

# User Manual



## **Dex series**

### **Fully Digital-control Multi-functional Inverter**

### **MIG/MAG/CO<sub>2</sub> Welder**

Dex CM3000 / DM3000 / PM3000 / PM3000Q

Dex DM3000R / PM3000R / PM3000QR

Dex DM3000S / DM3000SF / PM3000S / PM3000QS

**MEGMEET**

# **Dex Series Full-digital Inverter CO<sub>2</sub>/MAG/MIG**

## **Multi-Functional Welding Power Source**

### **User Manual**

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**MEGMEET Welding Technology Co., Ltd.** provides customers with all-around technical support, including but not limited to: opening CAN communication, robotic coordination, software upgrading of welding process database and after-sales services. Customers can contact any office or customer service center of **MEGMEET Welding Technology Co., Ltd.** in the vicinity, or directly contact the company headquarters.

#### **MEGMEET Welding Technology Co., Ltd.**

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# Preface

Thank you for purchasing the multi-functional full-digital inverter CO<sub>2</sub>/MAG/MIG welding power source (hereinafter referred to as the welding power source) produced by **MEGMEET Welding Technology Co., Ltd.**

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

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# Safety Precautions

## Definition of safety



Please operate as required, or death or serious injury may be caused.



Please operate as required, or moderate or minor injury or property damage may be caused.

- Please read through this manual before use for correct use.
- Safety considerations have been sufficiently taken in the design and manufacturing of this welding power source. However, to ensure the safe use of this welding power source and avoid injuries and major accidents, please follow the precautions in this manual during use.
- The incorrect use of the welding power source will result in injury accidents.

## Precautions for installation



- Before handling or moving the welding machine, the input power source from the electric distribution box must be cut off.
- If you use a crane to handle the welding machine, ensure that the machine enclosure has been installed.
- The welding machine should not be hoisted together with other objects.
- Please install the welding machine on a non-combustible object, or there is a risk of fire.
- Don't put combustibles near the product, or there is a risk of fire.
- Do not install the machine in an explosive environment, or there's risk of explosion.
- Wiring must be carried out by qualified personnel, or there is a risk of electric shock.
- Make sure that the input power is completely disconnected before wiring, or there is a risk of electric shock.
- Before powering on, the grounding wire of the welding machine must be reliably grounded, or there is a risk of electric shock.
- The enclosure must be installed before powering on, or there is a risk of electric shock.
- Do not touch any terminal with hands when the power is on, or there is a risk of electric shock.
- Do not operate the welding machine with wet hands, or there is a risk of electric shock.
- The maintenance should be carried out after 5 minutes since the power source having

been turned off when the indicator for welding power source has thoroughly been out and the voltage between positive bus and negative bus is less than 36V, or there is a risk of electric shock.

- Parts can only be replaced by professional personnel. It is forbidden to leave any wire residue or metal objects in the machine, or there is a fire risk.
- If the control panel is replaced, the parameters must be set correctly before the operation, or there is a risk of property damage.
- The cable joint wiring must be wrapped with insulating tape and should not be exposed, or there is a risk of electric shock.
- The power source of the cooling-unit is of high voltage of AC380V. Please turn off the welding power source before connection, or there is a risk of electric shock.

 **Caution**

- Do not apply force to the operation panel or the cover plate during handling, or falling down of such objects may cause personal injury or property damage.
- If you use a forklift to handle the welding machine, fix the wheels firmly.
- The welding machine should be installed in a place that can bear its weight, or there is a risk of falling and injury or damage to property.
- It is strictly forbidden to install the machine in places such as the water pipe where water droplets may splash, or there is a risk of property damage.
- Do not drop foreign objects such as screws, gaskets and metal rods into the welding machine, or there is a risk of fire and property damage.
- If the welding machine is damaged or the parts are incomplete, please do not install and use the machine, or there is a risk of fire and injury.
- The terminals and cable lugs of the main circuit must be firmly connected, or there is a risk of property damage.

## Precautions for use

 **DANGER**

- To ensure safety, welding operations must be conducted by personnel with safe operation knowledge and welding skills.
- Do not use the welding machine for any purpose other than welding.
- The installation, commissioning and maintenance of the welding machine must be carried out by professional personnel.
- Those wearing a cardiac pacemaker cannot get close to the welding machine and the welding place without a doctor's permission.

- Do not touch any live parts, or there is a risk of electric shock.
- Do not use cables with insufficient cross-sectional area or exposed conductors or damaged cables.
- Do not remove the enclosure during use.
- Please use undamaged insulating gloves with good insulation.
- Pay attention to safety protection for working at height.
- The power supply of the welding machine and the distribution box must be cut off when the machine is not in use.
- For welding in a narrow or confined space, the operator should be supervised by inspectors in ensuring sufficient ventilation or wearing breathing protective apparatus, or suffocation may occur due to lack of oxygen.
- Harmful smoke and gases will be produced during welding. Please provide full ventilation or use respiratory protection equipment, or welder's health may be damaged.
- Do not weld pressurized containers such as pipe filled with gas and sealed container.
- Do not put hot workpieces near combustibles.
- Do not weld near combustibles.
- Provide fire extinguishers near the welding operation place.
- The cylinder must be fixed with a special bracket, or it may tip over and cause personal injury.
- Do not bring the cylinder into contact with any electrode.
- Please use the pressure reducing valve correctly as required.
- The disassembly and repair of the pressure reducing valve must be carried out by professional personnel.
- Do not touch any rotating parts in operation, such as the fan and the wire-feeder, or personal injury may be caused.
- Please use protective equipment with enough shading in welding or welding supervision to prevent arc light from damaging the eyes or skin.
- Please use special leather protective gloves, long sleeved clothes, foot protection, apron, glasses and other protective equipment. Prevent damage from arc light, spatters and welding slags.
- Protective barriers shall be provided around the welding place to avoid arc light causing any damages to others.
- Please use sound insulation equipment to prevent noise hazard.

 **Caution**

- It is forbidden to use this welding power source for operations other than welding.
- Do not place any heavy objects on the welding power source.
- Do not block the air vent of the welding power source.
- Please put the welding power source at a place where metal foreign objects such as spatters can't go into the welding power source.
- Please keep the distance between the machine and the wall or other welding machines greater than 30cm.
- To prevent the arc from being blown directly by the wind, some shield should be used.
- Fix the wheels firmly to prevent the welding power source from sliding.
- To prevent electromagnetic hazards, electromagnetic shielding should be applied to cables or welding operation places.
- The welding machine should be put on a plane with an inclination angle of less than 15 degrees to prevent the welding machine from tipping over.
- The protection grade of the welding machine is IP23S, and the working conditions for use environment are as follows:
  - Operating temperature range:  $-10^{\circ}\text{C}\sim+40^{\circ}\text{C}$ .
  - Transportation and storage temperature range:  $-40^{\circ}\text{C}\sim+70^{\circ}\text{C}$ .
  - Operating humidity range: not greater than 75% RH at  $40^{\circ}\text{C}$ , not greater than 95% RH at  $20^{\circ}\text{C}$ .
  - The altitude should not exceed 2000m.
  - There is no obvious mechanical vibration and impact in the operating environment, and the inclination angle of the welding machine is not greater than 15 degrees.
  - The dust, metal dust and corrosive gas in the surrounding air should not exceed the normal contents.
  - Do not expose the welding machine to the rain or prevent the rain from entering the fan.
- When the temperature in the use environment is lower than  $10^{\circ}\text{C}$ , please use the special antifreeze for the cooling-unit, or there is a risk of damage to the cooling-unit.

## Precautions for scrapping

When scrapping welding machine, please note that:

- When the electrolytic capacitor in the main circuit and the printed circuit board is burned, an explosion may occur.
- Burning the front panel and other plastic parts will produce toxic gases.
- The welding power source should be disposed as industrial waste.

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# Chapter 1. Product Overview

## 1.1 Product introduction

- DEX series welding power source is a multi-functional full-digital control welding power source suitable for car seats, motorcycles, hardware and sheet metal, medium and thin plate welding, medium and thick plate backing welding and other applications.
- With the CO<sub>2</sub>, MAG, MIG gas-shield welding and manual arc welding functions.
- It can customize special welding control methods for customers.
- The inverting frequency is up to 180KHz with use of the Tri-level Topology.
- Dex DM3000 can be used for many welding materials including carbon steel, stainless steel and galvanized sheets.
- Dex PM3000 can be used for many welding materials including carbon steel, stainless steel, galvanized sheets, pure aluminum and aluminum alloy.
- It is more convenient to conduct mobile operation by using together with the welding vehicle supplied by MEGMEET.
- The welding gun can be better cooled by using it together with the water cooling equipment supplied by MEGMEET.

## 1.2 System composition

The welding machine system is shown in Fig. 1-1, Fig. 1-2 and Fig. 1-3.

