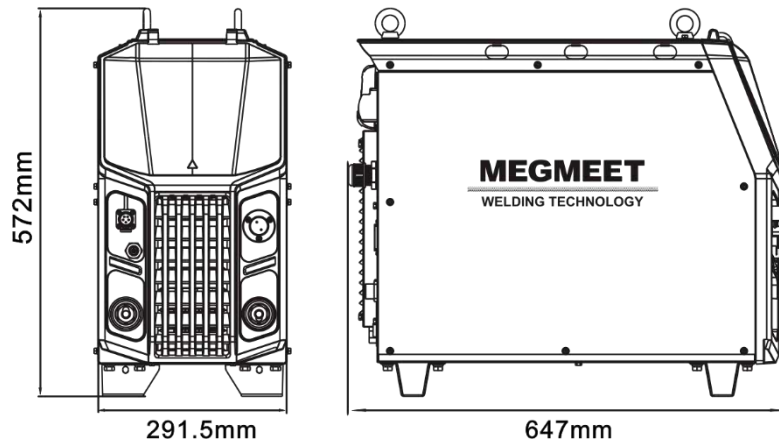


Figure 1-2 Exterior dimension drawing

1.4 System Composition

Welding machine system is shown in Figure 1-3.

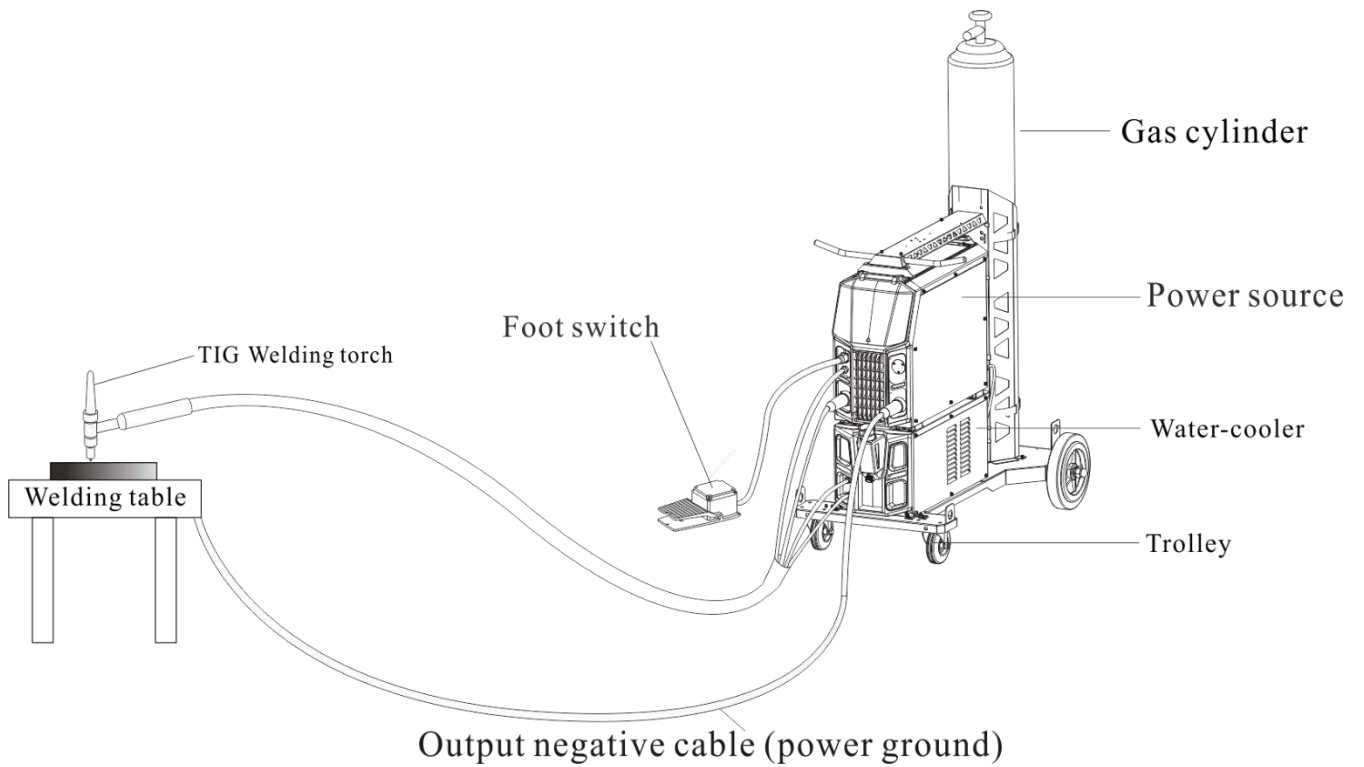


Figure 1-3 Schematic diagram of system composition

Chapter 2 Installation and Wiring

This chapter describes welding machine installation requirements, operating procedures, and precautions.

2.1 Unpacking Inspection

1. Before unpacking, please confirm that the outer packaging of the product is in good condition.
2. After unpacking, please confirm whether the accessories and instructions of welding machine are complete, and whether the model is consistent with the purchase order (if you find accessories are missing or wrong, please contact 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, so do not destroy it!

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 pay attention to windproof, and use wind deflectors if necessary, otherwise it will affect welding performance;
 6. If there are special installation requirements, please consult and confirm in advance;
 7. The welding machine is at least 20cm away from the wall, and the interval should be more than 30cm when multiple welding machines are placed side by side, it is recommended to place the welding machine according to the reserved space in Table 2-1, otherwise the best air cooling effect will be affected.

Table 2-1 Welding power source installation overhead

	Front	Top	Left side	Right side	Back side
Reserve 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 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 welding power source hoisting, and it is recommended that the maximum angle of the lifting rope is 30 degrees.

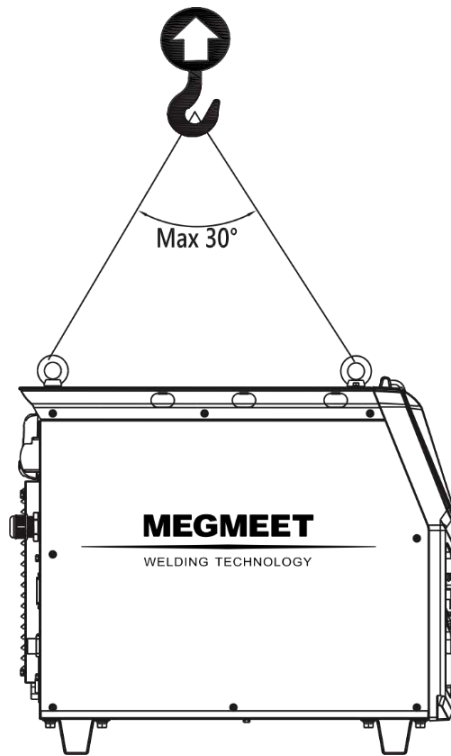


Figure2-1 Hoisting diagram

2.4 Electrical Connection Steps

1. TIG welding torch connection(see 2.4.1 Welding Torch Connection)
2. Water cooler connection(see 2.4.2 Water Cooler Connection).
3. Shielding gas connection(see 2.4.3 Gas Hose Connection)
4. Foot pedal connection(see 2.4.4 Foot Pedal Connection).
5. Input power cable connection(see 2.4.5 Input Power Cable Connection).

2.4.1 Welding Torch Connection

Steps

1. Connect positive power cable(TIG ground cable)to the positive output terminal of welding power source(+)and tighten it;
2. Connect welding torch to the(-)negative output terminal of welding power source;
3. If equipped with a water-cooled welding torch, connect inlet and outlet hose of welding torch to the corresponding interfaces of water cooler(air-cooled welding gun does not need to be connected);
4. Connect the gas hose of welding torch to the gas.

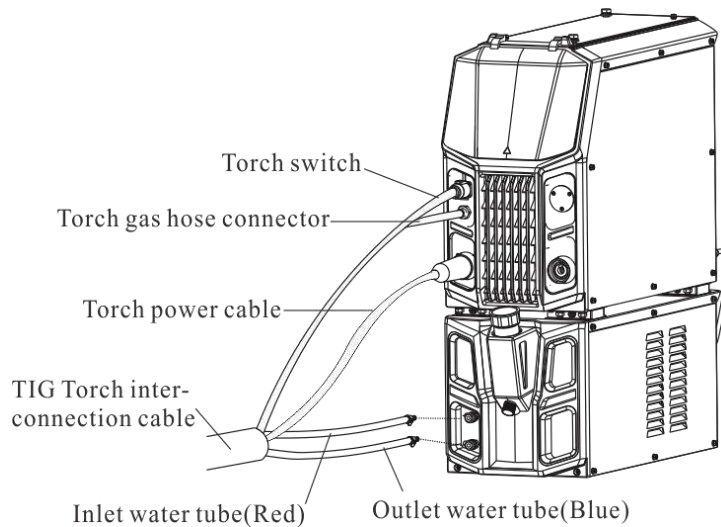


Figure2-2 Schematic diagram of welding torch connection

2.4.2 Water Cooler Connection

Working voltage of water cooler is 380VAC, which can be powered by the welding power source, and the power cable of the water cooler is connected to the position shown on the welding power source.

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

Water cooler switch: Turn F18 to ON, default is OFF;

Water flow switch detection function: Turn F19 to ON, default is OFF.

(For detailed operations, please see Chapter 5 Internal Menu on P30)

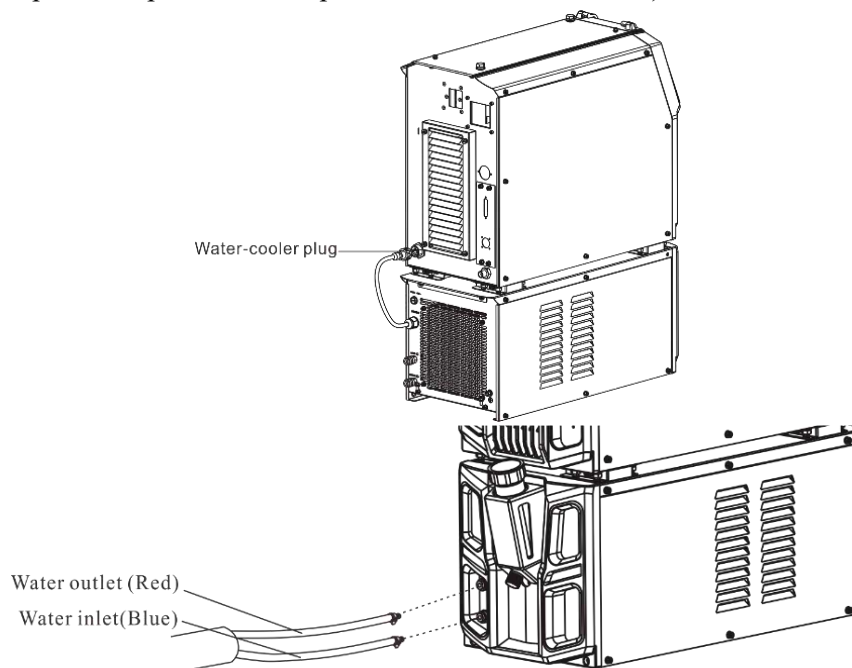


Figure2-3 Schematic diagram of water cooler connection



Security Warnings

1. The power supply of the water cooler power plug is high-voltage 380VAC, please turn off welding power source when wiring, otherwise there is a risk of electric shock;
2. When the ambient temperature is lower than 10°C, please use water cooler all-organic antifreeze, otherwise there is a risk of damaging the tank.

2.4.3 Gas Hose Connection

Steps

1. Install gas flow meter on the gas cylinder;
2. Connect both ends of the gas hose to the gas flow meter interface and the welding power source respectively.

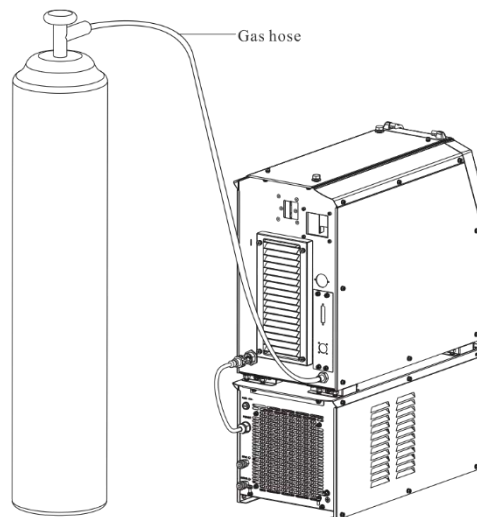


Figure2-4 Schematic diagram of gas hose connection

2.4.4 Foot Pedal Connection

Steps

1. Connect the control cable(5-pin)of the foot pedal to the welding power source;
2. Welding torch switch and current can be controlled through the foot pedal;
3. Foot pedal can be set as needed with the maximum distance range:5-500A;
4. When the foot pedal is connected,welding machine is ADP(adaptive mode:plug and use);
5. If need to cancel the"current distance setting"function of the foot pedal,please enter the internal menu N12 of the welding machine.

N12 selects FOT:the foot pedal can adjust the current distance range and start&stop switch;welding machine panel cannot adjust current.

N12 selects PAN:the foot pedal is only used as a switch,and all parameters are controlled by welding machine panel.

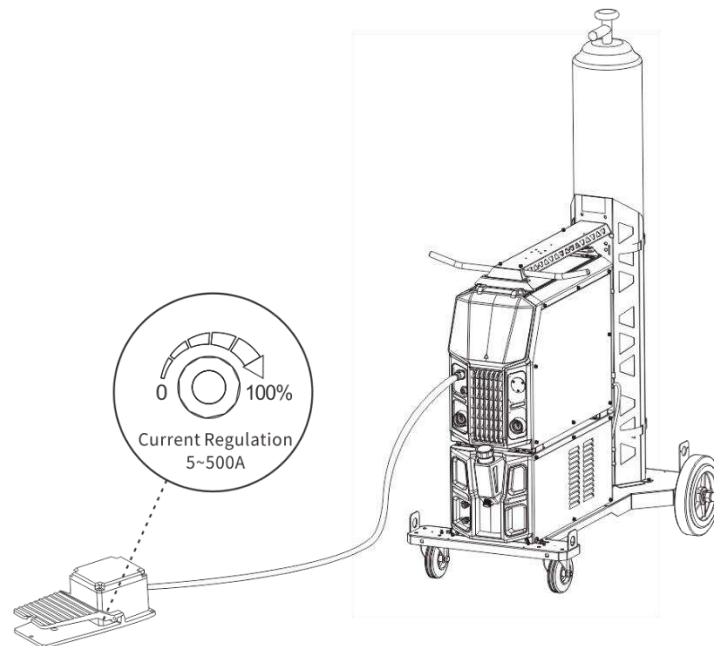


Figure2-5 Foot pedal connection



Note

1. Current adjustment of the foot pedal is only effective in the mode of 2 steps. While in 4 steps, special 4 steps, and spot welding modes, the foot pedal is only used as a switch, and current adjustment is invalid;
2. In MMA mode, the foot pedal is invalid;
3. The foot pedal is an optional accessory, if not from Megmeet, it cannot be used.

