

# **Artsen II fully digital IGBT Inverter CO<sub>2</sub>/MAG/MIG multi-function welding machine**

## **User Manual**

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Shenzhen Megmeet Welding Technology Co., Ltd. will provide all-round technical support for our customers, including but not limited to: activating CAN communication, welding machine group control, robotic coordination, upgrading the software for welding technique database and after-sales services. Customers can contact any office or customer service center of Shenzhen Megmeet Welding Technology Co., Ltd. in the vicinity, or directly contact the headquarters of our company.

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# Preface


Thank you for purchasing a fully digital IGBT Inverter CO<sub>2</sub>/MAG/MIG multi-function welding machine produced by Shenzhen Megmeet Welding Technology Co., Ltd.


This manual gives our customers the information about installation and wiring, parameter setting, failure diagnosis and trouble-shooting for the machine, and the relevant precautions for daily maintenance. In order to correctly install and operate the welding machine and best realize its excellent performances, please carefully read this manual before its installation, and properly keep and hand this manual to the operator of this welding machine.

Shenzhen Megmeet Welding Technology Co., Ltd. will further improve this product by research and development and innovation, therefore if there is any difference between the contents, parameters and figures in this manual and those of the real product, the real product shall prevail. We may make any change without prior notice. This company has the right of final interpretation of this manual.

# Precautions for safety

## Safety definition

 **Danger** Operate as required; otherwise death or serious injury may be caused.

 **Caution** Operate as required; otherwise moderate or minor injury or property damage may be caused.

- In order to correctly use this machine, please carefully read this manual before using it.
- To ensure that you can safely use this welding machine, and avoid any injury to you or others and any major accident, the precautions in this manual shall be complied with during using the machine, though safety has been fully taken into consideration in the design and manufacturing of this product.
- Improper use of this welding machine may cause some injury accident.

## Precautions for installation



- Before handling welding machine, the input power source from the electric distribution box must be cut off.
- When using a hoist to handle the welding machine, you must ensure that the lifting eye rings have been tightened by rotating and the enclosure and covering plates of the machine have been installed.
- Welding machine shall not be hoisted together with other object.
- Install welding machine on non-flammable object; otherwise there is a risk of fire.
- Do not put the welding machine in the vicinity of any flammable material; otherwise there is a risk of fire.
- Do not install the welding machine in an environment that are rich in explosive gas; otherwise there is a risk of explosion.
- Wiring shall be done by qualified professional people; otherwise there is a risk of electric shock.
- Wiring shall not be done until it is ensured that input power source has been turned off; otherwise there is a risk of electric shock.
- Before powering on, the grounding terminals of the welding machine must be reliably grounded; otherwise there is a risk of electric shock.
- Before powering on, the covering plates must be placed properly; otherwise there is a risk of electric shock.
- When powering on, do not touch the terminals by hand; otherwise there is a risk of electric shock.
- Do not operate the welding machine with a wet hand; otherwise there is a risk of electric shock.
- Maintenance shall be carried out after 5 minutes since the power source having been turned off when the

indicator for welding power has thoroughly been out and the voltage between positive bus and negative bus is less than 36 V; otherwise there is a risk of electric shock.

- Replacement of any part shall be done by professional people and it is forbidden to leave any wire residue or metal object in the machine; otherwise there is a risk of fire.
- After replacement of control panel, the parameters must be set correctly before running of the machine; otherwise there is a risk of property damage.
- The exposed part of cable jointing sleeve shall be wrapped with insulation tape; otherwise there is a risk of electric shock.
- Power source plug of water tank is of high voltage of AC 380V and when wiring it, the welding power source shall be turned off; otherwise there is a risk of electric shock.



- When handling, do not make the operation panel or covering plate under any force; otherwise falling down of such objects may cause personal injury or property damage.
- When using a forklift to handle the welding machine, you shall firmly fix the car wheels.
- When installing, you shall use a method that can withstand the weight of welding machine; otherwise falling down of such machine may cause personal injury or property damage.
- It is forbidden to install the welding machine at a place where there is water spatter out of water pipe and the like; otherwise there is a risk of property damage.
- Do not let any screw, gasket and metal rod and the like foreign object drop into the inside of the welding machine; otherwise there are risks of fire and property damage.
- When the welding machine is damaged or of incomplete parts, do not install and use such machine; otherwise there are risks of fire and personal injury.
- Connection between the main circuit terminals and wire jointing sleeves must be firm; otherwise there is a risk of property damage.

## Precautions for using



- In order to ensure safety, only personnel who have safe operation knowledge and welding skills can do welding operations.
- Welding machine shall not be used for the usage other than welding.
- Installation, commissioning and maintenance of welding machine shall only be done by professional personnel.
- Those who use a cardiac pacemaker shall not be close to welding machine and welding place without a permission from a doctor.
- Do not touch any live parts; otherwise there is a risk of electric shock.
- Do not use any cable that features insufficient sectional area, conductor exposed or damaged part.
- Do not remove the enclosure or cover of welding machine during using the machine.
- Use only undamaged, good-insulation gloves.
- When working high above the ground, the operator shall pay attention to safety protection.
- When the welding machine is not used, please cut off the power supplies for welding machine and

electric distribution box.

- When welding in a narrow or enclosed space, the operator shall be supervised by a checker in ensuring sufficient ventilation or wearing breathing protective apparatus; otherwise asphyxia may be caused due to lack of oxygen.
- There will be some harmful fume and gas during welding, so please have sufficient ventilation or wear breath protective apparatus; otherwise health will be endangered.
- Do not weld the pressurized containers such as pipe filled with gas and sealed container.
- Do not place a hot working piece close to some flammable material.
- Do not weld something in the vicinity of some flammable material.
- Do not place a fire extinguisher in the vicinity of the welding place.
- Dedicated holder shall be used for fixing gas cylinder; otherwise toppling and falling of gas cylinder may cause personal injury.
- Do not have electrode contact gas cylinder.
- Please correctly use the pressure relief valve as required.
- Disassembling, repairing and maintenance of pressure relief valve shall be done by professional personnel.
- Do not touch any rotating parts of working fan, wire feeder and the like; otherwise personal injury may be caused.
- When welding or supervising welding process, please ensure the operator or checker use the protective device with enough arc light shielding, to avoid arc light damaging the eyes or skin.
- Please use dedicated protective leather gloves, long-sleeved clothes, welding spats, apron goggles and other protective devices for welding. Avoid arc light, spatter and welding slags causing any damages.
- Protective shield shall be set up around the welding place, to avoid arc light causing any damages to others.
- Acoustic insulation device shall be used to avoid any noise damages.



- It is forbidden to use this welding machine for the task other than welding.
- Do not place any heavy thing on the welding machine.
- Do not block or jam the ventilation holes of the welding machine.
- Put the welding machine at a place where the metal foreign objects such as metal spatters are unable to drop into the inside of the welding machine.
- Keep the distance between the welding machine and the wall or other welding machine be 30 cm or more.
- To avoid the wind directly blowing electric arc, some shield shall be used.
- Please firmly fix the wheels to avoid the welding machine sliding.
- To avoid electromagnetic hazards, electromagnetic shielding should be applied to cables or welding place.
- Inclination angle of the plane where the welding machine is placed shall be less than 15 degrees to avoid the welding machine toppling.
- The protection level of this welding machine is IP 23S, and the working conditions for usage shall be required as follows:

Working 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  $40^{\circ}\text{C}$ , no more than 75%RH; at  $20^{\circ}\text{C}$ , no more than 95%RH

Height above sea level shall not be more than 2000 m

There shall be no remarkable mechanical vibration and impact and the inclination angle of the welding machine shall not be more than 15 degrees.

Contents of dust, metal powder and corrosive gas in the ambient air shall be within a normal scope.

Prevent the welding machine from being rained on or the fan from inhaling raining water.

- When the ambient working temperature is lower than 10°C, the dedicated antifreeze for the water tank shall be used; otherwise the water tank may be damaged.

## **Precautions for abandonment**

When abandoning the welding machine, the following issues shall be noted:

1. When being incinerated the electrolytic capacitors on the main circuit and the electrolytic capacitors on the printed circuit board may explode.
2. The plastic parts on the front panel or the like may produce toxic gases when being incinerated.
3. The welding machine shall be disposed as industrial waste.

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# Chapter 1 Product overview

## 1.1 Product introduction

Artsen II PM/CM series products are applicable for various domains such as automobile and its parts industry, instrument manufacturing, machine and rail transportation, shipbuilding and marine platform, chemical and aluminum template. Artsen II PM/CM series products designed for professional users are fully digital IGBT inverter CO<sub>2</sub>/MAG/MIG multi-function welding power source, and when connected to fully digital control wire feeder, the following operations can be available:

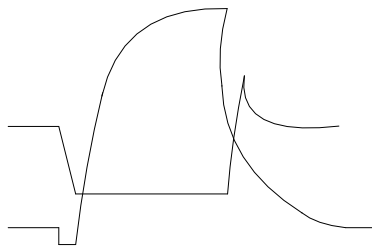
- A number of intelligent welding control methods as options, including DC, single pulse and double pulses based on real-time power control.
- Being used for welding various materials, such as carbon steel, stainless steel and aluminum alloy.
- Being used for welding with solid core wire and flux-cored wire.
- Welding control methods can be customized for special requirements.
- Being able to be used in cooperation with automation equipment (including robots and intelligent tooling).
- Being used for welding application with push-pull wire feeding, including manual push-pull wire feeding, robotic push-pull wire feeding, and intermediate drive wire feeder.
- Being able to be matched to welding trolley provided by Megmeet for more convenient moveable operations.
- Being able to be matched to water-cooling system provided by Megmeet for better cooling of welding torch.

## 1.2 Process introduction

### 1.2.1 DC short arc welding

Artsen II PM/CM series products adopt the control technique of short-circuiting transition controlled by special energy, which can adjust the transition features and shape of molten drop, improve weld formation, increase welding speed, and decrease welding spatter, by real-time control of welding voltage and current, especially suitable for welding of medium, thin, super-thin carbon plates and backing welding and so on.

Control waveform is shown in Figure 1-1.

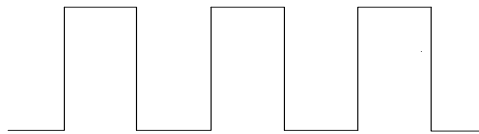


**Figure 1-1 DC short arc welding**

### 1.2.2 Single pulse welding

Artsen II PM series products adopt the molten drop transition control technique of pulse energy regulation, which by controlling pulse current can adjust the size and shape of transition molten drop, increase electric arc energy, improve weld formation and decrease welding spatter, especially suitable for welding of stainless steel, aluminum alloy and some nonferrous metals.

Control waveform is shown in Figure 1-2.

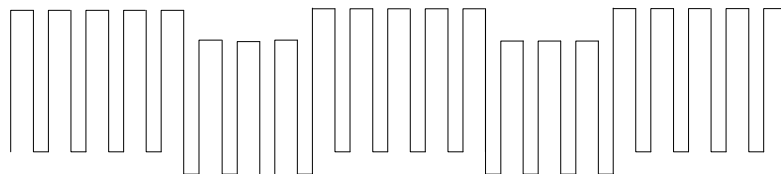


**Figure 1-2 Single pulse welding**

### 1.2.3 Double pulses welding

Artsen II PM series products adopt the coordinated pulse energy control technique based on changing of wire feeding speeds, which can adjust welding heat input, and improve weld formation and quality, by periodic coordination with wire feeding speed, pulse current parameter and arc length parameter, especially suitable for welding of aluminum, aluminum alloy and other metals.

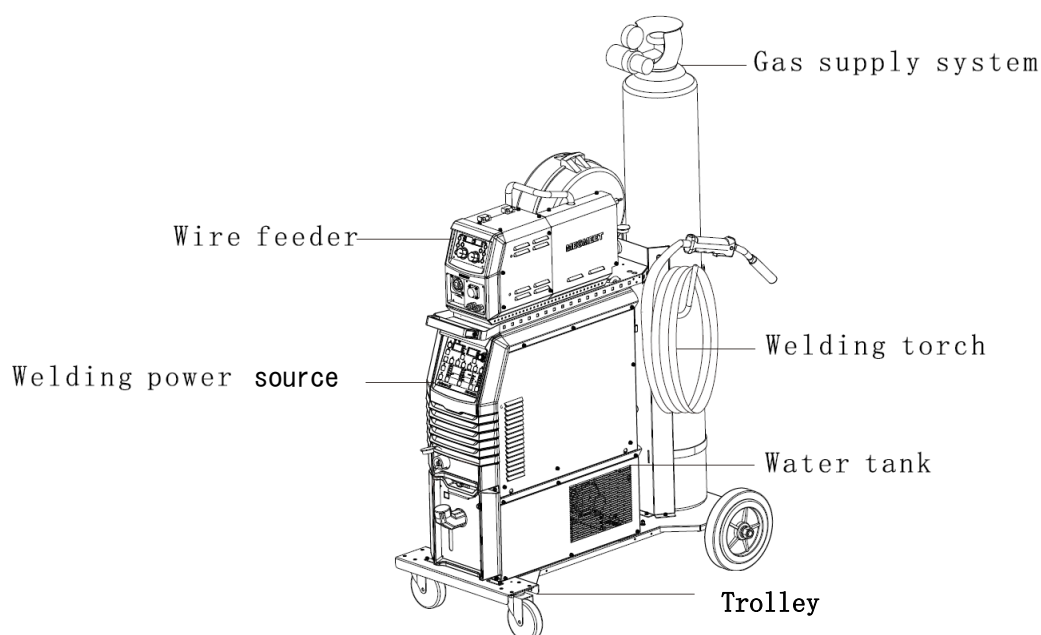
Control waveform is shown in Figure 1-3.



**Figure 1-3 Double pulses welding**

### 1.3 Systematic structure

Welding machine system is shown in Figure 1-4.



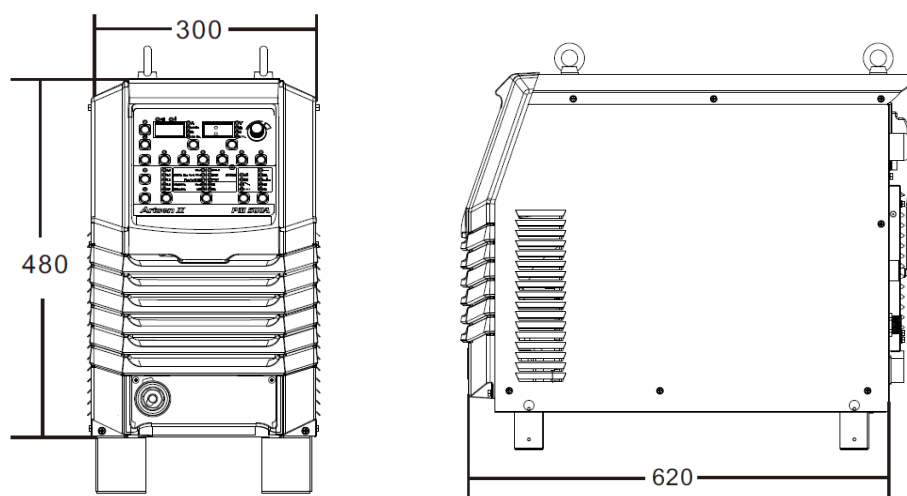
**Figure 1-4 Systematic structure of manual welding**

**Note:**

Manual welding system can be matched by the functions of a welding torch with manual push-pull wire feeding and a intermediate drive wire feeder, as an option; robotic welding system can be matched by the function of a welding torch with robotic push-pull wire feeding, as an option. For the relevant details, see **Welding torch model selection (F03)** in **3.2.13 Internal menu**.

### 1.4 Dimensions and gross weight

Dimensions of the welding machine are shown in Figure 1-5, and gross weights of the machine and its accessories are shown in Table 1-1.



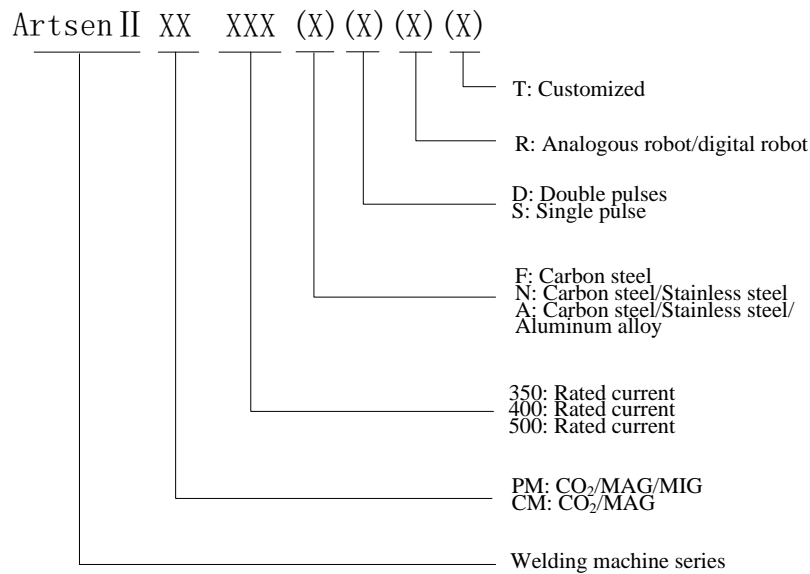
**Figure 1-5 Dimensions of welding machine**

Table 1-1 Dimensions of welding machine and its accessory

Part name	Dimensions (Length*Width*Height) (mm)	Gross weight (kg)
Welding machine	620*300*480	55
Water tank	643*300*268	15

## 1.5 Model code explanation

Model code of welding machine is shown in Figure 1-6.



**Figure 1-6 Model code explanation**

**Note:** ( ) means optional, for representing different models of welding machine.

**Example 1:**

Artsen II PM500ADR represents Artsen series, CO<sub>2</sub>/MAG/MIG, Rated current of 500A, double pulses, aluminum alloy, robotic welding machine.

**Example 2:**

Artsen II CM350 represents Artsen series, CO<sub>2</sub>/MAG, Rated current of 350A, carbon steel, manual welding machine.

# Chapter 2 Installation and wiring

This chapter will describe the installation requirements for welding machine, and the relevant steps and precautions.

## 2.1 Opening package to check

The machine is placed in a durable package designed and dedicated for the purpose.

1. Before opening the package, check if the external package of the product is good.
2. After opening the package, check if the various spare parts and User Manual for installation and operation are complete, the model is consistent with that in the order (If there is some spare part missed or false by delivery, please duly contact the relevant supplier).
3. Packing materials can be recycled.
4. The serial number of the machine is unique, and marked in the name plate of machine. When repairing or technical support is needed for the machine, such serial number is very important.

## 2.2 Installation requirements

### ● Environmental requirements

When choosing the installation environment, please note the following items:

1. The machine shall be installed in a place where there is a good ventilation and the vibration is less than  $5.9 \text{ m/s}^2$  (0.6 g).
2. Avoid being installed in a place with much dust and metal powder.
3. It is forbidden to install the machine in a place where there is corrosive and explosive gas.
4. The ambient temperature shall be within the scope of  $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$ ; when the temperature is over  $40^{\circ}\text{C}$ , forced external heat dissipation shall be applied or the machine shall be used at lower rated power. The humidity shall be less than 95%, and there is no condensed water drop.
5. Wind prevention shall be applied for the welding place, and when necessary the windshield shall be used; otherwise the welding technique will be affected.
6. If there is any special installation requirement, please make a consultation in advance, then a conclusion.

### ● Requirements for installation space

There shall be at least a distance of 20 cm from the welding power source to the wall; when several machines are to be aligned in a line, the distance between every two adjacent machines shall be no less than 30 cm. The reserved space for placing welding power source is recommended in Table 2-1.

**Table 2-1 Reserved space for installation of welding supply power**

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

### 2.3 Precautions for handling

1. Before handling the welding power source, the input power from the electric distribution box must be cut off.
2. When handling the welding power source with a fork lift, the car wheels must be firmly fixed.
3. there is some risk in lifting the welding power source for installation, and it is not recommended to use a hoist for installation.

### 2.4 Requirements for specifications of welding power source

The specifications of Artsen II PM/CM series welding power source are shown in Table 2-2.