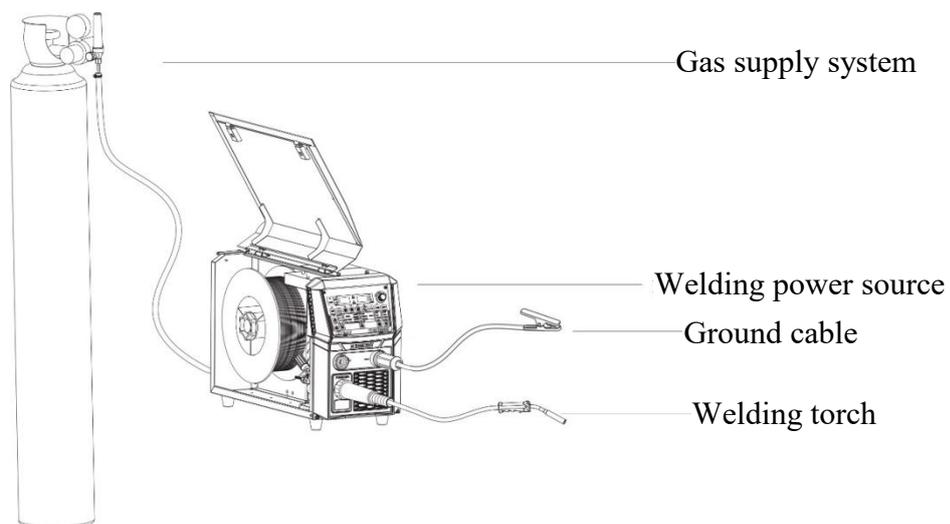


Fig. 1-1 DEX CM3000 / DM3000 / PM3000

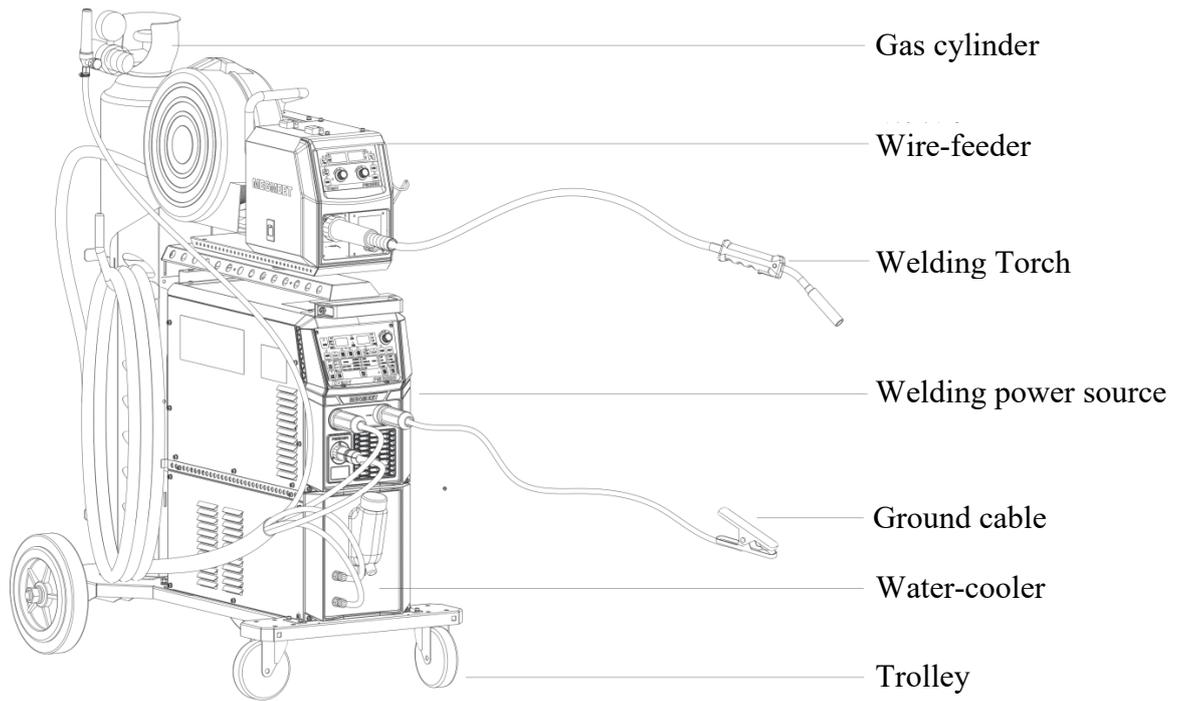


Fig. 1-2 Dex PM3000S water cooling package

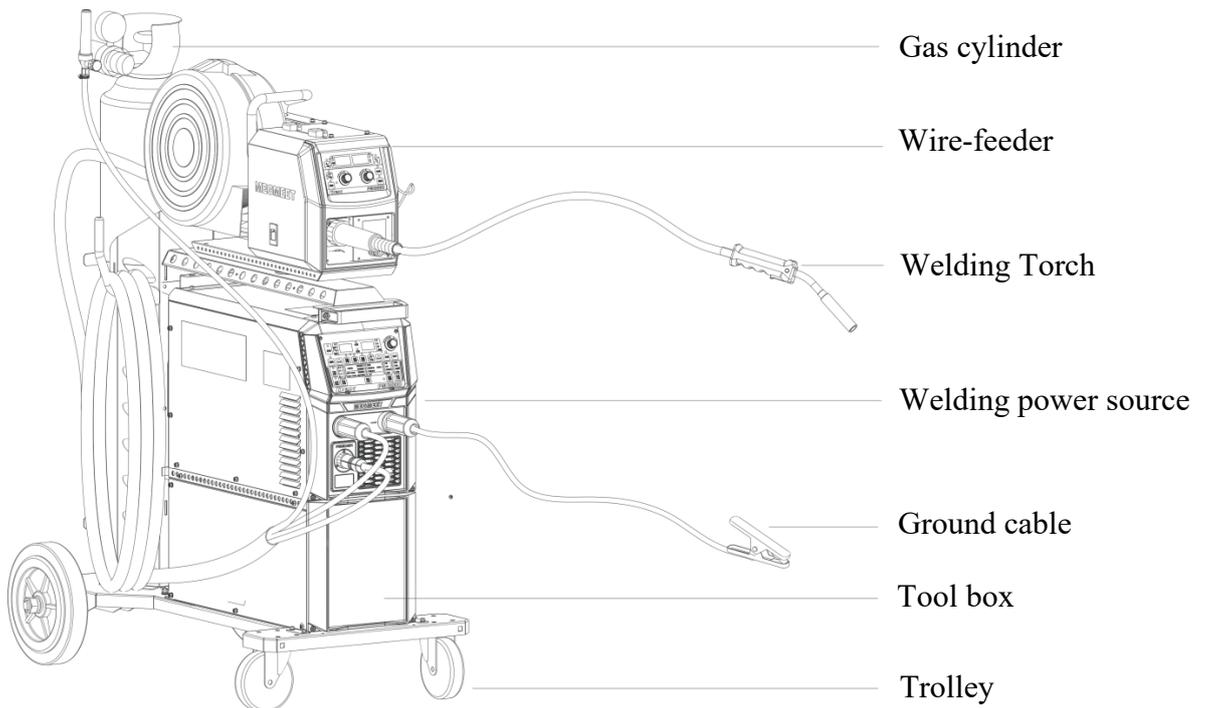


Fig. 1-3 Dex PM3000S air cooling package

### 1.3 Model description

The model description of welding power source is illustrated in Fig. 1-4.

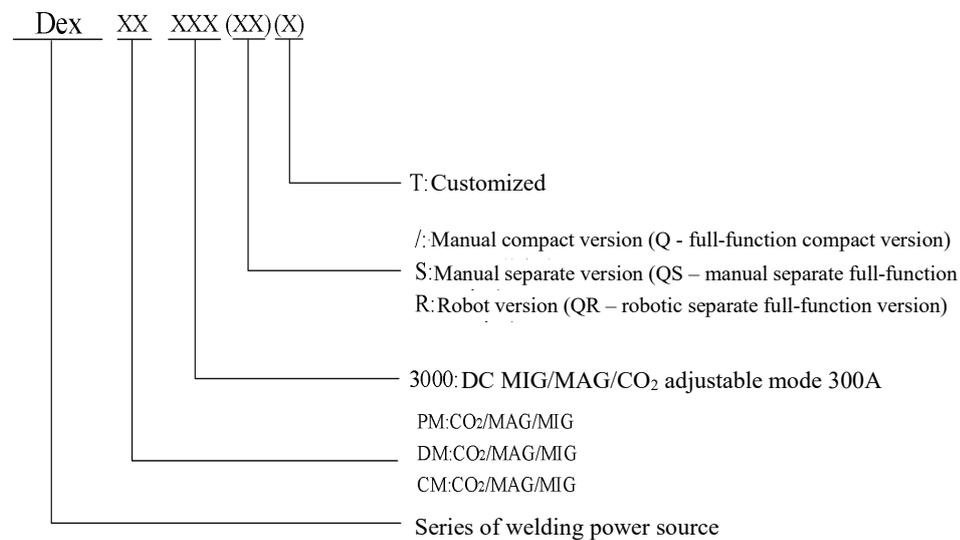


Fig. 1-4 Model description

Note: the symbol of "(" indicates optional, which is used to represent different models of welding power source.

#### Example 1:

- Dex PM3000R represents Dex series double pulse CO<sub>2</sub>/MAG/MIG aluminum alloy robotic welding power source with the adjustable current of 300A.
- Dex PM3000QR represents Dex series full-function double pulse CO<sub>2</sub>/MAG/MIG aluminum alloy robotic welding power source with the adjustable current of 300A.

#### Example 2:

- Dex PM3000S represents Dex series manual separate double pulse CO<sub>2</sub>/MAG/MIG aluminum alloy welding machine with the adjustable current of 300A.
- Dex PM3000QS represents Dex series manual separate full-function double pulse CO<sub>2</sub>/MAG/MIG aluminum alloy welding machine with the adjustable current of 300A.

#### Example 3:

- Dex PM3000 represents Dex series manual compact double pulse CO<sub>2</sub>/MAG/MIG aluminum alloy welding power source with the adjustable current of 300A.
- Dex PM3000Q represents Dex series manual compact full-function double pulse CO<sub>2</sub>/MAG/MIG aluminum alloy welding power source with the adjustable current of 300A.

## Chapter 2. Installation and Wiring

This chapter introduces the installation requirements of the welding machine and the operation steps and precautions related to the installation.

### 2.1 Unpacking inspection

The machine is contained in a durable package specially designed for it:

1. Before unpacking, please confirm whether the outer package of the product is in good condition.
2. After unpacking, please confirm whether all parts of the welding machine, installation and operation instructions are complete and whether the model is the same with that in the order (if any missing or wrong parts are found, please contact the supplier in time).
3. Packaging materials can be recycled.
4. The unique serial number of the machine is marked on the machine's nameplate. When the equipment needs repair or technical support, this serial number is very important.

### 2.2 Installation requirements

- Environmental requirements

In selecting the installation environment, please note the following:

1. The machine should be installed in a well-ventilated place with a vibration less than  $5.9\text{m/s}^2$  (0.6g).
2. Avoid installation in places full of dust and metal powders.
3. It is strictly forbidden to install the machine in places with the presence of corrosive and explosive gas.
4. The ambient temperature is required to be within the range of  $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$ . When the temperature exceeds  $40^{\circ}\text{C}$ , forced heat dissipation or derating is required.
5. The humidity is required to be less than 95%, and no water droplet is condensed.
6. Protection against the wind should be provided at the welding site, and windshields should be used if necessary, or the welding process will be affected.
7. If any special installation requirements, please make advance consultation and confirmation.

- Requirements for installation space

The welding power source should be at least 20cm away from the wall, and the interval should be more than 30cm when several sets are placed side by side. It is recommended to place welding power sources according to the reserved space in Table 2-1.

Table 2-1 Reserved space for welding power source installation

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

### 2.3 Precautions for handling

1. Before handling the welding power source, be sure to cut off the distribution box's input power.
2. The trolley wheels must be firmly fixed when handling the welding power source with a forklift.
3. There is a certain risk in hoisting the welded power source, therefore hoisting is not recommended.

### 2.4 Electrical connection

#### Safety warning

1. Connection should be made by qualified professional electrical operators.
2. The electrical connection must be carried out after disconnecting the switch in the distribution box and ensuring safety.
3. Please use the cable of specified specifications.
4. Do not touch with wet hands.
5. Please don't put heavy objects on the cable.
6. It is likely that the running water pipe and the house body's steel bar are not fully grounded. Please do not connect the safety ground cable.
7. Please connect the welding power source with the matching or specified wire-feeder, welding torch, gas meter and cooling unit, or the welding performance and welding quality will be affected.
8. If the workplace is wet and operation is conducted on an iron plate and an iron frame, please install a residual current-operated protective device.

#### 2.4.1 Connection of input power (380V AC)

The welding power source is provided with a 3m power supply cable (without plug). Please arrange for a professional electrician to connect the input cable at the other end to the output terminal of the switch in the distribution box.

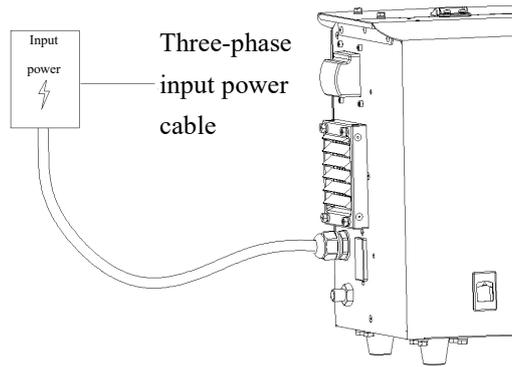


Fig. 2-1 Diagram of connection at the 380V AC power input side

**Caution**

Make sure that the green / yellow wire of the input power cable is safely grounded.

### 2.4.2 Welding power connection

Install and fasten the welding power cable connector onto the positive pole of the welding power source. Insert and fasten the control cable plug of the wire-feeder into the welding power socket, as shown in Fig. 2-2.

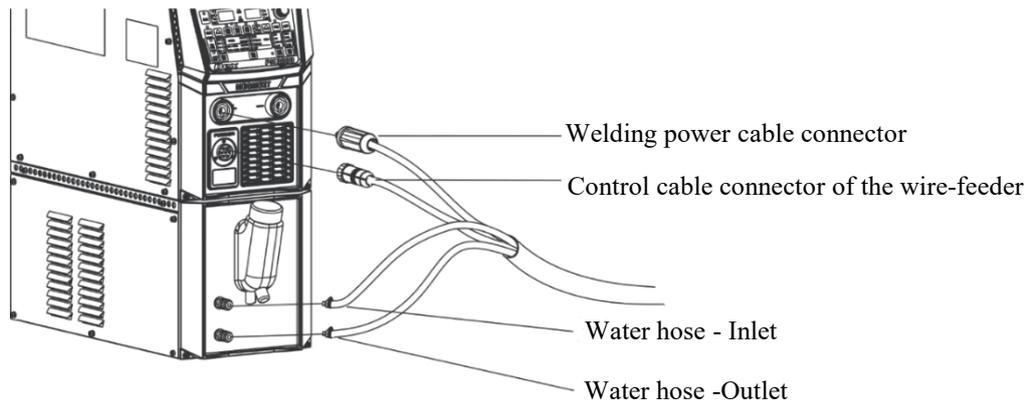


Fig. 2-2 Connection diagram of welding power source

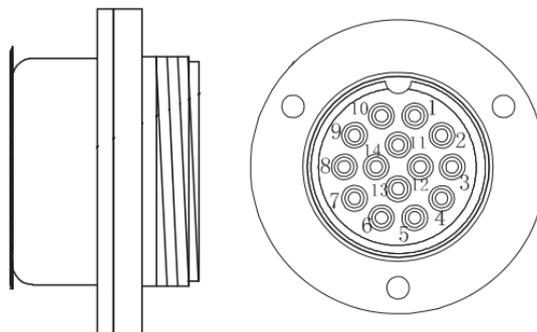


Fig. 2-3 Definitions of 14-core socket pins of welding power source

### 2.4.3 Wire-feeder connection

#### Steps

1. Loosen the clip at the backside of the wire-feeder, fix the welding power cable on the bolt of the bottom plate of the wire-feeder, and fasten with a nut.
2. Screw the control cable plug of the wire-feeder onto the socket.

The connection diagram of the robot wire-feeder is given in Fig. 2-4.

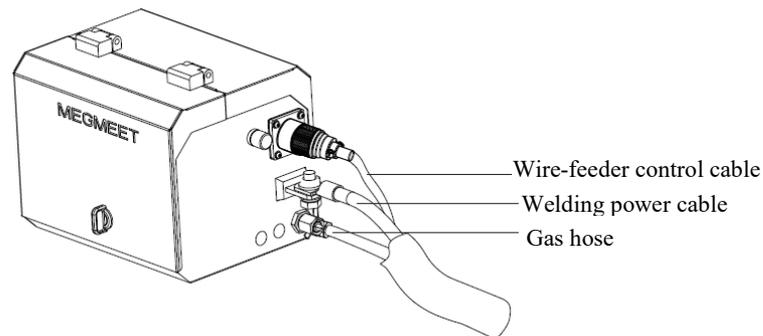


Fig. 2-4 Connection diagram of robot wire-feeder

The connection diagram of the manual wire-feeder is given in Fig. 2-5.