2.4.5 Connecting Input Power Cable(380VAC)

Steps

1. Turn off the switch of distribution box;
2. Open input terminal cover at the rear of welding machine, connect the power cable to the input end of the welding machine, then use a clamp bracket to fix the power cable to prevent it from being dragged directly, and close input terminal cover;
3. Connect the safety ground cable in the power cable to the M6 ground stud of the welding power source housing;
4. Connect the other side of the power cable to the output terminal of switch on the distribution box and complete the connection. As shown in Figure 2-6.

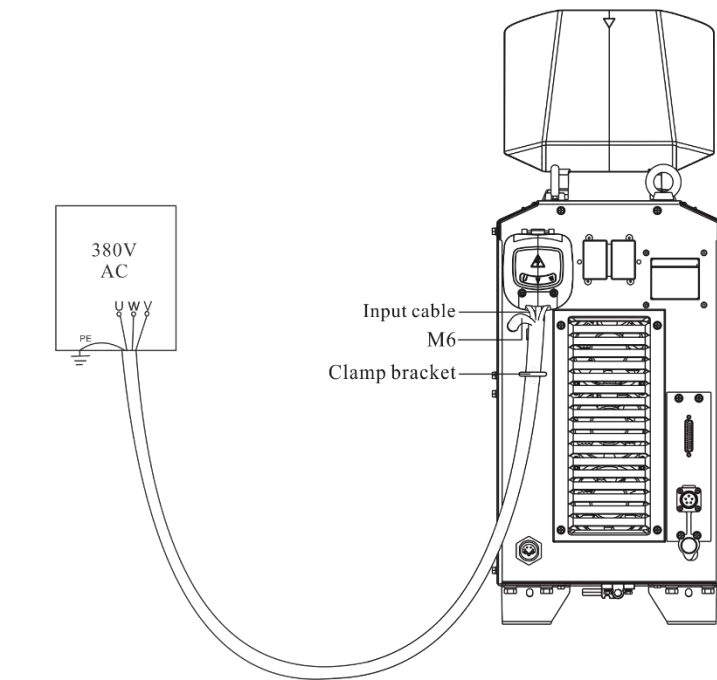


Figure2-6 Schematic diagram of 380VAC input power connection



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 MetaTig 315 series and MetaTig 400 series should be 6mm² or above,MetaTig 500 series power input cable should be 10mm² or above.
-

Chapter 3 DC TIG Welding Machine Series

3.1 Series Description

DC TIG welding machine series: MetaTig 500 DC, MetaTig 400DC, MetaTig 315DC.

3.2 Operation Panel Functions

The function description of panel is shown in Figure 3-1.

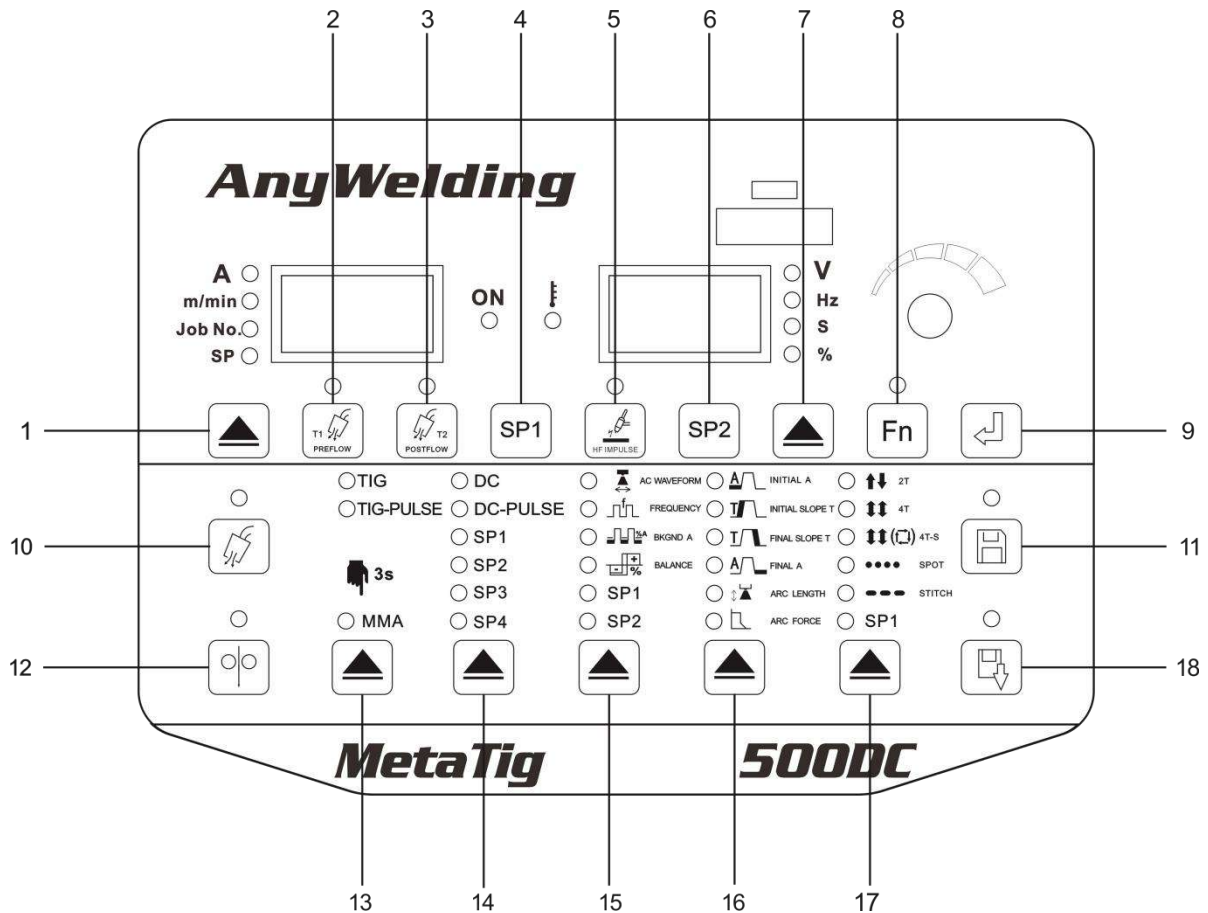


Figure3-1 Description of operation panel functionality

Table3-1 Function description

Numbering	Number Name	Description of each function button
1	Left Select key	Used to switch among current,wire feed speed,channel
2	Gas preflow	Used to set the pre gas time of welding gas
3	Gas postflow	Used to set the post gas time of welding gas
4	SP1	SP is reserved for customized need
5	HF Impulse	For switching between high-frequency arc starting and lifting arc starting
6	SP2	SP is reserved for customized need
7	Right Select key	Used to switch among voltage,frequency,time parameters and percentages

8	Function selection	For entry and exit of the internal menu(long press for 3s to enter,short press to exit)
9	Enter button	Used for the confirmation of parameters and the operation of locking function
10	Gas flow detection	Check whether there is protective gas.
11	Save	To save and store the selected welding parameters
12	Wire inching	Reserved(for automatic wire filling)
13	Welding program selection	Used to select different welding program(TIG,Tig-Pulse,MMA).
14	Mode selection	For the selection of different welding mode(DC,DC-PULSE).
15	Arc selection	Used to select different output current waveforms(hardness,frequency,intensity,duty cycle).
16	Welding sequence	Used to select the welding sequence(initial current,rise time,fall time,arc end current,MMA arc length,thrust current).
17	Mode control	For operation in different welding control(2-step,4-step,special 4-step,spot welding,continuous spot welding).
18	Recall	To recall the stored welding parameters.

3.3 Gas Flow Detection



Click

Check whether there is gas and to set the gas flow on regulator.

Press "gas flow detection" button, LED light will turn on, and you can check the functions of gas flow rate, gas opening and others.

If it does not actively shut down and it is detected that it has not been working for 5 minutes, it will shut down automatically (5 minutes is the default value, you can enter the internal menu to set the shutdown time)

3.4 Wire Inching

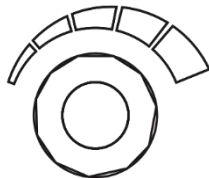


For automatic wire filling(reserved).

3.5 Gas Preflow



Click



Adjust the time range of the Pre Gas
0~25S

After welding torch switch button is pressed, arc starts after 0.3 seconds of Pre gas flow in advance by default.

Time range of pre gas can be set: 0-25s. Press the "Pre gas" button on the panel, the LED light is on, then adjust the time range by the main knob on panel.

3.6 Gas Postflow



When torch switch button is released, gas supply will automatically stop after 2 seconds by default.

Time range of post gas time can be set: 0-250s, Press the "Post gas" button on panel, the LED light is on, then adjust the time range by the main knob on panel.

3.7 HF Impulse



- **High-frequency arc ignition**

LED light of "High Frequency Arc Ignition" button is on (default), and high frequency and high voltage are used for non-contact arc ignition.



Note

When arc starting is abnormal, please check: whether the cable and welding torch are firmly connected, and whether the tip of tungsten electrode is too blunt.

- **Lifting Arc Start**

Turn off "High Frequency Arc Ignition" button, LED light turns off, and it becomes lifting arc start (scratch ignition), and no high frequency high voltage is generated when arc starts, suitable for special welding occasions.



Note

If arc start too many times, it will be difficult to start the arc due to dirt on the surface of tungsten electrode (whitening), so please regrind the tungsten electrode.

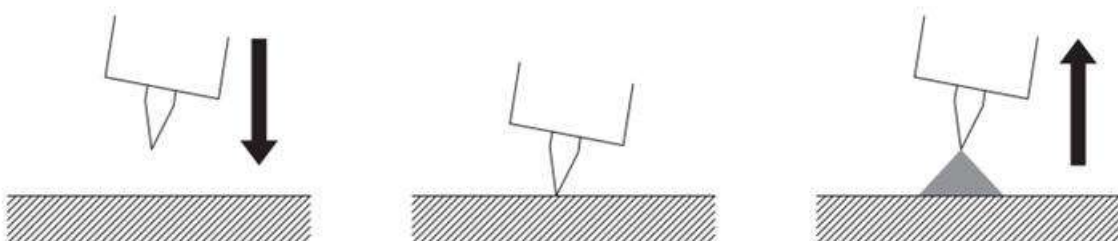


Figure 3-2 Schematic diagram of lifting arc start

3.8 Mode Control



Press the "Trigger selection" key, LED light is on as above.

3.8.1 2 Steps

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

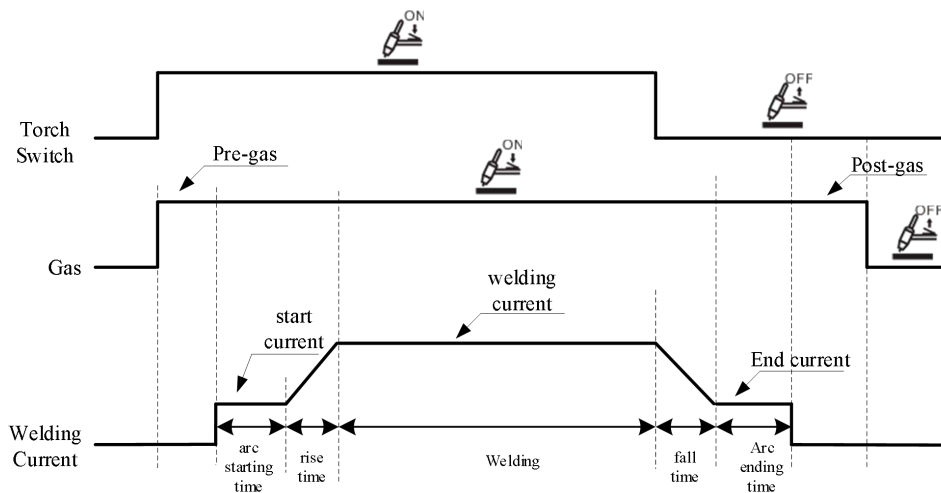


Figure3-3 2-steps logic diagram

3.8.2 4 Steps

4-step mode arc starting time is determined by the arc starting time set on the welding machine panel, and the arc ending parameter time is determined by the time the welding torch switch is pressed.

Steps

1. Press welding torch switch and release it after arc starting. After the arc starting time is over, the welding current will automatically start;
2. Press and hold the welding torch switch again to enter arc end current;
3. Release the welding torch switch to stop welding.

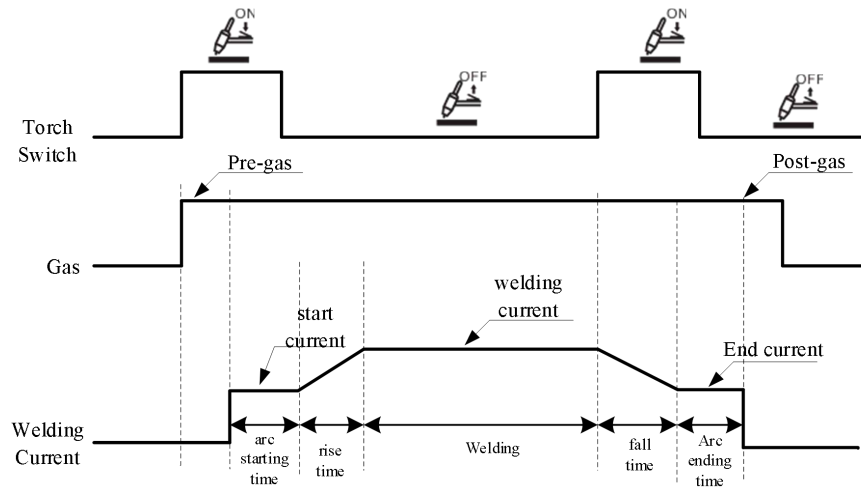


Figure3-4 4-step logic diagram

3.8.3 Special 4 steps

Arc start current time and arc end current time are decided by the time that the torch switch is held on.

Steps

1. Press and hold the welding torch switch to start arc, and enter welding current after releasing the torch switch;
2. Press and hold the welding torch switch again to enter arc end current;
3. Release the torch switch to stop welding.

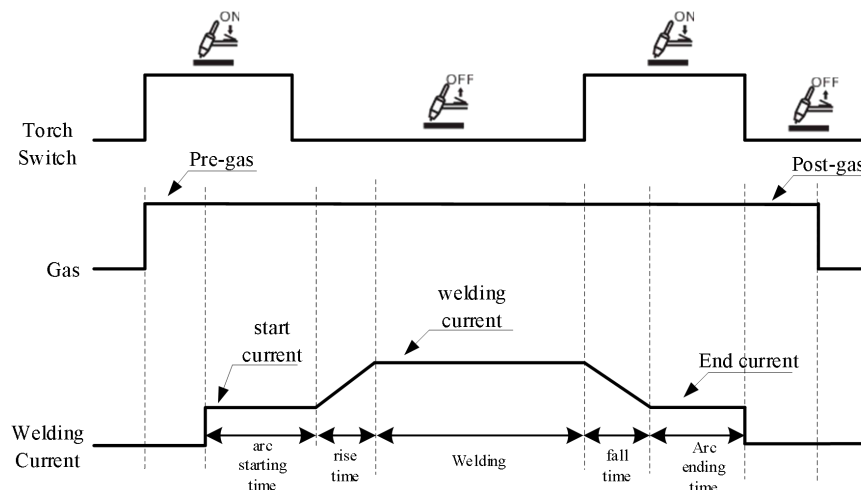


Figure3-5 Special 4-step logic diagram

3.8.4 Spot Welding

Steps

1. Press the "Trigger control" key to switch to spot welding mode and switch to Spot welding mode.
2. Turn right knob, set the spot welding time, press the welding torch switch, and weld;

- Loosen the welding torch within a pre-set spot welding time and the arc can still be discontinued.