**Table 2-2 Specifications of welding power source**

Items		Model Power		
		CM350	CM400/PM400	CM500/PM500
Rated power source current features		Three phases, AC 380V 50Hz/60Hz	Three phases, AC 380V ,50Hz/60Hz	Three phases, AC 380V ,50Hz/60Hz
Power source capacity	Network power source	30kVA or more	30kVA or more	30kVA or more
	Power generation equipment	50kVA or more	50kVA or more	50kVA or more
Input protection equipment (electric distribution box)	Air switch	C class, 63A or more	C class, 63A or more	C class, 63A or more
Cable	Input side of welding power source	10mm <sup>2</sup> or more	16mm <sup>2</sup> or more	16mm <sup>2</sup> or more
	Output side of welding power source	35mm <sup>2</sup> or more	50mm <sup>2</sup> or more	70mm <sup>2</sup> or more
	Grounding wire for machine enclosure	Equivalent to or more than input side of welding power source	Equivalent to or more than input side of welding power source	Equivalent to or more than input side of welding power source

**Note:** Specifications of robotic series welding power source are the same as that shown in the above.

#### ● Warning about safety

When operating on iron plate or frame in a wet working place, please install the leakage protector.

## 2.5 Electrical connection

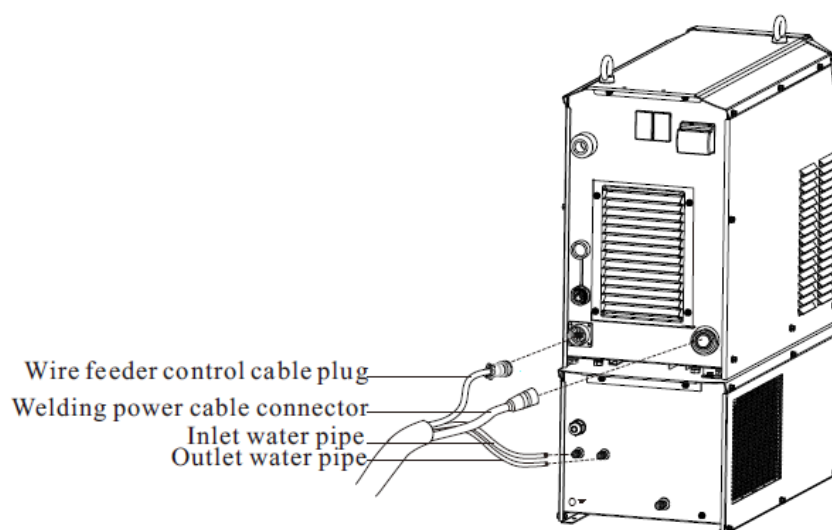
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### ● Safety Warning

1. Have qualified professional electrical operator do the connection operations.
  2. Electrical connection shall only be done under the condition that the switch on the electric distribution box has been turn off and safety is ensured.
  3. Use only the cables of defined specifications.
  4. Do not touch it with a wet hand.
  5. Do not put any heavy thing on the cables.
  6. It is possible that the water supply pipes and the steel bars in the house structure are not fully grounded, and such pipes or bars cannot be used for connecting safety grounding wire.
  7. Connect this welding power source with matched or specified wire feeder, welding torch, gas meter and water tank for usage; otherwise welding performance and quality may be affected.
- 

### 2.5.1 Welding power source connection

Connect the welding power cable connector to the positive pole of welding power source and fasten the connection, and plug the wire feeder control cable plug into the socket of welding power source and fasten it as shown in Figure 2-1.



**Figure 2-1 Schematic diagram for connection of welding power source**

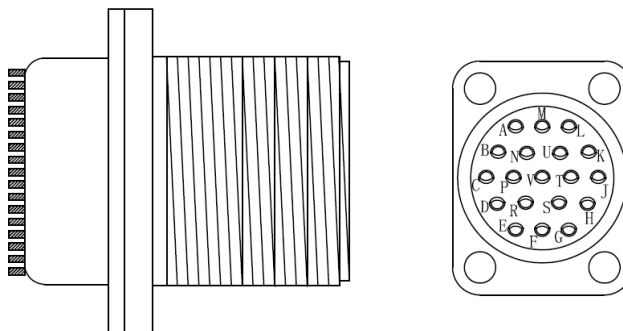


Figure 2-2 19 pins definition of welding power source

Table 2-3 Manual welding power source - connections  
between wire feeder control cables and socket

Cable No.	7 pins plug of manual wire feeder	19 pins plug of manual welding power source	Functions
Red	A	A	Positive line of wire feeder power source
Yellow	B	M	Negative line of wire feeder power source
Green	C	J	Positive line for communication
Black 1	D	H	Negative line for communication
Blue	E	E	Remote voltage compensation line
Black 2	/	/	Reserved

Table 2-4 Robotic welding power source - connections  
between wire feeder control cables and socket

Cable No.	14 pins plug of robotic wire feeder	19 pins plug of robotic welding power source	Functions
Black 1	A	A	Wire feeder motor power supply +
Black 2	B	M	Wire feeder motor power supply -
Black 3	C	N	Wire feeder Solenoid valve power supply +
Black 4	D	B	Wire feeder Solenoid valve power supply -
Black 5	F	T	Wire feeder encoding disk pinboard 15

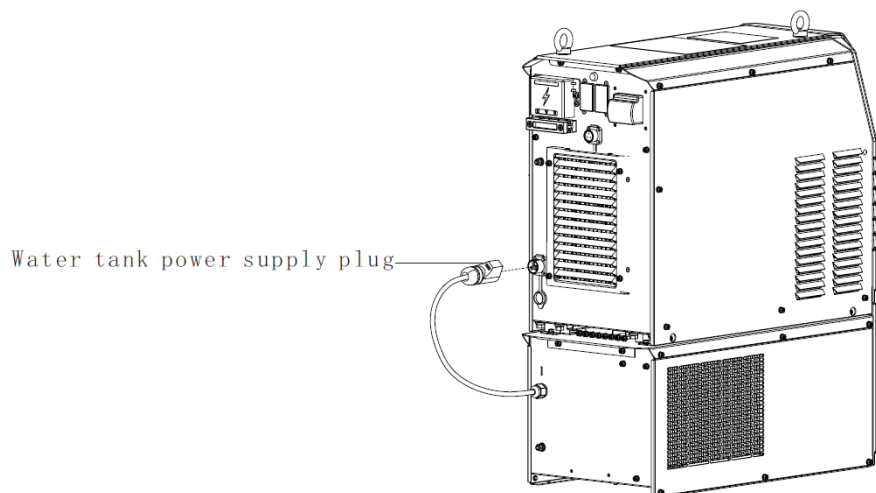


			V power supply +
Black 6	I	S	Wire feeder encoding disk pinboard 15 V power supply -
Black 7	G	J	Wire feeder encoding disk pinboard signal A+
Black 8	J	R	Wire feeder encoding disk pinboard signal A -
Black 9	H	H	Wire feeder encoding disk pinboard signal B+
Black 10	K	D	Wire feeder encoding disk pinboard signal B -
Black 11	E	P	Inching wire feeding signal+
Black 12	L	E	Output voltage remote sampling +
Black 13	M	F	Motor power supply + of push-pull wire torch
Black 14	N	G	Motor power supply - of push-pull wire torch

## 2.5.2 Water tank connection

- **Connections for water tank power supply**

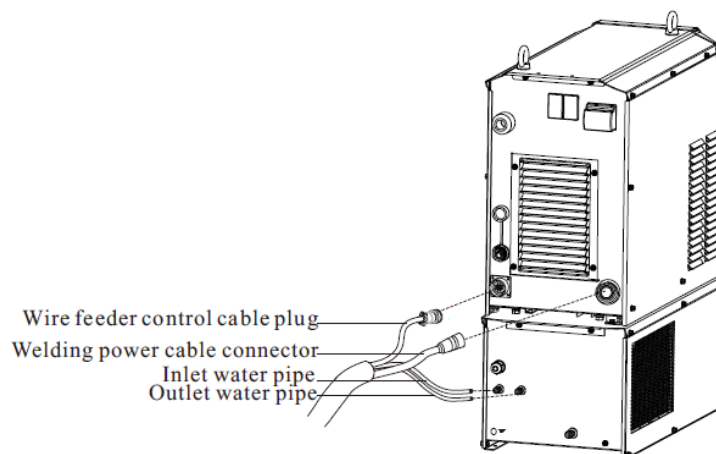
Connect one end of water tank power supply plug to the plug of welding power source, and other end to the socket of water tank power supply, as shown in Figure 2-3.



**Figure 2-3 Schematic diagram of connections for water tank power supply**

- **Connections for water tank pipes**

Connect the inlet pipe and outlet pipe in the combined cable to the inlet pipe and outlet pipe on the water tank respectively, as shown in Figure 2-4.



**Figure 2-4 Schematic diagram of connections for water tank pipes**

- **Safety Warning**

1. When using the water tank, you need to turn on **3.2. 4Air cooling/Water cooling** function on the panel; otherwise there is a risk of damaging the welding torch.
2. Water tank power supply plug is of high voltage of 380 V AC, and when wiring, you need to cut off welding power source; otherwise there is a risk of electric shock.
3. When the ambient working temperature is lower than 10°C, the dedicated antifreeze for the water tank shall be used; otherwise the water tank may be damaged.

### 2.5.3 Connections for working piece side welding cable (grounding wire)

Tighten one end of working piece side welding wire to the output terminal of negative electrode; other end to the working piece, as shown in Figure 2-5.

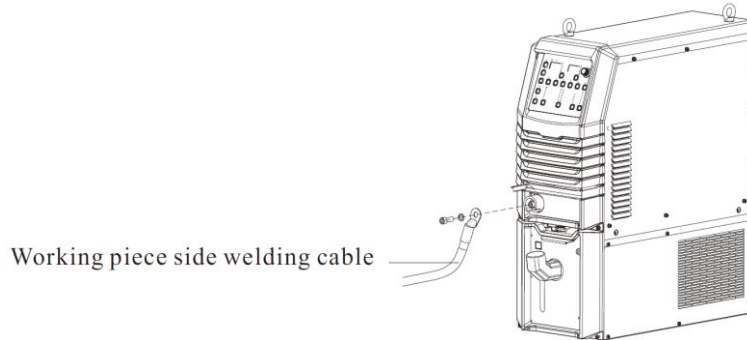


Figure 2-5 Schematic diagram of connections for working piece side welding cable

### 2.5.4 Connections for power source input cable (AC 380V)

#### Steps

1. Turn off the switch on the electric distribution box (User's equipment), and remove the cover of input terminal.
2. Connect one end of the input cable to the input terminal of power source and fix them with a cable clamping plate; connect the safety grounding wire in the input cable to the M6 grounding bolt on the enclosure of welding power source, as shown in Figure 2-6.
3. Restore the cover of input terminal.
4. Connect other end of the input cable to the output terminal of the electric distribution box, then the connections for welding power source side cable are done.

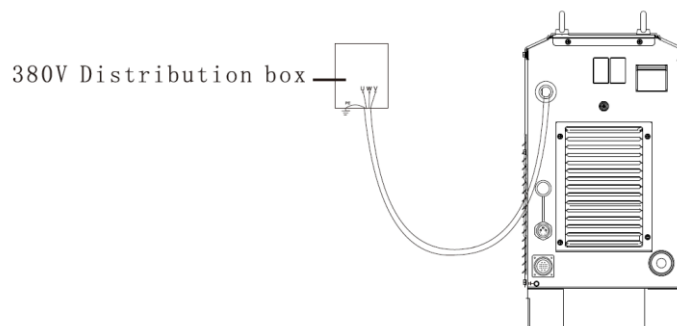


Figure 2-6 Schematic diagram of connections for welding power source side input cable

#### ● Caution

With welding power source, there are no special requirements for three phases sequence of network source. The input cable for Artsen II CM350 shall be of  $10 \text{ mm}^2$  or more; the input cables for Artsen II PM/CM 400 and Artsen II PM/CM500 shall be of  $16 \text{ mm}^2$  or more.

# Chapter 3 Function description and operation

## 3.1 Preparation before welding

- a) **Check whether the wiring of welding machine is correct.**

For details, see [☞ Electrical connection](#).

- b) **Install the wire.**

For how to install the wire, See [☞ User Manual for Artsen II Fully Digital Wire Feeder](#).

- c) **Turn on the switch of the welding power source.**

Turn on the switch of the welding power source.

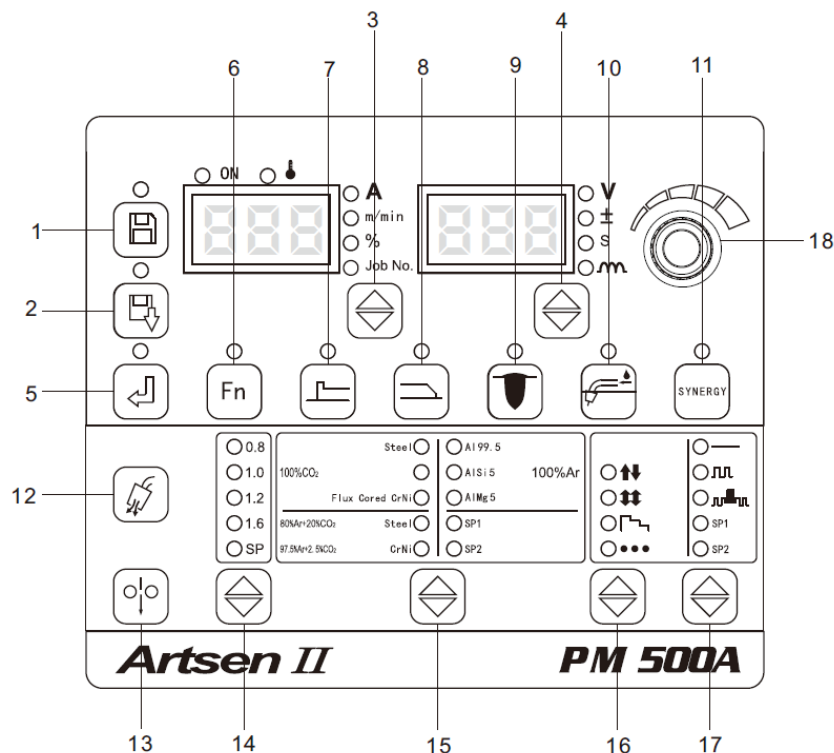
- d) **Check whether the parameters setting on the panel is correct.**

When using a water-cooling welding torch, activate the functional key of **Air cooling/Water cooling** on the panel. For details, see [☞ 3.2.4 Air cooling/Water cooling](#).

## 3.2 Function description and operation

Function description of the panel of welding power source is shown in Figure 3-1. Figure 3-1 shows only the ArtsenII PM500A model. The functions of other models are different from those in Figure 3-1. For details, see [☞ Appendix 4 Technique matching list](#).

The serial numbers on the panel of welding power source are corresponding to key numbers in the failure code.



**Figure 3-1 Function description of the panel of welding power source****Table 3-1 Function description of the panel of welding power source**

No.	Name	Description of various functional keys
1	Store	To store the welding parameters selected.
2	Invoke	To invoke the welding parameters stored.
3	Left cycle switching key	To be used to switch among Current, Wire feeding speed, Percentage and Channel number.
4	Right cycle switching key	To be used to switch among Voltage, Voltage modification value, Time and Arc dynamics
5	Enter	To confirm and lock the parameters
6	Function	To set the internal menu parameters.
7	Parameters for arc starting	To view the current, wire feeding speed and voltage in arc starting parameters
8	Parameters for arc ending	To view the current, wire feeding speed and voltage in arc ending parameters.
9	Weld penetration control	When there is some change in rod extension, weld penetration is kept constant.
10	Air cooling/Water cooling	Key for switching Air cooling or Water cooling.
11	Synergic /Separate	At Synergic mode, the system will apply the corresponding voltage according to applied current. At separate mode, these are adjusted separately.
12	Gas detection	Check whether there is protective gas.
13	Inching wire feeding	Under the non-welding condition, feed the wire to the top of welding torch.
14	Wire diameter	To choose different wire diameters; SP means other wire diameters.
15	Welding material type	To choose different welding materials; SP means other welding materials.
16	Welding control	to be used in different welding operations (non-arc ending, arc ending, repeating arc ending, 2 steps, 4 steps, special 4 steps, inching welding).
17	Welding method	To be used to choose different welding methods (switching among DC, single pulse and double pulses. SP1 and SP2 to be used in other welding methods.)
18	Panel adjustment knob	To be used to adjust the welding parameters, locked parameters and internal menu parameters.

### 3.2.1 Welding parameters

Left digital tubes are used to display “A”, “m/min.”, “%” and “Channel”, locked

**parameters, internal menu numbers and failure code;** Left cycle switching key switches “A”, “m/min.”, “%” and “Channel” in a cycle, and the corresponding LED indicators will be lit up.

“A” part is used to indicate welding current.

“m/min.” part is used to indicate wire feeding speed.

“%” part is used to indicate % of wire feeding speed.

“Channel” part is used to indicate the channel number stored and invoked.

Right digital tubes are used to display “V”, “±”, “Second” and “Arc dynamics”, **locked parameters, internal menu parameters and failure code;** Right cycle switching key switches “V”, “±”, “Second” and “Arc dynamics” in a cycle, and the corresponding LED indicators will be lit up.

“V” part is used to indicate welding voltage.

“±” part as voltage modification value is used to modify Synergic matching voltage.

“Second” part is used to indicate the parameters related to time.

“Arc dynamics” part is used to indicate the arc stiffness.

### 3.2.2 Gas detection

This key is used to detect the relevant gas and its flow.

Method 1: Shortly press the **Gas detection** key on the panel of welding power source for 30s to start gas feeding, and shortly press the **Gas detection** key again to stop gas feeding.

Method 2: Press the **Gas detection** key on the wire feeder for continual gas feeding, and release the key to stop gas feeding.

### 3.2.3 Inching wire feeding

Method 1: Press the **Inching wire feeding** key on the panel of welding power source for continual wire feeding, and release the key to stop wire feeding.

Method 2: Press the **Inching wire feeding** key on the wire feeder for continual wire feeding, and release the key to stop wire feeding.

### 3.2.4 Air cooling/Water cooling

#### ● Attention

1. When a water tank and water cooling torch are equipped on the welding power source, it is needed to choose Water cooling; otherwise there is a risk of damaging the torch.
2. After choosing Water cooling and the welding power source being powered, the water tank motor will automatically running for 3 minutes, and if there is no welding in this period, the water tank motor will stop running at the end of 3 minutes.
3. When the welding power source starts to do welding, the water tank motor will start running synchronously; when welding is stopped, the water tank motor will delay 3 minutes to stop running.

When LED indicator is on (see Figure 3-1), water cooling setting is done; when LED indicator is off, air cooling setting is done.

### 3.2.5 Arc dynamics

Check the stiffness of electric arc according to different welding techniques.

The stiffness of electric arc dynamics is shown in Figure 3-2 and described in Table 3-2.

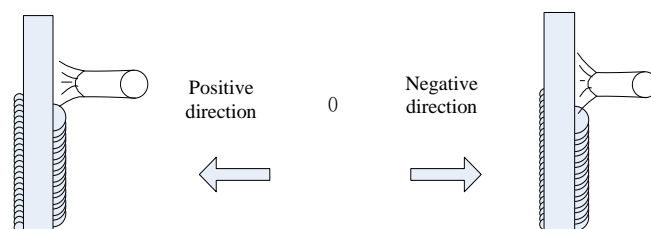


Figure 3-2 Schematic diagram of electric arc dynamics

Table 3-2 Description of electric arc dynamics

Arc dynamics	Functions
0	Normally used as default arc feature.
Hard arc 0~9	Deep weld pool, ready for penetration, suitable for all-position welding and high speed welding, and even if the cable is extended, stable arc is ensured.
Soft arc 0~-9	Shallow weld pool, not easy penetration, suitable for thin plate welding.

#### Steps

1. Set welding parameters properly, and switch to **Arc dynamics** by **Right cycle** switching key, then the corresponding LED indicator will be on;
2. Right digital tubes will indicate arc feature value, as shown in Figure 3-3.

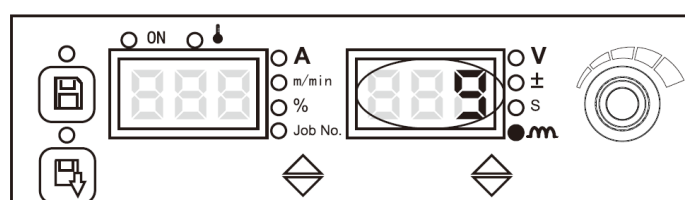
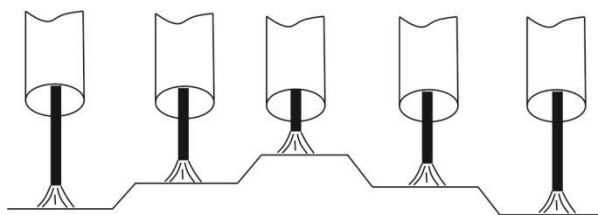


Figure 3-3 View screen of arc dynamics

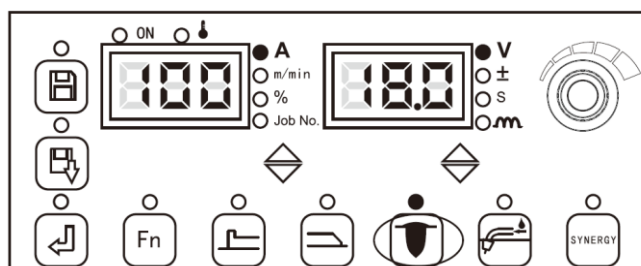
### 3.2.6 Weld penetration control

When there is some change in wire extension, weld penetration is kept constant, as shown in Figure 3-4.