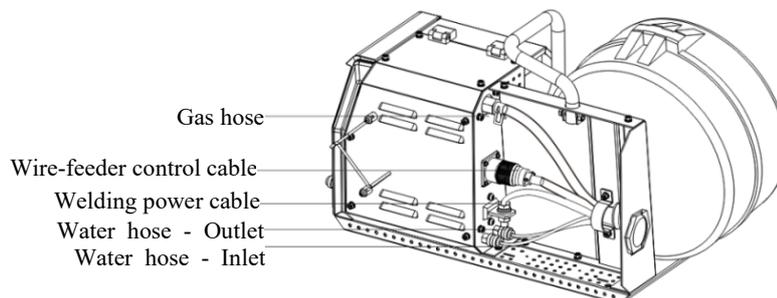


Fig. 2-5 Connection diagram of the closed manual wire-feeder

### 2.4.4 Welding torch connection

#### Steps

1. Install the welding torch onto the welding torch socket of the wire-feeder.
2. Install the welding torch detection cable to the wire-feeder detection cable socket to finish the welding torch detection and installation.

The connection diagram of the robot welding gun is given in Fig. 2-6.

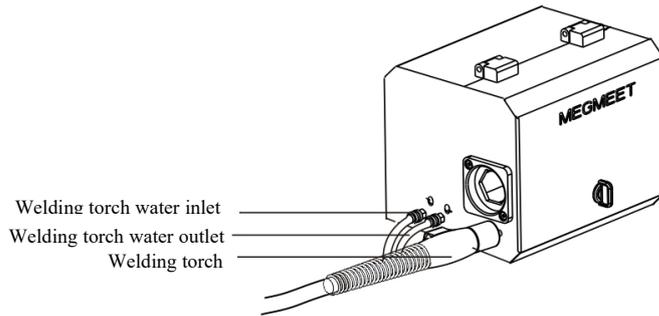


Fig. 2-6 Connection diagram of the robot welding torch

The connection diagram of the welding torch of the closed manual wire-feeder is given in Fig. 2-7.

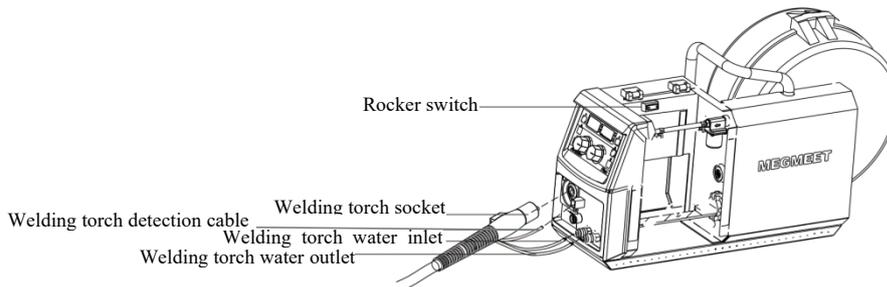


Fig. 2-7 Connection diagram of welding torch of the closed manual wire-feeder

The connection diagram of the welding torch of the open type manual wire-feeder is given in Fig. 2-8.

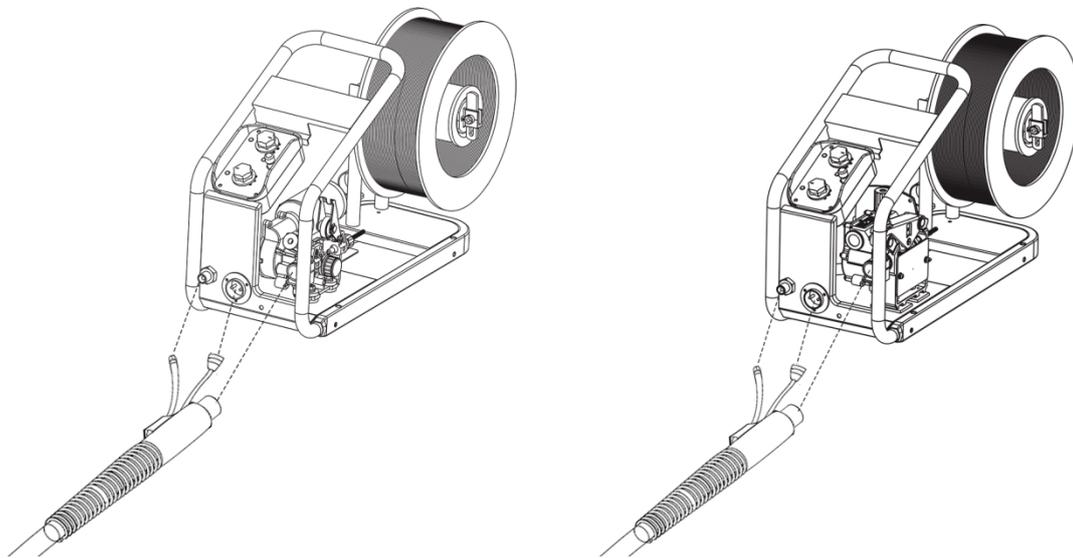


Fig. 2-8 Connection diagram of welding torch of the open type manual wire-feeder

### 2.4.5 Connection of cooling unit

- **Cooling unit power connection**

Connect one end of the cooling unit power plug with the welding power plug and the other end with the cooling-unit power socket, as shown in Fig. 2-9.

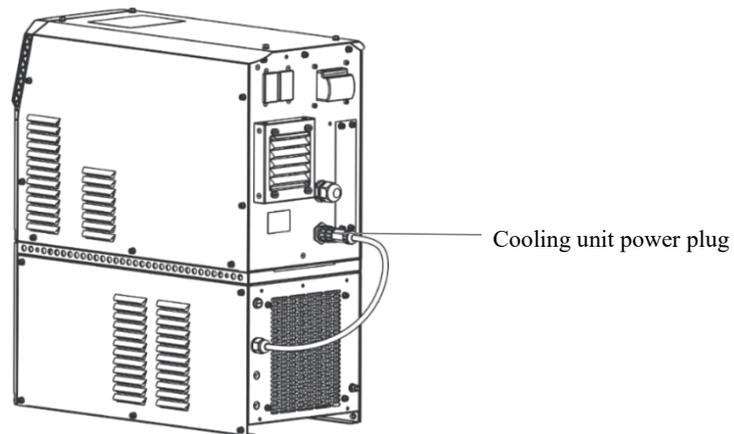


Fig. 2-9 Connection diagram of cooling unit power supply

● **Water hose connection of cooling unit**

Insert the inlet hose and outlet hose of the combined cable into the inlet and outlet hose of the cooling unit respectively, as shown in Fig. 2-10.

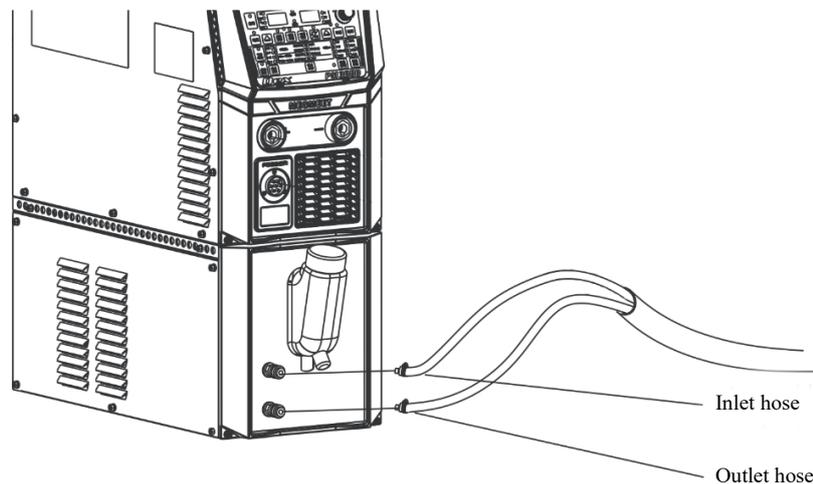


Fig. 2-10 Water hose connection diagram of cooling unit

 **Caution**

1. If cooling unit is used, please **set the internal menu FAE to be ON**, or there is a risk of burning the welding torch.
2. The power source of the cooling unit power plug is high voltage power 380VAC. Please turn off the welding power source before connection, or there is a risk of electric shock.
3. When the temperature in the use environment is lower than 10°C, please use the special antifreeze for the cooling unit, or there is a risk of damage to the cooling unit.
4. The upper one is the inlet hose, and the lower one is the outlet hose.

### 2.4.6 Connection of ground cable

Screw the fast plug of the ground cable into the negative socket clockwise, as shown in Fig. 2-11. Fasten the other end to the workpiece. The area of contact with the workpiece should be as large as possible. The surface of the workpiece should be free of dirt or paint, or the wiring clamp will be burnt.

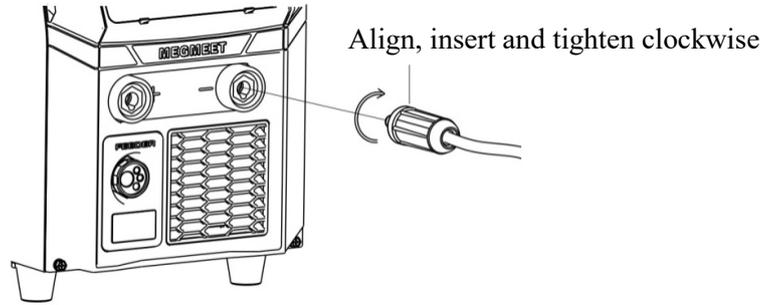


Fig. 2-11 Connection diagram of ground cable

---

#### **Caution**

To ensure the welding effect and the ground cable's service life, it is recommended that the cross-section of the ground cable should be greater than 25mm<sup>2</sup>.

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# Chapter 3. Function and Operation

## 3.1 Function description and operation

The function description of the welding power source panel is shown in Fig. 3-1, Fig. 3-2 and Fig. 3-3, which are Dex PM3000, DM3000 and CM3000 respectively.