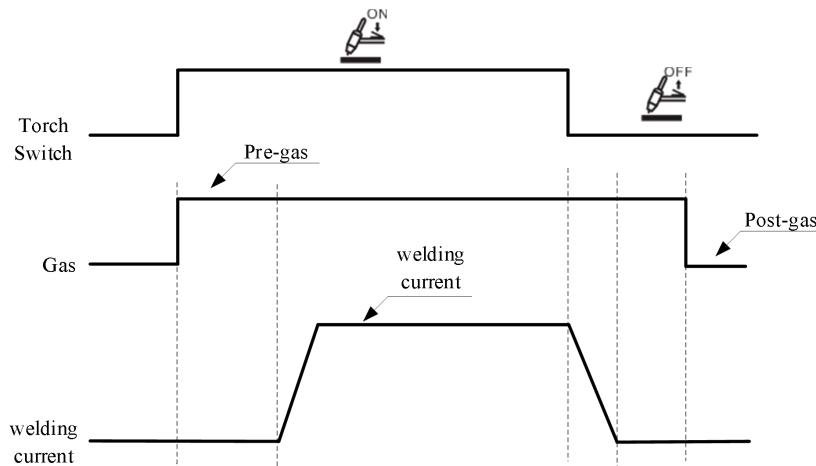


Figure3-6 Diagram of spot welding logic

3.8.5 Continuous Spot Welding

When the welding torch switch is long pressed, continuous spot welding can be performed. Spot welding time and interval time can be set independently.

Steps

- Press the "Trigger mode" key to switch to continuous spot welding mode;
- Rotate the knob to set the spot welding time (adjustment range 0.1-25s);
- Press and hold the "Function" button for 3 seconds to enter internal menu settings, and the LED light will light up;
- Rotate the knob, select F06, press the "enter" key and the numbers will flash;
- Rotate the knob to set the off time (adjustment range 0.1-10s), press the "enter" key again to confirm, and short press the "enter" key to exit.

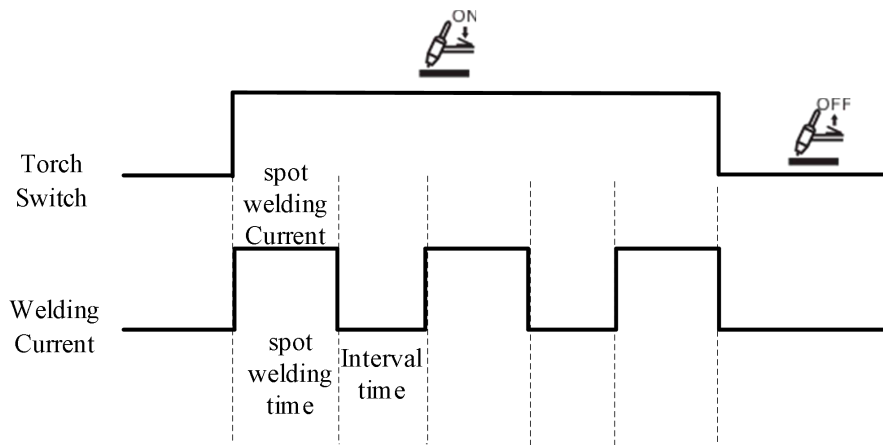
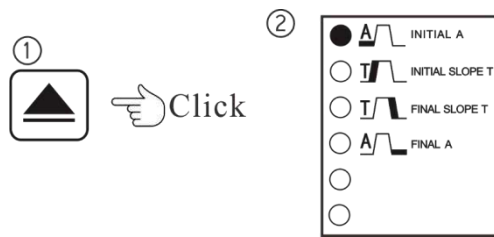


Figure3-7 Logic Diagram of continuous spot welding

3.9 Welding Sequence



It is able to perform segmentation settings for the complete current segment. The welding parameters are shown in Table 3-2.

Steps

1. Press the "Welding sequence" key and the LED light will light up. Each time the "Welding sequence" key is pressed, the indicator will light up in a cycle from the initial current–rising time–fall time–arc ending current, and the logic is shown in Figure 3-8.
2. If it is selected, you can perform the operation of the corresponding function.

Table 3-2 Welding parameters

Parameter	Default value	Range	Unit	Purpose
Ratio value of arc start current	100	1-200	1	Set the initial current ratio value
Ratio value of arc end current	100	1-200	1	Set arc end current ratio value
Absolute value of arc start current	30(A)	3-500(A)	1(A)	Set the initial current absolute value
Absolute value of arc end current	30(A)	3-500(A)	1(A)	Set the absolute value of arc end current
Arc rising slope	1(S)	0.2-20(S)	0.1(S)	Set arc rising time
Arc fall slope	1(S)	0.2-20(S)	0.1(S)	Set arc fall time

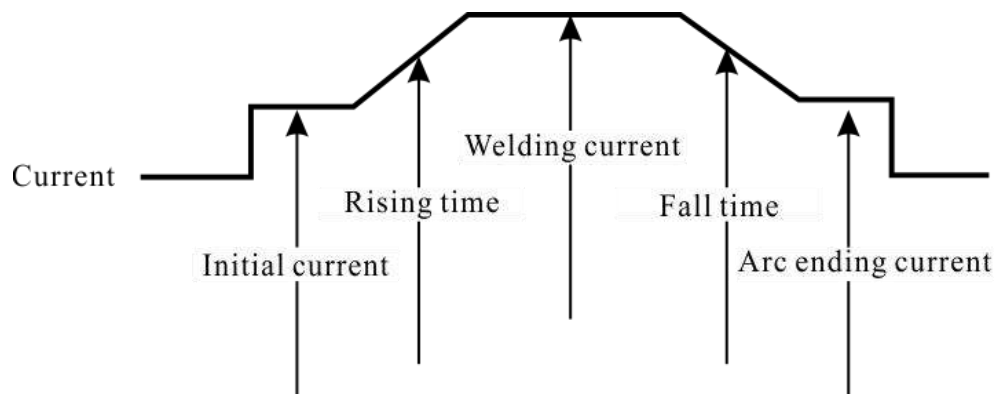


Figure 3-8 Current segment logic diagram

3.9.1 MMA Arc Length

Set arc length in the MMA mode, you can set MMA arc length range of 20-70V, and default is 50V.

Steps

1. Press the "Welding sequence" key to switch to MMA arc length;
2. If it is selected, you can perform the operation of corresponding function.

3.9.2 Thrust Current

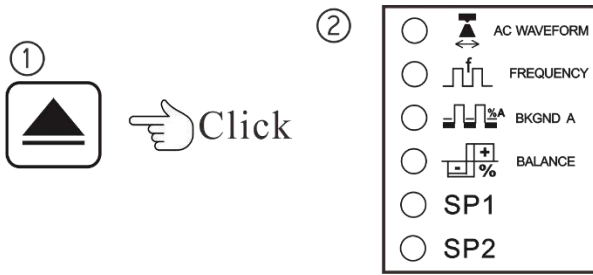
Set the-Thrust Current value in MMA mode,you can set the current range 0-200A,default is 50A.

Steps

1. Press the"Welding sequenc"key to switch to the Thrust Current;
2. If it is selected,you can perform the operation of the corresponding function.

3.10 Arc Selection

It is for selecting the waveform parameters of hardness,frequency,intensity,and duty cycle.



Steps

1. Press the"Arc Selection"key,LED light is on;
2. Each time you press the"Arc Selection"button,the indicator light will cycle through from hardness-frequency-intensity-duty cycle;
3. Light up means selecting,and you can operate the corresponding function.

3.10.1 Softness and Hardness

It refers to the waveform selection in DC TIG.It is divided into four waveforms,which are square wave(SQU),triangular wave(TRI),trapezoidal wave(TRA),and sine wave(SIN),as shown in the figure below.

- Square wave:DC/AC square wave,fast polarity switching,good arc stability,good dynamics.

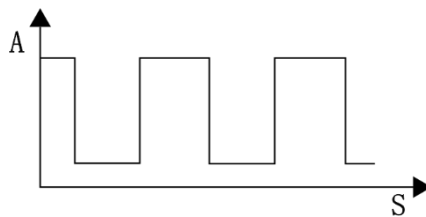


Figure3-9 DC square wave schematic

- Triangular wave:peak time is short,the heat input is low,and it is suitable for welding heat-sensitive metals such as thin plates and nine-nickel steel

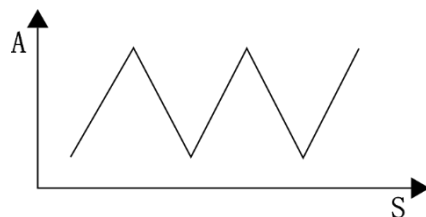


Figure3-10 Schematic diagram of DC triangle waves

- Trapezoidal waves:DC trapezoidal wave,smooth polarity switching,soft arc,has a good wetting effect on the weld pool,suitable for groove welding and over-head welding.

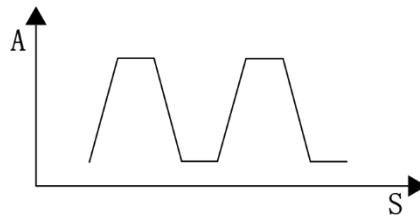


Figure3-11 DC trapezoidal wave schematic

- Sine wave:DC sine wave,zero-crossing point adopts a rectangular transition,welding noise is small,and arc is softer.

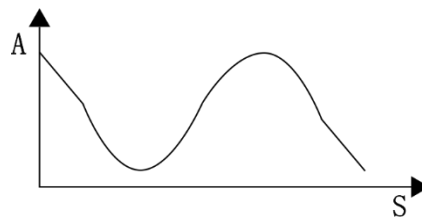


Figure3-12 DC sine wave schematic

3.10.2 Frequency

Set pulse frequency.

The number of times the combination of peak current and base current is repeated in 1 second.The frequency range can be set from 0.1 to 3000Hz,and default is 1.5Hz.

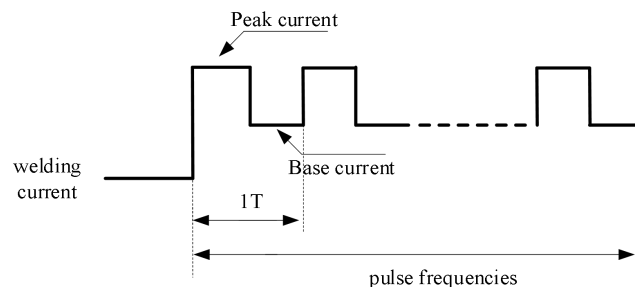


Figure3-13 Frequency diagram



Note

1. The higher the frequency,the more concentrated the arc,the bigger the penetration depth,and the less tungsten electrode consumption;
2. The lower the frequency number,the easier it is for the welding wire to be into the molten pool,cut well,and the front section of welding wire is easy to be at an acute angle.

3.10.3 Intensity

Set the percentage of pulse base current.Formula:Welding current(peak current) \times intensity(%)=base current

The greater the intensity,the smaller the difference between peak value and base value,the greater the heat input,and the less clear the fish scale pattern,and vice versa.

Example:welding current 200A,and current waveform is as shown below when the intensity is set to 50%.

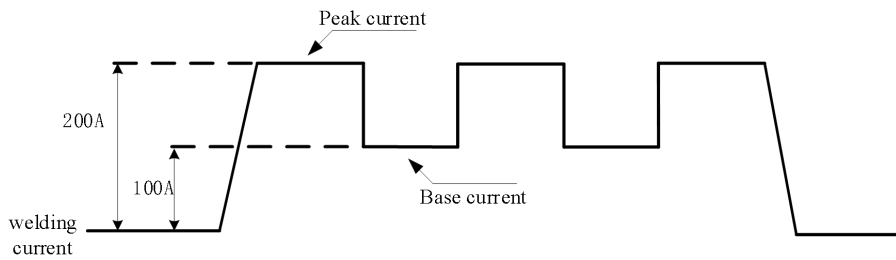


Figure3-14 Intensity diagram

3.10.4 Duty cycle

The proportion of peak current action time in a pulse cycle.

The larger the duty cycle,the greater the heat input and the less clear the fish scale pattern,and vice versa.

Example:The current waveform is as shown below when duty cycle is 50%and the frequency is 1Hz.

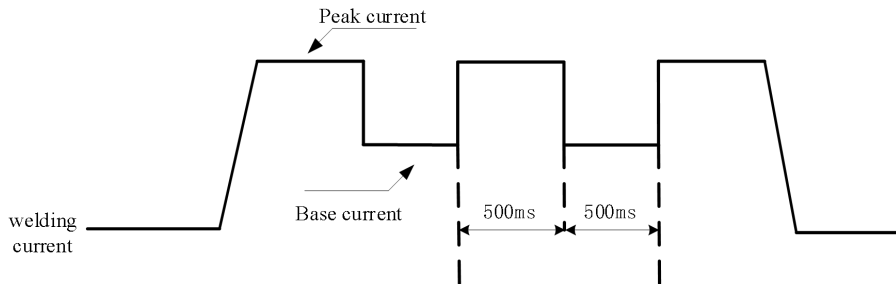


Figure3-15 Duty cycle diagram

3.11 Mode Selection



For the selection of welding programs:DC,DC-PULSE.

Steps

1. Press"Mode Selection"button,the LED light is on;
2. Every time press the"Mode Selection"key,the indicator will be light up in turn from DC to DC-PULSE;
3. If it is selected,you can perform the operation of corresponding function.

3.11.1 DC Welding

Stable DC output from low current to high current.

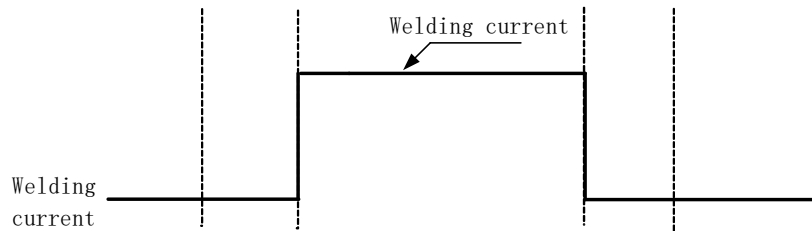


Figure3-15 Schematic diagram of DC welding

3.11.2 DC-PULSE

Suitable for welding of thin plates that require fish scale pattern in appearance, and can realize beautiful fish scale appearance

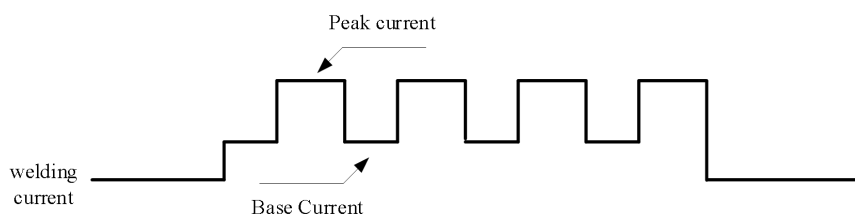


Figure3-16 Schematic diagram of DC-PULSE welding

3.12 Welding Program Selection

Used to select different welding methods: TIG, TIG-PULSE, MMA.