**Figure 3-4 Schematic diagram of change of wire extension**

Press **Weld penetration control key**, the corresponding LED indicator will be on showing that the function is activated; or the LED indicator will be off, showing the function is deactivated, as shown in Figure 3-5.



**Figure 3-5 Setting screen of weld penetration control**

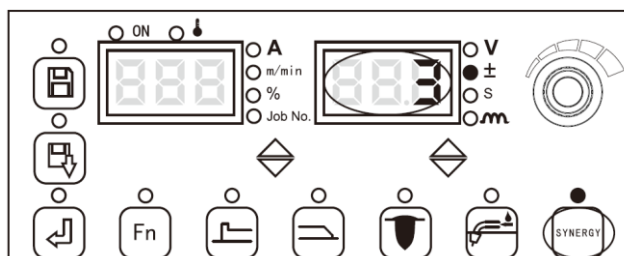
### 3.2.7 Synergic /Separate

- **Synergic**

The system will automatically match a voltage according to the current and Synergic voltage modification value that have been currently set for welding.

#### Steps

1. Shortly press **Synergic /Separate**, and when the LED indicator is on, Synergic mode will be applied.
2. Switch to Synergic voltage modification value “±” by **Right cycle switching key**, and when the indicator is on or flashing, by adjusting the voltage key on the wire feeder or the panel knob on welding power source, the automatically matched voltage may be slightly adjusted, as shown in Figure 3-6. By **Right cycle switching key**, view the matched voltage and arc modification value.



**Figure 3-6 Display for matched voltage modification value under Synergic mode**

Under Synergic mode, default voltage value is 0, and the scope is of -30~+30.

The formula for current voltage given for welding is as follows:



Current voltage given for welding = Voltage value under Synergic mode + (Voltage modification value%) x (Voltage value under Synergic mode)

- **Separate**

**Steps**

Shortly press **Synergic /Separate**, and when the LED indicator is off, Separate mode is applied, and the current and voltage given for welding will be separately regulated.

- **Caution**

Arc starting parameters and arc ending parameters can only be adjusted under Synergic mode.

### 3.2.8 Parameters for arc starting

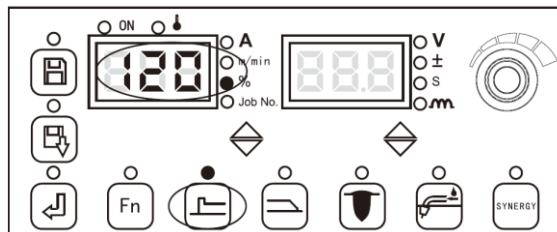
In arc welding, when welding is started, the parameters involved include wire feeding speed, current and voltage and so on.

For wire feeding speed for arc starting, the following formula is applicable:

**Wire feeding speed for arc starting = Welding wire feeding speed currently given x (%)**

**Steps**

1. Shortly press the **Parameters for arc starting** key, the indicator for parameters for arc starting and the indicator for “%” are on, then the parameters for arc starting can be viewed, as shown in Figure 3-7.



**Figure 3-7 Setting screen for % of parameters for arc starting**

2. To view “±”, “Second” and “Arc dynamics” for arc starting time, **Right cycle switching key** may be used.
3. When finished viewing parameters for arc starting, shortly press the **Parameters for arc starting** key, then the indicator for parameters for arc starting will be off, exit viewing the parameters for arc starting.

- **Caution**

1. Wire feeding and welding current are different indications for a same thing.
2. The parameters for arc starting on the display panel of manual welding power source can only be viewed, but not adjusted; if it is needed to adjust the parameters for arc starting, you can only adjust them on the display panel on the manual wire feeder.

### 3.2.9 Parameters for arc ending

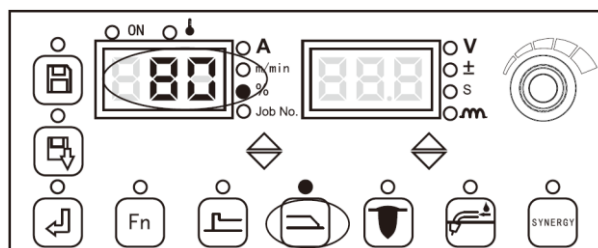
In arc welding, when welding is to be extinguished, the parameters involved include wire feeding speed, current and voltage and so on.

For wire feeding speed for arc ending, the following formula is applicable:

Wire feeding speed for arc ending = Welding wire feeding speed currently given x (%)

#### Steps

1. Shortly press the **Parameters for arc ending** key, the indicator for parameters for arc ending and the indicator for “%” are on, then the parameters for arc ending can be viewed, as shown in Figure 3-8.



**Figure 3-8 Setting screen for % of parameters for arc ending**

2. To view “±”, “Second” and “Arc dynamics” for arc ending period, **Right cycle switching** key may be used.
3. When finished viewing parameters for arc ending, shortly press the **Parameters for arc ending** key, then the indicator for parameters for arc ending will be off, exit viewing the parameters for arc ending.

#### ● Caution

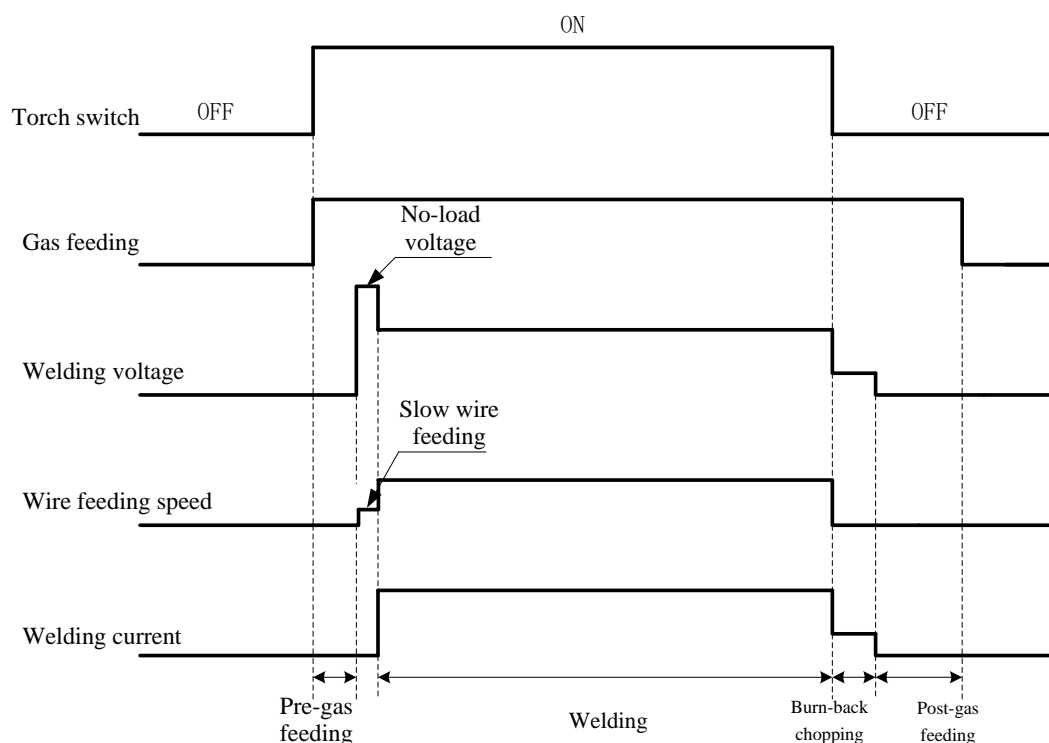
1. Wire feeding and welding current are different indications for a same thing.
2. The parameters for arc ending on the display panel of manual welding power source can only be viewed, but not adjusted; if it is needed to adjust the parameters for arc ending, you can only adjust them on the display panel on the manual wire feeder.

### 3.2.10 Welding control

#### ● Spot welding

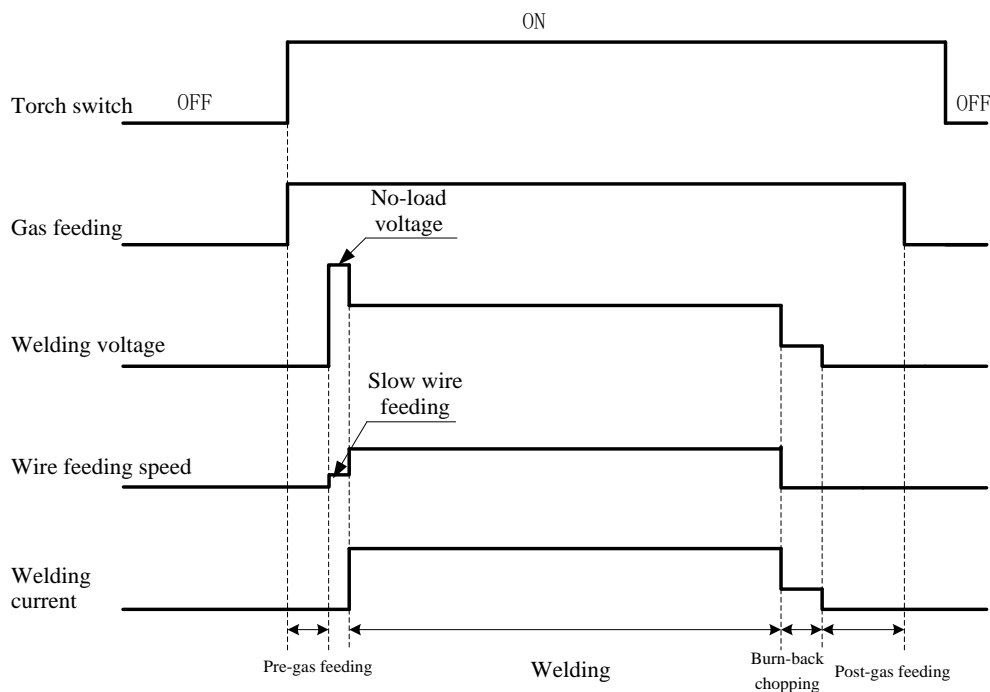
It is used to weld the working piece in a fixed period.

When the torch switch is released before the spot weld time ending, spot weld will be earlier ended, as shown in Figure 3-9.



**Figure 3-9 Logic diagram 1 for spot welding**

When spot welding time ends, but the torch switch is not released, the spot welding function will end, as shown in Figure 3-10.



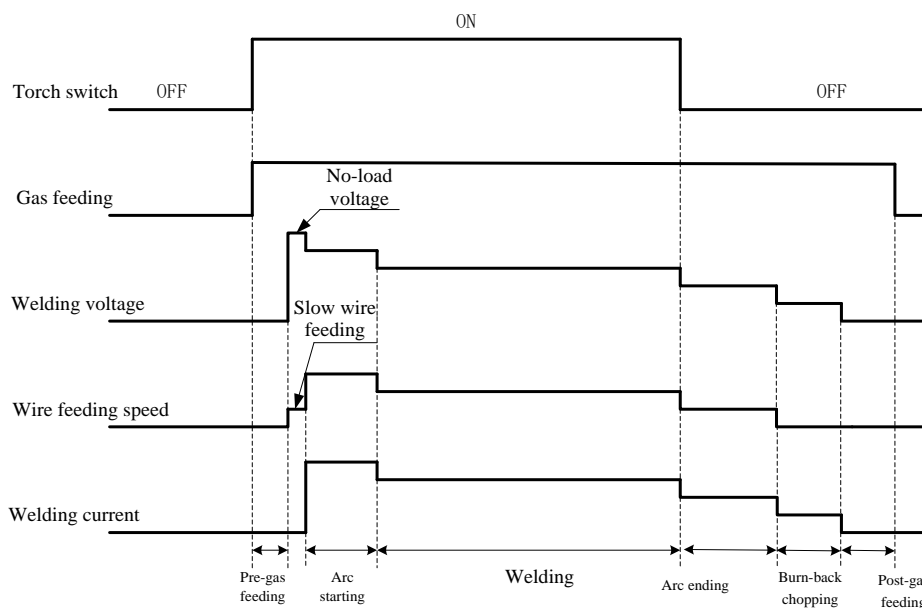
**Figure 3-10 Logic diagram 2 for spot welding**

### Steps

1. Press the **Welding control** key to switch to **spot welding** mode.
2. Switch to welding time “**Second**” part by **Right cycle switching** key, and use panel key to set the welding time (0.1s ~ 10s), and press the **Enter** key for confirmation, then setting of spot welding is completed.

- **2 steps (without arc ending)**

The logic diagram is shown in Figure 3-11.



**Figure 3-11 Logic diagram for 2 steps (without arc ending)**

- **Caution**

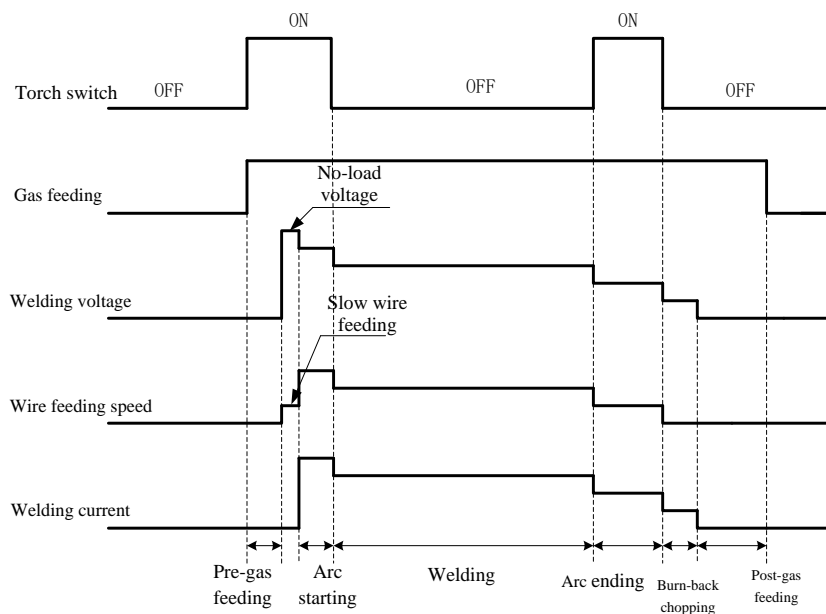
Arc starting duration as a parameter and arc ending duration as a parameter will be dependent on the time set on the panel of welding power source.

### Steps

1. Press the **Welding control** key to switch to **2 steps (without arc ending)** mode.
2. Set the parameters for arc starting, and for details see **Parameters for arc starting**.
3. Set the parameters for arc ending, and for details see **Parameters for arc ending**.

- **4 steps (with arc ending)**

The logic diagram is shown in Figure 3-12.



**Figure 3-12 Logic diagram for 4 steps (with arc ending)**

● **Caution**

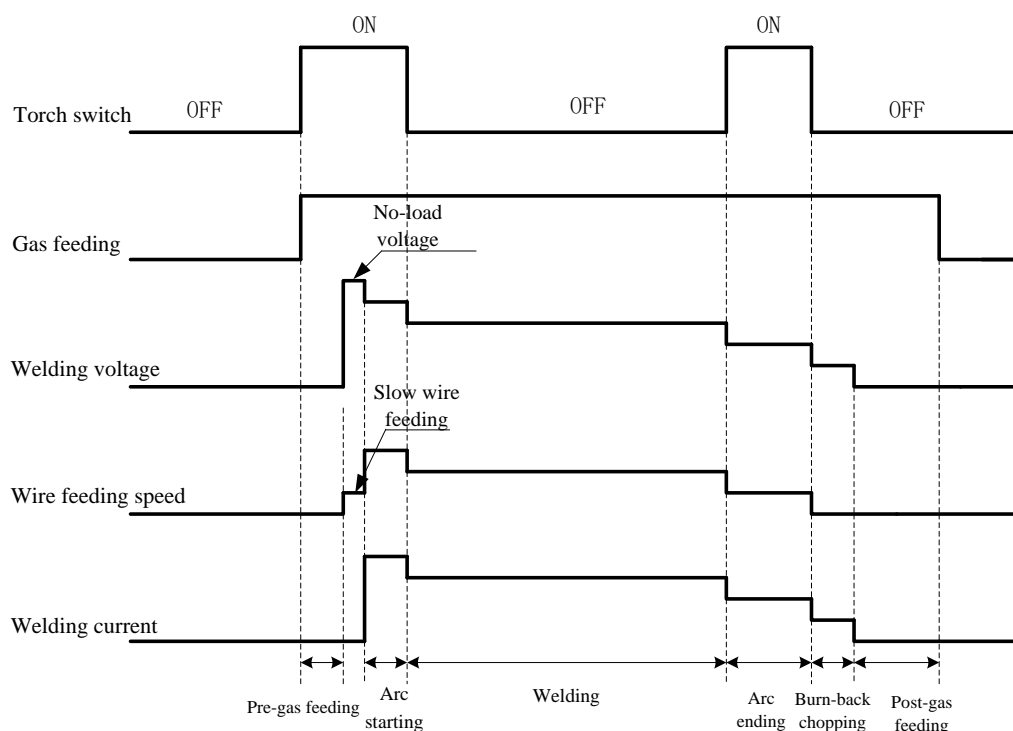
Arc starting duration as a parameter will be dependent on the time for arc starting set on the panel of welding power source; Arc ending duration as a parameter will be dependent on the duration when the torch switch has been pressed.

**Steps**

1. Press the **Welding control** key to switch to **4 steps** (with arc ending) mode.
2. Set the parameters for arc starting, and for details see **Parameters for arc starting**.
3. Set the parameters for arc ending, and for details see **Parameters for arc ending**.

### ● Special 4 steps

The logic diagram is shown in Figure 3-13.



**Figure 3-13 Logic diagram for Special 4 steps**

#### Steps

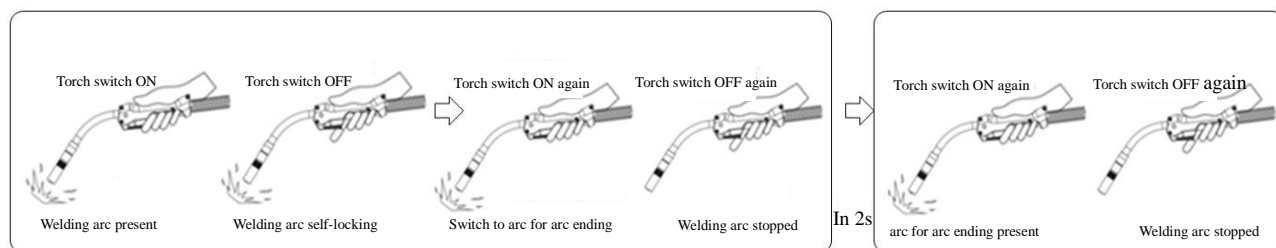
1. Press the **Welding control** key to switch to **Special 4T** mode.
2. Set the parameters for arc starting, and for details see **Parameters for arc starting**.
3. Set the parameters for arc ending, and for details see **Parameters for arc ending**.

### ● Caution

Arc starting duration as a parameter and arc ending duration as a parameter will be dependent on the duration when the torch switch has been pressed.