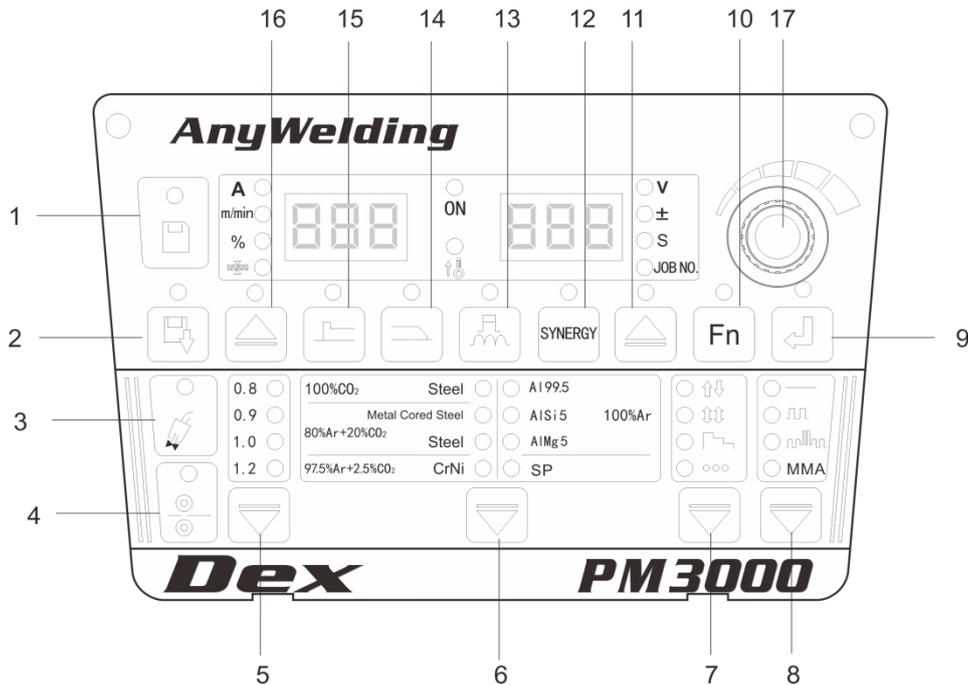


Fig. 3-1 Description of panel functions

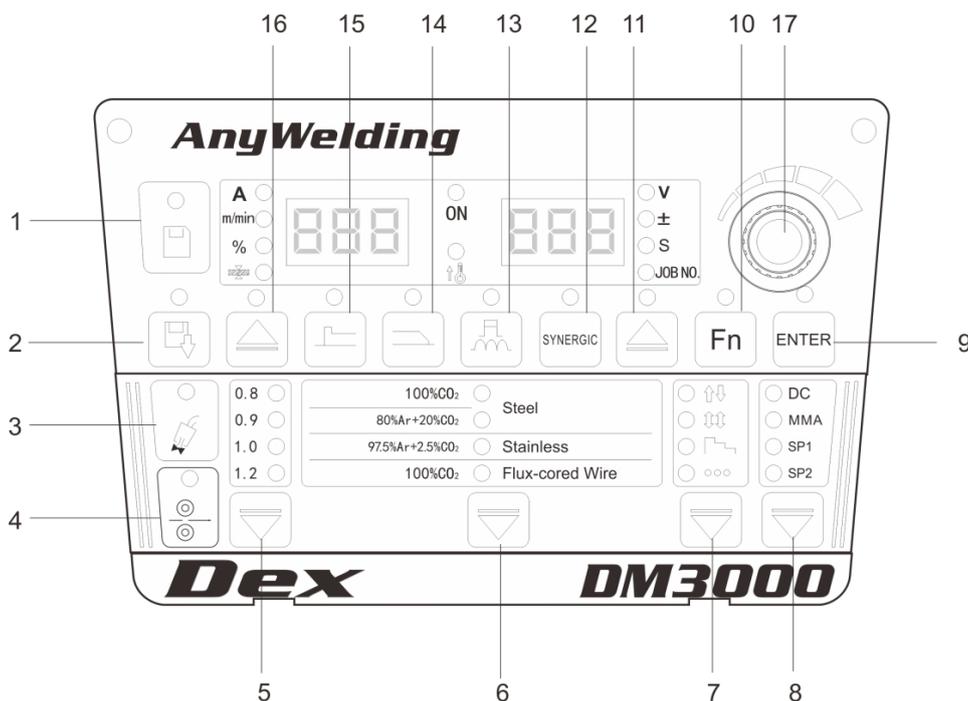


Fig. 3-2 Description of panel functions

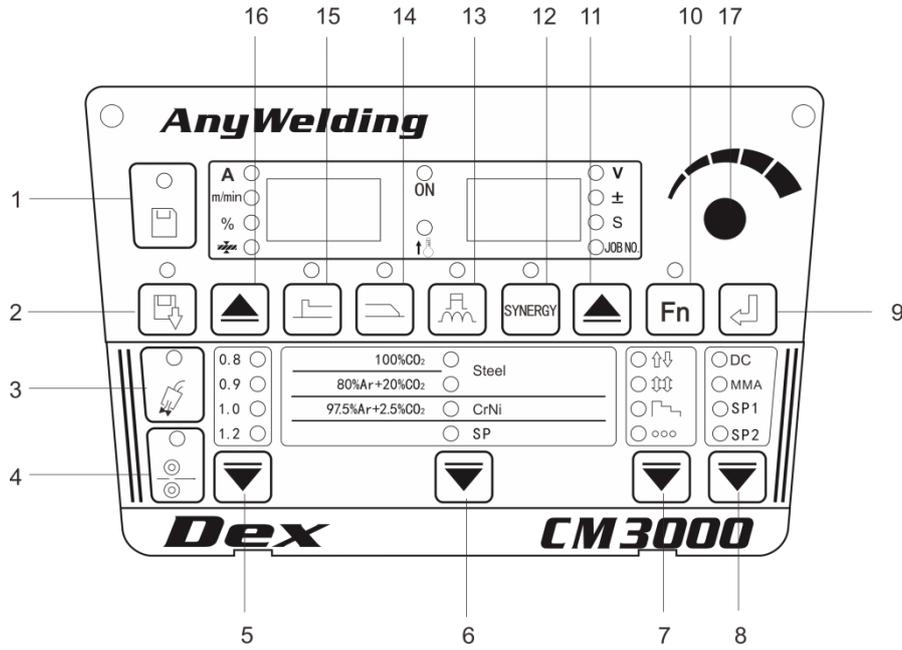


Fig. 3-3 Description of panel functions

Table 3-1 Function description

Number	Name	Description of function keys
1	Save	To save selected welding parameters.
2	Call	To call saved welding parameters.
3	Gas inspection	To check if there's protective gas.
4	Inching	To feed the welding wire to the top of the welding torch under non-welding conditions.
5	Wire diameter	To select different welding wire diameters. SP means customized wire diameters.
6	Material selection	To select different welding materials. SP means customized welding materials.
7	Welding control	Used for operation of different welding modes (2-step, 4-step, special 4-step, spot welding).
8	Welding method	To select different welding methods (switching among DC, pulse, double pulse and electrode).
9	Enter	Used for the confirmation of parameters and the operation of locking functions.
10	Function	To set the internal menu parameters.
11	Right-cycle switching key	Used to switch among voltage, corrected voltage value, time parameter and channel number.

12	Synergic/Separate	In the synerigc mode, the system will configure the corresponding voltage according to the current current. in the separate mode, a separate adjustment is made.
13	Arc characteristics	To set the arc softness and hardness.
14	Crater	To view the crater current and voltage in the crater parameters, and adjust the crater current percentage, corrected crater voltage value and crater time.
15	Starting arc Parameters	To view the current and voltage in the starting-arc parameters, and adjust the current percentage, corrected arcing voltage value, time and arc characteristics.
16	Left-cycle switching key	To switch among current, wire-feeding speed, percentage and plate thickness.
17	Panel adjustment knob	To adjust welding parameters, locking parameters and internal menu parameters.

### 3.2 Inching wire feeding



Send the welding wire to the top of the welding torch under non-welding conditions.

#### Steps

1. Press and hold "**Inching**" key. Then the LED indicator will go on.  
The inching speed is the current set inching speed, and the maximum inching speed is 8m / min.
2. Release this function key, then the LED indicator will go out, and the wire-feeding will stop.

### 3.3 Gas detection



Check for gas and the gas flow rate.

#### Steps

1. Press and hold the "**Gas inspection**" key. Then the LED indicator will go on.  
Once the gas starts to flow, you can check the gas flow rate. It turns off automatically 30 seconds later.
2. Press this function key again, then the LED indicator will go out, and the gas inspection will stop.

### 3.4 Synergic and manual control



- Synergic:

The system will automatically match the voltage according to the current set welding current and the corrected synergic voltage value.

The corrected voltage value in the synergic mode is 0 by default, and the range is -30 ~ +30.

The relation of the current set welding voltage is given below:

Current set welding voltage = Synergic voltage value + (Corrected voltage value%) × (Synergic voltage value)

#### Steps

1. Press and hold the "**Synergic/Manual**" key to enter the synergic mode when the LED indicator goes on.
2. Switch to the synergic corrected voltage value "±" with the "**Right-cycle switching**" key.
3. When the indicator is on or blinking, you can make a fine adjustment of the automatically matched voltage in the synergic mode by adjusting the voltage knob on the wire-feeder or the panel knob on the welding power source, as shown in Fig. 3-4.
4. Turn the "**Right-cycle switching**" key to view the matching voltage value and the corrected arc length value.

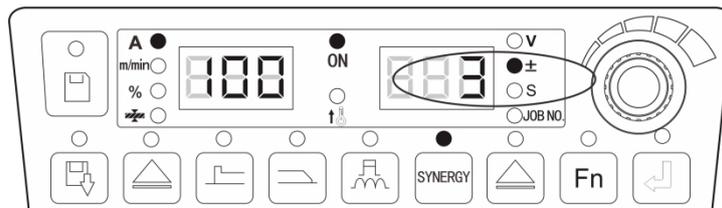


Fig. 3-4 Interface of corrected synergic matching voltage value

- Manual: the current and voltage are separately adjusted.

#### Steps

Press and hold the "**Synergic/Separate**" key. When the LED indicator goes off, enter the Separate mode. In this case, the set welding current and voltage are separately adjusted.

#### Caution

The starting-arc parameters and crater parameters can only be adjusted in the synergic mode.

### 3.5 Arc characteristics



Arc characteristics are used to adjust the arc softness and hardness.

When an adjustment is made in the positive direction, the arc becomes hard. when adjustment is made in the negative direction, the arc becomes soft.

Refer to Table 3-2 and Fig. 3-5 for the description of arc characteristics.

Table 3-2 Description of arc characteristics

Arc characteristics	Effects
0 (default value)	Usually used, the default value of arc characteristics.
0~50 (hard arc)	Featuring deep weld penetration, it is suitable for all-position welding and high-speed welding and can ensure arc stability even when the cable is extended.
0~-50 (soft arc)	It is suitable for thin sheet welding because of its shallow penetration.

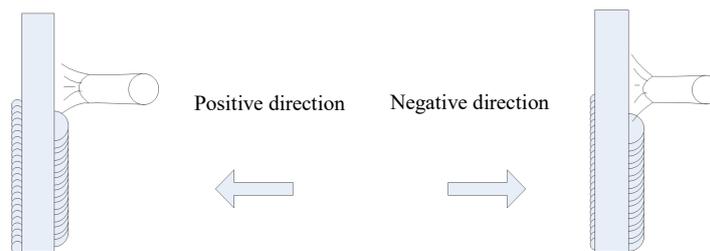


Fig. 3-5 Diagram of arc characteristics

#### Steps

1. Press and hold the "Arc characteristic" key, then the LED indicator will go on and the arc characteristic function will be enabled.
2. Turn the panel knob to adjust the arc characteristic value in the range of -50 ~ 0 ~ +50.

### 3.6 Arcing parameters



In arc welding, the parameters involved at the beginning of welding includes wire-feeding speed, current and voltage.

The wire-feeding speed at starting arc is given below:

Wire-feeding speed of starting arc = Current set wire-feeding speed × ( )%.

### Steps

1. Press and hold the "**Starting arc parameters**" key to enter the setting or viewing of starting arc parameters when the starting arc parameter indicator and "%" indicator go on.
2. When the "%" indicator is on and the left digital tube is blinking, set the percentage of wire-feeding speed in the arcing section with the panel knob. After setting, press the "**Enter**" key to confirm, as shown in Fig. 3-6.

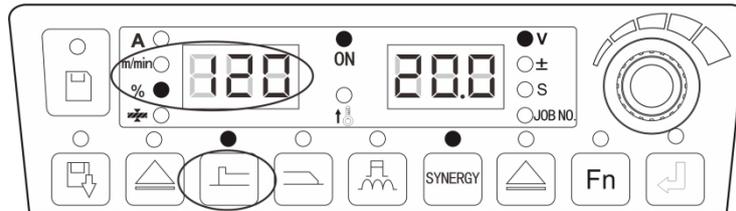


Fig. 3-6 Starting arc parameter percentage setting interface

3. You can set or view the "±" and "S" of the starting arc section by switching with the "**Right-cycle switching**" key. When the corresponding indicator is on and the digital tube is blinking, set the corresponding parameters by turning the panel knob, and press the "**Enter**" key to confirm.
4. After adjusting the starting arc parameters, press the "**Starting arc parameters**" key, then the indicator of starting arc parameters will go off, and you will exit from the setting of starting arc parameters. The starting arc parameters can be set in 2-step, 4-step and special 4-step operation.

## 3.7 Crater



Before finishing welding, the welding parameters includes wire-feeding speed, current and voltage. Wire-feeding speed of crater is given below:

$$\text{Wire feeding speed of crater} = \text{Current set wire feeding speed} \times ( \quad )\%$$

### Steps

1. Press and hold the "**Crater**" key to enter the setting or viewing of crater parameters when the LED indicator and "%" indicator go on.
2. When the "%" indicator is on and the left digital tube is blinking, set the percentage of wire-feeding speed in the crater section with the panel knob. After setting, press the "**Enter**" key to confirm, as shown in Fig.3-7.

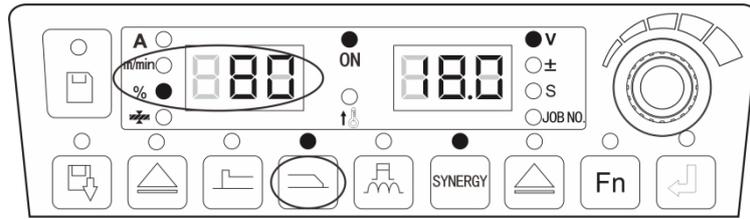


Fig. 3-7 Arc crater parameter percentage setting interface

3. You can set or view the "±" and "S" of the crater section by switching with the "**Right-cycle switching**" key. When the corresponding indicator is on and the digital tube is blinking, set the corresponding parameters by turning the panel knob, and press the "**Enter**" key to confirm.
4. After adjusting the crater parameters, press the "**Crater**" key, the indicator of arc extinguishing parameters will go off, and you will exit from the setting of the crater parameters.

#### Caution

1. The set current in the crater parameters can only be adjusted proportionally according to the set welding current. The wire-feeding speed and the welding current characterize the same quantity differently.
2. The set voltage in the crater parameters can only be adjusted in the synergic mode according to the rated current.
3. The current and wire-feeding speed of the crater section can only be viewed but not adjusted.
4. The arc characteristics of the crater section are independent of those of the welding section.
5. The setting of crater time is based on the function logic of 2-step, 4-step and special 4-step.
6. Crater parameters that cannot be directly adjusted on the panel can be adjusted in the internal menu. Refer to 4.10 for details.