Steps

1. Press "Welding Method selection" key, the LED light is on;
2. Every time you press the "Welding Method selection" key, the indicator will be lit up in turn from TIG-TIG PULSE-MMA;
3. If it is selected, you can perform the operation of the corresponding function.

3.12.1 TIG-PULSE

TIG-PULSE refers to low-frequency pulse TIG welding, frequency range: 0.1Hz~100Hz. The mode selection can be selected from DC and DC-Pulse. When TIG-PULSE and DC-Pulse are combined, the frequency of DC-Pulse is at least 5 times the frequency of TIG-PULSE.

For details of TIG-PULSE parameter settings, please refer to P30 Table 5-1 Internal Menu D00-D06.

3.12.2 MMA

MMA mode selection can select DC welding. For details of relevant parameter settings, see P28 Table 5-1 internal menu H00-H02.



Note

MMA function requires a long press of the "Welding Method Selection" key for 3 seconds.

Chapter 4 AC/DC TIG Welding Machine Series

4.1 Series Description

AC/DC TIG welding series: MetaTig 500 ACDC, MetaTig 400ACDC, MetaTig 315ACDC.

4.2 Operation Panel Functions

The function description of front panel is shown in Figure 4-1.

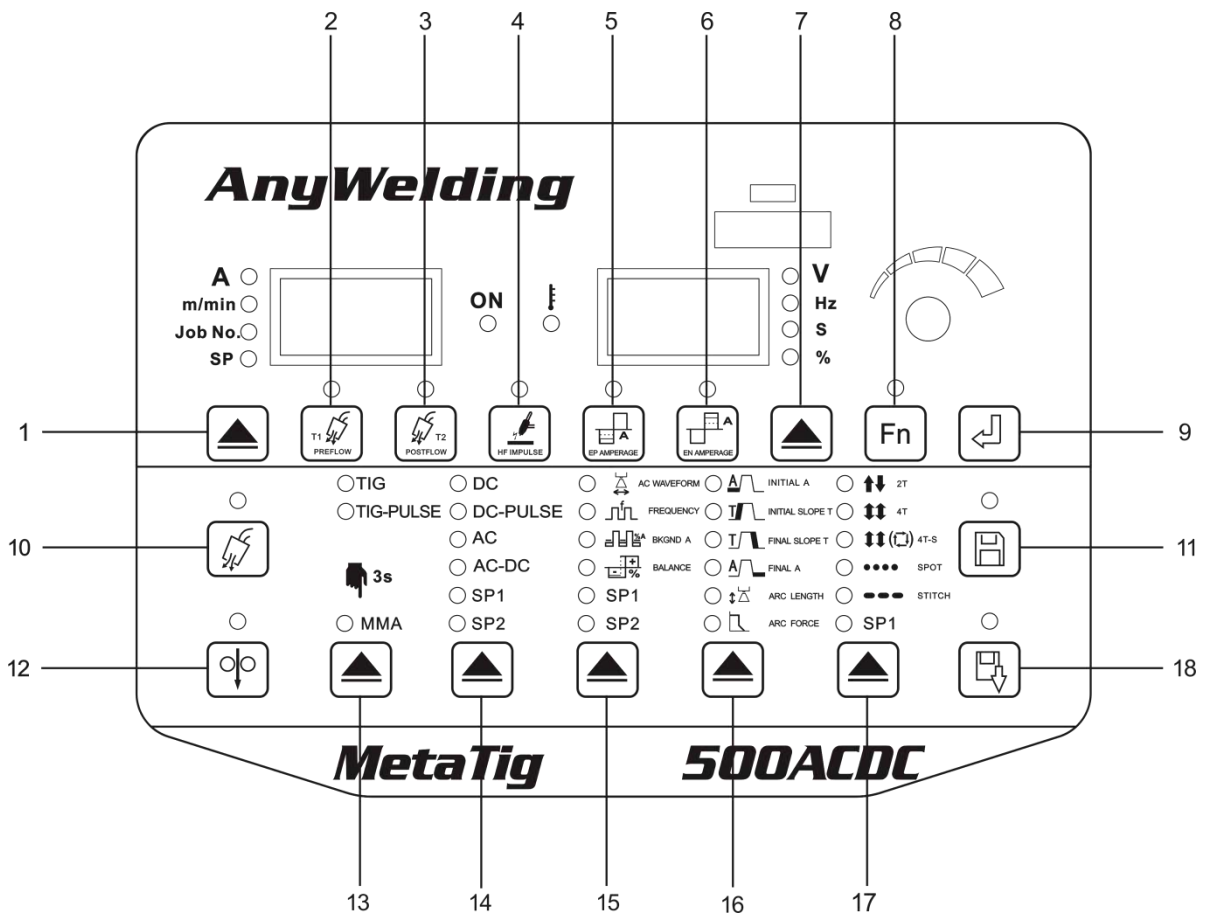


Figure 4-1 Description of front panel

Table 4-1 Function description

Numbering	Number Name	Description of each function button
1	Left Select key	Used to switch among current, wire feed speed, channel
2	Gas preflow	Used to set the pre gas time of welding gas
3	Gas postflow	Used to set the post gas time of welding gas
4	SP1	SP is reserved for customized need
5	HF impulse	For switching between high-frequency arc starting and lifting arc starting
6	SP2	SP is reserved for customized need

7	Left Select key	Used to switch among voltage,frequency,time parameters and percentages
8	Function selection	For entry and exit of the internal menu(long press for 3s to enter,short press to exit)
9	Enter button	Used for the confirmation of parameters and the operation of locking function
10	Gas flowdetection	Check whether there is protective gas.
11	Save	To save and store the selected welding parameters
12	Wire inching	Reserved(for automatic wire filling)
13	Welding program selection	Used to select different welding program(TIG,Tig-Pulse,MMA).
14	Mode selection	For the selection of different welding mode(DC,DC-PULSE).
15	Arc selection	Used to select different output current waveforms(hardness,frequency,intensity,duty cycle).
16	Welding sequence	Used to select the welding sequence(initial current,rise time,fall time,arc end current,MMA arc length,thrust current).
17	Mode control	For operation in different welding control(2-step,4-step,special 4-step,spot welding,continuous spot welding).
18	Recall	To recall the stored welding parameters.

4.3 Gas Flow Detection

Operation is the same with DC TIG welding,see 3.3 Gas Flow Detection in page10.

4.4 Wire Inching

Operation is the same with DC TIG welding,see 3.4 Wire Inching in page10.

4.5 Gas Preflow

Operation is the same with DC TIG welding,see 3.5 Gas Preflow in page10.

4.6 Gas Postflow

Operation is the same with DC TIG welding,see 3.6 Gas Postflow in page11.

4.7 HF Impulse

Operation is the same with DC TIG welding,see 3.7 HF Impulse in page11.

4.8 EP/EN Amplitude

Amplitude ratio of EP and EN can be independently adjusted to further adjust the cleaning intensity of oxide film,adjust penetration depth and welding width,and make the welding operation easier.EP/EN adjustment ratio range:0-200%,default is 100%.

The larger the EN amplitude,the narrower the weld bead,the smaller the clean zone,and the deeper the penetration.For smaller values,it is opposite.

The larger the EP amplitude,the wider the weld bead,the larger the clean area,and the shallower the penetration depth.For smaller values,it is opposite.

Steps

1. Press"EP amplitude or EN amplitude"key,the LED light is on;

- Adjustment knob for amplitude current adjustment in EP/EN direction.

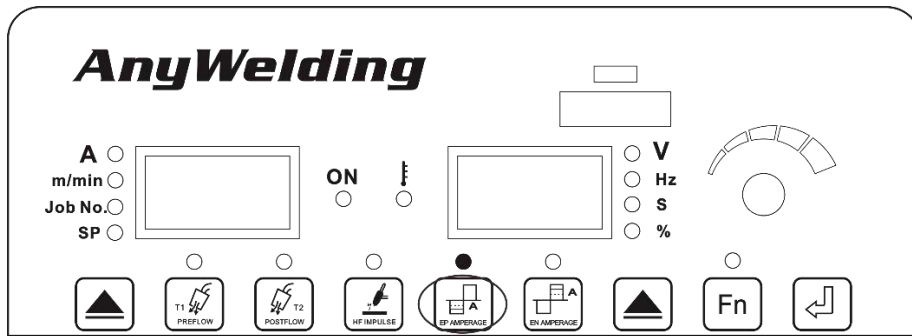


Figure4-2 EP amplitude setting interface

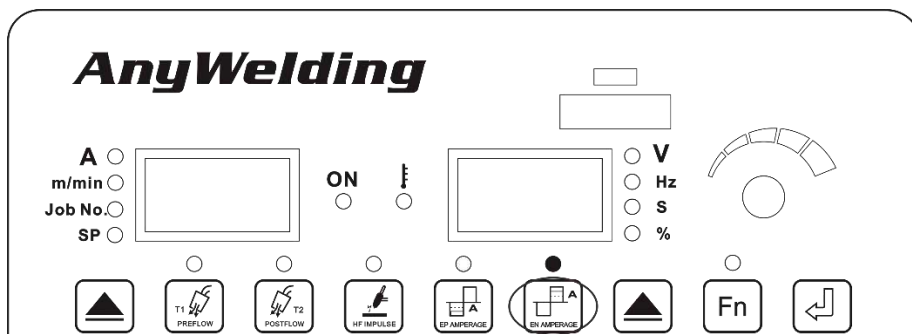


Figure4-3 EN amplitude setting interface

4.9 Mode Selection

Steps

- Press the "Trigger Mode" key, the LED light is on;
- Each time the indicator is pressed, it will light in turn from 2 steps-4 steps-special 4 steps-spot welding-continuous spot welding; If it is selected, you can perform the operation of the corresponding function.

4.9.1 2 Steps

Operation is the same with DC TIG welding, see 3.8.1 2 Steps in page 12.

4.9.2 4 Steps

Operation is the same with DC TIG welding, see 3.8.2 4 Steps in page 12.

4.9.3 Special 4 steps

Operation is the same with DC TIG welding, see 3.8.3 Special 4 Steps in page 13.

4.9.4 Spot Welding

Operation is the same with DC TIG welding, see 3.8.4 Spot Welding in page 13.

4.9.5 Continuous Spot Welding

Operation is the same with DC TIG welding, see 3.8.5 Continuous Spot Welding in page 13.

4.10 Welding Sequence

Operation is the same with DC TIG welding, see 3.9 Welding Sequence in page 14.

4.11 Arc Selection

It is for selecting the waveform parameters of hardness, frequency, intensity, and duty cycle.

Steps

1. Press the "Arc Selection" key, LED light is on;
2. Each time you press the "Arc Selection" button, the indicator light will cycle through from hardness-frequency-intensity-duty cycle;
3. Light up means selecting, and you can operate the corresponding function.

4.11.1 Softness and Hardness

Hardness refers to the waveform selection in DC Pulse or AC TIG. It is divided into four waveforms, which are square wave, triangle wave, trapezoidal wave, and sine wave, as shown in the figure below.

- Square wave: DC/AC square wave, fast polarity switching, good arc stability, good dynamics, AC square wave has the ability to clean aluminum oxide film, suitable for aluminum and aluminum alloy welding.

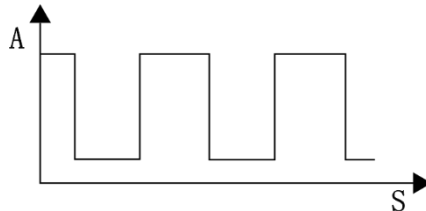


Figure 4-4 DC square wave schematic

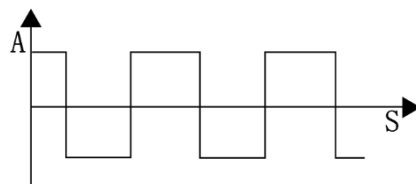


Figure 4-5 AC square wave schematic

- Triangular wave: With short peak time and low heat input, it is suitable for welding heat-sensitive metals such as thin plates and stainless steel.

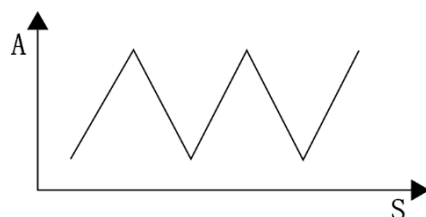


Figure 4-6 Schematic diagram of DC triangle waveform

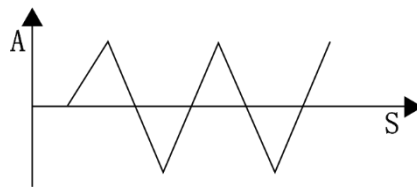


Figure 4-7 Schematic diagram of AC triangular waveform

- Trapezoidal waveform:DC/AC trapezoidal wave,smooth polarity switching,soft arc,good wetting effect on molten pool,suitable for groove welding and overhead welding.

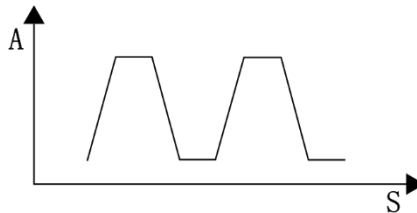


Figure 4-8 DC trapezoidal waveform schematic

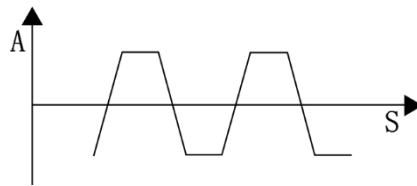


Figure 4-9 AC trapezoidal waveform schematic

- Sine waveform:DC/AC sine wave,zero-crossing point adopts rectangular transition,arc noise is small and softer.

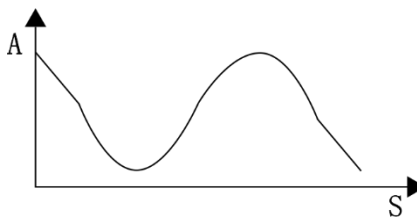


Figure 4-10 DC sine waveform schematic

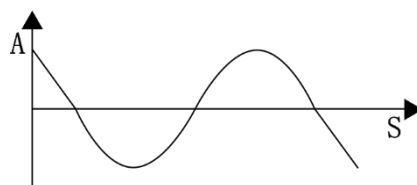


Figure 4-11 AC sine waveform schematic

4.11.2 Pulse frequency

Set pulse frequency. The number of times the combination of peak current and base current is repeated within 1 second.

When in DC mode, "frequency" refers to DC pulse frequency, range: 0.1-3000Hz, default value 1.5Hz;

When in AC mode, "frequency" refers to AC frequency, range: 20-300Hz, default value 80Hz.