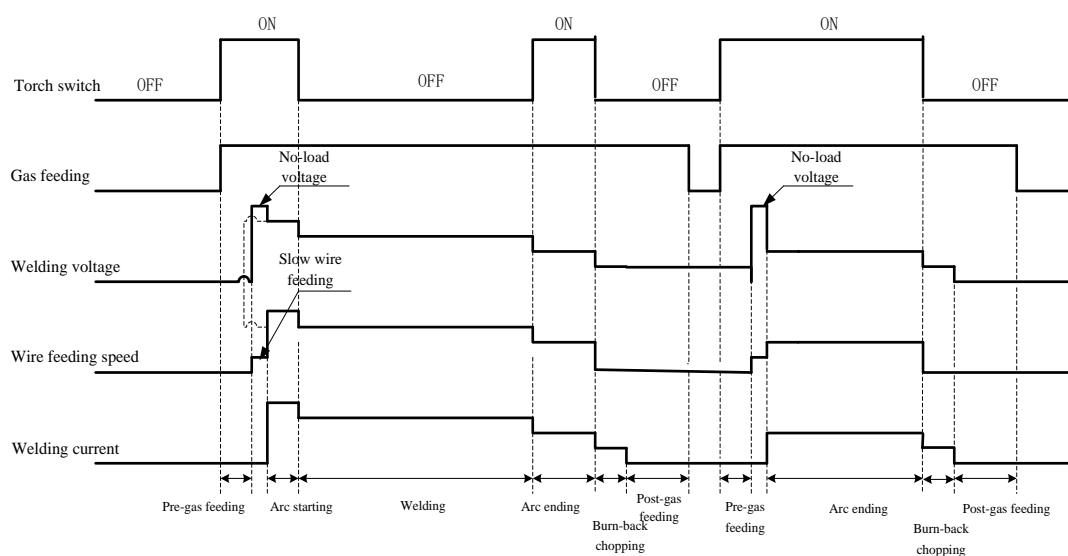
### ● Repeating arc ending

When the torch switch is pressed (ON), do welding with the parameters for arc starting; when the torch switch is released (OFF), do welding with given parameters; Press the torch switch (ON) again, switch to do welding with the parameters for arc ending; Release the torch switch (OFF), stop welding. If there is no actions in 2 seconds, then the repeating arc ending welding end; if the torch switch is pressed again in 2 seconds, then go on to do welding with the parameters for arc ending, and so on. The schematic diagram for operations of torch switch for repeating arc ending is shown in Figure 3-14.



**Figure 3-14 schematic diagram for operations of torch switch for repeating arc ending**

The logic diagram is shown in Figure 3-15.



**Figure 3-15 Logic diagram for repeating arc ending**

### ● Caution

Arc starting duration as a parameter will be dependent on the time for arc starting set on the panel of welding power source; Arc ending duration as a parameter will be dependent on the duration when the torch switch has been pressed.

### Steps

1. Press the **Welding control** key to switch to **Repeating arc ending** mode.
2. Set the parameters for arc starting, and for details see **Parameters for arc starting**.
3. Set the parameters for arc ending, and for details see **Parameters for arc ending**.

### 3.2.11 Store and invoke

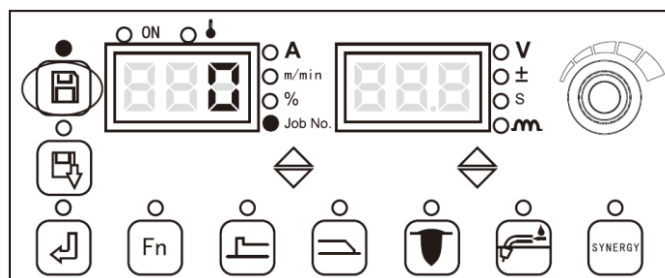
#### ● Store

It is used to store the welding parameters that have been set.

### Steps

1. Set the welding parameters, press the **Store** key, the corresponding indicator is flashing, and the indicator for Channel is on, then go on to select the store channel.

- Use the panel knob to select channel number ( 0~49), and press the **Enter** key for confirmation, as shown in Figure 3-16.



**Figure 3-16** Setting screen for Store

#### ● Caution

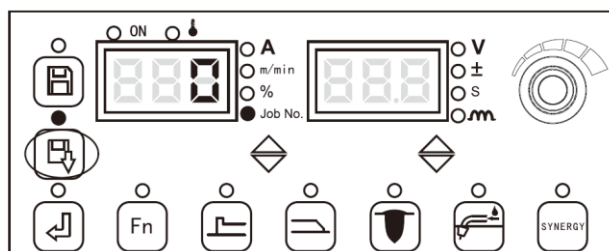
- After the welding power source being restored to factory settings, the parameters that have been stored will not be cleared.
- During storing any parameter that has not been confirmed by the **Enter** key will not be stored.
- When the storage channels are full, a new storage channel number will cover the original channel number.
- When a same channel number is used, the parameter of the new channel number will cover the original channel number.

#### ● Invoke

It is used to invoke the welding parameters that have been stored.

##### Steps

- Press the **Invoke** key, the corresponding indicator is flashing, and the indicator for Channel is on, then go to the invoke mode.
- Use the panel knob to select **channel** number ( 0~49) to be invoked, and press the **Enter** key for confirmation, as shown in Figure 3-17.



**Figure 3-17** Setting screen for Invoke

#### ● Modifying

To modify the stored and recorded welding parameters.

##### Steps

- Press the **Invoke** key, the invoking LED indicator will light up and flash, then enter the JOB number selection;



2. Use the panel knob to select the JOB number (0 to 49) whose parameters need to be modified, as shown in Figure 3-17.
  3. Modify the welding parameters and press the **Store** key. The storage indicator flashes and JOB indicator lights, then enter the storage JOB number selection;
  4. Use the panel knob to select the storage JOB number (0 to 49) and press the **Enter** key to confirm, as shown in Figure 3-16.
- 

- **Caution**

1. After pressing the Invoking key, wait for 5 seconds to modify the welding parameters.
  2. When the parameter is re-stored, it can be stored in the current JOB or in other JOB.
  3. When the storage JOB is the same channel, the original JOB parameter will be covered.
- 

### 3.2.12 Lock

---

- **Prompts**

1. Initial password has been set as “00000” at factory settings; after initial password being modified, the new password shall prevail.
  2. Once the locking password has been set, such password will not be cleared even if the welding power source is restored to factory setting.
  3. Keep your password carefully; if you forget your password and cannot unlock the welding power source, please contact the manufacturer or distributor.
- 

There are two categories of lock, namely **Common lock** and **Password lock**; Password lock consists of two parts, namely **Password setting** and **Parameter range lock**.

Under lock mode, the knob for the given voltage and current on the wire feeder cannot be normally operated; on the welding power source, except for Store, Invoke, Enter, Inching wire feeding and Gas detection, all other keys and knob operations will not response.

- **Lock usages**

1. **Common lock** can only protect the parameters set on the panels of the welding power source and the wire feeder from being modified; long pressing the **Enter** key will unlock it.
2. **Password lock** is to facilitate management of welding technique specifications; when the relevant parameters are locked, such parameters can only be adjusted within the set range; once a password is set, only entering the right password can unlock it.

- **Common lock**



1. Select the relevant welding parameters, long press the **Enter** key for 3 seconds, then the left digital tubes will display “L”, the indicators for Store and Invoke will simultaneously be flashing, then go to the screen for Common lock, as shown in Figure 3-18.

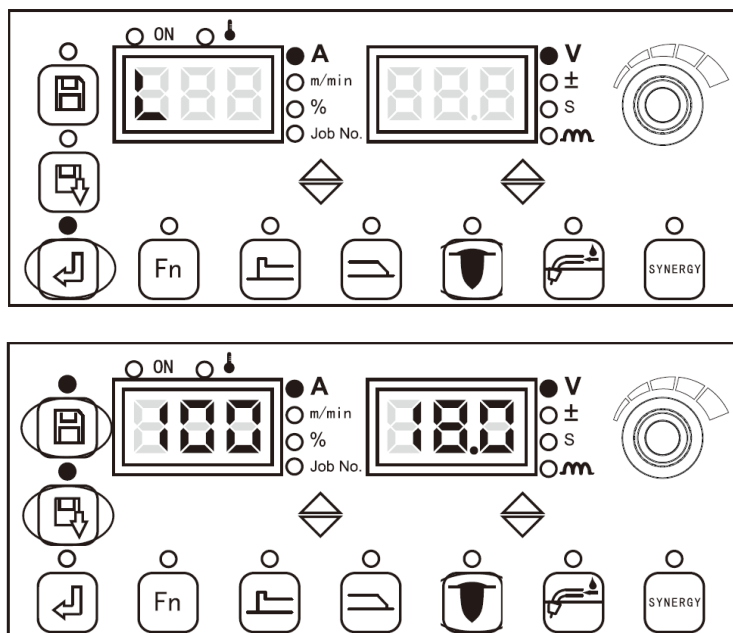


Figure 3-18 Screen for Common lock

2. Long press the **Enter** key, the indicators for Store and Invoke will be off, thus exiting Common lock, being restored to a non-lock condition, as shown in Figure 3-19.

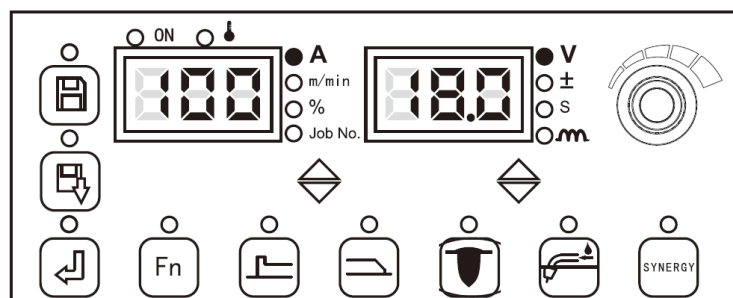


Figure 3-19 Screen for non-lock

### ● Password lock

**Password lock** consists of two parts, namely **Password setting** and **Parameter range lock**.

#### A. Password setting

1. Long press the **Enter** key, then go to Common lock.
2. Long press the **Store** key, then the digital tubes will display “0 - - - -”, as shown in 3-20, adjust the knob on the panel of welding power source, and enter a new password for each digital position, then press the **Invoke** key for confirmation.

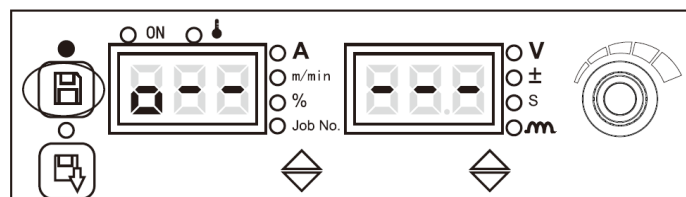
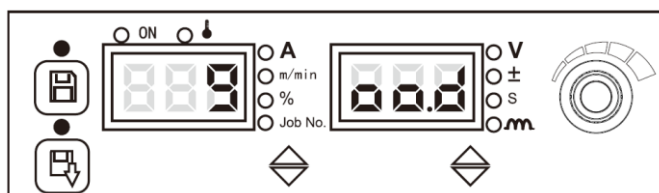


Figure 3-20 Screen for entering password

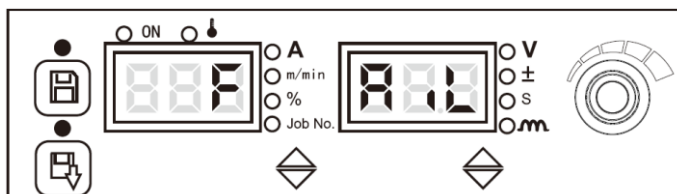
When the password entered is correct, “good” will be displayed, as shown in Figure 3-21, and

after flashing, it will automatically go to the screen for entering new password.



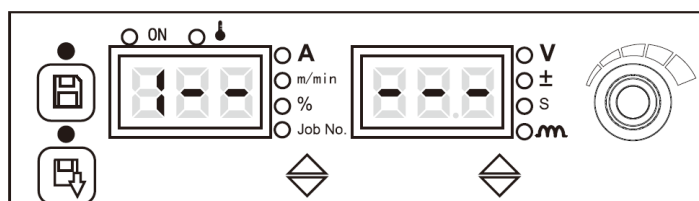
**Figure 3-21 Reminding screen for a correct password entered**

When the password entered is not correct, “**FAIL**” will be displayed, as shown in Figure 3-22, and it will automatically go to the screen for entering password, until “**good**” is displayed.



**Figure 3-22 Reminding screen for an incorrect password entered**

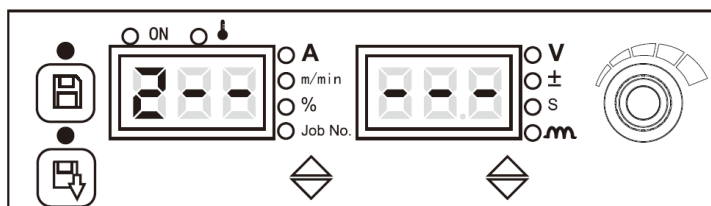
3. On the screen for setting new password, the digital tubes will display “**1 - - - -**”, as shown in Figure 3-23, and adjust the knob on the panel of welding power source, and enter a new password for each digital position, then press the **Invoke** key for confirmation.



**Figure 3-23 Screen for setting new password**

4. After new password setting is finished, the digital tubes will display “**good**”, and it will automatically go to the screen for new password confirmation.

5. On the screen for new password confirmation, the first digital tube will display “**2 - - - -**”, as shown in 3-24, and adjust the knob on the panel of welding power source, and enter a new password for each digital position, then press the **Invoke** key for confirmation.



**Figure 3-24 Screen for new password confirmation**

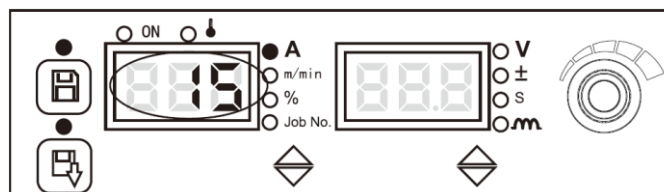
When the two passwords are consistent, “**good**” will be displayed, and it will automatically return to non-lock condition, thus the password setting is finished.

When the two passwords are inconsistent, “**FAIL**” will be displayed, and it will automatically return to the screen for new password confirmation, until “**good**” is displayed.

## **B. Parameter range lock**

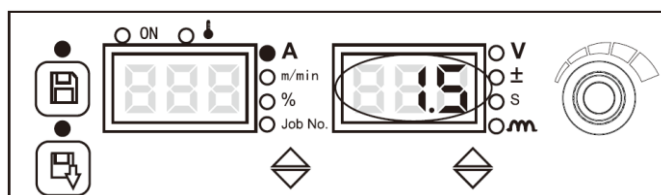
### **I. Enter the screen for parameter range lock**

1. Long press the **Enter** key, enter the common lock mode, and for details, see **Common lock** on the panel for parameters.
2. Long press the **Invoke** key, go to the screen for parameter range lock, and enter the locking password.
3. On the screen for adjustable current range lock, according to the flashing digital tubes as reminding, use the knob on the panel of welding power source to set the adjustable current range, as shown in Figure 3-25, with the default adjustable current range locked as  $\pm 15A$ , and press the **Invoke** key for confirmation, and it will automatically go to the screen for adjustable voltage range lock.



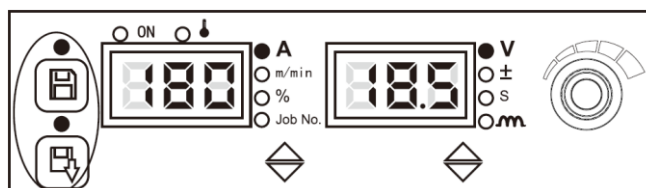
**Figure 3-25 Screen for adjustable current range lock**

4. On the screen for adjustable voltage range lock, according to the flashing digital tubes as reminding, use the knob on the panel of welding power source to set the adjustable voltage range, as shown in Figure 3-26, with the default adjustable current range locked as  $\pm 1.5V$ , and press the **Invoke** key for confirmation, and it will automatically go to the screen for parameter range lock.



**Figure 3-26 Screen for adjustable voltage range lock**

5. On the screen for parameter range lock, the indicators for Store and Invoke will always be flashing, as shown in Figure 3-27, and the current and voltage can only be adjusted within the locked ranges.



**Figure 3-27 Screen for parameter range lock**

## II. Exit Parameter range lock

Long press the **Enter** key, enter the five number password, and press the **Invoke** key for confirmation.

### ● Caution

1. When long press the **Enter** key during setting the parameter range lock, it will return to Common lock on the panel for parameters, and the setting of parameter range lock will not be successful.

2. During setting the parameter range lock, power off and restart the welding power source, it will return to Common lock in the panel for parameters; when powering off and restarting of the welding power source under the mode of parameter range lock, it will still be under the mode of parameter range lock when the power is switched on.
3. When you exit the parameter range lock, you need to enter the password; otherwise you cannot exit.
4. The current and voltage ranges to be locked will differ according to different machine models, and for the specific parameters, see the relevant technical specifications.

### 3.2.13 Internal menu

#### Steps

1. Long press the **Enter** key for 3 seconds to go to internal menu setting, and the corresponding LED indicator is on; shortly press the **Enter** key to exit internal menu setting, and the corresponding LED indicator is off.
2. At internal menu setting, use **the panel knob** of welding power source to switch among various same level menu options and adjust the parameter values.
3. At internal menu setting, the **Enter** key is used as confirmation for the parameter that has been selected.
4. When setting various parameters at internal menu, if the digital tubes display “**OFF**”, the default parameters of the welding power source will be applied.

#### Welding torch model selection (F03)

It is used to select different welding torch models, and **OFF** means applying a common welding torch as default.

#### Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **F03**, and press the **Enter** key, the right digital tubes will flash.
2. Adjust **F03** parameters using the knob on the panel of welding power source (see Table 3-3), press the **Enter** key for confirmation, then the **F03** parameters setting is finished.

**Table 3-3 Welding torch matching**

Function name	0	1	2	3	4-6	7	Default
F03	Common torch	TBI push-pull System (24V)	ABICOR push-pull System (24V)	Reserved	Reserved	Megmeet intermediate drive wire feeder	Common torch

#### Push-pull Torque Adjustment (F04)

Push-pull motor torque default value is **OFF**.

#### Steps

1. Enter the internal menu, adjust panel knob to **F04**, press the **Enter** key and the right digital tube flashes.

2. Adjust **F04** parameters by panel knob (see Table 3-4), press **Enter** key to confirm, and then **F04** parameter setting is completed.

**Table 3-4 push wire torque parameter table**

Function name	Unit	Adjustment range	Step length	Default value
F04	/	-99~100	1	Automatic matching

#### **MMA Switch (F05)**

**ON** means MMA function open, **OFF** means MMA function closed and default value is **OFF**.

##### Steps

1. Enter the internal menu, adjust panel knob to **F05**;
2. Press **Enter** key and the right nixie tube will flashes. Choose **F05** status through panel knob and confirm by pressing **Enter** key.

#### **Water Cooling/Air Cooling Switch(F06)**

**ON** Means water cooling function, **OFF** means air cooling function, and default value is **OFF**.

##### Steps

1. Enter the internal menu, adjust panel knob to **F06**;
2. Press **Enter** key and the right nixie tube will flashes. Choose **F06** status through panel knob and confirm by pressing **Enter** key.

#### ● **Caution**

1. When the welding power has been equipped with a water cooling system and a water-cooled welding torch, the internal menu F06 must be set to ON to turn on water cooling function, otherwise there is a risk of burning the welding torch.
2. When water cooling function is turned on, water tank motor automatically runs for 3 minutes after welding power source is power on. During this time, if the welding is not performed, water tank motor will stop after 3 minutes.
3. When welding power source starts to weld, the water tank motor starts to run synchronously. After welding is stopped, water tank motor stops running by 3 minutes delayed.

#### **Water tank protection switch (F07)**

It is used to switch the flow detection function of water-cooling system. **ON** means witching on the flow detection function of water-cooling system; **OFF** means switching off the flow detection function of water tank; **ON** is applied as default.

##### Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **F07**.
2. Press the **Enter** key, the right digital tubes will flash. Select **F07** status using the knob on the panel of welding power source, and press the **Enter** key for confirmation.

#### **Slow wire feeding speed (F10)**

It is used to adjust the wire feeding speed for arc starting.

##### Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **F10**, and press the **Enter** key, the right digital tubes will flash.

2. Adjust **F10** parameters using the knob on the panel of welding power source (see Table 3-5), press the **Enter** key for confirmation, then the **F10** parameters setting is finished.

**Table 3-5 Slow wire feeding speed as parameters**

Function name	Unit	Adjustable range	Step length	Default
F10	m/min.	1.4~18m/min.	0.1m/min.	1.4m/min.

#### Pre-gas time (F11)

It means an earlier period of gas feeding before arc starting.

##### Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **F11**, and press the **Enter** key, the right digital tubes will flash.
2. Adjust **F11** parameters using the knob on the panel of welding power source (see Table 3-6), press the **Enter** key for confirmation, then the **F11** parameters setting is finished.

**Table 3-6 Pre-gas time as parameters**

Function name	Unit	Adjustable range	Step length	Default
F11	s	0~25 s	0.1 s	0.2 s

#### Soft starting time (F12)

It means a time from slow wire feeding speed to wire feeding speed for arc starting or wire feeding for welding.

##### Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **F12**, and press the **Enter** key, the right digital tubes will flash.
2. Adjust **F12** parameters using the knob on the panel of welding power source (see Table 3-7), press the **Enter** key for confirmation, then the **F12** parameters setting is finished.