## 3.8 Welding control

### ● Spot welding

Weld the workpiece at the set spot welding time. The spot welding function is only controlled by the set spot welding time, not by the welding torch switch, as shown in Fig.3-8.

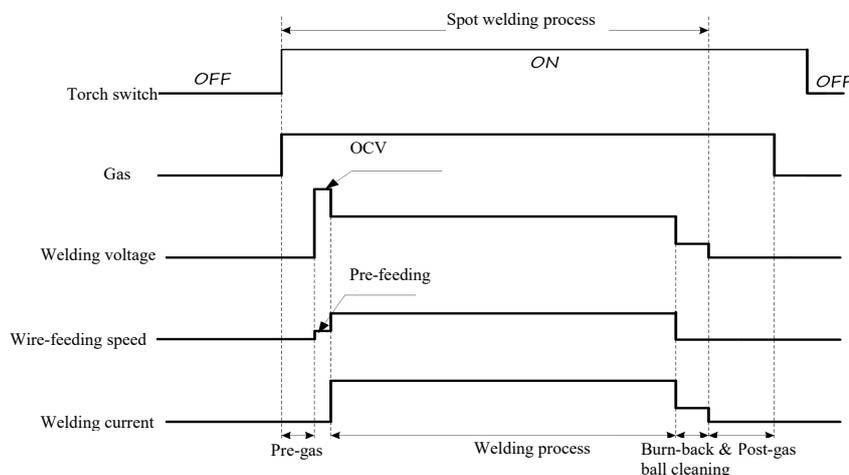


Fig. 3-8 Logic diagram of spot welding

### Steps

1. Press and hold "**Welding control**" key to switch to the **Spot welding** mode.
2. Use the "**Right-cycle switching**" key to switch to the spot welding time "**S**", set the spot welding time (0.1s ~ 10s) with the panel knob, and press the "**Enter**" key to confirm, to finish the spot welding setting.

#### ● 2-step

The logic is shown in Fig. 3-9

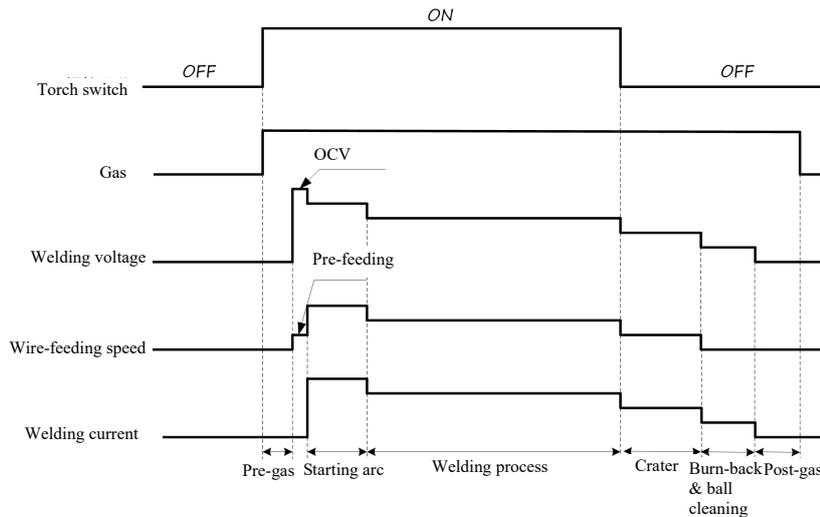


Fig. 3-9 Logic diagram of 2-step

### 📖 Caution

The time of both starting arc and crater parameters is based on the set time on the welding power panel.

### Steps

1. Press the "**Welding control**" key to switch to the **2-step** mode.
2. Set the starting arc parameters. Refer to starting arc parameter setting for details.
3. Set the crater parameters. Refer to arc extinguishing parameter setting for details.

#### ● 4-step

The logic is shown in Fig.3-10.

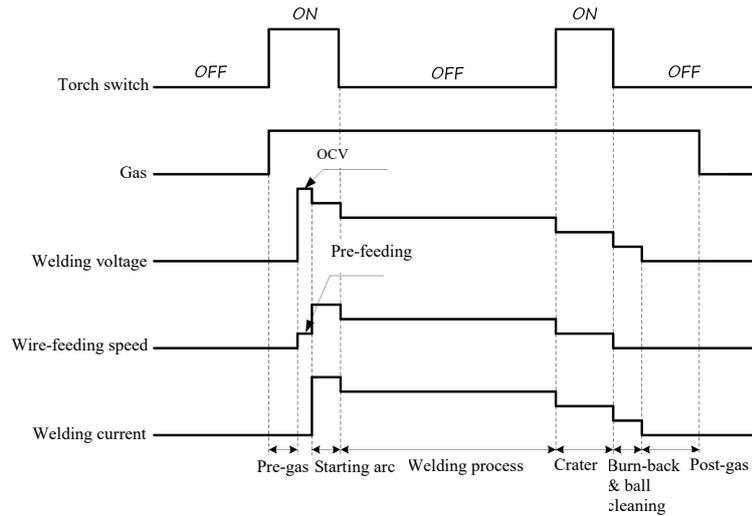


Fig. 3-10 Logic diagram of 4-step

### Caution

The time of starting arc parameters is based on the set starting arc time on the welding machine's power panel, and that of crater parameters is based on the duration when the welding torch switch is pressed and held.

### Steps

1. Press and hold the "**Welding control**" key to switch to the **4-step** mode.
2. Set the starting arc parameters. Refer to starting arc parameter setting for details.
3. Set the crater parameters. Refer to crater parameter setting for details.

### ● Special 4-step

The logic is shown in Fig.3-11.

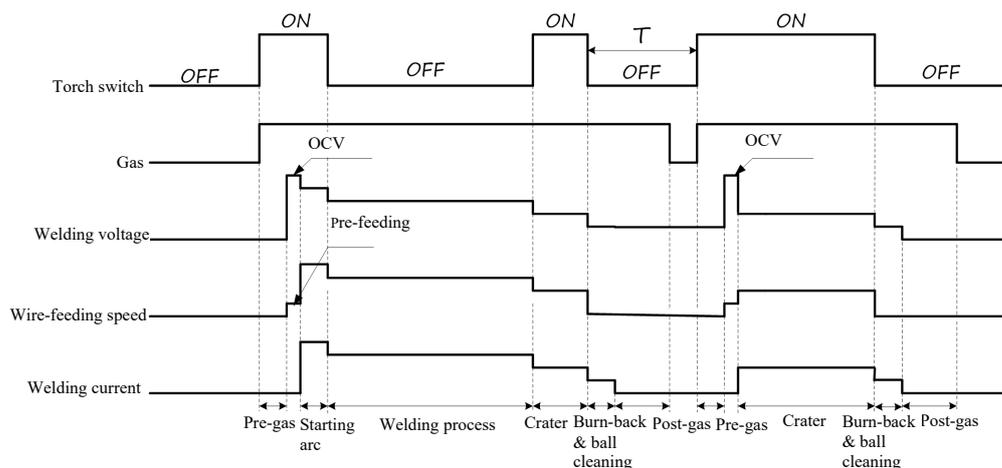


Fig. 3-11 special 4-step logic diagram

### Caution

The time of both starting arc parameters and crater parameters is based on the duration when the welding torch switch is pressed and held.

**T:** If there is no action after 2 seconds, repeated crater welding comes to an end.

If the welding torch switch is pressed again within 2 seconds, the crater parameter welding will be started again.

### Steps

1. Press and hold the "**Welding control**" key to switch to the **Special 4-step** mode.
2. Set the starting arc parameters. Refer to starting arc parameter setting for details.
3. Set the crater parameters. Refer to crater parameter setting for details.

## 3.9 Save and recall

### ● Save

Save the set welding parameters.

### Steps

1. Set the welding parameters, and press the "**Save**" key, then the storage indicator will blink and the channel indicator will go on. Now, you are at the save channel number selection.
2. Select the channel number (0~49) with the panel knob, and press the "**Enter**" key to confirm, as shown in Fig. 3-12.

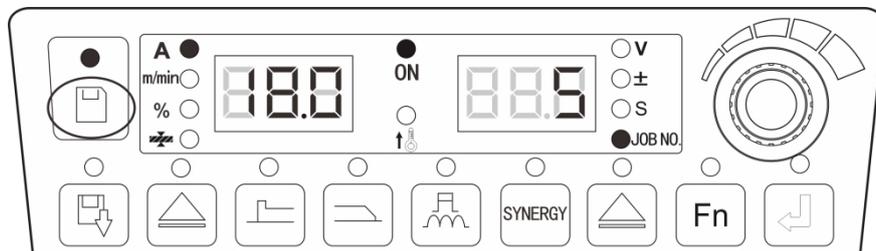


Fig. 3-12 Storage setting interface

### 📖 Caution

1. After the welding power source is restored to the factory settings, the saved parameters are not cleared.
2. If you fail to press the Enter key to confirm the storage process, the parameters will not be saved.
3. When it is full of storage channels, the newly saved channel number will cover the original channel number.
4. When the storage channels are the same channel, the original channel number parameter will be covered.

### ● Call

To call the saved welding parameters.

### Steps

1. Press and hold the "Call" key, then the LED indicator will go on and blink to enter the parameter call mode.
2. Select the **Channel number** (0~49) to be called with the panel knob, and press the "Enter" key to confirm, as shown in Fig. 3-13.

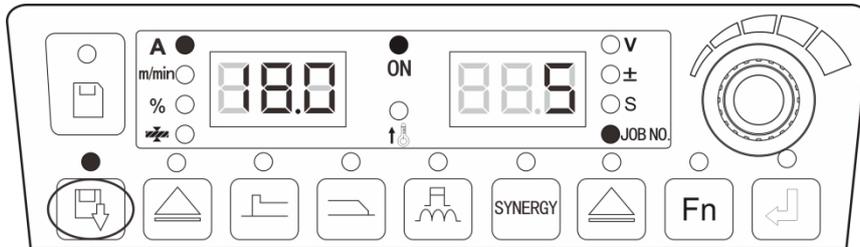


Fig. 3-13 Call setting interface

## 3.10 Internal functions

For the adjustment of internal functions of robot (FA0~FA9), please refer to **Table 3-3 Internal menu** or **Chapter 4 Robot and special machine automation**.

### Tips

FA0~FA9 are only for Dex PM / DM3000R model.

# Fn

Selection key for entry into the internal menu.

### Steps

1. Long press the "Function" key for 3 seconds to enter the internal menu setting, then the LED indicator will go on. short press the "Function" key to exit from the internal menu setting, then the LED indicator will go off.
2. Enter the internal menu setting, select a parameter, press the "Enter" key to confirm. when the digital tube displays "OFF", the default parameters of the welding power source is used.

Table 3-3 Internal menu

Function code	Meaning of function code	Adjustment range	Adjustment range (Displayed)	Default value	Default value (Displayed)	Step size
F01	Restore factory setting	/	/	/	/	/
F10	Slow wire feeding	0.5~18m/min	0.5~18m m/min	1.4m/min	OFF	0.1m/min
F11	Pre-gas time	0~25s	0~25s	0.2s	OFF	0.1s
F12	Soft start time	0.001~0.999s	1~999	Automatic matching	OFF	0.001s
F13	Transition time on wire feeding speed	0.01~9.99s	0.01~99.9 s	0.1s	OFF	0.01s
F14	Post-gas time	0~25s	0~25s	1s	OFF	0.1s