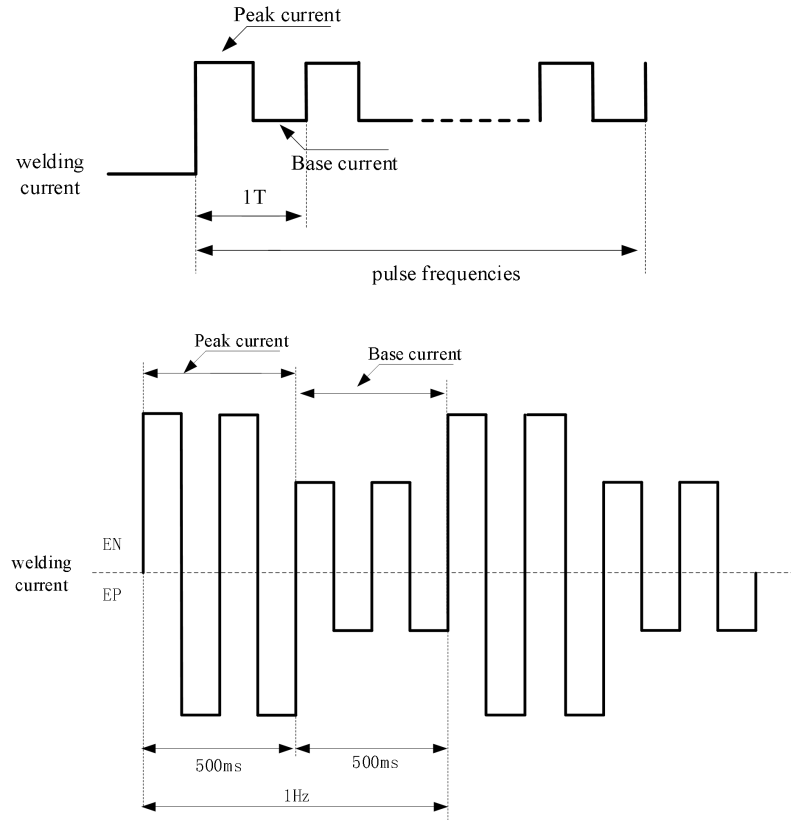


Figure4-12 Frequency diagram



Note

1. The higher the frequency, the more concentrated the arc, the bigger the penetration depth, and the less tungsten electrode consumption;
2. The lower the frequency number, the easier for welding wire to be into the molten pool, and the front section of the welding wire is easy to be at an acute angle.

4.11.3 Intensity

Set up the percentage of pulse base current. Formula: $\text{Welding current(peak current)} \times \text{intensity(\%)} = \text{base current}$.

The greater the intensity, the smaller the difference between peak value and base value, the greater the heat input, and the less clear the fish scale pattern, and vice versa.

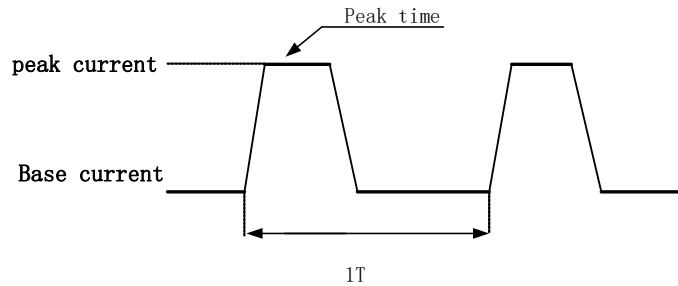


Figure4-14 Intensity diagram

4.11.4 Cleaning Width

In the AC frequency waveform, the ratio of positive side (ACEP) waveform time to the waveform time per cycle.

Cleaning width range: 5-70, default: 30.

Formula: Cleaning width (%) = (positive ACEP time / cycle T) × 100%

The function of cleaning width: in welding aluminum alloy, when the oxide film on surface of the workpiece is thick and dirty, the welding surface of aluminum metal is treated to increase the cleaning width to make welding easier. The wider the cleaning width, the faster the tungsten electrode is consumed.

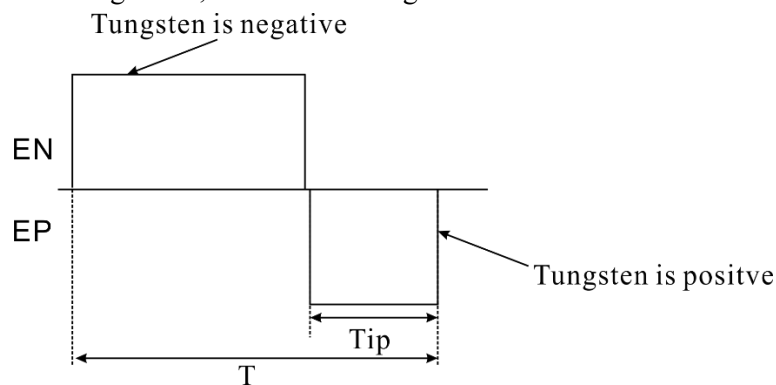


Figure4-12 Clean width diagram

4.12 Mode Selection

Used to select welding modes: DC, DC PULSE, AC, AC-DC.

Steps

1. Press "Mode Selection" button, the LED light is on;
 2. Every time press the "Mode Selection" key, the indicator will light up from DC--DC PULSE-AC-AC-DC in turn;
 3. If it is selected, you can perform the operation of the corresponding function.
- DC welding

Stable DC output from low current to high current.

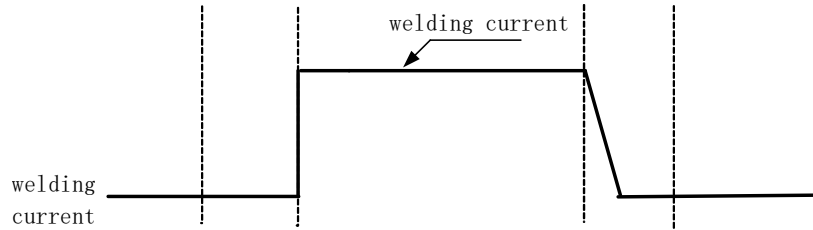


Figure 4-16 Schematic diagram of DC welding

- DC-PULSE

Suitable for thin plate, fillet weld and others.

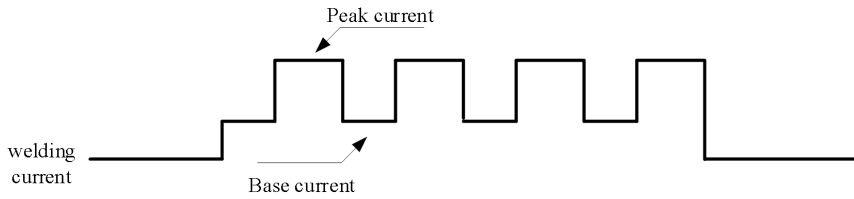


Figure 4-17 Schematic diagram of DC-PULSE welding

- AC

The electrode periodically switches between positive half-wave and negative half-wave, which has a cathode crushing effect and is mostly suitable for welding aluminum and aluminum alloys.

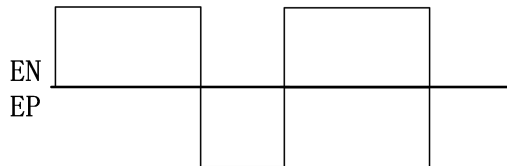


Figure 4-18 AC welding schematic

- AC-DC

In this mode, AC and DC alternate output to further improve the heat input of heating base metal, increases the penetration depth, and reduces the tungsten electrode burnout.

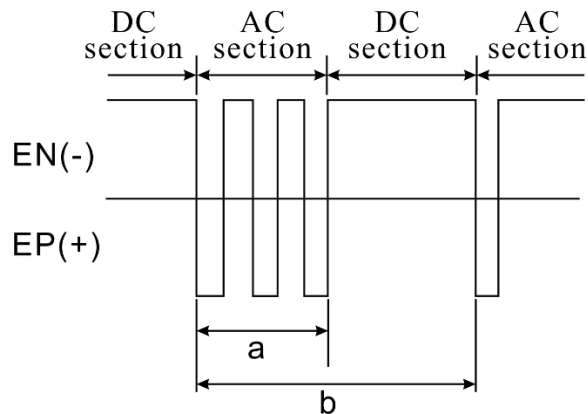


Figure 4-19 Schematic diagram of AC and DC welding

4.13 Welding Program Selection

Operation is the same with DC TIG welding, see 3.12 in page 18: Welding Program Selection.

4.13.1 Pulse TIG

Pulse TIG refers to low-frequency pulsed TIG welding, frequency range: 0.1Hz~999Hz. Mode selection is DC, DC-PULSE, AC, AC-DC. When pulse TIG and DC-Pulse are combined, the frequency of DC-Pulse is at least 5 times that of pulse TIG.

For details about pulse TIG parameters, see Table 5-1 Internal Menu D00-D06 in P32.

4.13.2 AC MMA

MMA mode can select DC and AC, AC mode can be set in the panel "frequency" key. For details about related parameters, see Table 5-1 Internal Menu H00-H02 on P32.



Note

For MMA function, you need to press and hold "welding method function" button for 3 seconds.

Chapter 5 Internal Menu

5.1 Internal Menu

Steps

1. Long press the "Function" key for 3 seconds to enter internal menu settings, and the LED light lights up;
2. Turn the knob key to select the internal function that needs to be adjusted, the corresponding function code is displayed in the left digital tube, press the "Enter" key to confirm;
3. Turn the knob key to adjust the corresponding parameters, the parameters are displayed in the right digital tube, press the "Enter" key to confirm;
4. Press the "Function" key shortly, exit the internal menu settings, and LED light off.

Table 5-1 Internal menu

Code	Feature Name	Default Value	Adjustment Range	Content
F00	Factory reset	/	/	Restore the factory parameter settings of the welding power source
F01	F parameter is open	OFF(hidden).	OFF-ON(unfold).	OFF:Hide F01-F20 function codes ON:unfold and adjusts parameters
F02	Switching key between ratio value and absolute value of arc starting and ending current	OFF(ratio value).	OFF(ratio value)-ON(absolute value).	OFF:The digital tube shows that the current is a ratio value ON:The digital tube shows that the current is absolute
F03	Arc start current time	0(s)	0.1-10(s)	Set the current time of arc starting sequence, the step size is 0.1(s)
F04	Arc end current time	0(s)	0.1-10(s)	Set the current time of arc end sequence, the step size is 0.1(s)
F05	Continuous spot welding enable	OFF(not enabled).	OFF(not enabled)-ON(enabled).	Set gas detection duration
F06	Continuous spot welding cut-off time	0.5(s)	0.1-10(s)	Interval time of continuous spot welding, step size is 0.1(s)
F07	Wire feeding speed	1.4(m/min)	1.0-25(m/min)	Set the wire feed speed with a step size of 0.1(m/min)
F08	Inching speed	ADP(self-adaptation)(m/min).	1-18(m/min)	Set the wire inching speed with a step size of 0.1(m/min)
F09	Reverse wire speed	2(m/min)	1-18(m/min)	Set the reverse wire speed with a step size of 0.1(m/min)
F10	Reverse wire time	Adaptive(s).	0-2(s)	Set the reverse wire time, the step size is 0.1s
F11	Robot feedback filter coefficient	63	0-127	Set the robot feedback filter coefficient with a step size of 1
F12	High frequency arc starting intensity	15	10-30	Set the intensity of high-frequency arc starting, the step size is 1
F13	Smart fan control	ON(open)	OFF(close)-ON(open)	After turning on, the fan stops running 6 minutes after welding ends.
F14	VRD mode	ADP(self adaptive)	ADP(self adaptive)	Set to ADP:

			OFF ON	1)High frequency arc starting,no VRD; 2)Scratch arcing,there is VRD,but VRD time is invalid; 3)MMA,no VRD Set to ON: 1)High-frequency arc starting,with VRD,and VRD time setting is valid; 2)Scratch arcing,there is VRD,but the VRD time is invalid; 3)MMA has VRD,and the VRD time setting is fixed at 3S. Set to OFF: There is no VRD for high-frequency arc starting,scratch arc starting,and MMA,and the VRD time setting is invalid.
F15	VRD time	3(s)	0-5(s)	Adjust VRD voltage time,step size is 0.1(s)
F16	VRD voltage	30(V)	Fix value 30(V)	Fixed value 30(V)cannot be adjusted
F17	Reverse arc start time	40(ms)	0-80(ms)	Set reverse arc starting time in AC,the step size is 1(ms)
F18	Water tank switch	OFF(未使能)	OFF-ON	OFF:Turn off water cooling function
F19	Water flow detection switch	OFF(未使能)	OFF-ON	ON:Turn on water cooling function
F20	Arc stabilizing voltage selection	270 (V)	270(V)-140(V)	OFF:Turn off cooling water flow detection function
F22	Foot switch sensitivity	0	Negative40-40	Numerical adjustment of foot switch sensitivity
F23	Macid selection	0	0-63	Robot communication master-slave selection
C00	The c parameter is open	OFF(hidden).	OFF-ON(expand).	OFF:Hides the C01-C06 function code ON:Expands and adjusts parameters
C01	Deviation value of heating current relative to given welding current	0(A)	0-100(A)	Heating current size adjustment,step size is 1(A)
C02	Heating current time	20(s)	0-100(s)	Heating current time before arcing current,step size is 1(s)
C03	Heating current to arcing current slope	0(s)	0-10(s)	The rising speed from heating current to arcing current,step size is 0.1(s)
C04	Heating current waveform selection	SQU(square waveform)	TRI(triangular wave)- TRA(trapezoidal wave)- SIN(sine wave)-NO(no waveform)	Heating current waveform selection
C05	Arc starting current waveform selection	SQU(square wave)	TRI(triangular wave)- TRA(trapezoidal wave)- SIN(sine wave)-NO(no waveform)	Arc starting current waveform selection in pulse or pulsating TIG mode
C06	Crater arc current waveform selection	SQU(square wave)	TRI(triangular wave)- TRA(trapezoidal wave)- SIN(sine wave)-NO(no waveform)	In pulse or pulsating TIG mode,arc current waveform selection
D00	D parameter enable	OFF(hide)	OFF(hide)-ON(expand)	OFF:Hide D01-D06 function codes
D01	Strong pulse waveform selection	SQU(square wave)	TRI(triangular wave)- TRA(trapezoidal wave)- SIN(sine wave)-NO(no waveform)	ON:Expand and adjust parameters