**Table 3-7 Soft starting time parameters**

Function name	Unit	Adjustable range	Step length	Default
F12	s	0.001~0.999 s	0.001 s	Automatic matching

#### Transition time for wire feeding speed (F13)

It is a period for arc starting wire feeding speed transiting to welding wire feeding speed, or a period for given welding wire feeding speed transiting to arc ending wire feeding speed.

##### Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **F13**, and press the **Enter** key, the right digital tubes will flash.
2. Adjust **F13** parameters using the knob on the panel of welding power source (see Table 3-8),

press the **Enter** key for confirmation, then the setting of transition time for wire feeding speed is finished.

**Table 3-8 Wire feeding speed transition time parameter table**

Function name	Unit	Adjustable range	Step length	Default
F13	s	0.01~9.99 s	0.01 s	0.1 s

#### Post gas feeding time (F14)

It is a time of delayed gas feeding after arc ending being completed.

##### Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **F14**, and press the **Enter** key, the right digital tubes will flash.
2. Adjust **F14** parameters using the knob on the panel of welding power source (see Table 3-9), press the **Enter** key for confirmation, then the **F14** parameters setting is finished.

**Table 3-9 Post gas feeding time parameters**

Function name	Unit	Adjustable range	Step length	Default
F14	s	0~25 s	0.1 s	1 s

#### Inching wire feeding speed (F15)

It means the wire feeding speed when welding is not conducted.

##### Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **F15**, and press the **Enter** key, the right digital tubes will flash.
2. Adjust **F15** parameters using the knob on the panel of welding power source (see Table 3-10), press the **Enter** key for confirmation, then the **F15** parameters setting is finished.

**Table 3-10 Inching wire feeding speed parameters**

Function name	Unit	Adjustable range	Step length	Default
F15	m/min.	1.4~24 m/min.	0.1 m/min.	Automatic matching

#### Reverse wire drawing speed (F16)

##### Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **F16**, and press the **Enter** key, the right digital tubes will flash.
2. Adjust **F16** parameters using the knob on the panel of welding power source (see Table 3-11), press the **Enter** key for confirmation, then the **F16** parameters setting is finished.

**Table 3-11 Reverse wire feeding speed parameters**

Function name	Unit	Adjustable range	Step length	Default
F16	m/min.	1.4~10 m/min.	0.1 m/min.	1.4 m/min.



**Reverse wire drawing time (F17)**

It is a reverse wire drawing time, when welding is not conducted.

**Steps**

1. Enter the internal menu, adjust the knob on the panel of welding power source to **F17**, and press the **Enter** key, the right digital tubes will flash.
2. Adjust **F17** parameters using the knob on the panel of welding power source (see Table 3-12), press the **Enter** key for confirmation, then the **F17** parameters setting is finished.

**Table 3-12 Reverse wire drawing time as parameters**

Function name	Unit	Adjustable range	Step length	Default
F17	s	0~2 s	0.01 s	OFF

● **Caution**

When reverse wire drawing time is OFF, reverse wire drawing time will be controlled by the switch for reverse wire drawing; otherwise it will be controlled by the given reverse wire drawing time.

**Arc tracking Current Filter Parameter 1 (F18)**

**Steps**

1. Enter internal menu, adjust panel knob to **F18**, press **Enter** key and the right digital tube will flash.
2. Adjust **F18** parameters by panel knob (see Table 3-13), press **Enter** key to confirm, and then **F18** parameter setting is completed.

**Table 3-13 Arc Tracking Current Filtering Parameters Table 1**

Function Name	Unit	Adjustment Range	Step Length	Default Value
F18	/	1~50	1	20

**Arc Tracking Current Filter Parameter 2 (F19)**

**Steps**

1. Enter internal menu, adjust panel knob to **F19**, press **Enter** key and the right digital tube will flash.
2. Adjust **F19** parameters by panel knob (see Table 3-14), press **Enter** key to confirm, and then **F19** parameter setting is completed.

**Table 3-14 Arc Tracking Current Filtering Parameters Table 2**

Function Name	Unit	Adjustment Range	Step Length	Default Value
F19	/	1~64	1	56

**Logic diagram for DC welding parameters**

Logic diagram for DC welding parameters is shown in Figure 3-28.

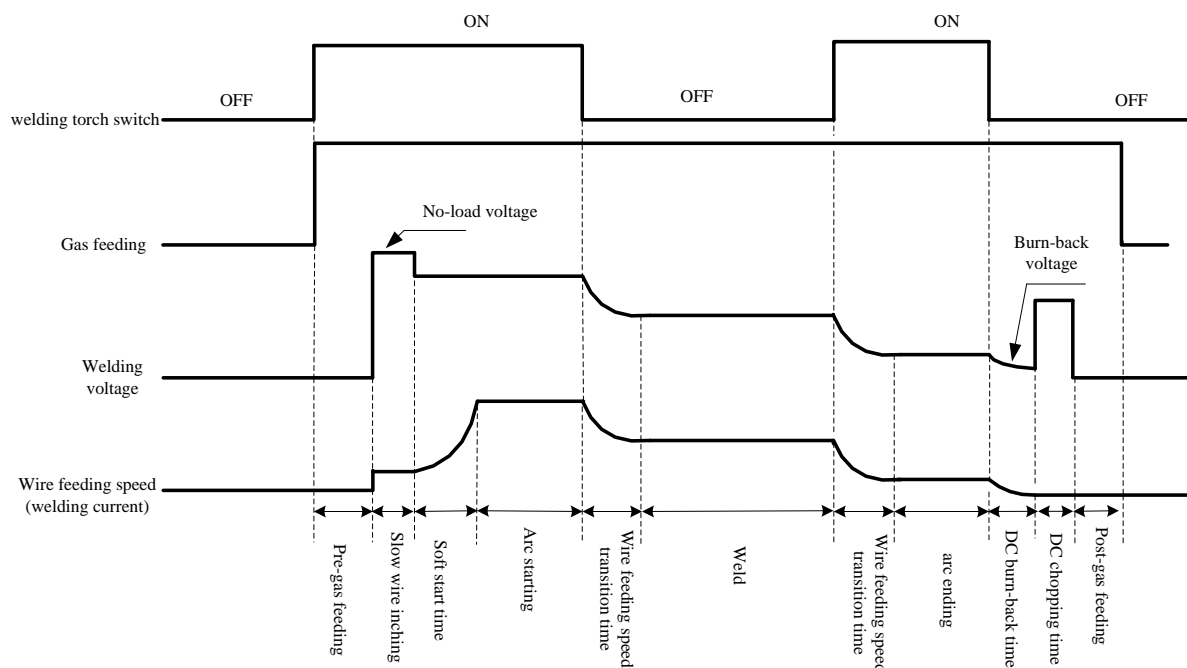


Figure 3-28 Logic diagram for DC welding parameters

### DC Burn-back voltage (F20)

#### Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **F20**, and press the **Enter** key, the right digital tubes will flash.
2. Adjust **F20** parameters using the knob on the panel of welding power source (see Table 3-15), press the **Enter** key for confirmation, then the **F20** parameters setting is finished.

Table 3-15 DC Burn-back voltage parameters

Function name	Unit	Adjustable range	Step length	Default
F20	V	12~45V	0.1V	12V

### DC burn-back time (F21)

#### Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **F21**, and press the **Enter** key, the right digital tubes will flash.
2. Adjust **F21** parameters using the knob on the panel of welding power source (see Table 3-16), press the **Enter** key for confirmation, then the **F21** parameters setting is finished.

Table 3-16 DC Burn-back time parameters

Function name	Unit	Adjustable range	Step length	Default
F21	s	0.00~1.00 s	0.01 s	Automatic matching

### DC Chopping time (F22)

## Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **F22**, and press the **Enter** key, the right digital tubes will flash.
2. Adjust **F22** parameters using the knob on the panel of welding power source (see Table 3-17), press the **Enter** key for confirmation, then the **F22** parameters setting is finished.

Table 3-17 DC Chopping time parameters

Function name	Unit	Adjustable range	Step length	Default
F22	s	0.00~1.00 s	0.01 s	0.24 s

## Logic diagram for single pulse and double pulses welding parameters

Logic diagram for single pulse and double pulses welding parameters is shown in Figure 3-29.

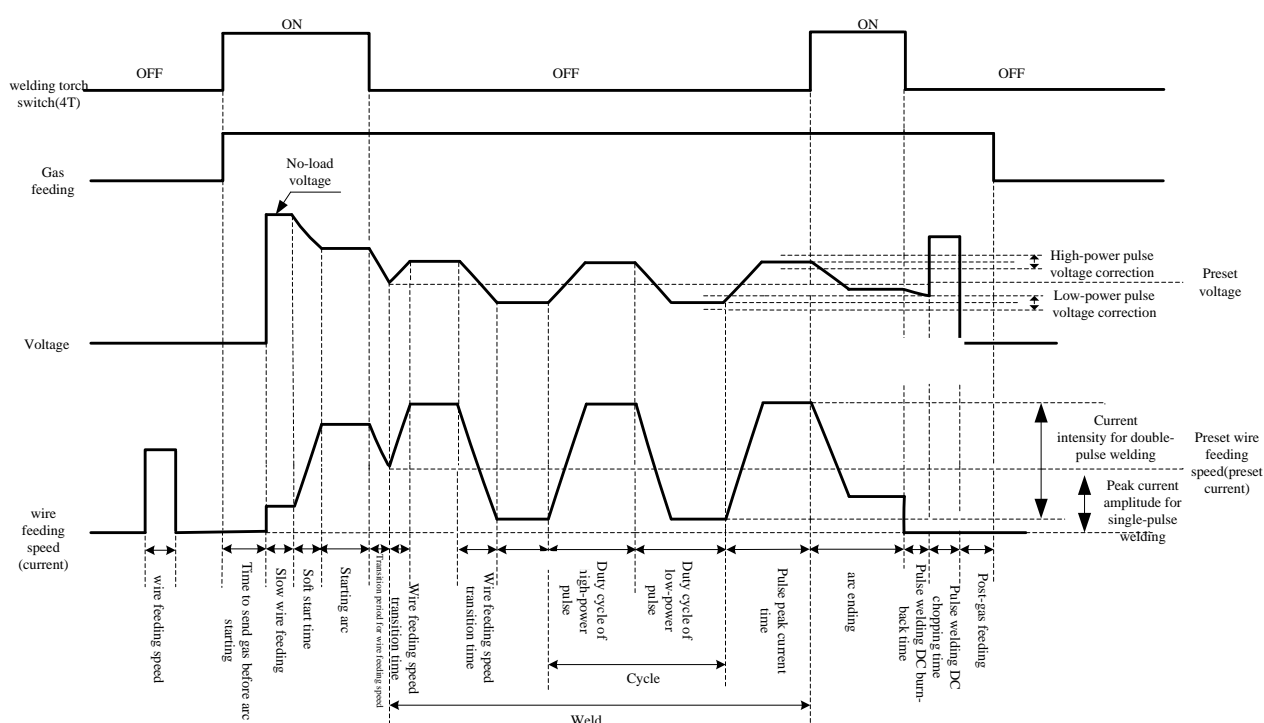


Figure 3-29 Logic diagram for single pulse and double pulses welding parameters

## Pulse peak current value amplitude (F30)

## Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **F30**, and press the **Enter** key, the right digital tubes will flash.
2. Adjust **F30** parameters using the knob on the panel of welding power source (see Table 3-18), press the **Enter** key for confirmation, then the **F30** parameters setting is finished.

Table 3-18 Pulse peak current value amplitude parameters

Function name	Unit	Adjustable range	Step length	Default
F30	A	200~750 A	1 A	360 A

**Pulse peak current value time (F31)****Steps**

1. Enter the internal menu, adjust the knob on the panel of welding power source to **F31**, and press the **Enter** key, the right digital tubes will flash.
2. Adjust **F31** parameters using the knob on the panel of welding power source (see Table 3-19), press the **Enter** key for confirmation, then the **F31** parameters setting is finished.

**Table 3-19 Pulse peak current value time parameters**

Function name	Unit	Adjustable range	Step length	Default
F31	1/32 ms	16~160	1	50

**Pulse welding Burn-back time (F34)****Steps**

1. Enter the internal menu, adjust the knob on the panel of welding power source to **F34**, and press the **Enter** key, the right digital tubes will flash.
2. Adjust **F34** parameters using the knob on the panel of welding power source (see Table 3-20), press the **Enter** key for confirmation, then the **F34** parameters setting is finished.

**Table 3-20 Pulse welding Burn-back time parameters**

Function name	Unit	Adjustable range	Step length	Default
F34	s	0~1 s	0.01 s	Automatic matching

**Pulse welding Chopping time (F35)****Steps**

1. Enter the internal menu, adjust the knob on the panel of welding power source to **F35**, and press the **Enter** key, the right digital tubes will flash.
2. Adjust **F35** parameters using the knob on the panel of welding power source (see Table 3-21), press the **Enter** key for confirmation, then the **F35** parameters setting is finished.

**Table 3-21 Pulse welding Chopping time parameters**

Function name	Unit	Adjustable range	Step length	Default
F35	1/32 ms	0~250	1	75

**Double pulses frequency (F40)**

The number of times for alternating between strong pulse and weak pulse in 1 second is called double pulses frequency.

$$\text{Double pulses frequency} = s / T \text{ (cycle)}$$

**Steps**

1. Enter the internal menu, adjust the knob on the panel of welding power source to **F40**, and press the **Enter** key, the right digital tubes will flash.

- Adjust **F40** parameters using the knob on the panel of welding power source (see Table 3-22), press the **Enter** key for confirmation, then the **F40** parameters setting is finished.

**Table 3-22 Double pulses frequency parameters**

Function name	Unit	Adjustable range	Step length	Default
F40	Hz	0.2~10	0.1	1

**Double pulses Duty Cycle (F41)**

It means the temporal proportion of strong pulse and weak pulse in a cycle (T).

**Steps**

- Enter the internal menu, adjust the knob on the panel of welding power source to **F41**, and press the **Enter** key, the right digital tubes will flash.
- Adjust **F41** parameters using the knob on the panel of welding power source (see Table 3-23), press the **Enter** key for confirmation, then the **F41** parameters setting is finished.

**Table 3-23 Double pulse duty cycle parameters**

Function name	Unit	Adjustable range	Step length	Default
F41	%	0~99	1	50

**Double pulses current intensity (F42)****Steps**

- Enter the internal menu, adjust the knob on the panel of welding power source to **F42**, and press the **Enter** key, the right digital tubes will flash.
- Adjust **F42** parameters using the knob on the panel of welding power source (see Table 3-24), press the **Enter** key for confirmation, then the **F42** parameters setting is finished.

**Table 3-24 Double pulses current intensity parameters**

Function name	Unit	Adjustable range	Step length	Default
F42	%	0~50	1	20

**Weak pulse voltage corrected value (F43)**

It is used for weak pulse voltage correction in double pulses welding.

**Steps**

- Enter the internal menu, adjust the knob on the panel of welding power source to **F43**, and press the **Enter** key, the right digital tubes will flash.
- Adjust **F43** parameters using the knob on the panel of welding power source (see Table 3-25), press the **Enter** key for confirmation, then the **F43** parameters setting is finished.

**Table 3-25 Weak pulse voltage corrected value parameters**

Function name	Unit	Adjustable range	Step length	Default
F43	%	-30~30	1	0

**Strong pulse voltage corrected value (F44)**

It is used for strong pulse voltage modification in double pulses welding.

**Steps**

1. Enter the internal menu, adjust the knob on the panel of welding power source to **F44**, and press the **Enter** key, the right digital tubes will flash.
2. Adjust **F44** parameters using the knob on the panel of welding power source (see Table 3-26), press the **Enter** key for confirmation, then the **F44** parameters setting is finished.

**Table 3-26 Strong pulse voltage corrected value parameters**

Function name	Unit	Adjustable range	Step length	Default
F44	%	-30~30	1	0

**MMA Starting Arc Current (F50)**

**Steps**

1. Enter the internal menu, adjust the knob on the panel of welding power source to **F50**, and press the **Enter** key, the right digital tubes will flash.
2. Adjust **F50** parameters using the knob on the panel of welding power source (see Table 3-27), press the **Enter** key for confirmation, then the **F50** parameters setting is finished.

**Table 3-1 Starting Arc Current Parameter**

Function Name	Unit	Regulating Range	Step Length	Default
F50	A	0~400 (500)	1	400 (500)

**MMA Hot Start Current (F51)**

**Steps**

1. Enter the internal menu, adjust the knob on the panel of welding power source to **F51**, and press the **Enter** key, the right digital tubes will flash.
2. Adjust **F51** parameters using the knob on the panel of welding power source (see Table 3-28), press the **Enter** key for confirmation, then the **F51** parameters setting is finished.

**Table 3-2 Hot Start Current Parameter**

Function Name	Unit	Regulating Range	Step Length	Default
F51	A	0~400 (500)	1	50

**MMA Arc Force Current (F52)**

**Steps**

1. Enter the internal menu, adjust the knob on the panel of welding power source to **F52**, and press the **Enter** key, the right digital tubes will flash.
2. Adjust **F52** parameters using the knob on the panel of welding power source (see Table 3-29), press the **Enter** key for confirmation, then the **F52** parameters setting is finished.

**Table 3-3 Arc Force Current Parameter**

Function Name	Unit	Regulating Range	Step Length	Default
F52	A	0~400 (500)	1	30

- **Prompts**

F50~F52 are the function configuration options of MMA, which is effective when F05 welding rod switch is turned on.

### Group control switch (F90)

It is a control switch for welding power source group. **ON** means welding power source group control mode; **OFF** means standard mode. **OFF** is applied as default.

#### Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **F90**.
2. Press the **Enter** key, the right digital tubes will flash. Adjust **F90** status using the knob on the panel of welding power source, press the **Enter** key for confirmation.

- **Prompts**

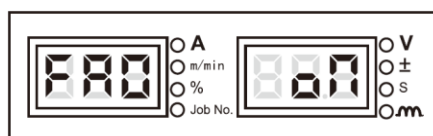
F90 cluster control switch, after setting is completed, welding machine needs to be powered off and restarted to take effect.

### Robot connection switch (FA0)

It is a switch for switching between manual welding power source and robotic welding power source. Robotic welding power source model is **ON** as default; **OFF** means manual welding mode.

#### Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **FA0**, the digital tubes will display as shown in Figure 3-30.



**Figure 3-30 Screen for FA0 display**

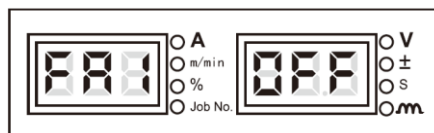
2. Press the **Enter** key, the right digital tubes will flash. Adjust **FA0** status using the knob on the panel of welding power source, press the **Enter** key for confirmation.

### Local control switch (FA1)

**OFF** means that close control function is off; **ON** means that close control function is on.

#### Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **FA1**, the digital tubes will display as shown in Figure 3-31.



**Figure 3-31 Screen for FA1 display**

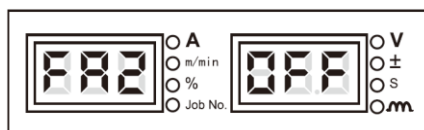
2. Press the **Enter** key, the right digital tubes will flash. Adjust **FA1** status using the knob on the panel of welding power source, press the **Enter** key for confirmation.

#### **JOB switching time (FA2)**

It is used to control switching the **JOB** channels as the transition time for current and voltage; **OFF** means the time is 0.1 s.

#### Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **FA2**, the digital tubes will display as shown in Figure 3-32.



**Figure 3-32 Screen for FA2 display**

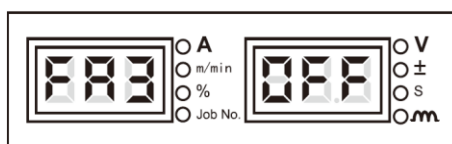
2. Press the **Enter** key, the right digital tubes will flash. Adjust **FA2** status using the knob on the panel of welding power source, press the **Enter** key for confirmation.

#### **Welding Machine MAC ID (FA3)**

According to communication protocol of both parties, it is used to set the communication address for welding machine.

#### Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **FA3**, the digital tubes will display as shown in Figure 3-33.



**Figure 3-33 Screen for FA3 display**

2. Press the **Enter** key, the right digital tubes will flash. Select **FA3** value range using the knob on the panel of welding power source, press the **Enter** key for confirmation.

#### **Polarity selection for robot touch sense signal (FA4)**

It is a selection switch for polarity selection for robot touch sense signal, and for details, see Table 3-30.