F15	Inching wire-feeding speed	0.5~8m/min(pm) 1.4~8m/min(cm)	0.5~8m/min(pm) 1.4~8m/min(cm)	Automatic matching	OFF	0.1m/min
F16	Wire withdrawing speed	0.5~8m/min(pm) 1.4~8m/min(cm)	0.5~8m/min(pm) 1.4~8m/min(cm)	1.4m/min	OFF	0.1m/min
F17	Wire withdrawing time	0~2s	0~2s	Automatic matching	OFF	0.01s
F18	Robot polling cycle	1~50ms	1~50ms	20ms	OFF	1ms
F19	Filter coefficient of feedback current	0~63	0~63	56	OFF	1
F1A	Speed compensation percentage	0~100	0~100	20	OFF	1
F1B	/	/	/	Reserved	/	/
F1C	/	/	/	Reserved	/	/
F1D	/	/	/	Reserved	/	/
F1E	/	/	/	Reserved	/	/
F20	DC burn-back voltage	12.0~30.0 V	12.0~30.0 V	14V	OFF	0.1V
F21	DC burn-back time	0.00~1.00s	0.00~1.00 s	Automatic matching	OFF	0.01s
F22	DC chopping time	0.00~1.00s	0.00~1.00 s	0.24s	OFF	0.01s
F23	Slope of rapid rise in short circuit current of DC welding	1~300	1~300	150	OFF	1
F24	Sensitivity to DC welding necking	0~500	0~500	70	OFF	1
F25	Judgment method of DC welding necking	0~6	0~6	Automatic matching	OFF	1
F30	Special process selection	0~6	0~6	0	OFF	1
F31	Increase percentage of peak pulse	-50~50	-50~50	50	OFF	1
Function code	Meaning of function code	Adjustment range	Adjustment range (Displayed)	Default value	Default value (Displayed)	Step size
F34	Burn-back time of pulse welding	0~1s	0~1s	Automatic matching	OFF	0.01s
F35	Chopping time of pulse welding	0~250	0~250	53	OFF	1
F36	Adjustment parameters of super pulse speed	-50 ~ 0 ~ +50	-50 ~ 0 ~ +50	0	OFF	1
F37	Pulse arc shape adjustment	-50 ~ 0 ~ +50	-50 ~ 0 ~ +50	0	OFF	1
F38	Control of pulse arcing energy	-50 ~ 0 ~ +50	-50 ~ 0 ~ +50	0	OFF	1
F39	/	/	/	Reserved	/	/
F40	Double pulse frequency	0.2~10Hz	0.2~10Hz	1.5Hz	OFF	0.1Hz
F41	Dual pulse duty cycle	1~99	1~99	50	OFF	1
F42	Double pulse strength	0~90	0~90	20	OFF	1
F43	Corrected value of strong pulse voltage	-30~30	-30~30	0	OFF	1
F44	Corrected value of weak pulse voltage	-30~30	-30~30	0	OFF	1
F51	Compensation of wire feeding cable for DM split-type machine	1~250	1~250	20	OFF	1
F52	MMA arc starting current	30~400A	30~400A	300A	OFF	1A
F53	MMA hot starting current	0~60A	0~60A	50A	OFF	1A

F54	MMA arc force current	0~50A	0~50A	30A	OFF	1A
FA0	Robot switch	OFF/ON	OFF/ON	0	OFF	1
FA1	Close-control switch	OFF/ON	OFF/ON	0	OFF	1
FA2	JOB switching time	0.01~0.99s	0.01~0.99s	0.1s	OFF	0.01s
FA3	Welding machine MAC ID	0~127	0~127	Automatic matching	OFF	1
FA4	Polarity selection of locating signal of robot	0~1	OFF/ON	0	OFF	1
FA5	Polarity switch of welding power source ready signal	0~1	OFF/ON	0	OFF	1
FA6	Polarity switch of successful arcing signal for robot	0~1	OFF/ON	0	OFF	1
FA7	Set robot signal type switch	0~1	OFF/ON	1	ON	1
FA8	High voltage location switch(This function is under development)	0~3	OFF/Hi/Lo/clo	0	OFF	1
FA9	Robot communication protocol options	0~13	OFF/FAn/FAS/Abb/yAS /KuK/KAS/Est/StE/goo /KEb/tur/stA/CoP/SIA	0	OFF	1
FAA	Baud rate selection	0~2	OFF/125/250/500	125	OFF	1
FAB	Robot ready signal inverting switch	0~1	OFF/ON	0	OFF	1
FAC	Terminal resistance switch	0~1	OFF/ON	1	ON	1
FAD	Water flow switch(This function is under development)	0~1	OFF/ON	Reserved	OFF	1
FAE	Cooling-unit switch	0~1	OFF/ON	0 (subject to model)	OFF	1
FAJ	Function enabling switch of special machine	0~1	OFF/ON	0	OFF	1
FAH	Set voltage and current switch of manual machine	0~1	OFF/ON	0(subject to model)	OFF	1
FB0	Software version checking	Software and eeprom version number	/	/	/	/
FB1	Error record	0~199	0~199	/	/	/
FB2	Model checking	/	/	/	/	/
FC0	Standard fast switch	0~1	OFF/ON		OFF	1
FC2	MMA function selection switch	0~1	OFF/ON	0	OFF	1

### 3.10.1 Adjustment of wire-feeding speed (F10)

The wire-feeding speed before arc starting.

#### Steps

1. Enter the internal menu, turn the panel knob of the welding power source to **F10**, and press the "**Enter**" key, then the right digital tube blinks.
2. Adjust the **F10** parameters of the welding power panel knob (refer to Table 3-4), and press the "**Enter**" key to confirm to finish the **F10** parameter setting.

Table 3-4 Slow wire feeding speed parameters

Function name	Unit	Adjustment range	Step size	Default value
F10	m/min	0.5~18m/min	0.1m/min	1.4m/min

### Caution

1. The adjustment range of DEX DM separate machine: 1.4~18 m/min.
2. The adjustment range of DEX DM compact machine: 1.4~18 m/min.
3. The adjustment range of DEX PM compact machine: 0.5~18 m/min.
4. The adjustment range of DEX PM compact machine: 0.5~18 m/min.

### 3.10.2 Inching wire-feeding speed (F15)

The speed of sending the welding wire to the top of the welding torch under non-welding conditions.

#### Steps

1. Enter the internal menu, turn the panel knob of the welding power source to **F15**, and press the "**Enter**" key, then the right digital tube blinks.
2. Adjust the **F15** parameters of the welding power panel knob (refer to Table 3-5), and press the "**Enter**" key to confirm to finish the **F15** parameter setting.

Table 3-5 Inching wire feeding speed parameters

Function name	Unit	Adjustment range	Step size	Default value
<b>F15</b>	m/min	1.4~8m/min	0.1m/min	Automatic matching

Logic diagram of DC welding parameters.

As shown in Fig. 3-14:

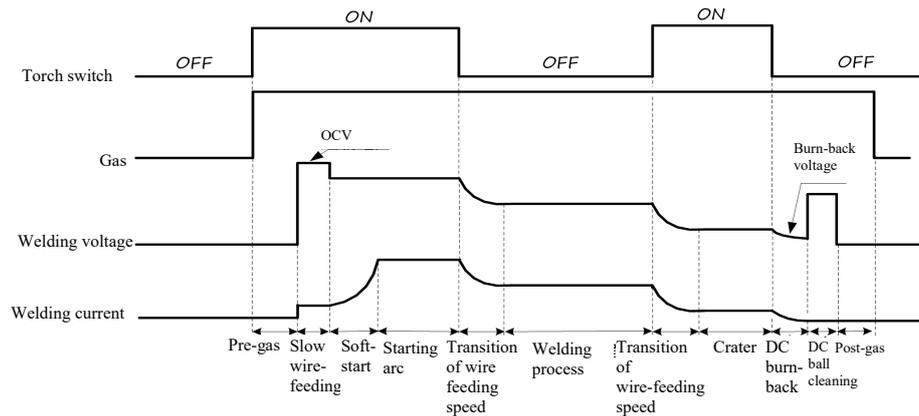


Fig. 3-14 Logic diagram of DC welding parameters (4-step)

### 3.10.3 Current necking sensitivity (F24)

In DC welding, the amplitude of current rising speed in short circuit duration.

#### Steps

1. Enter the internal menu, turn the panel knob of the welding power source to **F24**, and press the "**Enter**" key, then the right digital tube blinks.
2. Adjust the **F24** parameters of welding power panel knob (refer to Table3-6), and press the "**Enter**" key to confirm, to finish the **F24** parameter setting.

Table 3-6 Parameters of rapid rising amplitude of short circuit current of DC welding

Function name	Unit	Adjustment range	Step size	Default value
F24	A	0-500A	1A	Automatic matching

### 3.10.4 Critical pulse process (F30)

The critical pulse process is a process that suppresses the arc to a critical state of pulse and short circuit through software process algorithm, and changes the pulse melt droplet transfer method from the traditional one pulse one droplet to one pulse, one droplet and one short circuit. This process can not only reduce the welding arc length of pulse welding, but also overcome some defects of the traditional pulse, such as excessive heat input, proneness to undercut and low welding speed, etc. With appropriate parameters, the pulse welding speed of the critical pulse technology is 1.5-2 times higher than that of the traditional pulse.

## Steps

1. Enter the internal menu, turn the panel knob of the welding power source to **F30**, and press the "**Enter**" key, then the right digital tube blinks.
2. Adjust the **F30** parameters of welding power panel knob to be 2, and press the "**Enter**" key to confirm, to finish the critical pulse process setting.

Table 3-7 Critical pulse setting parameters

Function name	Unit	Adjustment range	Step size	Default value
F30	/	0~6	1	0

 **Caution**

The P version does not have the critical pulse process, so F30 is not adjustable. The Q version has the critical pulse process, so F30 is adjustable.

3.10.5 Ball cleaning time of pulse welding (**F35**)

## Steps

1. Enter the internal menu, turn the panel knob of the welding power source to **F35**, and press the "**Enter**" key, then the right digital tube blinks.
2. Adjust the **F35** parameters of the welding power panel knob (refer to Table 3-8), and press the "**Enter**" key to confirm to finish the **F35** parameter setting.

Table 3-8 Ball cleaning time parameters of pulse welding

Function name	Unit	Adjustment range	Step size	Default value
F35	1/32ms	0~250	1	53

3.10.6 Double pulse frequency (**F40**)

The number of alternations between strong and weak pulses in one second is called double pulse frequency.

$$f \text{ (frequency)} = \frac{1}{T(\text{period})}$$

## Steps

1. Enter the internal menu, turn the panel knob of the welding power source to **F40**, and press the "**Enter**" key, then the right digital tube blinks.
2. Adjust the **F40** parameters of the welding power panel knob (refer to Table 3-9), and press the "**Enter**" key to confirm to finish the **F40** parameter setting.

Table 3-9 Double pulse frequency parameters

Function name	Unit	Adjustment range	Step size	Default value
F40	Hz	0.2~10	0.1	1.0

### 3.10.7 Double pulse duty cycle (F41)

In a period (T), the ratio of strong pulse duration.

#### Steps

1. Enter the internal menu, turn the panel knob of the welding power source to **F41**, and press the "**Enter**" key, then the right digital tube blinks.
2. Adjust the **F41** parameters of the welding power panel knob (refer to Table 3-10), and press the "**Enter**" key to confirm to finish the **F41** parameter setting.

Table 3-10 Double pulse duty cycle parameters

Function name	Unit	Adjustment range	Step size	Default value
F41	Percentage	0~99	1	50

### 3.10.8 Double pulse current strength (F42)

Value of double pulse current welding parameter.

The calculation formula of the double pulse current is given below:

The parameter value of the double pulse current is called X

$$\text{Peak current} = 100+X$$

$$\text{Base current} = 100-X$$

#### Steps

1. Enter the internal menu, turn the panel knob of the welding power source to **F42**, and press the "**Enter**" key, then the right digital tube blinks.
2. Adjust the **F42** parameters of welding power panel knob (refer to Table3-11), and press the "**Enter**" key to confirm, to finish the F42 parameter setting.

Table 3-11 Double pulse current strength parameters

Function name	Unit	Adjustment range	Step size	Default value
F42	Percentage	0~50	1	20

### 3.10.9 Corrected value of weak pulse voltage (F43)

The correction of weak pulse voltage parameters in double pulse welding.

**Steps**

1. Enter the internal menu, turn the panel knob of the welding power source to **F43**, and press the "**Enter**" key, then the right digital tube blinks. Adjust the **F43** parameters of the welding power panel knob (refer to Table 3-12), and press the "**Enter**" key to confirm to finish the **F43** parameter setting.

Table 3-12 Parameters of corrected value of weak pulse voltage

Function name	Unit	Adjustment range	Step size	Default value
F43	Percentage	-30~30	1	0

### 3.10.10 Corrected value of peak pulse voltage (F44)

The correction of peak pulse voltage parameters in double pulse welding.

**Steps**

1. Enter the internal menu, turn the panel knob of the welding power source to **F44**, and press the "**Enter**" key, then the right digital tube blinks.
2. Adjust the **F44** parameters of welding power panel knob (refer to Table 3-13), and press the "**Enter**" key to confirm, to finish the **F44** parameter setting.

Table 3-13 Corrected value of peak pulse voltage

Function name	Unit	Adjustment range	Step size	Default value
F44	Percentage	-30~30	1	0

Logic diagram of manual welding parameters.

As shown in Fig. 3-15.