			waveform)	
D02	Double pulse frequency	1.5(Hz)	0.1-100(Hz)	The frequency of alternating strong and weak pulses within 1 second is called the double pulse frequency
D03	Dual pulse duty cycle	50(%)	5-95(%)	The number of alternating strong and weak pulses within 1 second is called the double pulse frequency.
D04	Double pulse intensity	30(%)	0-100(%)	Within a period(T),the proportion of time a strong pulse lasts,with a step size of 1(%)
D05	Weak pulse to strong pulse slope	1(s)	0.01-2(s)	Double pulse current welding parameter value,step size is 1(%)
D06	Strong pulse to weak pulse slope	1(s)	0.01-2(s)	During double pulse welding,the modified value of the strong pulse voltage parameter,the step size is 0.01(s)
P00	P parameter enable	OFF(hide)	OFF(hide)-ON(unfold)	During double pulse welding,the modified value of the weak pulse voltage parameter,the step size is 0.01(s)
P01	High frequency pulse duty cycle	50(%)	5-95(%)	OFF:Hide P01 function code
H00	H parameter enable	OFF(hide)	OFF(hide)-ON(unfold)	ON:Expand and adjust parameters
H01	Manual arc welding arc starting current	300(A)	30-500(A)	Set the high-frequency pulse duty cycle,the default step size is 1(%)
H02	Manual arc welding heating current	60(A)	1-200(A)	OFF:Hide H01-H02 function codes
N00	N parameter enable	OFF(hide)	OFF(hide)-ON(unfold)	ON:Expand and adjust parameters
N01	Close control mode enabled	OFF	OFF-ON	Set the MMA arcing current with a step size of 1(A)
N02	Job switching time	0.1(s)	0.01-9.99(s)	Control the transition time of current and voltage when switching JOB channels,the step size is 0.01(s)
N03	Welding machine macid	ADP(self adaptive)	0-63	The communication address set by the welding machine according to the communication protocol between the two parties,the step size is 1
N04	Position finding success signal invert switch	OFF	OFF-ON	OFF:Turn off the signal inversion function
N05	Welding machine ready signal invert switch	OFF	OFF-ON	ON:Turn on the signal inversion function
N06	Robot ready signal invert switch	OFF	OFF-ON	OFF:Turn off the signal inversion function
N07	Welding machine arc starting success signal reset switch	OFF	OFF-ON	ON:Turn on the signal inversion function
N08	Robot speed and current given method	CUR	CUR-SPD	OFF:Turn off the signal inversion function
N09	Search voltage	200(V)	1-400(V)	ON:Turn on the signal inversion function
N10	Letter of	Ang	Ang-FAn-Abb-kUk-yAS-	OFF:Turn off the signal inversion

	agreement		kAS-CrP-Hyd-SIA	function
N11	Baud rate	125	125-250-500	ON:Turn on the signal inversion function
N12	Network port communication box selection switch	OFF	OFF-ON	Select the robot given mode.
N16	Welding machine current given source selection	PAN(main machine panel)	ADP(self adaptive)-PAN(main machine panel)-FOT(foot pedal)	CUR:robot current given
N17	Special machine switch	OFF	OFF-ON	SPD:robot speed given
N18	Group control switch	OFF	OFF-ON	When the robot is searching for a position,the output positioning voltage is adjusted with a step size of 1(V).
N19	Welding machine factory barcode			According to the different communication methods of the robot,select the matching communication protocol
T0A	Current sampling ad calibration	0	0-50	Current sampling ad calibration, the step size is 1
T0D	AC TIG arc selection	0	0-50	AC TIG arc selection, the step size is 1
T0F	Internal and external water pipe selection	0	0-50	Choose internal water tank,external water tank. 0:the external water tank. Other selections:the internal water tank
FB0	The software version number of the single board in the welding machine			Can baud rate selection when communicating with the robot via Can
FB1	Welding machine fault record			OFF:Turn off the network port communication box function
FB2	Welding machine model			ON:Turn on the network port communication box function

Chapter 6 Welding Condition Setting

6.1 Welding Timing

The flow description of welding timing setting is shown in Figure 6-1.

Steps

1. Set arc starting method(see 3.7 HF Impulse for details in page 11);
2. Set gas preflow time(see 3.5 Gas Preflow for details in page 10);
3. Set initial current(see 3.9 Welding Sequence for details in page 15);
4. Set rise time(see 3.9 Welding Sequence for details in page 15);
5. Set up basic welding;
6. Set fall time(see 3.9 Welding Sequence for details in page 15);
7. Set arc end current(see 3.9 Welding Sequence for details in page 15);
8. Set post gas time(see 3.6 Gas Postflow for details in page 11).

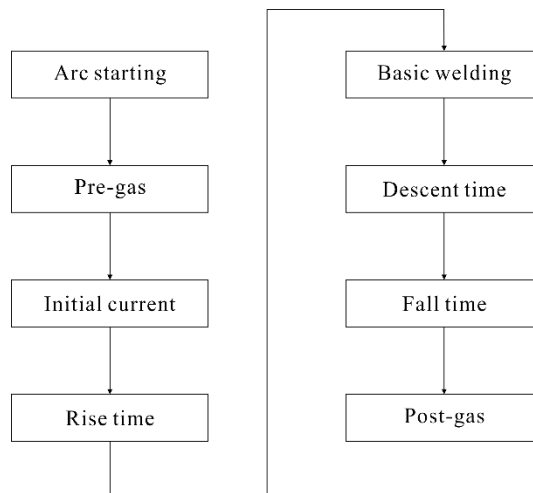


Figure 6-1 Welding timing setting



Note

The welding timing setting method of DC TIG welding machine and AC/DC TIG welding machine is the same.

6.2 Set Up Welding Parameters

Steps

1. Press the "left switch key", and "A" (unit of welding current) LED light is on;
2. Turn the knob, adjust the parameters to set welding current, and the setting value is displayed in the left digital tube.

6.3 Save and Recall

● Save

Save welding parameters that have been set.

Steps

1. Set the welding parameters,press the"Save"key,the storage indicator flashes while the JOB indicator lights up,and enters the save channel number selection;
2. Select JOB number(0~49)with the panel knob and press the"enter"key to confirm,as shown in Figure 6-2.

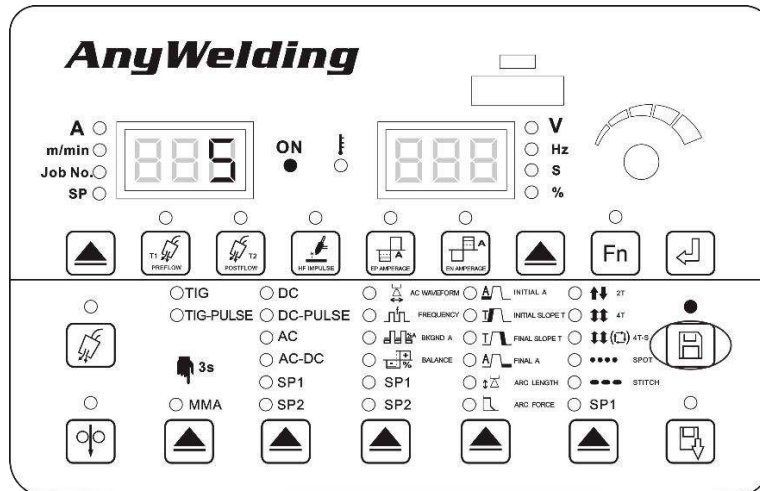


Figure 6-2 Save settings interface



Note

1. After the welding power source is restored to factory settings,storage parameters are not cleared to zero;
2. When the Enter key is not pressed in the saving procedure,the parameter will not be saved;
3. When the saving JOB is the same JOB,the original JOB number parameter is overwritten.

- Recall

Recall the saved welding parameters.

Steps

1. Press and hold"recall"key,the LED indicator lights up and flashes,entering the parameter recall mode.
2. Select the JOB number(0~49)with the panel knob and press the"enter"key to confirm,as shown in Figure 6-3.

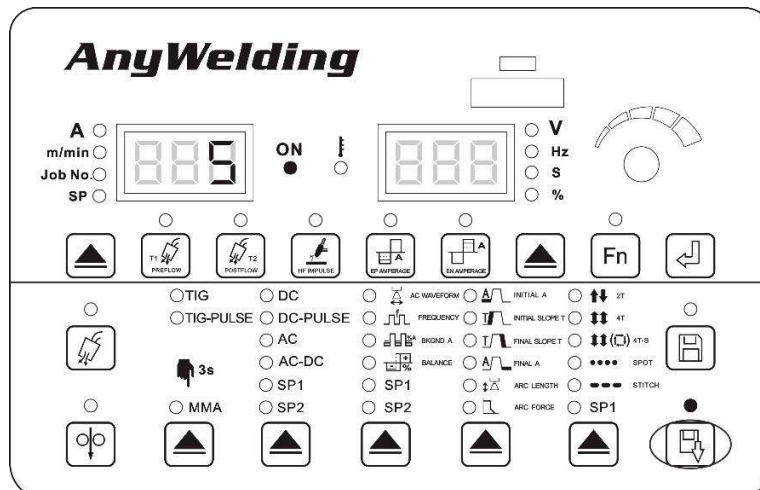


Figure6-3 Recall settings interface

Chapter 7 Trouble Shooting

7.1 Welding Power Source Error Indication

When an error occurs inside the welding machine, the red indicator light on the panel will light up.



Note

When the current and voltage displayed by LED digital tube deviate from the set values during welding, it does not necessarily mean that a fault has occurred.

Differences in actual application working conditions will also lead to the occurrence of the above phenomena, such as incorrect selection of welding methods, improper gas, reverse connection of positive and negative electrodes, etc.

7.2 Welding Power Source Error Code and Countermeasures

The error code is displayed as shown in Figure 7-1.

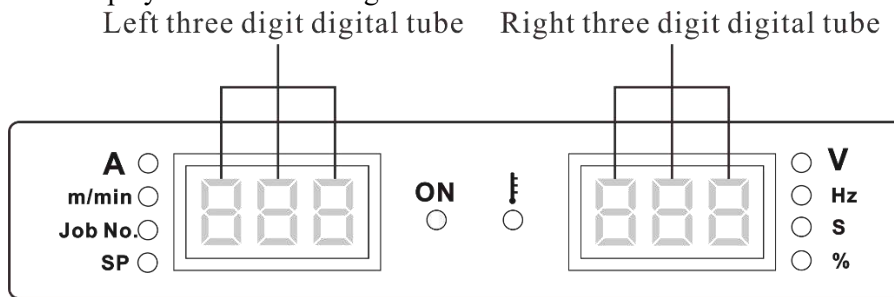


Figure 7-1 Error codes are displayed

Table 7-1 Welding power source error and countermeasures

Error code	Display		Details of error	Causes	Countermeasure
	3-digit digital tube on the left	3-digit digital tube on the right			
E1	E1		The main power board and auxiliary power board are connected in series and parallel with abnormal fault fan failure	The main power board is connected in series and the auxiliary power board is connected in parallel.	According to the specific model, connect the main power board and auxiliary power board in series and in parallel state is consistent
E2	E2			The main power board is connected in parallel and auxiliary power board is connected in series.	
E3	E3		Hardware and software mismatch failure	Software and hardware mismatch	Contact Megmeet
E4	E4				

E5	E5				
E6	E6		The input power supply is abnormal Bus voltage overvoltage	Bus voltage overvoltage	1.Check that the input cable is connected correctly 2.Check whether the input power is normal 3.The M1 board is 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		The main control board undervoltage fault of the 15V power supply	The auxiliary power supply of the main control board of the welding machine is abnormal	Contact Megmeet
E12	E12			The output of auxiliary power board 1 is shorted	
E13	E13			The output of the auxiliary power board 2 is shorted	
E14	E14	1~18	Wrong key press	The key is stuck	Check whether the relevant button is stuck,please check according to the panel serial number
E15	E15	1~6	The welding machine PCB is wrong	The key is stuck	Contact Megmeet
E16	E16			The main control board is wrong	
E17	E17			wire feeder control board is wrong	
E18	E18			robot communication board is wrong	
E20	E20		Communication failure	Internal communication failure	Check whether the terminals of the LCD board and its bottom plate are loose
E21	E21				Check the display board and main control board for loose terminals
E22	E22				Check whether the terminals of the main control board and the wire feeder control board are loose
E23	E23				
E24	E24				Check whether the terminals of the main control board and the robot communication board are loose
E25	E25		EEPROM failure	The welding machine master controls the EEPROM fault	1.Power down and restart 2.The fault has not been recovered,contact Megmeet
E28	E28		The current Hall is not plugged in	The current Hall connector is not plugged in	Check the current Hall connector
E29	E29		Welding torch failure	When the welding power source is turned on,the welding torch opens and closes or the welding torch switch is damaged	Put the torch switch to the OFF state or replace the torch switch
E31	E31		Primary side overflow	1.The main transformer is damaged	1.Check the main transformer 2.Check the output diode module

E32	E32			2.The output diode module is damaged 3.The main power board is damaged	3.Check the main power board After the inspection is completed,restart the welding machine to recover
E33	E33		Output overcurrent	1.The output is short circuit or the current is too large 2.The output diode module is damaged	1.Check whether the output is short-circuited(whether the nozzle is bonded with the contact tip,and whether the welding wire is short-circuited with the workpiece sticking wire). 2.After the inspection,press the welding torch switch again to resume work 3.Check whether the output diode module is damaged
E38	E38		Wire feeder is faulty	The main wire feeder(wire pusher)motor overcurrent	Check the wire plugging or stuck
E39	E39			Overcurrent from the wire feeder(wire puller)motor	
E40	E40		The code disc is faulty	The signal terminal of the code tray of the main wire feeder(wire pusher)is not firmly connected	Check whether the code disc signal terminals are firmly connected
E41	E41			The signal terminal of the code tray of the main wire feeder(wire pusher)is not firmly connected	
E42	E42		The wire feeder board 15V power supply undervoltage fault	The auxiliary power supply of the wire feeder control board of the welding machine is abnormal	Contact Megmeet
E44	E44		Overtemperature	The auxiliary power board PA is abnormal(short circuit,overcurrent,etc.),causing it to overtemperature	Check the auxiliary power board for abnormalities
E45	E45			The PB of the auxiliary power board is abnormal(short circuit,overcurrent,etc.),causing it to overtemperature	
E46	E46			The secondary side is overwarm	1.Use strictly in accordance with the rated load duration rate range 2.Check whether the welding power source vent is blocked 3.Clean the radiator 4.Check if the fan is working properly
E47	E47			The primary side radiator is overwarm	
E48	E48			The output terminals are overtemperature	
E53	E53		Robotic communication-related failures	The short circuit time of high voltage positioning function of the robot board is too long	Check if the output is always short circuited
E54	E54			The main station(robot,etc.)is abnormal	Check whether the master station enters a fault state
E55	E55			Communication error the master station(robot,etc.)	Check whether the communication line between the main station and the welding machine is interfered with

E56	E56			Communication with master station(robot,etc.)is not established	Check the communication configuration between the main station and the welding machine,and check whether the communication line is interfered with
E57	E57			MACID does not match	Match the MACID of the master station and the welding machine
E61	E61		Water cooler-related failures	The water flow switch of the water cooler is faulty	Check the water flow switch
E62	E62			The water cooler start switch is faulty	Check the switch relay for damage
E65	E65		Failure with long no-load time	The output no-load voltage time is too long	1.Check whether the negative electrode of welding machine is connected to the workpiece 2.Whether the output power of the welding machine is normal