**Table 3-30 Signal true values**

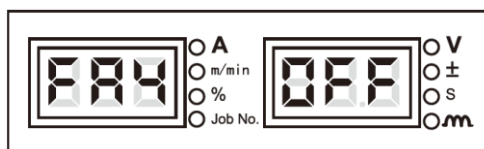
Function	I/O type	Successful location	Status
----------	----------	---------------------	--------



FA4	Output	Low level/"1"	OFF (default)
	Output	High level/"0"	ON

### Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **FA4**, the digital tubes will display as shown in Figure 3-34.



**Figure 3-34** Screen for FA4 display

2. Press the **Enter** key, the right digital tubes will flash. Select **FA4** status using the knob on the panel of welding power source, press the **Enter** key for confirmation.

### Polarity switch for signal of welding power source standby (FA5)

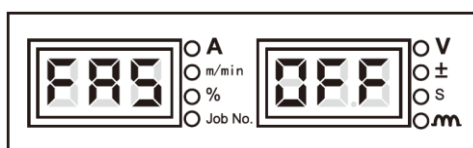
For the details about polarity switch for signal of welding power source being ready, see Table 3-31.

**Table 3-31** Signal true values

Function	I/O type	Successfully being ready	Status
FA5	Output	Low level/"1"	OFF (default)
	Output	High level/"0"	ON

### Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **FA5**, the digital tubes will display as shown in Figure 3-35.



**Figure 3-35** Screen for FA5 display

2. Press the **Enter** key, the right digital tubes will flash. Select **FA5** status using the knob on the panel of welding power source, press the **Enter** key for confirmation.

### Polarity switch for successful arc starting of robot (FA6)

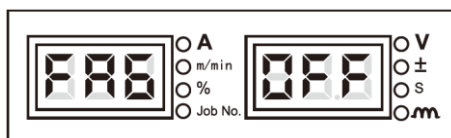
For the details about polarity switch for successful arc starting of robot, see Table 3-32.

**Table 3-32** Signal true values

Function	I/O type	Successful arc starting	Status
FA6	Output	Low level/"1"	OFF (default)
	Output	High level/"0"	ON

### Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **FA6**, the digital tubes will display as shown in Figure 3-36.



**Figure 3-36 Screen for FA6 display**

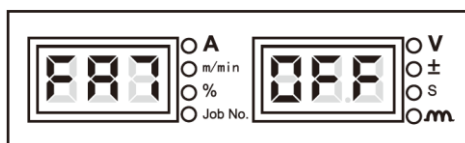
2. Press the **Enter** key, the right digital tubes will flash. Select **FA6** status using the knob on the panel of welding power source, press the **Enter** key for confirmation.

### Switch for given signal type of robot (FA7)

It is used to switch the given signal to be received by robot, and there are two types of signal, namely current signal and wire feeding signal. **OFF** means that robot receives wire feeding signal; **ON** means that robot receives current signal, **OFF** is default.

### Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **FA7**, the digital tubes will display as shown in Figure 3-37.



**Figure 3-37 Screen for FA7 display**

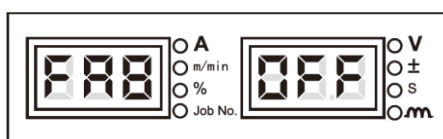
2. Press the **Enter** key, the right digital tubes will flash. Select **FA7** status using the knob on the panel of welding power source, press the **Enter** key for confirmation.

### Switch for high voltage touch sense (FA8)

For switch for high voltage, **OFF** means selecting high voltage touch sense as default; **HI** means selecting high voltage touch sense; **LO** means selecting low voltage touch sense; **CLO** means turning off touch sense function.

### Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **FA8**, the digital tubes will display as shown in Figure 3-38.



**Figure 3-38 Screen for FA8 display**

2. Press the **Enter** key, the right digital tubes will flash. Select **FA8** status using the knob on the panel of welding power source, press the **Enter** key for confirmation.

**Robot Communication Protocol Option (FA9)**

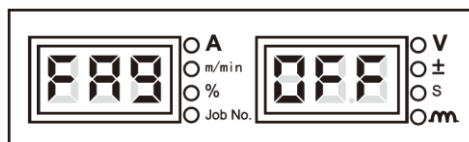
Robot Communication Protocol Option (FA9), OFF is default Analog communication.

**Table 3-4 Robot Communication Protocol Adaptive table**

FA9	The Right LED displaying	Communication Protocol	Remarks
1	OFF	Analog Communication	Default
2	FAN	Fanuc Standard Protocol	
3	FAS	Fanuc Customized Protocol	Not in used
4	ABB	ABB Agreement	
5	YAS	MOTOMAN Yaskawa Protocol	
6	KUK	Kuka Protocol	
7	KAS	Kawasaki Protocol	
8	EST	ESTUN/Tuling Protocol	
9	STE	STEP Protocol	
10	GOO	GOOGOL Protocol	
11	KEB	Keba Protocol	
12	STA	Megmeet standard Protocol	
13	COP	Megmeet Customized Protocol	
14	SIA	SIASUN Protocol	

**Steps**

1. Enter the internal menu, adjust the knob on the panel of welding power source to **FA9**, the digital tubes will display as shown in Figure 3-39.

**Figure 3-39 Screen for FA9 display**

2. Press the **Enter** key, the right digital tubes will flash. Select **FA9** status using the knob on the panel of welding power source, press the **Enter** key for confirmation.

**Options for robot digital communication baud rate (FAA)**

For options for robot communication protocol, **OFF** is applied for communication baud rate being 125 kbps as default.

**Table 3-34 Options for robot digital communication baud rate**

Function name	0	1	2	Default
FAA	125kbps	250kbps	500kbps	125kbps

**Steps**

1. Enter the internal menu, adjust the knob on the panel of welding power source to **FAA**.
2. Press the **Enter** key, the right digital tubes will flash. Select **FAA** status using the knob on the

panel of welding power source, press the **Enter** key for confirmation.

#### Robot Standby Reverse Switch (FAB)

Robot readiness reverse switch: **ON** means reverse function is open, **OFF** is reverse function is off, and default value is **OFF**.

##### Steps

1. Enter into internal menu and adjust the panel knob to **FAB**.
2. Press **Enter** key and the right digital tube will flash. You can select the **FAB** status by pressing the panel knob and press **Enter** key to confirm.

#### Options for robot digital communication terminal resistor (FAC)

For options for robot digital communication terminal resistance, **ON** means that the welding machine end communication bus features a resistance of 120 R; **OFF** means that the welding machine end communication bus does not feature a resistance of 120 R. **ON** is applied as default.

##### Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **FAC**.
2. Press the **Enter** key, the right digital tubes will flash. Select **FAC** status using the knob on the panel of welding power source, press the **Enter** key for confirmation.

#### ● Prompts

For detailed application of FA0~FAC options for robotic welding machine models, see Operation guideline for robotic welding power source.

#### Wire Feeder Motor Encoder mode Switch (FAD)

Wire feeder encoder long-short line gating option: **ON** is wire feeder motor encoder long line gating, **OFF** is wire feeder motor encoder short line gating, default value is **ON**.

##### Steps

1. Enter into internal menu and adjust the panel knob to **FAD**.
2. Press **Enter** key and the right digital tube will flash. You can select the **FAD** status by pressing the panel knob and press **Enter** key to confirm.

#### Switch for wire feeding motor running directions (FAE)

For switch for wire feeding motor running directions, **ON** means that the wire feeding motor will run reversely; **OFF** means that the wire feeding motor will run forwardly; and default mode is **OFF**.

##### Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **FAE**.
2. Press the **Enter** key, the right digital tubes will flash. Select **FAE** status using the knob on the panel of welding power source, press the **Enter** key for confirmation.

#### Automation Equipment Option Switch (FAF)

Automation equipment mode switching option, **ON** is automation mode, **OFF** is standard mode, and default mode is **OFF**.

### Steps

1. Enter into internal menu and adjust the panel knob to **FAF**.
2. Press **Enter** key and the right digital tube will flash. You can select the **FAF** status by pressing the panel knob and press **Enter** key to confirm.

### ● Prompts

FAF special automation option, after setting completed, welding machine needs to be powered off and restarted before the setting takes effect.

### Query about versions of software and hardware (FB0)

It is used to query about versions of software and hardware.

### Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **FB0**. The digital tubes will display as shown in Figure 3-40.

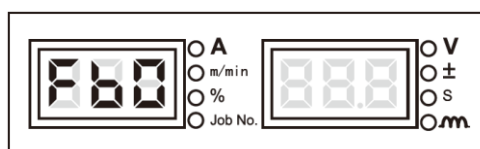


Figure 3-40 Screen for FB0 display

2. Press the **Enter** key, and use the knob on the panel of welding power source to query about versions of software and hardware, as shown in Figure 3-41.

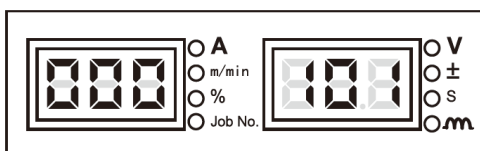


Figure 3-41 Screen for query about versions of software and hardware

### Query about failures (FB1)

It is used to query the failure records that have happened during using of welding power source, and there totally 200 records. **F00** means self-checking at starting the machine.

### Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **FB1** as shown in Figure 3-42.

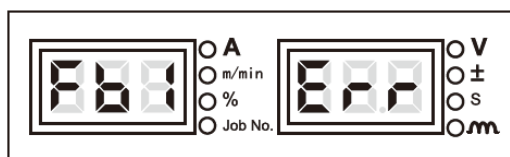


Figure 3-42 Screen for query about failures

2. Press the **Enter** key, there will display failure codes, and use the knob on the panel of welding power source to view about failures.

### Query about models (FB2)

It is used to query about the models of welding power source.

#### Steps

1. Enter the internal menu, adjust the knob on the panel of welding power source to **FB2** as shown in Figure 3-43.

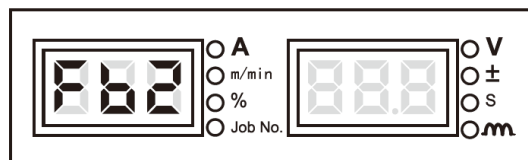


Figure 3-43 Screen for query about models

2. Press the **Enter** key, the digital tubes will display the model of welding power source, as shown in Figure 3-44.

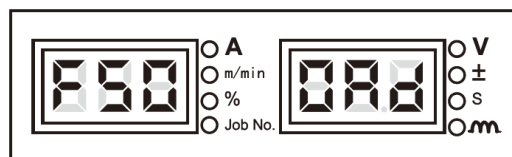


Figure 3-44 Screen for model display

### Restore to factory settings (F01)

#### Steps

1. Enter the internal menu, the left digital tubes will display **F01**, other digital tubes will display as shown in Figure 3-45.

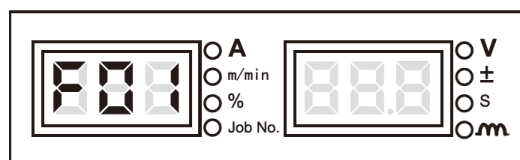


Figure 3-45 Restore to factory settings

2. Long press the **Enter** key, and the digital tubes will display “good” and flash, thus restoring to factory settings is successful.

#### ● Prompts

After restoring to factory settings, except for the parameters stored, invoked and lock password, F90 and FA0-FAF that will not be cleared, other parameters will be restored to factory settings. Be careful to do it.

### 3.3 Communication interface

Artsen II PM/CM series robotic models can be connected to robot by installing an analog communication box, a DeviceNet communication box, an EtherNet/IP communication box, or an EtherCAT communication box on the back of welding power source; Artsen II PM/CM series manual models can be connected to dedicated machine by installing a dedicated communication

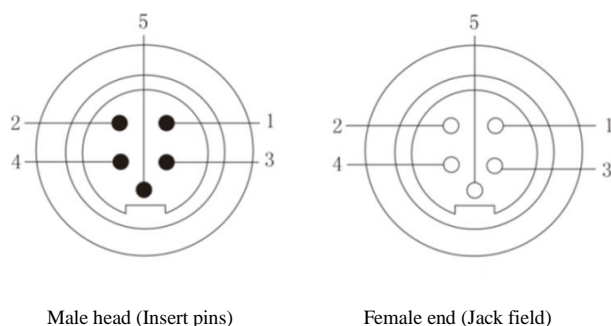
box, an analog communication box, or a DeviceNet communication box on the back of welding power source, and can be installed a group control box to realize welding machine group control; Artsen II PM/CM series welding power supplies have CAN communication interface reserved for special customization and background software upgrading; the communication boxes are shown in Figure 3-46.



**Figure 3-46 Communication boxes**

### 3.3.1 Robot DeviceNet interface

Aviation pin sequence of robot DeviceNet interface on the digital communication box is shown in Figure 3-47, and the pin definitions are shown in Table 3-35.



**Figure 3-47 Aviation pin sequence**

**Table 3-35 Aviation pin definitions**

Pin No.	Color	Signal name	Function
1	Red (18AWG)	24V power	Robot power signal
2	White (22AWG)	CAN_H signal line	Communication line CAN_H
3	Black (18AWG)	Grounding line	Robot power grounding line
4	Blue (22AWG)	CAN_L signal line	Communication line CAN_L
5	Shielding wire (18AWG)	Shielding wire	PE

### ● Prompts

1. 24 V power source is provided by the welding power source; if robot has this 24 V, this power may be disconnected;
2. 120Ω resistance shall be connected between high level and low level of digital interface; if robot has this resistance, then it is not needed to be matched.
3. The robot CANopen communication interface shares the robot DeviceNet interface on the DeviceNet communication box. The pin definition is the same as Table 3-35.

### 3.3.2 Robot analog interface

Terminal pin sequence of J39B-25 on the analog communication box is shown in Figure 3-48, and the pin definitions are shown in Table 3-36.

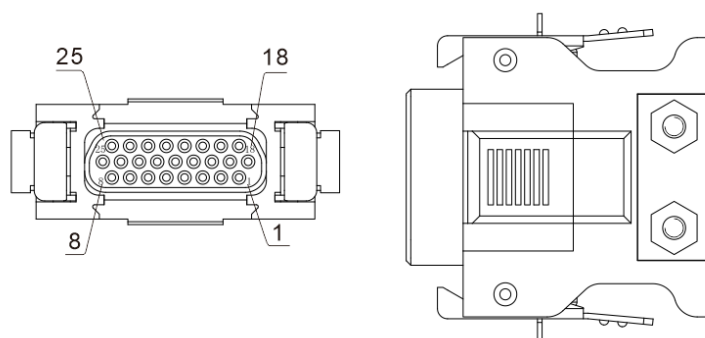


Figure 3-48 Terminal pin sequence of J39B-25

Table 3-36 Communication terminal pin definitions of J39B-25

Pin No.	Communication line color	Signal name	Function	Notes
1	Black 1	24V power	DC power positive pole, provided by robot to welding power source.	Note 1
2	Black 2	Signal for arc starting	Output from robot to welding power source, low level is effective. (default)	Note 2
3	Black 3	Signal for reverse wire feeding	Output from robot to welding power source, low level is effective. (default)	Note 2
4	Brown 1	Signal for successful arc starting	Output from welding power source to robot, low level is effective. (default)	Note 3
5	Brown 2	Signal for being ready	Output from welding power source to robot, low level is effective. (default)	Note 3
6	Brown 3	I/O signal common grounding line	Signal common grounding line for pin 1,2,3,4,5,7,8,9,10 I/O	
7	Orange 1	Signal for inching wire feeding	Output from robot to welding power source, low level is effective. (default)	Note 2
8	Orange 2	Signal for robot	Output from robot to welding power source,	Note 2



		emergent stop	low level is effective. (default)	
9	Orange 3	Signal for gas detection	Output from robot to welding power source, low level is effective. (default)	Note 2
10	Purple 1	Localization signal	Output from welding power source to robot, low level is effective. (default)	Note 3
11	Purple 2	Welding current signal	Output from welding power source to robot, feedback actual welding current value.	Note 4
12	Purple 3	Given current signal	Analog signal, output given current value from robot to welding power source.	Note 6 Note 7
13	Blue 1	Analog signal common grounding line	Analog signal common grounding line for pin 11, 12, 14, 15.	
14	Blue 2	Welding voltage signal	Output from welding power source to robot, feedback actual welding voltage value.	Note 5
15	Blue 3	Given voltage signal	Analog signal, output given voltage value from robot to welding power source.	Note8 Note9
16	Blank	Reserved		
17	Blank	Reserved		
18	Pink 1	JOB input port 1	Output from automation equipment or robot to welding power source, and for corresponding JOB number, see Table 3-37.	Note 2
19	Pink 2	JOB input port2	Output from automation equipment or robot to welding power source, and for corresponding JOB number, see Table 3-37.	Note 2
20	Pink 3	JOB input port3	Output from automation equipment or robot to welding power source, and for corresponding JOB number, see Table 3-37.	Note 2
21	Gray1	I/O signal common grounding line	Analog signal common grounding line for pin 18, 19, 20, 22, 23.	
22	Gray2	Touch Sensing Signal	Output from robot to welding power source, active-low (default)	Note 2
23	Blank	Reserved		
24	Blank	Reserved		
25	Blank	Reserved		

Table 3-37 JOB truth values

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:** 0 in the truth table indicates that JOB input is disconnected to ground, and 1 indicates that the JOB input is short-connected to ground. If you need to enter the analog port JOB mode, the welding power source needs to be in the Invoke state.

#### ● Definitions of communication line colors

For explanation about definitions of communication line colors, see Figure 3-49.

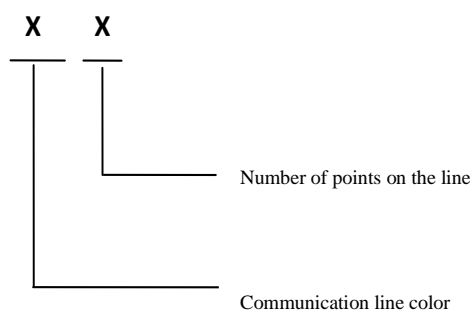


Figure 3-49 Explanation about communication line colors

#### For an example:

Black 3 means there are three points on the black line.

#### Explanations about notes on pin definitions

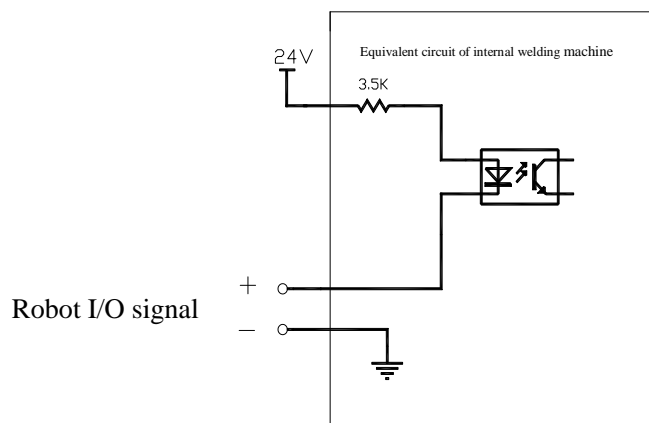
##### Note 1

The voltage scope of 24V DC power provided by dedicated machine or robot to welding power source shall be limited to within 20~30V. If dedicated machine or robot is unable to provide this power, the positive line of such power may be left blank, and welding machine will provide 24V DC on its inside.

##### Note 2

Equivalent circuit of I/O signal transmission output from robot to welding power source is shown in Figure 3-50, with low level being effective, namely, when the voltage between I/O signal terminal + and signal terminal - is 0~5V, as low level, welding machine will act; when the voltage

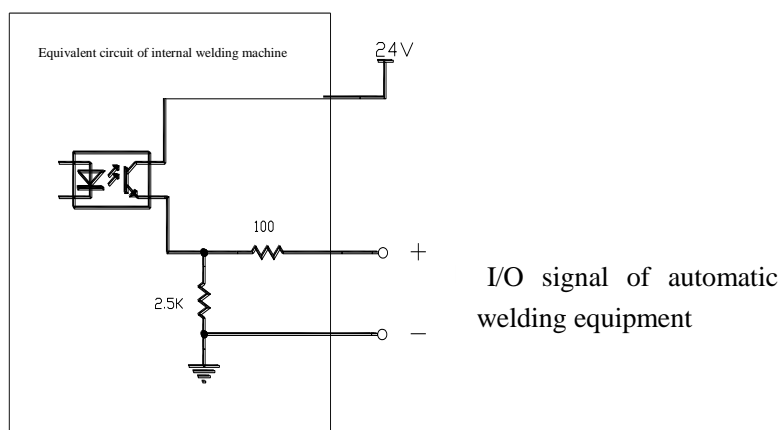
between I/O signal terminal + and signal terminal - is 18~24V, as high level, welding machine will not act. The voltage scope of I/O signal will be limited to within 0~30V.