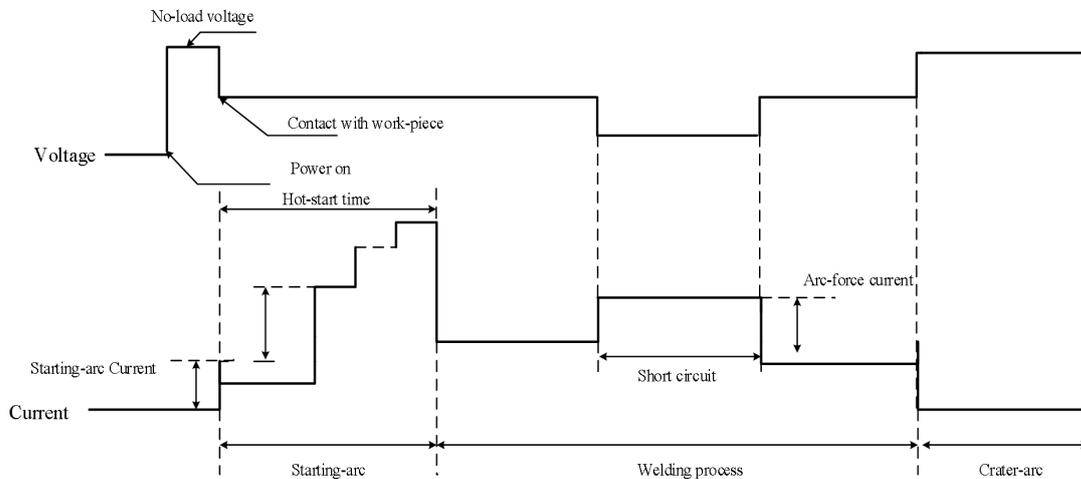


Fig. 3-15 Logic diagram of manual welding

### 3.10.11 MMA arc striking current (F52)

#### Steps

1. Enter the internal menu, turn the panel knob of the welding power source to **F52**, and press the "**Enter**" key, then the right digital tube blinks.
2. Adjust the **F52** parameters of the welding power panel knob (refer to Table 3-14), and press the "**Enter**" key to confirm to finish the **F52** parameter setting.

Table 3-14 MMA arc striking current parameters

Function name	Unit	Adjustment range	Step size	Default value
F52	A	0~400A	1A	300A

### 3.10.12 MMA hot-start current (F53)

#### Steps

1. Enter the internal menu, turn the panel knob of the welding power source to **F53**, and press the "**Enter**" key, then the right digital tube blinks.
2. Adjust the **F53** parameters of the welding power panel knob (refer to Table 3-15), and press the "**Enter**" key to confirm to finish the **F53** parameter setting.

Table 3-15 MMA hot-start current parameters

Function name	Unit	Adjustment range	Step size	Default value
F53	A	0~60A	1A	50A

### 3.10.13 MMA thrust current (F54)

#### Steps

1. Enter the internal menu, turn the panel knob of the welding power source to **F54**, and press the "**Enter**" key, then the right digital tube blinks.
2. Adjust the **F54** parameters of the welding power panel knob (refer to Table 3-16), and press the "**Enter**" key to confirm to finish the **F54** parameter setting.

Table 3-16 MMA thrust current parameters

Function name	Unit	Adjustment range	Step size	Default value
F54	A	0~50A	1A	30A

### 3.10.14 Activating power source panel or manual wire-feeder for setting current and voltage in manual welding systems (**FAH**)

**OFF:** setting welding amperage and voltage from robot teach-pendant, or from wire-feeder of manual machines. For robotic machines, **OFF** is the default value by factory setting.

**ON:** setting welding amperage and voltage from panel of welding power source.

#### Steps

1. Enter the internal menu and find **FAH** by turning the knob. The digital meter is as displayed in Fig. 3-16.

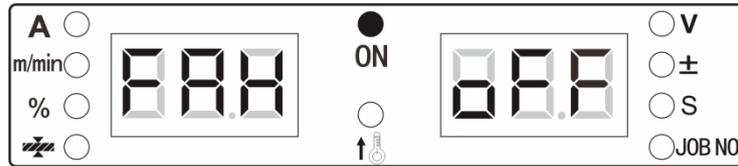


Fig. 3-16 FAH display interface

2. Press the "ENTER" to select **FAH**. Then turn the knob to select **ON** or **OFF** and press "ENTER" to activate the change.

### 3.10.15 Activating the power source for welding automation (**FAJ**)

**OFF:** power source not activated for welding automation. **ON:** power source activated for welding automation.

#### Steps

1. Enter the internal menu and find **FAJ** by turning the knob. The digital meter is as displayed in Fig. 3-17.

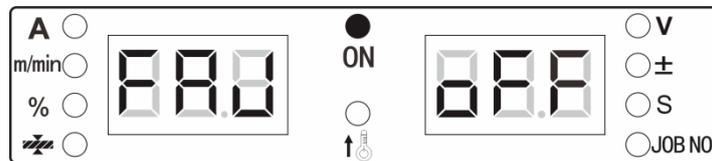


Fig. 3-17 FAJ display interface

2. Press the "ENTER" to select **FAJ**. Then turn the knob to select **ON** or **OFF** and press "ENTER" to activate the change.

### 3.10.16 Software version number query (**Fb0**)

Used to query the software version number of the welding power source.

### Steps

1. Enter the internal menu, and turn the panel knob of the welding power source to **FB0**. The digital tube display is as shown in Fig. 3-18.

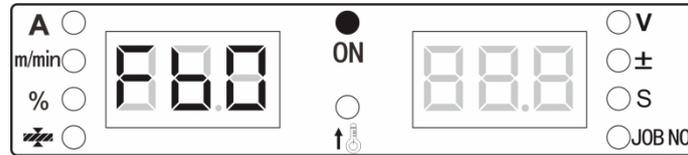


Fig. 3-18 FB0 display interface

2. Press the "Enter" key to confirm. Then you can turn the welding power panel knob to query software version number, as shown in Fig. 3-19.

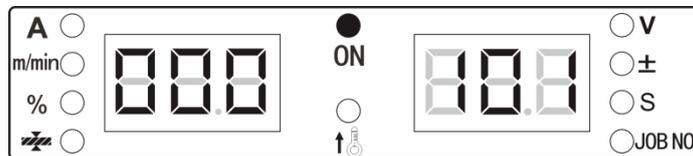


Fig. 3-19 Display interface

### 3.10.17 Fault query (Fb1)

Used to query fault records kept during the use of the welding power source. There are 200 groups in total. "F00" represents a power-on self-test.

### Steps

Enter the internal menu, and turn the panel knob of the welding power source to **FB1**. The display is as shown in Fig.3-20.

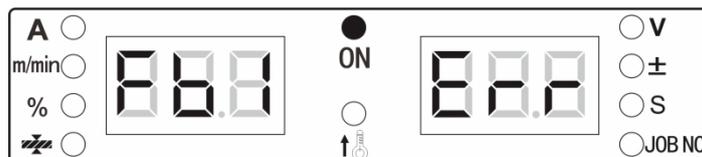


Fig. 3-20 Fault query display interface

Press the "Enter" key to confirm, then fault codes will appear. You can turn the the panel knob of the welding power source to query fault records.

See Fig. 3-21 to query the fault record:

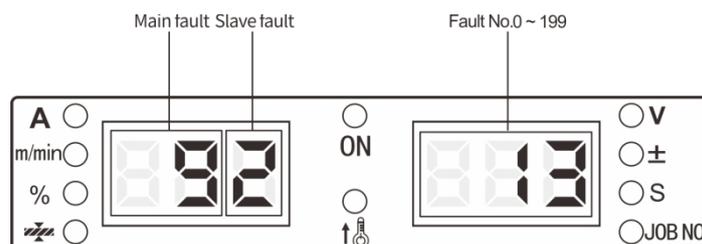


Fig. 3-21 Fault record

The left digital tube indicates fault E9-2, the right digital tube indicates the 13th fault record.

### 3.10.18 Machine model query (Fb2)

Used to query welding power source models.

#### Steps

1. Enter the internal menu, and turn the panel knob of the welding power source to **Fb2**, as shown in Fig.3-22.

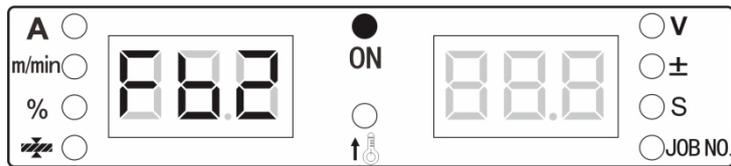


Fig. 3-22 Model query display interface

2. Press the "Enter" key to confirm, then the digital tube will display the welding power source model, as shown in Fig.3-23.

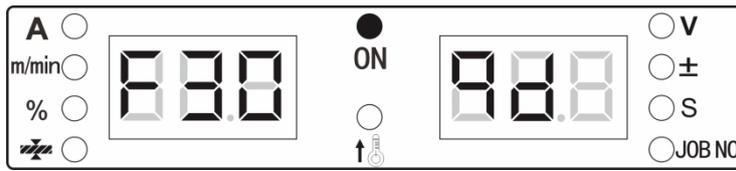


Fig. 3-23 Model display interface

### 3.10.19 MMA function enabling switch (FC2)

#### Steps

1. Enter the internal menu, turn the panel knob of the welding power source to **FC2**, and press the "Enter" key, then the right digital tube blinks.
2. Adjust the **FC2** parameter of the welding power panel knob, and press the "Enter" key to confirm to finish the **FC2** parameter setting.

### 3.10.20 Restoring the factory settings (F01)

#### Steps

1. Enter the internal menu. The left digital tube will display **F01**. The digital tube display is as shown in Fig.3-24.

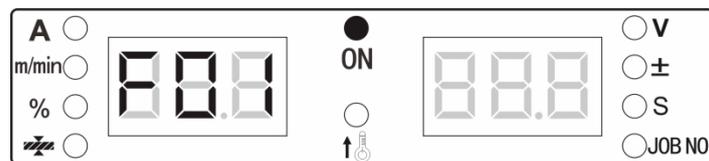


Fig. 3-24 Interface of restoring the factory settings

2. Long press the "**Enter**" key. The digital tube will display good and blink, indicating that the factory settings are restored successfully.

---

 **Tips**

After the factory settings are restored, except that the storage call parameters and the locking password cannot be cleared, and all other parameters are restored to the factory settings. Please use the function with care.

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# Chapter 4. Robotic Welding and Automatic Welding

## Welding

### 4.1 Configuration for robotic welding

#### 4.1.1 Enabling of robotic welding (FA0)

**ON / OFF** switch of robotic welding function. **OFF** in factory setting for robotic models.

##### Steps

1. Enter the internal menu and find **FA0** by turning the knob. The digital meter display is as displayed in Fig. 4-1.

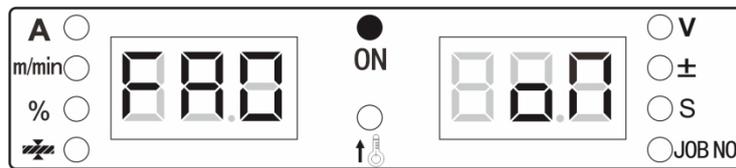


Fig. 4-1 FA0 display interface

2. Press "ENTER" to select **FA0**. Then turn the knob to select **ON** or **OFF**, and press the "ENTER" to activate the change.

#### 4.1.2 Switching between panel control or teach-pendant control (FA1)

**OFF** enables front panel of power source to control and set parameters. **ON** enables robot teach-pendant to control and set parameters.

##### Steps

1. Enter the internal menu and find **FA1** by turning the knob. The digital meter is as displayed in Fig. 4-2.

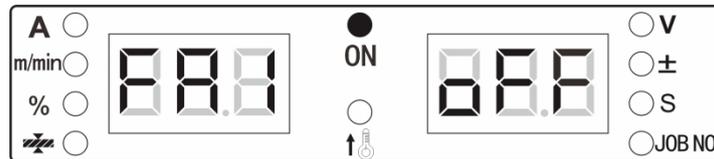


Fig. 4-2 FA1 display interface

2. Press the "ENTER" to select **FA1**. Then turn the knob to select **ON** or **OFF** and press "ENTER" to activate the change.

### 4.1.3 JOB switching time (FA2)

Used to control the transition time of current and voltage in **JOB** switching. **OFF** means that the transition time is 0.1s by default.

#### Steps

1. Enter the internal menu and find **FA2** by **turning the knob**. The digital meter is as displayed in Fig. 4-3.

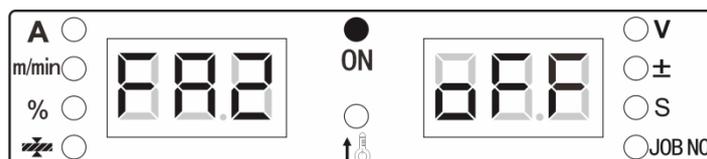


Fig. 4-3 FA2 display interface

2. Press "ENTER" to select **FA2**. Then turn the panel knob to change the status and value of **FA2**, and press "ENTER" to activate the change.

### 4.1.4 Setting MAC ID of the welding power source (FA3)

Setting MAC ID of the welding machine according to the communication protocol.

#### Steps

1. Enter the internal menu and find **FA3** by **turning the knob**. The digital meter is as displayed in Fig. 4-4.

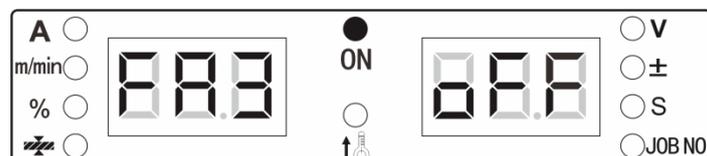


Fig. 4-4 FA3 display interface

2. Press "ENTER" to select **FA3**. Then turn the panel knob to change the value of **FA3**, and press "ENTER" to activate the change.