7.3 Welding Issues and Countermeasures

Table 7-2 Welding Issues and Countermeasures

No.	Issues	Causes	Countermeasures
1	Arc start is failed	<ol style="list-style-type: none"> 1.Power error alarm 2.Poor ground connection 3.Poor connection of welding torch 4.The arc discharge spark plug gap is inappropriate. 5.The welding torch switch is damaged 6.The arc signal cable is disconnected 7.The pre gas time is set too long 8.In lifting arc starting mode 9.Internal failure of welding machine 	<ol style="list-style-type: none"> 1.Clear error alarm according to the meaning of the error code 2.Check the ground cable connection 3.Check the welding torch connection 4.Adjust the electrode gap 5.Replace the welding torch switch 6.Check arc signal cable 7.Reduce pre gas time 8.Pay attention to arc starting mode selection 9.Find professionals for repairs
2	Difficulty in arc starting	<ol style="list-style-type: none"> 1.The arcing current is too small 2.The tungsten electrode is too blunt in DC mode 3.The pre gas flow is too large 4.The tungsten arc starting height is too high 5.The surface of the workpiece is seriously stained with paint,oil,or rust. 	<ol style="list-style-type: none"> 1.Increase arc starting current 2.Repair and grind tungsten electrode 3.Reduce pre-gas flow rate 4.Reduce the distance between tungsten electrode and workpiece 5.Clean workpiece surface
3	The tungsten electrode is seriously burned	<ol style="list-style-type: none"> 1.The polarity of the welding gun is incorrectly connected in DC mode. 	<ol style="list-style-type: none"> 1.Connect the welding torch to the negative pole 2.Adjust cleaning width and EP amplitude 3.Check the gas flow 4.Replace electrodes with good quality
4	Arc is not stable	<ol style="list-style-type: none"> 2.The cleaning width or EP amplitude is unreasonable during communication 	<ol style="list-style-type: none"> 1.Check the loop cable connection 2.Take degaussing or other anti-magnetic blowout measures 3.Reduce gas flow 4.Professionals perform repairs

5	Arc is not ending	<ol style="list-style-type: none"> 1. In 4-step mode, welding torch switch is damaged or switch cable is broken. 2. Current decay time is set too long and the current is in decay stage. 	<ol style="list-style-type: none"> 1. Replace welding torch switch or repair switch cable 2. Reduce current decay time
6	Welding porosity	<ol style="list-style-type: none"> 1. Gas flow is too small 2. Gas flow rate is too fast, causing turbulence effect 3. Nozzle diameter is too small 4. Electrode extends too long, resulting in poor protection. 5. Gas hose leakage or blockage 6. Serious oil stains and rust on the surface of the workpiece 7. Gas purity is not good 8. Wind speed is too high 	<ol style="list-style-type: none"> 1. Increase gas flow 2. Adjust to appropriate gas flow 3. Replace appropriate nozzle diameter 4. Adjust electrode extension length 5. Check whether gas hose is leaking or blocked 6. Clean workpiece surface 7. Replace gas that meets relative standards 8. Take precautions against wind
7	Poor fusion	<ol style="list-style-type: none"> 1. Current is too small and heat input is insufficient. 2. Welding speed or swing speed is too fast 3. There is oil stain, rust, etc. on the surface of the workpiece or groove. 4. The filling amount of welding wire is too large 	<ol style="list-style-type: none"> 1. Rise welding current 2. Reduce welding or swing speed 3. Clean workpiece surface 4. Reduce filling amount
8	Tungsten inclusion	<ol style="list-style-type: none"> 1. The diameter of tungsten electrode does not match with current, causing tungsten electrode to burn and penetrate into molten pool. 2. Grinding angle of tungsten electrode does not match the welding current, causing the tungsten electrode to burn and penetrate into molten pool. 3. Short circuit between tungsten electrode and workpiece 4. Tungsten electrode quality issues 	<ol style="list-style-type: none"> 1. Increase diameter of tungsten electrode 2. Increase grinding angle of the tungsten electrode to improve the current carrying capacity 3. Keep an appropriate distance between tungsten electrode and workpiece 4. Choose quality-assured tungsten electrodes
9	Weld undercut	<ol style="list-style-type: none"> 1. Welding current is too large the heat input is too high 2. There is oil stain, rust, etc. on the surface of the workpiece 3. Insufficient standing time at the edge 4. Insufficient filling amount of welding wire 	<ol style="list-style-type: none"> 1. Reduce welding current and heat input 2. Clean workpiece surface 3. Increase edge standing time 4. Increase filling amount
10	Crack	<ol style="list-style-type: none"> 1. Welding heat input is too large, resulting in thermal cracks 2. Cooling speed is too fast 3. Arc ending current drops too fast 4. Arc crater is not filled 5. Welding material quality issues 	<ol style="list-style-type: none"> 1. Reduce welding current and increase welding speed 2. Take preheating and slow cooling measures 3. Increase fall time and take measures to slow down the falling speed 4. Fill the arc crater and take repeated arc ending measures 5. Replace welding materials with good quality
11	Welding nodules, burn-through	<ol style="list-style-type: none"> 1. Welding current is too large and heat input is too high 2. Welding speed is too slow 3. The gap is too large during bottom welding 	<ol style="list-style-type: none"> 1. Reduce welding current 2. Increase welding speed 3. Reduce bottom welding gap

Chapter 8 Maintenance

8.1 Daily Check



Security Warnings

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

- Instructions for use
 1. Adherence to daily inspections is essential to maintain the high performance and safe operation of this welding equipment;
 2. Daily inspections are 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 parts provided or recommended by the factory.
- Welding power source

Table8-1 Welding power source daily inspection content

Project	Check the main points	Remark
Front panel	Whether each mechanical appliance is damaged or loose Whether the lower cable connection is tight Observe if the fault LED is flashing	The inside of the lower terminal cover is used as a regular inspection item.In case of non-conformity,it is necessary to check the internal inspection of the welding power source,replenish the tightening or replace the parts
Back panel	The input power terminal cover is intact Whether the air inlet is unobstructed and free of foreign objects	
Roof	Check for loose eye bolts or other bolts	
Base panel	Check the wheel feet for damage or looseness	
Side panel	Check the side panel for looseness	
Routine	Check the appearance for discoloration or overheating Check whether the sound of the fan is normal when the welding power source is running Check whether there is any peculiar smell,abnormal vibration or noise when the welding power source is running and welding	If there is an abnormal situation,the internal inspection of the welding power source is required

- Cable

Table8-2 Cable daily inspection content

Project	Check the main points	Remark
Grounding cable	Check if the positive power cable is detached	In the event of non-conformity,additional fastening or replacement parts are required

- Other accessories

Table8-3 Other accessories daily inspection content

Project	Check the main points	Remark
Welding torch	Carry out daily inspections in accordance with the requirements of the welding torch instruction manual	/
Water cooler	Daily inspection is carried out in accordance with the requirements of the instruction manual of the water cooler	
Gas meter	Carry out daily inspections according to the requirements of the gas meter manual	/
Gas hose	Check whether the connection is secure,and when using the soft clamp,check whether it is loose, Whether the hose is worn or leaked	In case of non-conformity,it is necessary to replenish the tightening or replace the trachea

8.2 Regular Check



Security Warnings

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 the user's distribution box and turning off the power of the unit.Avoid personal injury accidents such as electric shock and burns;
3. Due to the capacitor discharge,the inspection operation must be carried out after the welding power source is de-energized 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 wired inside the machine,or remove static electricity in advance by touching the metal parts of the case by touching them with your hands;
2. When cleaning plastic parts,do not use solvents other than neutral detergents for household use.

- Regular check 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.

- Regular check contents

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

1. Internal dust removal of welding power source

By disassembling the top cover and side panels of the welding power source,the spatter and dust accumulated inside the welding power source 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 overtemperature protection.

2. Welding power source inspection

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

3. Cable, trachea inspection

Inspection of safety grounding wires, cables, air pipes, etc., requires more detailed inspection on the basis of the daily inspection items, and routine supplemental tightening.

4. Withstand voltage test and insulation test

Withstand voltage tests and insulation tests should be carried out by our after-sales service personnel, and can also be carried out by personnel with expertise in electrical and welding power sources.

5. Discharge spark plug cleaning

Turn off the welding power source three-phase input power supply, open the side cover to clean the WPACT7315M3 PCB board discharge spark plug dust. Please make sure a person with expertise in electrical and welding power supplies.

8.3 After-sales Service

● Warranty card

Each device has a warranty card, please fill in the relevant content on the warranty card.

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

● Maintenance

Please check according to the content of 7.2 welding power fault code and countermeasures, and preliminarily eliminate the fault or record the fault information.

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

The company 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.

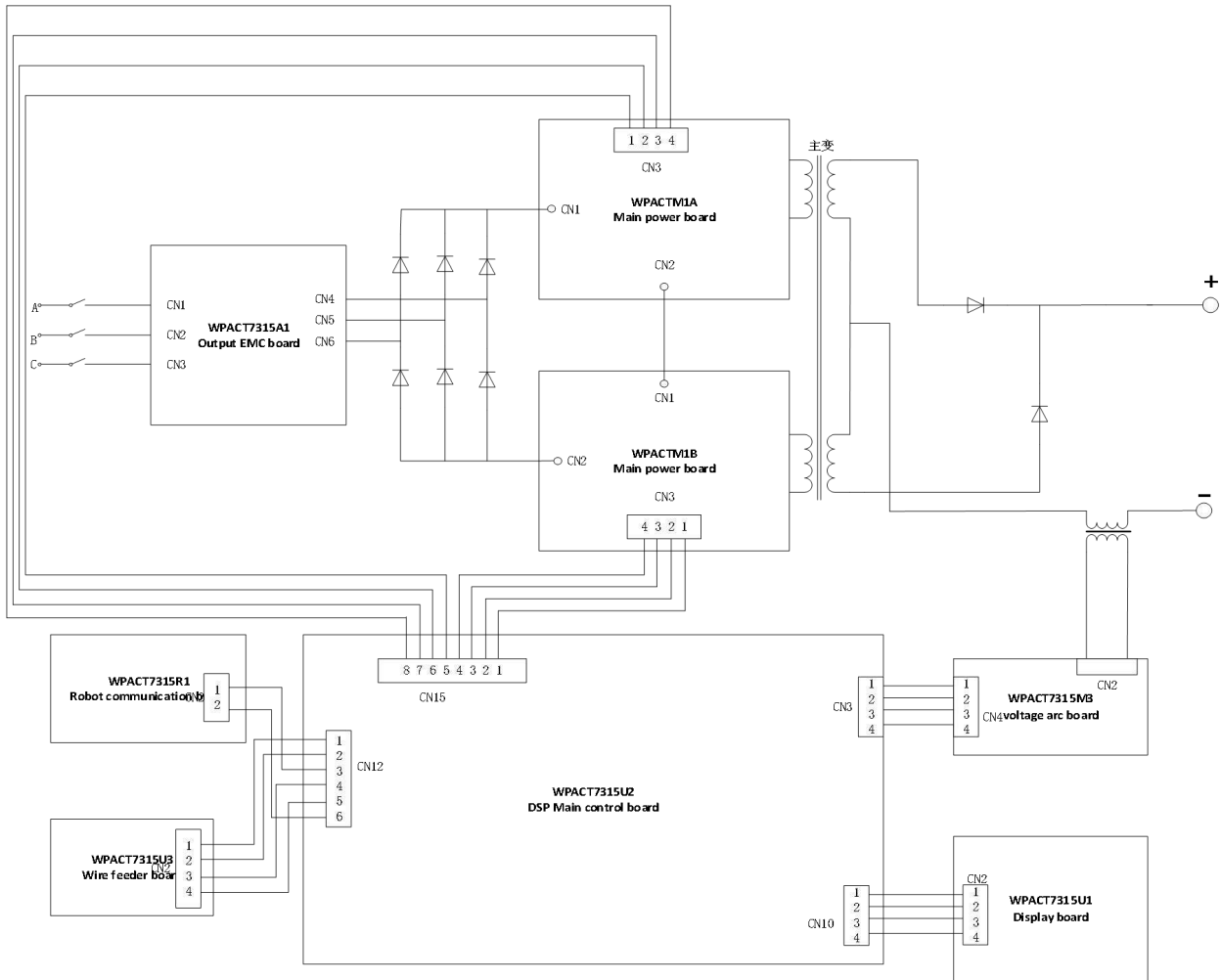
Appendix 1 Technical Specifications

Attached table1-1 Technical Specifications

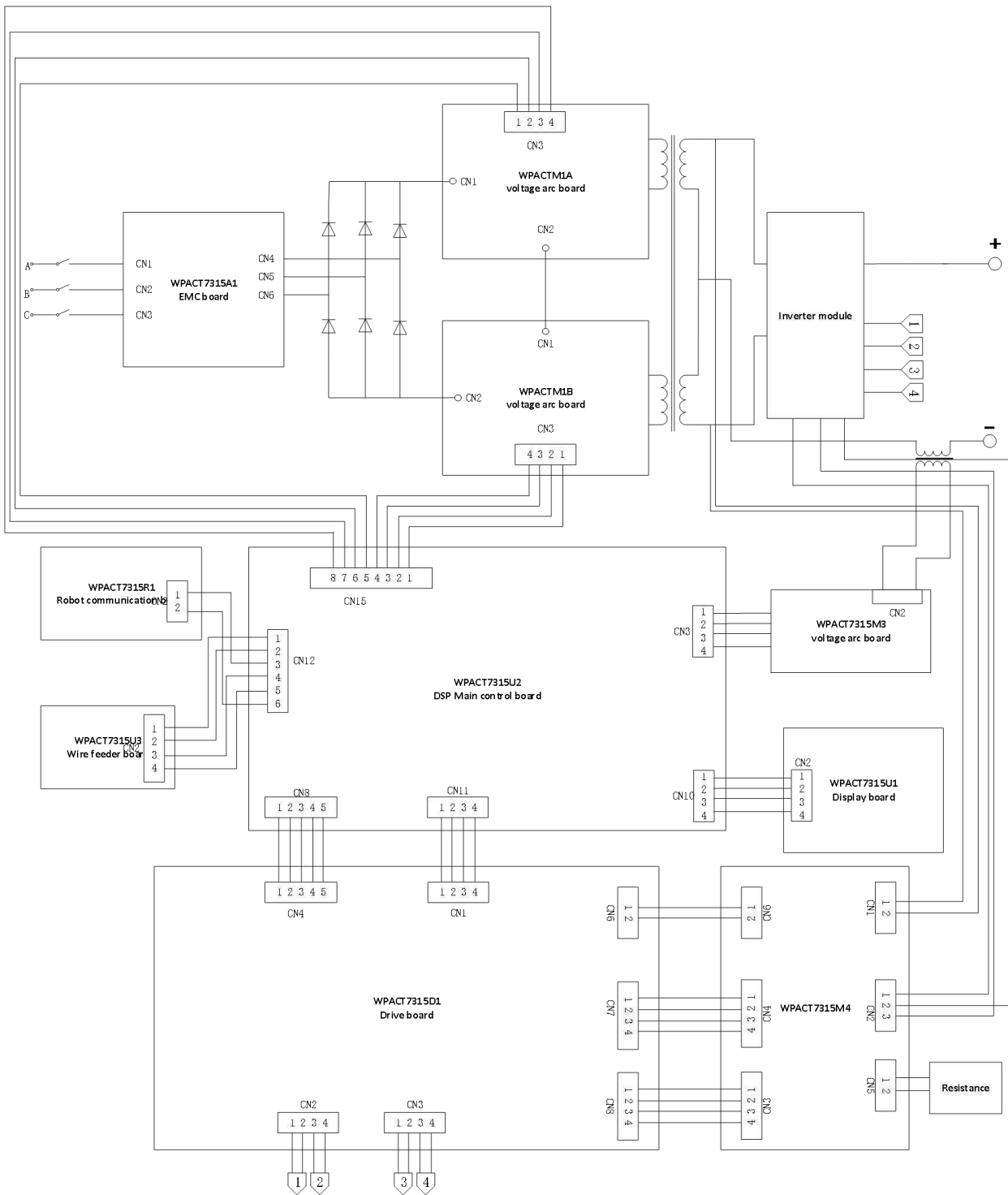
Welding power source	MetaTig 500 ACDC	MetaTig 400 ACDC	MetaTig 315 ACDC	MetaTig 500 DC	MetaTig 400 DC	MetaTig 315 DC
Control mode	Digital IGBT control					
Input voltage	Three-phase AC 380 V(+/-25%)					
Input frequency	40~70Hz					
Inverter switching frequency	110Khz					
Rated input capacity	19KVA/17.7KW	13.1KVA/12.3KW	10.2KVA/9.3KW	19KVA/17.7KW	13.1KVA/12.3KW	10.2KVA/9.3KW
Constant no-load voltage	68V					
Rated output current	500A	400A	315A	500A	400A	315A
Rated output voltage	30V	26V	22.6V	30V	26V	22.6V
Duty cycle	20%@500A 100%@350A	60%@400A 100%@350A	100%@350A	40%@500A 100%@400A	100%@400A	100%@350A
Output current range	DC TIG 3~500A	DC TIG 3~400A	DC TIG 3~315A	DC TIG 3~500A	DC TIG 3~400A	DC TIG 3~315A
	AC TIG 4~500A	AC TIG 4~400A	Exchange TIG 4~315A	/	/	/
	MMA 30-500A					
Power factor	0.94					
efficiency	87%@500A	88%@400A	88%@315A	90%@500A	91%@400A	91%@315A
DC pulse frequency	0.1-3000Hz					
AC pulse frequency	20-300Hz			/		
Pulse width	1-99%					
Arc ignition method	High frequency arc ignition/lifting arc ignition					
Parameter JOB	50 JOB					
Rise time	0-20s continuous adjustment(0.1s increments).					
Fall time	0-20s continuous adjustment(0.1s increments).					
Pregas time	0-25s continuous regulation(0.1s increments).					
Post gas time	0-25s continuous regulation(0.1s increments).					
Output terminals	Quick plug					
The welding torch contains a foot pedal signal	Can be adapted to foot pedal					
Enclosure rating	IP23 S					
Insulation class	H					
Cooling method	Forced air cooling					