**Figure 3-50 Equivalent circuit of signal**

**Note 3**

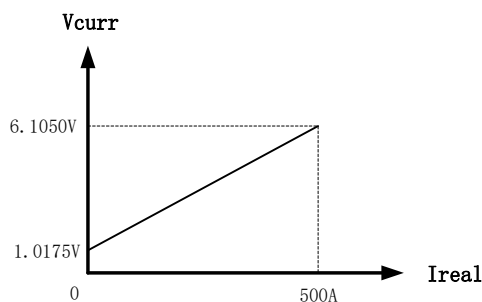
Equivalent circuit of I/O signal transmission output from welding power source to robot is shown in Figure 3-51, with low level being effective. When I/O signal outputs low level, robot will act; when I/O signal outputs high level, robot will not act. The maximum load-carrying capacity of I/O signal is 200 mA.



**Figure 3-51 Equivalent circuit of signal**

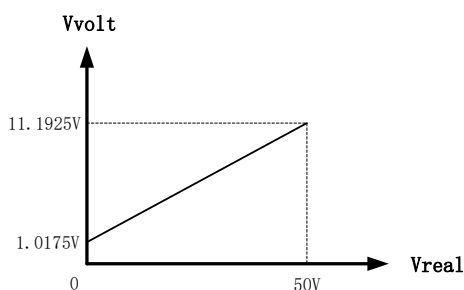
**Note 4**

The corresponding relationship between the actual current set on robot and the current analog output value is shown in Figure 3-52.

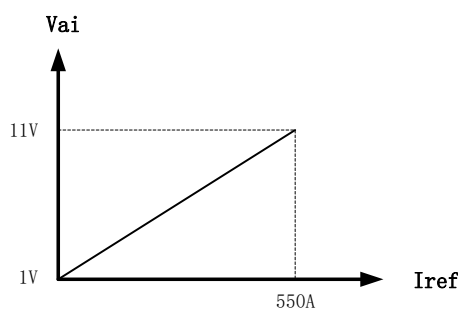


**Figure 3-52 Equivalent circuit of signal****Note 5**

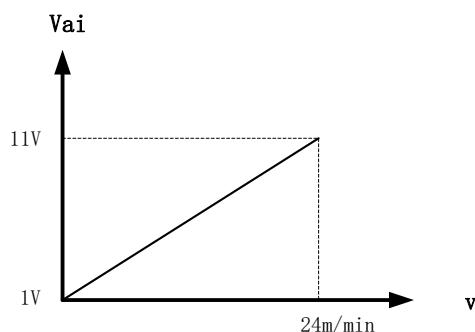
The corresponding relationship between the actual voltage set on robot and the voltage analog output value is shown in Figure 3-53.

**Figure 3-53 Equivalent circuit of signal****Note 6**

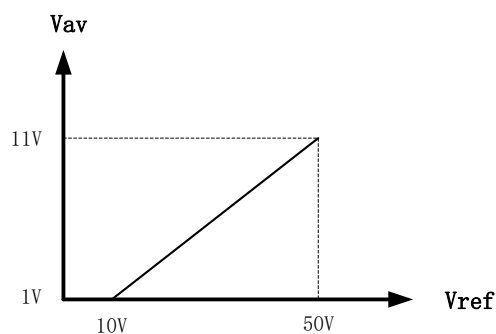
The corresponding relationship between the actual displayed current value on robot and received current analog value is shown in Figure 3-54.

**Figure 3-54 Equivalent circuit of signal****Note 7**

The corresponding relationship between the actual displayed voltage value on robot and received voltage analog value is shown in Figure 3-55.

**Figure 3-55 Equivalent circuit of signal****Note 8**

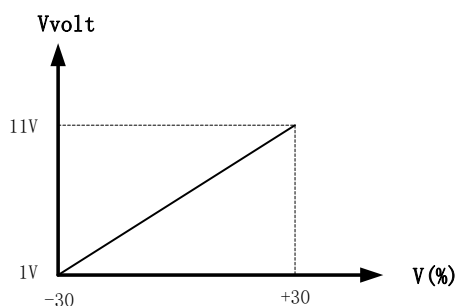
Corresponding relationship between actual set voltage correction value of welding machine Separate mode and voltage analog acceptance value of welding machine is shown in Figure 3-56.



**Figure 3-56 Equivalent circuit of signal**

**Note 9**

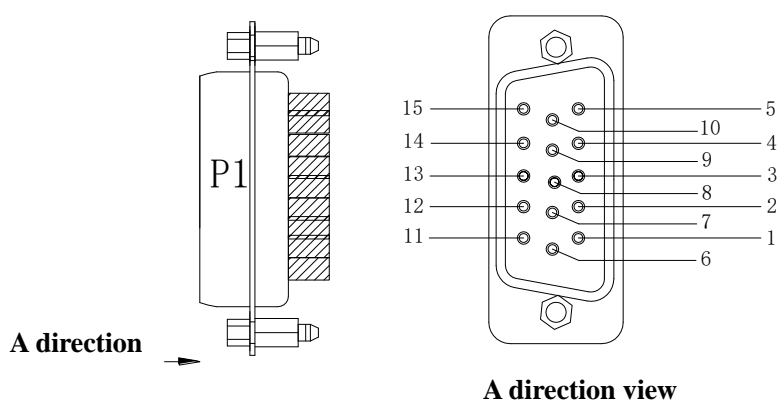
Corresponding relationship between actual set voltage correction value of welding machine synergic mode and voltage analog acceptance value of welding machine is shown in Figure 3-57.



**Figure 3-57 Equivalent circuit of signal**

**3.3.3 Communication Interface of Automation Equipment**

PIN sequence of DB15 connector on the communication box of automation machine is shown in Figure 3-58. Pin definition of DB15 communication interface of automation machine is shown in Table 3-38.



**Figure 3-58 DB15 Connector Pin Sequence**

**Table 3-38 DB15 Communication Interface Pin Definition**

Pin No.	Communication Cable Color	Signal Name	Function	Notes
1	Black 1	Reserved		

2	Black 2	Arc Starting Signal	The signal is output to welding power source by automation machine, and is active-low. (default)	Note2
3	Black 3	JOB Input Port 1	JOB input port 1 is output to welding power source by automation machine. The corresponding JOB channel number is shown in Table 3-37.	Note2
4	Brown 1	JOB Input Port 2	JOB input port 2 is output to welding power source by automation machine. The corresponding JOB channel number is shown in Table 3-37.	Note 2
5	Brown 2	JOB Input Port 3	JOB input port 3 is output to welding power source by automation machine. The corresponding JOB channel number is shown in Table 3-37.	Note 2
6	Brown 3	Analog signal common land	13, 14 Pin analog signal common land.	
7	Orange 1	Reserved		
8	Orange 2	I/O signal common land	2, 3, 4, 5, 9, 10, 11 pin I / O signal common land	
9	Orange 3	Inching Wire Feeding Signal	The signal is output to welding power source by automation machine, and is active-low. (default)	Note 2
10	Purple 1	Robot Scram Signal	The signal is output to welding power source by automation machine, and is active-low. (default)	Note 2
11	Purple 2	Gas Detecting Signal	The signal is output to welding power source by automation machine, and is active-low. (default)	Note 2
12	Purple 3	Reserved		
13	Blue 1	Given Voltage Signal	Analog signal, given voltage value is output by automation machine to welding power source.	Note8, Note 9
14	Blue 2	Given Current Signal	Analog signal, given current value is output by automation machine to welding power source.	Note6, Note 7
15	Blue 3	Reserved		

### 3.3.4 CAN communication interface

Pin sequence of M12 connector on reserved CAN communication interface is shown in Figure 3-59, and the pin definitions of CAN communication interface are shown in Table 3-39.

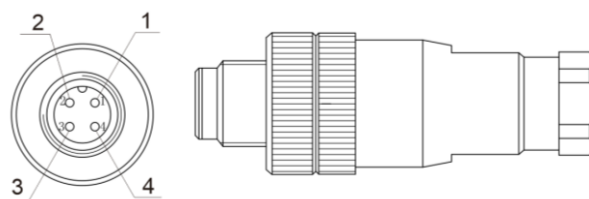


Figure 3-59 Pin sequence of M12 connector.

Table 3-39 Pin definitions of CAN communication interface

Pin No.	Signal name	Function
1	CAN_H signal line	CAN_H communication line
2	CAN_L signal line	CAN_L communication line
3	24V power	Reserved power
4	Grounding line	Reserved power source grounding line

### 3.4 Intelligent functions

#### Energy-saving function for fan

- When the power source is turn on, the fan will start rotate; if there is any operation with a time of 5 minutes, it will automatically stop rotating.
- When welding current is less than 300 A, it will rotate at a low speed; when welding current is more than 300 A, it will rotate at a high speed.
- The fan will automatically stop rotating in 5 minutes after welding is completed.

#### Safety protection function for welding torch

After the machine being started, the welding torch is long pressed without any actual welding for more than 10 s, main power output will be automatically turned off. The main purpose is to ensure safety in using.

#### Intelligent functions for water cooling system

See [3.2.4 Air cooling/Water cooling](#).

### 3.5 After welding

Firstly, close the main switch of gas cylinder, then turn off power.

When turning off power, firstly turn off the welding power source, then turn off the power source on the electric distribution box.

#### Prompts

In order to perform internal cooling of welding power source, the welding power source shall not be turned off unless it has been 3~5 or more after welding task.

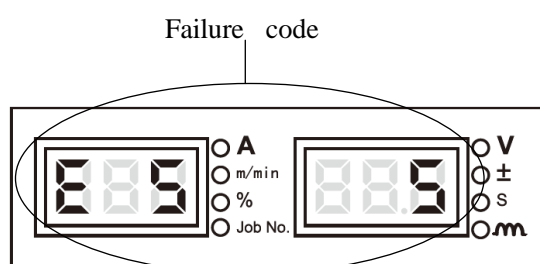
## Chapter 4 Failure diagnosis

### 4.1 Failure code and Solution for welding power source

#### Caution

During welding, when LED indicates that there is any variation of current and voltage from the values set, this does not necessarily mean that there is a failure. Any difference in gas, welding wire, rod extension and welding method and so on may cause the above phenomenon.

Display of failure code is shown in Figure 4-1.



**Figure 4-1 Failure code display**

Failure code, cause and solution for welding power source are shown in Table 4-1.

**Table 4-1 Failure code, cause and solution**

Failure	Failure code display		Cause	Solutions
	Left digital tubes	Right digital tubes		
Self-checking at starting the machine	F00	F00	/	/
Welding torch failure	E1	/	When welding power source is being started, torch switch is closed, or torch switch is damaged.	switch torch switch to OFF status, or replace torch switch.
Output terminal loose (terminal over temperature)	E2	1	Left terminal loose (terminal over temperature)	Firmly fix output terminal; Increase cable cross section;
	E2	2	Right terminal loose (terminal over temperature)	Choose suitable specification of cable terminal.
Input power abnormal	E3	1~6	Input power abnormal	Check whether input cable is of correct wiring; Check whether input power is normal.
Inductor or diode over temperature	E4	1	Inductor over temperature	Use strictly according to rated load continual rate range;
	E4	2	Diode over temperature	Check whether ventilation hole for welding power source is blocked; Removing the dusts from the radiator; Check whether the fan is working normally.
Key error	E5	1~17	Key blocked	Check the corresponding numbers of keys according to the numbers on the panel in Figure 3-1 (see display of the right three digital positions)



Failure	Failure code display		Cause	Solutions
	Left digital tubes	Right digital tubes		
				tubes)
Output over current	E6	E 6	Output short circuit or current too high; Output diode module damaged.	Check whether output is of short circuit; Check whether diode module is damaged.
Communication failure	E7	1	Internal communication failure of welding power source	Contact after-sales office.
	E7	2	Communication failure between manual wire feeder and welding power source	Check whether control wiring between manual wire feeder and welding power source is correct.
	E7	4	Internal communication failure of welding power source	Contact after-sales office.
	E7	5	Internal communication failure of manual wire feeder	Contact after-sales office.
	E7	6	Communication failure between intermediate drive wire feeder and manual wire feeder	Check whether control wiring between intermediate drive wire feeder and manual wire feeder is correct.
Output over voltage	E8	E 8	Input voltage is too high; Main transformer is damaged; Output wiring is wrong.	Check whether input voltage is normal; Check whether main transformer is damaged; Check output wiring.
Primary side over current	E9	E 9	Main transformer is damaged; Output diode module is damaged; Main power board is damaged.	Check main transformer; Check output diode module; Check main power board.
Primary side over voltage	E10	E10	Input voltage is too high.	Check input voltage.
Current Hall connector not inserted	E11	E11	Current Hall connector is not inserted.	Check current Hall connector.
Motor over current	E13	1	Wire feeding motor over current	Check whether welding wire is blocked or jammed. Clean or replace wire-guiding tube; Clean or replace contact tube.
	E13	2	Push-pull wire motor or intermediate drive wire feeder motor over current	Check whether welding wire is blocked or jammed. Clean or replace wire-guiding tube; Clean or replace contact tube.
Gas valve failure	E14	1	Gas valve is of short circuit or damaged.	Check whether gas valve is of short circuit or damaged.
	E14	2	Gas valve is of open circuit or wiring is disconnected.	Check whether gas valve is of open circuit or wiring is disconnected.
Size dial open circuit	E17	E17	Control cables are loose or wire feeder is blocked.	Check whether control cables are loose or wire feeder is blocked.

Failure	Failure code display		Cause	Solutions
	Left digital tubes	Right digital tubes		
Robot emergent stop	E18	E18	Robot emergent stop signal error.	Check whether robot communication cables are of correct wiring.
Robot communication failure	E19	/	Communication failure between digital robot and welding power source	Check communication lines.
Water cooling system protection	E26	1	Water flow warning	Check whether water lines are smooth; Check whether water pipes are bent; Check whether water tank is working normally.
JOB number over-range	E27	1	Robot Job number over-range	Check whether the JOB number and parameters issued to welding machine from robot is over-range.
	E27	2	Group Control JOB number over-range	Check whether the JOB number and parameters issued to welding machine from group control system is over-range.
Group control communication failure	E29	E29	Communication failure between welding power source and group monitoring system controller	Contact after-sales office.
Parameters sent under group control exceeding the scope	E30	E30	The technique parameters sent to welding power source under group control system exceed the relevant scope.	Send correct technique parameters under group control system.
For group control, need to scanning a card, but for welding machine, a card has not been scanned.	E32	E32	Under group control system, to use a welding power source, a card needs to be scanned.	Scan a card before using.
Reading head communication failure of group RFID card	E33	E33	Communication failure between RFID card reader of group control and welding power source	Check the communication cables between RFID card reader and welding power source are of correct wiring; Check whether RFID card reader is damaged.
Not-matching warning of group control RFID card	E34	E34	Group control RFID card does not match the card reader.	Use the correct RFID card; Check whether RFID card is damaged.
For group control, it is needed to scan the card twice, for welding machine, there is a warning that one time scanning in is done, but one time scanning out is not done.	E35	E35	Under group control system, RFID card needs to be scanned in and out, but actually there is only scanning in, but without scanning out.	Ensure that there are both scanning in and scanning out before and after using welding machine respectively.

# Chapter 5 Maintenance

## 5.1 Routine check

### Safety Warning

Routine check shall be carried out after disconnecting the power source of electric distribution box and the power source of this machine (except for appearance check without contacting conductor), thus avoiding electric shock, burn and other personal injury.

### Notes for usage

1. Routine checking is very important for realizing the high performance and safe running of this welding machine.
2. Do the Routine check according to the following list and do cleaning or replacing when necessary.
3. In order to ensure the high performance of this welding power source, when replacing some part, you shall use the part provided or recommended by Shenzhen Megmeet Welding Technology Co., Ltd.

**Table 5-1 Routine check for welding power source**

Item	Key points of Check	Note
Front panel	Whether any mechanical part is damaged or loose; Whether the cable wiring at the bottom is firmly fixed; Whether the indicator for failure is flashing.	Terminal cover at the bottom shall be one item for the periodic check. If there is any non-conformity, then internal check of welding power source shall be done, or further fixing shall be done, or some part shall be replaced.
Back panel	Whether the terminal cover of the input power source is good; Whether the ventilation hole is smooth without any foreign object.	
Top panel	Check whether the eyelet bolts or other bolts are loose.	If there is any non-conformity, further fixing or replacement of some parts shall be done.
Bottom panel	Check whether the wheel feet are damaged or loose.	
Side panel	Check whether the side panels are loose.	
Routine	Check whether there is any decoloration or over temperature in appearance. Check whether the sound of fan running of welding power source is normal. Check whether there is any irregular odour, vibration or noise when the welding power is running and you are doing welding.	If there is any non-conformity, then internal check of welding power source shall be done.

### ● Cable

**Table 5-2 Routine check for cable**

Item	Key points of Check	Note
Grounding cable	Check whether safety grounding cable is detached, including working piece grounding cable and the grounding cable for welding power source.	If there is any non-conformity, further fixing or replacement of some parts shall be done.
Welding cable	Check the insulation layer of cable is worn or otherwise damaged, whether there is any exposure of conductive part. Check whether there is any extension of cable owing to irregular external force. Check whether the connection between the working piece and the relevant cable for connecting the working piece is firm.	In order to ensure safe and proper welding, suitable methods for check shall be adopted according to the conditions of actual working site.

- **Other accessories**

**Table 5-3 Routine check for other accessories**

Item	Key points of Check	Note
Welding torch	Carry out daily check according to usage instructions for welding torch.	/
Wire feeder	Carry out daily check according to usage instructions for wire feeder.	/
Water tank	Carry out daily check according to usage instructions for water tank.	
Gas meter	Carry out daily check according to usage instructions for gas meter.	/
Gas pipe	Check whether connection is form, and when soft clamp is used, check whether there is looseness, whether soft hose is worn or damaged.	If there is any non-conformity, further fixing or replacement of some gas pipe shall be done.

## 5.2 Periodic check

### Safety Warning

1. In order to ensure safety, periodic check shall be done by qualified professional people.
2. Periodic check shall be carried out after disconnecting the power source of electric distribution box and the power source of this machine (except for appearance check without contacting conductor), thus avoiding electric shock, burn and other personal injury.
3. Since there is capacitor discharge, check shall not be carried out until it is 5 minutes after the welding power source being powered off.

- **Notes on operation**

1. To avoid being damaged by static electricity from semi-conductor parts and circuit boards, anti-static device shall be wearing before contacting the conductors and circuit boards of internal wiring of the machine, or by touching the metal parts of the enclosure or in other similar way, remove the static electricity in advance.
2. When cleaning the plastic parts, do not use the solvents other than the neutral detergents for household use.

- **Periodic check plan**

1. In order to ensure long-term normal use of this equipment, periodic check shall be done.
2. Periodic check shall be thorough, including internal check and cleaning of the equipment.
3. Periodic check shall usually be done on a basis of every 6 months, provided that when there is much dust or much oily fume on the welding site, periodic check shall be done on a basis of every 3 months.

- **Contents of periodic check**

(Besides the following items, user may add check items according to actual situation)

1. Internal dust removal for welding power source.

Remove the top panel and side panels of welding power source, firstly you may use dry compressed air to blow the internal spatter and dust accumulated in the welding power source, then remove the dirt and foreign object that are hard to blow away.

**📖 Caution**

Much dust accumulated on the heat radiator may affect heat radiation, easily triggering over-temperature protection.

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**2. Check welding power source**

Remove the top panel and side panels of welding power source, check whether there is any irregular odour, color or over-temperature damage phenomenon, and whether there is any looseness at the connections.

**3. Check cables and gas pipe**

Check the safety grounding wire, cable and gas pipe and so on. More thorough check shall be done based on the item of daily check, and routinely further tightening and fixing.

**● Dielectric strength withstanding testing and insulation testing**

Dielectric strength withstanding testing and insulation testing shall either be implemented by the after-sales people of our company, or be operated by the people who has the professional knowledge of electricians and welding power source.

**Rules for operations**

1. Turn off the power source of electric distribution box.
  2. Dismantle all safety grounding wires on the enclosure.
  3. Dismantle all peripherals such as wire feeder, to make welding power source a separate object.
  4. Connect the three input terminals on the input wiring bus with conductor as one body, making a short circuit.
  5. Set the switch of welding power source at “ON” position.
  6. At the secondary side, connect positive output terminal, negative output terminal, 19 cores socket (except for 19<sup>th</sup> core) with conductor as one body, making a short circuit.
  7. Above-mentioned connecting conductor for short circuit shall be of same model, and have its cross section of not less than 1.25 mm<sup>2</sup>.
- 

**📖 Caution**

All modifications and treatments for dielectric strength testing shall be undone after dielectric strength being completed.

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**5.3 After-sales service****● Warranty card**

There is a warranty card for every equipment, and please fill up the contents of your warranty card. Please carefully read the contents of warranty card and keep the card in a safe custody.

**● Repair**

User shall firstly carry out the check according to the contents in **4.1 Failure code and solutions for welding power source** and basically do trouble-shooting for the failure or record the failure information.

If it is needed to repair or replace some part, please contact the local distributor. Use the parts or accessories provided or recommended by Shenzhen Megmeet Welding Technology Co., Ltd.

For the product, we provide three years of warranty. Warranty period shall be calculated from the date that is recorded on the warranty card or the invoice for purchasing this product. Any product

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damage caused by improper use by user will not fall within the scope of warranty, but may be treated in a normal repairing manner.

# Chapter 6 Ordering list

## 6.1 Ordering list of accessories of welding power source

No.	Name	Ordering code	No.	Name	Ordering code
1	Plastic panel of welding power source	R29060546	14	WPCM1315M3 fan power board	R11110087
2	Current Hall sensor	R27060058	15	Secondary side power diode	R26020100
3	WPPM2315A3 output EMC board	R11112159	16	WPCM1315A2 output absorbing board	R11110090
4	WPPM4315U41 wire feeding control board	R11101447	17	WPPM2315L2 output reactor	R22011339
5	WPPM4315U31 main control board	R11101450	18	WPPM4315M2 rectifier board	R11113744
6	WPCM5315M1 main power board	R11114251	19	WPPM2315M4 high-voltage touch sense board	R11113047
7	Input rectifier bridge	R26060292	20	WPPM4315T2 power frequency large transformer	R23040011
8	WPPM2315A2 water tank relay control board	R11112096	21	three-line wiring socket	30040907
9	Output negative polar black power connector	30040912	22	WPCM1315A1 input EMC board	R11110089
10-1	WPPM4315U11 display panel of welding power source	R11101451	23	WPCM1315T4 power frequency small transformer	R23010894
10-2	Panel knob of welding power source	29130141	24	Three-phase input cable	/
10-3	Artsen II CM350 (R) panel sticker	R29102061	25	Fuse tube socket	R27010154
10-4	Artsen II CM400(R) panel sticker	R29102150		8A Fuse tube	R27010156
10-5	Artsen II CM500(R) panel sticker	R29102060	26	CO2 heater AC36V socket	R30040882
10-6	Artsen II PM400F(R) panel sticker	R29102149	27	Input breaker	R30040897
10-7	Artsen II PM500F(R) panel sticker	R29102152		Water-proof plastic bumper for input breaker	R29060225
10-8	Artsen II PM400N(R) panel sticker	R29102151	28-1	Automation Equipment communication box	R13400942
10-9	Artsen II PM500N(R) panel sticker	R29102154	28-2	Analog communication box	R13400887
10-10	Artsen II PM400A(S/D)(R) panel sticker	R29102063	28-3	DeviceNet communication box	R13400888
10-11	Artsen II PM500A(S/D)(R) panel sticker	R29102062	28-4	EtherNet/IP communication box	R13400943

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			28-5	EtherCAT communication box	R13401135
11	19 Pins Aerial socket	R30042414	28-6	Group Control System communication box	R13400886
12	Output positive polar red power connector	30040911	29	WPCM1315T6 main transformer	R23010887
13	DC fan	R34020011	30	Socket of water tank control	R30042738

Note: for the details of the parts with corresponding numbers, see **Appendix 5 Structure part list**.



## Appendix 1 Technical specification

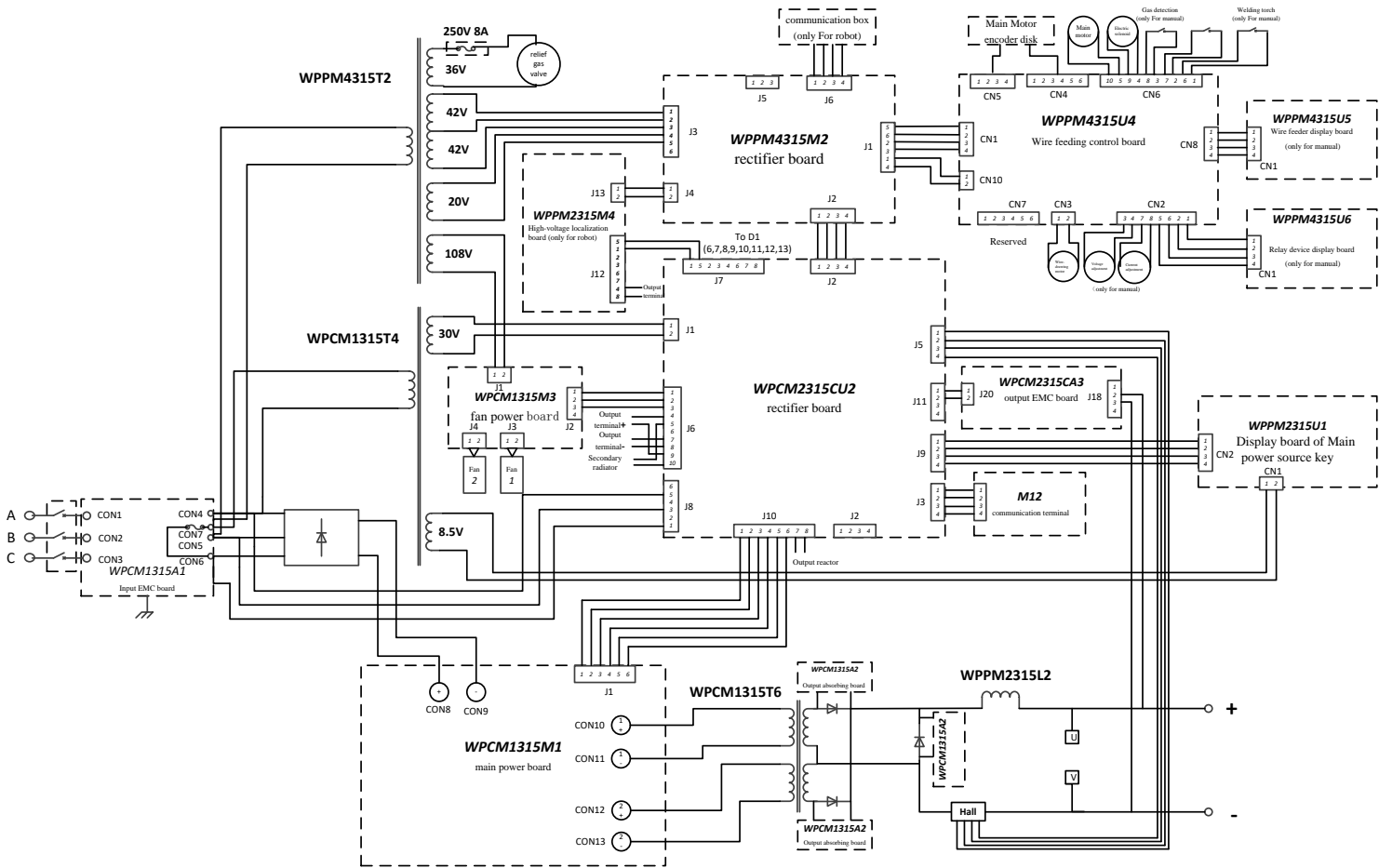
**Appendix Table 1-1 Technical specification of welding power source**

Welding power source	Unit	Artsen II CM350/400	Artsen II PM400	Artsen II CM500/PM500
Control method	-	Digital control		
Rated input voltage/phase number	-	3 phases AC380V $\pm 25\%$		
Input power frequency	Hz	45~65Hz		
Rated input capacity	kVA/kW	15KVA/12.7KW	19.7KVA/18KW	24KVA/22.3KW
Power factor	-	0.94	0.94	0.93
Output feature	-	CV		
Rated output current	A	350A	400A	500A
Rated output voltage	V	31.5V	34V	39V
Rated load continual rate	%	DC 100%	DC 100%	DC 60%
Rated output no-load voltage	V	63.7V	73.3V	73.3V
Output current range	A	30A~400A	30A~400A	30A~500A
Output voltage range	V	12V~45V	12V~45V	12V~45V
Robot analog communication interface		Yes (Analog communication box is as optional)		
DeviceNet/CANopen communication interface		Yes (DeviceNet communication box is as optional)		
EtherNet/IP communication interface		Yes (EtherNet/IP communication box is as optional)		
EtherCAT communication interface		Yes (EtherCAT communication box is as optional)		
Automation equipment communication interface		Yes (only manual model has a automation equipment box as an option)		
Group control		Yes (only manual model has a group control box as an option)		
CAN communication interface		Yes		
Enclosure protection grade	-	IP23S		
Ambient temperature		-10°C~40°C (welding power source can be started at -39°C)		
Insulation grade	-	H		

**Appendix Table 1-2 Technical specification of Water Cooling System**

Water cooling system		
Input voltage	V	AC 400V $\pm 10\%$
Cooling water volume	L	6.5L
Cooling water flow	L/min	3.5L/min
Cooling water maximum lift head	m	26m
Cooling capacity	KW	1.5KW(L/min)

### Appendix 2 Electric wiring diagram



Appendix Figure 2-1 Electric wiring for Artsen II PM/CM series welding power source

## Appendix 3 Systematic configuration

**Appendix table 3-1 Systematic configuration for manual welding machine**

Configuration			Machine model										
Name	Configuration	Quantity	Artsen II CM350	Artsen II CM400	Artsen II CM500	Artsen II PM400F	Artsen II PM500F	Artsen II PM400N	Artsen II PM500N	Artsen II PM400AD	Artsen II PM500AD	Artsen II PM400AS	Artsen II PM500AS
Welding power source	Standard	1	●	●	●	●	●	●	●	●	●	●	●
Wire feeder	Standard	1	●	●	●	●	●	●	●	●	●	●	●
Welding torch	Optional	1	○	○	○	○	○	○	○	○	○	○	○
Water tank	Optional	1	○	○	○	○	○	○	○	○	○	○	○
Combined cable	Standard	1	●	●	●	●	●	●	●	●	●	●	●
Working piece side welding cable (grounding wire)	Standard	1	●	●	●	●	●	●	●	●	●	●	●
Welding Trolley	Optional	1	○	○	○	○	○	○	○	○	○	○	○
Gas meter	Optional	1	○	○	○	○	○	○	○	○	○	○	○

**Note:** ● Standard configuration    ○ Optional configuration

Appendix table 3-2 Systematic configuration for robotic welding machine

Configuration			Machine model										
Name	Configuration	Quantity	Artsen II CM350R	Artsen II CM400R	Artsen II CM500R	Artsen II PM400FR	Artsen II PM500FR	Artsen II PM400NR	Artsen II PM500NR	Artsen II PM400ADR	Artsen II PM500ADR	Artsen II PM400ASR	Artsen II PM500ASR
Robotic welding power source	Standard	1	●	●	●	●	●	●	●	●	●	●	●
Robotic Wire feeder	Standard	1	●	●	●	●	●	●	●	●	●	●	●
Robotic welding torch	Optional	1	○	○	○	○	○	○	○	○	○	○	○
Water cooling system	Optional	1	○	○	○	○	○	○	○	○	○	○	○
Combined cable for Robotic wire feeder	Standard		●	●	●	●	●	●	●	●	●	●	●
Control cable for robot	Standard		●	●	●	●	●	●	●	●	●	●	●
Working piece side welding cable (grounding wire)	Standard	1	●	●	●	●	●	●	●	●	●	●	●
Welding Trolley	Optional	1	○	○	○	○	○	○	○	○	○	○	○
Gas meter	Optional	1	○	○	○	○	○	○	○	○	○	○	○

Note: ● Standard configuration ○ Optional configuration

## Appendix 4 Technique matching list

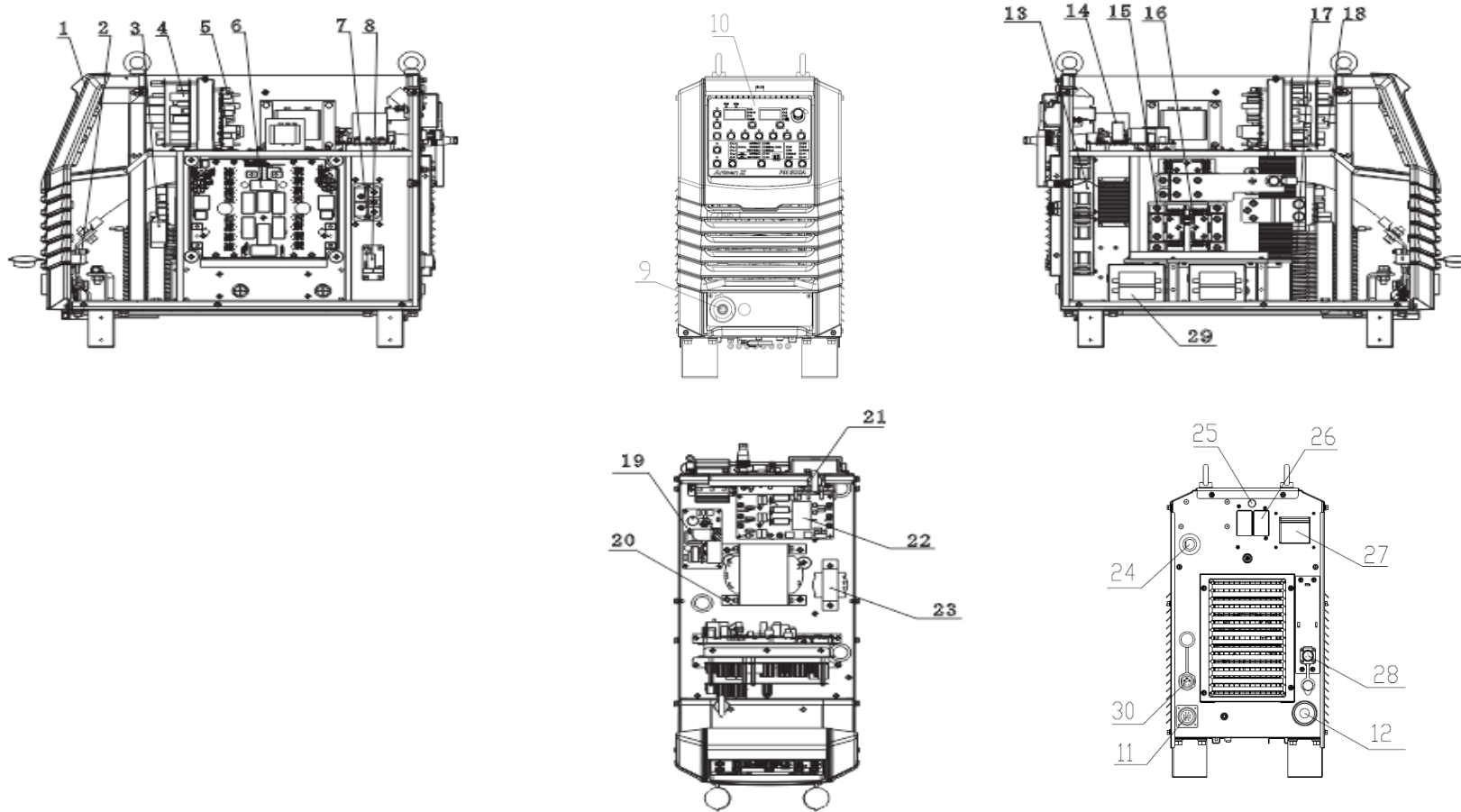
**Appendix table 4-1 Technique matching list**

Machine model	Welding method	Welding material type							
		CO <sub>2</sub> 100% solid carbon steel	CO <sub>2</sub> 100% flux-cored carbon steel	CO <sub>2</sub> 100% flux-cored stainless steel	80%Ar+20%CO <sub>2</sub> solid carbon steel	97.5%Ar+1.5%CO <sub>2</sub> solid core stainless steel	100%Ar pure aluminum	100%Ar aluminum silicon alloy	100%Ar aluminium magnesium alloy
Artsen II CM350	DC	0.8/1.0/1.2	1.2		0.8/1.0/1.2				
Artsen II CM400	DC	0.8/1.0/1.2	1.2		0.8/1.0/1.2				
Artsen II CM500	DC	0.8/1.0/1.2/1.6	1.2/1.6		0.8/1.0/1.2/1.6				
Artsen II PM400F	DC	0.8/1.0/1.2	1.2		0.8/1.0/1.2				
	Single pulse				0.8/1.0/1.2				
	Double pulses				0.8/1.0/1.2				
Artsen II PM500F	DC	0.8/1.0/1.2/1.6	1.2/1.6		0.8/1.0/1.2/1.6				
	Single pulse				0.8/1.0/1.2/1.6				
	Double pulses				0.8/1.0/1.2/1.6				
Artsen II PM400N	DC	0.8/1.0/1.2	1.2	1.2	0.8/1.0/1.2				
	Single pulse				0.8/1.0/1.2	1.0/1.2			
	Double pulses				0.8/1.0/1.2	1.0/1.2			
Artsen II PM500N	DC	0.8/1.0/1.2/1.6	1.2/1.6	1.2/1.6	0.8/1.0/1.2/1.6				
	Single pulse				0.8/1.0/1.2/1.6	1.0/1.2/1.6			
	Double pulses				0.8/1.0/1.2/1.6	1.0/1.2/1.6			
Artsen II PM400AS	DC	0.8/1.0/1.2	1.2	1.2	0.8/1.0/1.2				
	Single pulse				0.8/1.0/1.2	1.0/1.2	1.2	1.2	1.2
	Double pulses				0.8/1.0/1.2	1.0/1.2			

Artsen II PM500AS	DC	0.8/1.0/1.2/1.6	1.2/1.6	1.2/1.6	0.8/1.0/1.2/1.6				
	Single pulse				0.8/1.0/1.2/1.6	1.0/1.2/1.6	1.2/1.6	1.0/1.2/1.6	1.0/1.2/1.6
	Double pulses				0.8/1.0/1.2/1.6	1.0/1.2/1.6			
Artsen II PM400AD	DC	0.8/1.0/1.2	1.2	1.2	0.8/1.0/1.2				
	Single pulse				0.8/1.0/1.2	1.0/1.2	1.2	1.0/1.2	1.0/1.2
	Double pulses				0.8/1.0/1.2	1.0/1.2	1.2	1.0/1.2	1.0/1.2
Artsen II PM500AD	DC	0.8/1.0/1.2/1.6	1.2/1.6	1.2/1.6	0.8/1.0/1.2/1.6				
	Single pulse				0.8/1.0/1.2/1.6	1.0/1.2/1.6	1.2/1.6	1.0/1.2/1.6	1.0/1.2/1.6
	Double pulses				0.8/1.0/1.2/1.6	1.0/1.2/1.6	1.2/1.6	1.0/1.2/1.6	1.0/1.2/1.6

Welding process of robotic welding power source is the same with above. SP means customized process.

### Appendix 5 Structure list



Appendix figure 5-1 Structural part configuration





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**Notes to user**

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1. The warranty scope means only welding power source.
2. Warranty period is of one year. If welding power source fails or is damaged under proper using condition within the warranty period, our company will provide repairing service free of charge.
3. Warranty period is calculated from the date when welding power source leaves factory; serial number of welding power source is only basis to judge its warranty period and if there is no serial number of welding power source, then the equipment will be treated as falling out of warranty period.
4. If there is one of the following circumstances within the warranty period, we will still collect some repairing charge:
  - Welding power SOURCE failure due to any operation not complying with User Manual;
  - Welding power SOURCE damage due to fire, flood or irregular voltage;
  - Welding power SOURCE damage due to abnormal function using.
5. Service charge will be calculated according to actual charge; if there is any contract for the purpose, then such contract shall prevail.
6. Please carefully keep this card and present it to the service entity when warranted repair is needed.
7. If you have any question, you may contact the relevant distributor, or directly contact our company.

Shenzhen Megmeet Welding Technology Co., Ltd.  
Customer service center

Floor 5<sup>th</sup>, Block B, Unisplendour Information Harbour, Langshan Road, North Zone, Science and Technology Park, Nanshan District, Shenzhen, Guangdong Province  
Post code: 518057  
Customer service hot line: 4006662163

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**Notes to user**

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1. The warranty scope means only welding power source.
2. Warranty period is of one year. If welding power source fails or is damaged under proper using condition within the warranty period, our company will provide repairing service free of charge.
3. Warranty period is calculated from the date when welding power source leaves factory; serial number of welding power source is only basis to judge its warranty period and if there is no serial number of welding power source, then the equipment will be treated as falling out of warranty period.
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  - Welding power SOURCE failure due to any operation not complying with User Manual;
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