Appendix 2 Electrical Connection Diagram

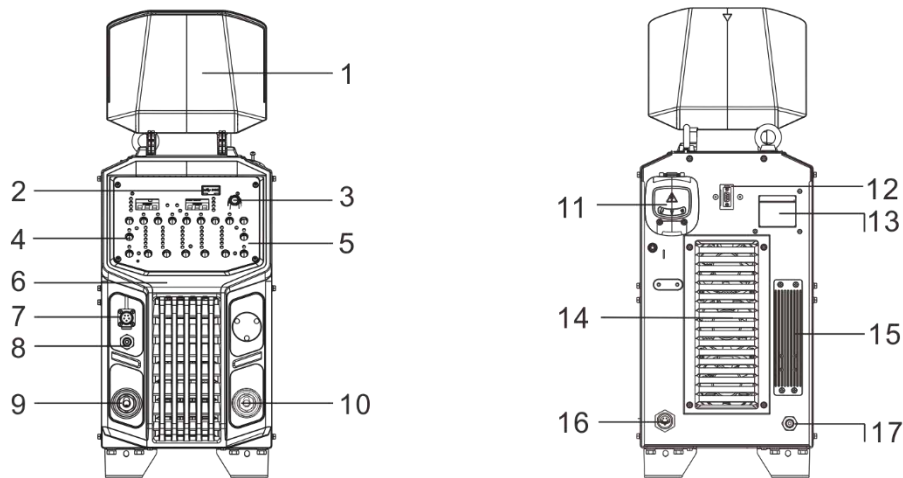
Attached figure2-1 DC TIG electrical connection diagram



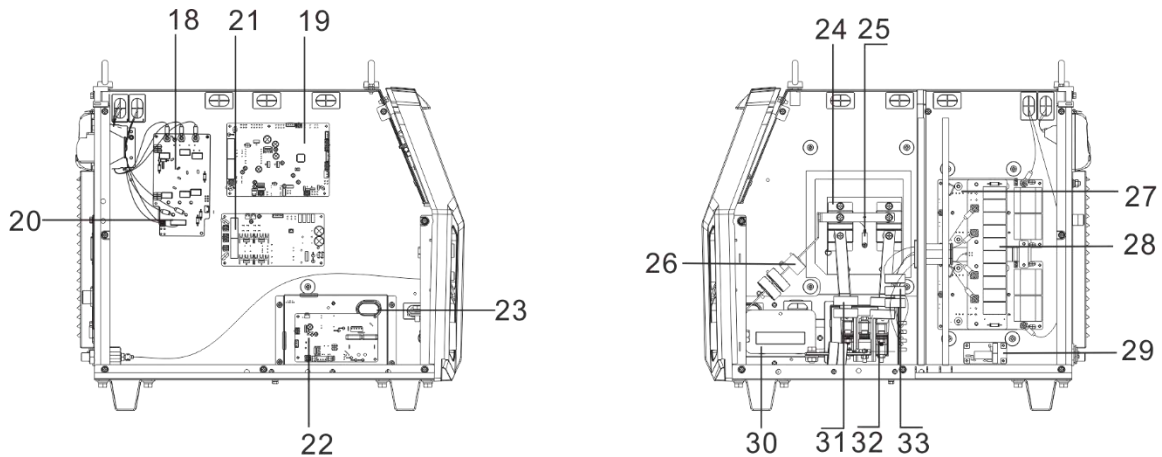
Attached figure2-2 AC/DC TIG electrical connection diagram



Appendix 3 Detailed Structure Diagram of DC TIG

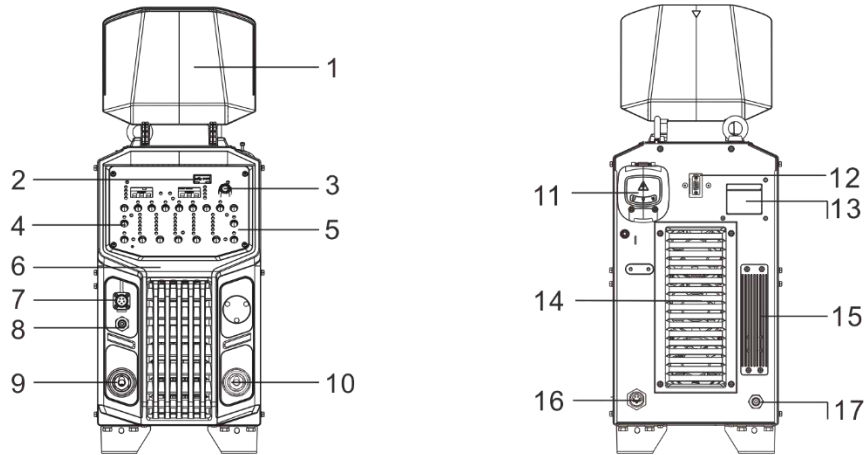


1	Dex transparent flip	R29061941	10	Red power connector of output positive pole	R30042864
2	USB waterproof rubber plug	R29160389	11	Wire holder of three-phase input cable	R29140611
3	Panel knob of welding power source	R29140623	12	Internal communication port	R30040881
4	Display board components	R111100VE	13	Air Switch	R30040897
5	MetaTig ACDC Front sticker	R29104655	14	DC fan	R34020311
6	Plastic panel of welding power source	R29062031	15	Flashing	R29061869
7	Torch switch/ Foot switch socket	R30047147	16	Water tank control socket	R30042738
8	Air valve	R29140064	17	Gas connector	R29120882
9	Black power connector of output negative pole	R30042862			

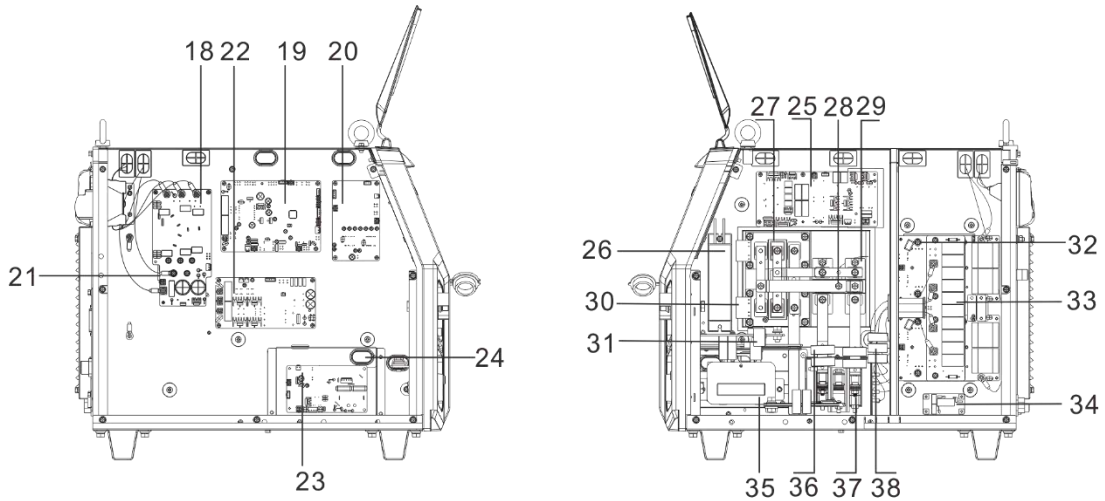


18	WPPM7315-A1 Output EMC board	R1111025P	26	Hall current sensor	R27060058
19	WPACT7315-U2 Main control board	R111100VT	27	WPACT7315-M1 Main power board	R111100YA
20	Input rectifier bridge	R26060292	28	WPACT7315-C1 Blocking capacitor board	R111100VU
21	WPACT7315-M2 Auxiliary power board	R111100VD	29	WPPM2315-A2 Water cooler relay control board	R111100VY
22	WPACT7315-M4 High voltage arc board	R111100VV	30	Output inductance	R22041839
23	High voltage Arc board Shielding cover	R29241847	31	Transformer output magnetic core	R24010449
24	Output diode module	R26060566	32	Main transformer	R23013664
25	Temperature sensor	R27050274	33	Transformer input magnetic core	R24010434

Appendix 4 Detailed Structure Diagram of AC/DC TIG



1	Dex transparent flip	R29061941	10	Red power connector of output positive pole	R30042864
2	USB waterproof rubber plug	R29160389	11	Wire holder of three-phase input cable	R29140611
3	Panel knob of welding power source	R29140623	12	Internal communication port	R30040881
4	Display board components	R111100VE	13	Air Switch	R30040897
5	MetaTig ACDC Front sticker	R29104655	14	DC fan	R34020311
6	Plastic panel of welding power source	R29062031	15	Flashing	R29061869
7	Torch switch/Foot switch socket	R30047147	16	Water tank control socket	R30042738
8	Air valve	R29140064	17	Gas connector	R29120882
9	Black power connector of output negative pole	R30042862			



18	WPPM7315-A1 Output EMC board	R1111025P	29	Output diode module	R26060566
19	WPACT7315-U2 Main control board	R111100VT	30	WPACT7315D2-ACDC Drive board	R111100YA
20	WPACT7315-D1 Drive board	R111100UK	31	Hall current sensor	R27060058
21	Input rectifier bridge	R26060292	32	WPACT7315-M1 Main power board	R111100VU
22	WPACT7315-M2 Auxiliary power board	R111100VD	33	WPACT7315-C1 Blocking capacitor board	R111100VY
23	WPACT7315-M4 High voltage arc board	R111100VV	34	WPPM2315-A2 Water cooler relay control board	R11112096
24	High voltage Arc board Shielding cover	R29241847	35	Output inductance	R22041839
25	WPACT7315M4-AC/DC Arc stability board	R111102L7	36	Transformer output magnetic core	R24010449
26	Cement resistance	R20040387	37	Main transformer	R23013664
27	Secondary power IGBT module	R26060853	38	Transformer input magnetic core	R24010434
28	Temperature sensor	R27050274			

MEGMEET Shenzhen Megmeet Welding Technology Co.,Ltd

Welding Machine Warranty

User Name:	
Detailed address:	
Zip:	Contact:
Phone:	Fax:
Machine Model:	
Power:	Machine Number:
Purchase order:	Date of purchase:
Service company:	
Contact:	Phone:
Maintenance Staff:	Phone:
Repair Date:	
User evaluation of service quality: Good <input type="checkbox"/> good <input type="checkbox"/> so-so <input type="checkbox"/> poor <input type="checkbox"/>	
Other comments:	
User signature: Year, month, day	
Customer Service Center Return Visit Record: <input type="checkbox"/> return visit by phone <input type="checkbox"/> letter return visit	
Other:	
Signature of technical support engineer: year, month and day	

Note: This table will be invalidated if the user is not able to have a return visit

MEGMEET Shenzhen Megmeet Welding Technology Co.,Ltd

Welding Machine Warranty

User Name:	
Detailed address:	
Zip:	Contact:
Phone:	Fax:
Machine Model:	
Power:	Machine Number:
Purchase order:	Date of purchase:
Service Company:	
Contact:	Phone:
Maintenance Staff:	Phone:
Repair Date:	
User evaluation of service quality: Good <input type="checkbox"/> good <input type="checkbox"/> so-so <input type="checkbox"/> poor <input type="checkbox"/>	
Other comments:	
User signature: Year, month, day	
Customer Service Center Return Visit Record: <input type="checkbox"/> return visit by phone <input type="checkbox"/> letter return visit	
Other:	
Signature of technical support engineer: year, month and day	

Note: This table will be invalidated if the user is not able to have a return visit

Notice to users

- 1.The warranty scope refers to only the welding power source.
- 2.The warranty period is 24 months,and under normal use during the warranty period,the welding power source fails or is damaged.Our company repairs free of charge.
- 3.The start of the warranty period is the date of the manufacture of welding power source,the welding power code is the only basis for judging the warranty period,and the equipment without welding power code is treated according to the warranty.
- 4.Even within the warranty period,a certain repair cost will be charged if the following occurs:
 - Failure of the welding power sourcecaused by not operating according to the user manual;
 - Damage to the welding power source due to fire,flood,abnormal voltage,etc.;
 - Damage caused when the welding power source is used for abnormal functions.
- 5.The service fee is calculated according to the actual cost,and if there is another contract,it will be handled on the principle of contract priority.
- 6.Please be sure to keep this card and present it to the repair unit at the time of warranty.
- 7.If you have any questions,you can contact the distributor,or contact our company directly.

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
Postal code:518057
Customer Service Hotline:4006662163

Notice to users

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An abstract graphic consisting of numerous thin, curved lines that sweep across the page from the top left towards the bottom right, creating a sense of motion and depth.

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