### 4.1.5 Switch of "Welding power source ready" signal between effectiveness at high and low level (FA5)

Refer to Table 4-1 for the polarity switch of "Welding power source ready" signal.

Table 4-1 Truth Table of Signal

Function	Communication Protocol	I/O Type	Welding Power Source Ready	Value
FA5	Analog	Output	Effective at Low level / 0	OFF (default)
		Output	Effective at High level / 1	ON
	Digital	Output	Effective at High level / 1	OFF (default)
		Output	Effective at Low level / 0	ON

**Steps**

1. Enter the internal menu and find **FA5** by turning the knob. The digital meter is as displayed in Fig.4-5.

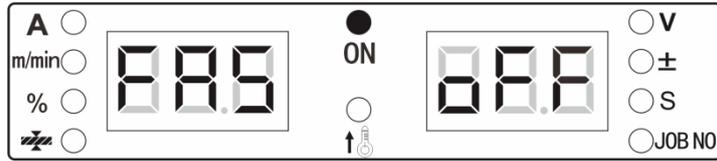


Fig. 4-5 FA5 display interface

2. Press "ENTER" to select **FA5**. Then turn the knob to select **ON** or **OFF** and press "ENTER" to activate the change.

#### 4.1.6 Switch of "Arc success" signal between effectiveness at high and low level (FA6)

Refer to Table 4-2 for polarity of robot's signal of "Arc success":

Table 4-2 Signal truth table

Function	Communication Protocol	I/O Type	Touch-sensing Success	Value
FA6	Analog	Output	Effective at Low level / 0	OFF (default)
		Output	Effective at High level / 1	ON
	Digital	Output	Effective at High level / 1	OFF (default)
		Output	Effective at Low level / 0	ON

**Steps**

1. Enter the internal menu and find **FA6** by turning the knob. The digital meter is as displayed in Fig.4-6.

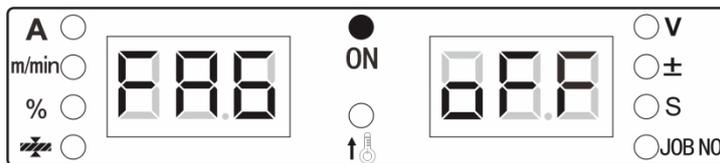


Fig. 4-6 FA6 display interface

2. Press the "ENTER" to select **FA6**. Then turn the knob to select **ON** or **OFF** and press "ENTER" to activate the change.

#### 4.1.7 Switching between wire-feeding speed or welding current from robotic setting (FA7)

**OFF:** robot's signal to welding power source changed to wire-feeding speed.

**ON:** robot's signal to welding power source changed to welding current.

**Steps**

1. Enter the internal menu and and find **FA7** by turning the knob. The digital meter is as displayed in Fig.4-7.

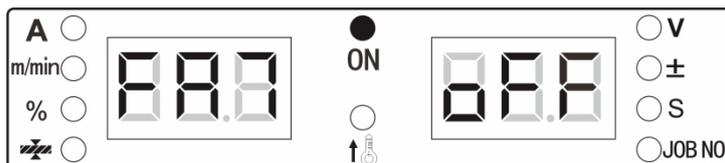


Fig. 4-7 FA7 display interface

- Press "ENTER" to select FA7. Then turn the knob to select ON or OFF and press "ENTER" to activate the change.

#### 4.1.8 Setting robot communication protocol (FA9)

Robot communication protocol options. OFF means analog communication as factory setting.

##### Steps

- Enter the internal menu and find FA9 by turning the knob. The digital meter is as displayed in Fig.4-8.

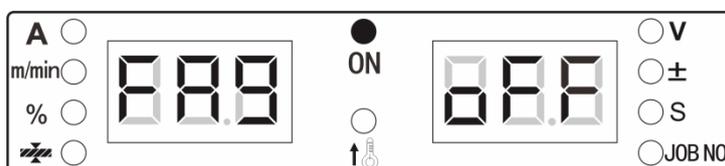


Fig. 4-8 FA9 display interface

- Press "ENTER" to select FA9. Then turn the knob to change the value and press "ENTER" to activate the change.

Table 4-3 List of Robot Communication Protocols

FA9	Display of Digital Meter	Robot	Communication Protocol	Remarks
1	OFF	All robots	Analog	Default value
2	FAN	FANUC standard	DeviceNet	
		All robots	EtherNet/IP	
		All robots	EtherCat	
3	FAS	FANUC customized	-	Not activated yet
4	ABB	ABB	DeviceNet	
5	YAS	YASKAWA Shougang (YSR)	DeviceNet	
6	KUK	KUKA	DeviceNet	
7	KAS	Kawasaki	DeviceNet	
8	EST	Estun	CANopen	
9	STE	Step	CANopen	
10	GOO	Googo	Can	
11	KEB	Keba	CANopen	
12	TUR	Turing	CANopen	
13	STA	MEGMEET standard	-	Not activated yet
14	COP	MEGMEET customized	-	Not activated yet
15	SIA	SIASUN	DeviceNet	

#### 4.1.9 Setting baud rate for digital communication with robot (FAA)

**OFF** means 125 kbps for baud rate of 125kbps and is the default value by factory setting.

Table 4-4 Options of Baud Rate

Menu	0	1	2	Default Value
FAA	125 kbps	250 kbps	500 kbps	125 kbps

##### Steps

1. Enter the internal menu and find **FAA** by turning the knob.
2. Press "**ENTER**" to select **FAA**. Then turn the knob to change the value and press "**ENTER**" to activate the change.

#### 4.1.10 Switch of "Robot ready" signal between effectiveness at high or low level (FAB)

Definition of "**Robot Ready**" signal will be different under analog protocol from under digital protocol (DeviceNet, EtherNet/IP, EtherCat and CANopen, etc). **OFF** would be the default value by factory setting.

Table 4-5 Switch of "Robot ready" signal between effectiveness at high or low level

Function	Communication Protocol	I/O Type	Robot Ready	Value
FAB	Analog	Output	Effective at Low level / 0	OFF (default)
		Output	Effective at High level / 1	ON
	Digital	Output	Effective at High level / 1	OFF (default)
		Output	Effective at Low level / 0	ON

##### Steps

1. Enter the internal menu and find **FAB** by turning the knob.
2. Press "**ENTER**" to select **FAB**. Then turn the knob to change the value and press "**ENTER**" to activate the change.

#### 4.1.11 Options of resistance for digital communication (FAC)

**ON**: A 12  $\Omega$  resistance attached to the communication connector for digital communication.

**OFF**: No 120  $\Omega$  resistance attached to the communication connector for digital communication. The default value is **ON**.

##### Steps

1. Enter the internal menu and find **FAC** by turning the knob.
2. Press "**ENTER**" to select **FAC**. Then turn the knob to change the value and press "**ENTER**" to activate the change.

### 4.1.12 Selection of wire-feeder motor (FAF)

Internal menu to select between different types of wire-feeder motor. **OFF** for barrel-type motor. **ON** for print motor. **ON** is the default value by factory setting.

#### Steps

1. Enter the internal menu and find **FAF** by turning the knob. The digital meter is as displayed in Fig. 4-9.

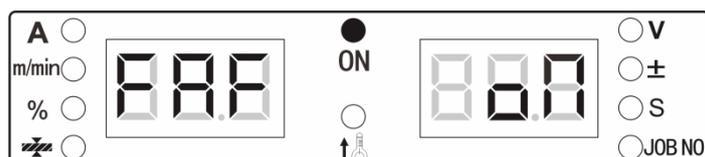


Fig. 4-9 FAF display interface

2. Press the "ENTER" to select **FAF**. Then turn the knob to select **ON** or **OFF** and press "ENTER" to activate the change.

## 4.2 Robot communication interface

Dex series supports communication with welding robots thru protocols of **Analog**, **DeviceNet**, **EtherNet/IP** and **EtherCat**. A CAN connector is installed on the rear panel of Dex power source for software upgrading or updating. Communication modules are as displayed in Fig. 4-10.

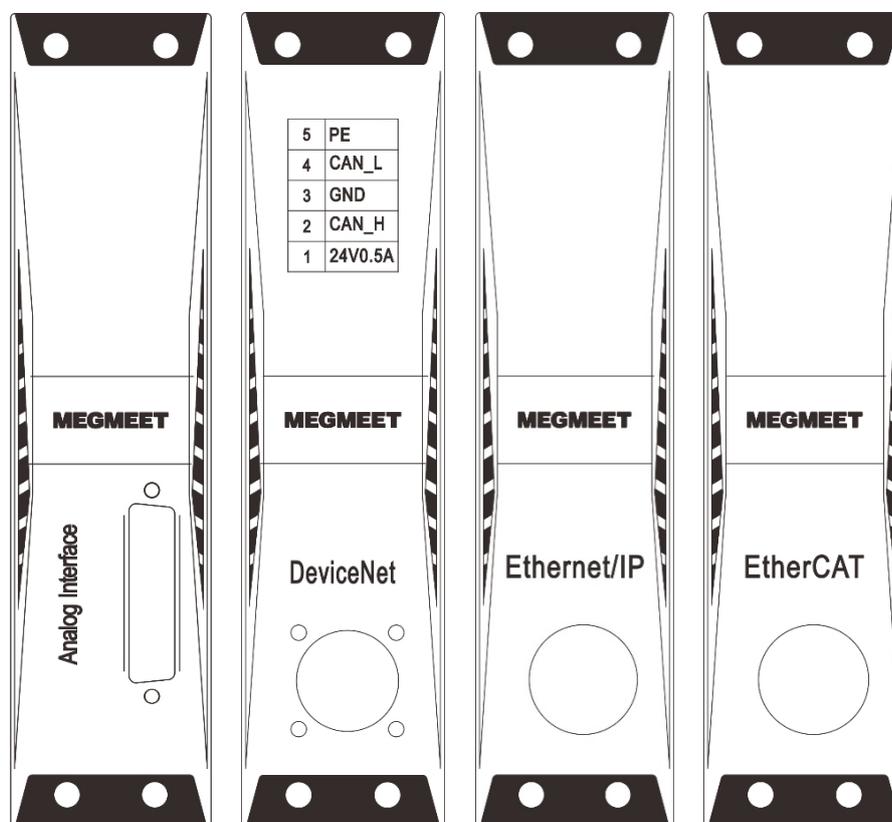


Fig. 4-10 Robotic Communication Modules

### 4.3 Analog communication with robots

Numbers of the pins in **DB25** connector in the analog communication module, as displayed in Fig.4-11.

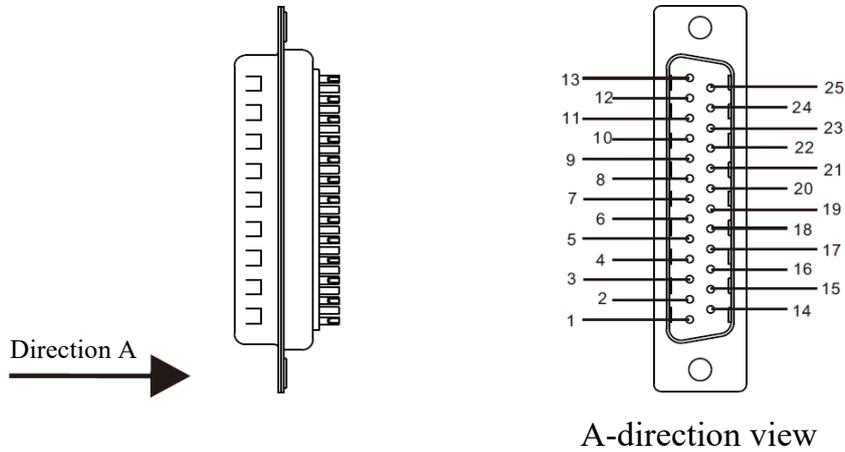


Fig. 4-11 Pins in DB25 Connector of Analog Communication Module

Table 4-6 Definitions the Pins in DB25 Connector in the Analog Communication Module

Pin No.	Cable Color	Signal	Function	Remarks
1	Black 1	24V power supply	The positive pole of DC power supply from the robot to the welding machine. If the welding machine supplies 24V as output, this power cable shall not be connected.	Note 1
2	Black 2	Arc on	Output from the robot to the welding machine. It is effective at a low level. (Default)	Note 2
3	Black 3	Wire retracing	Output from the robot to the welding machine. It is effective at a low level. (Default)	Note 2
4	Brown 1	Arc success	Output from the welding machine to the robot. It is effective at a low level. (Default)	Note 3
5	Brown 2	Welding machine ready	Output from the welding machine to the robot. It is effective at a low level. (Default)	Note 3
6	Brown 3	Common ground of I/O signals	Common ground of I/O signals of pin #1, #2, #3, #4, #5, #7, #8, #9 and #10.	
7	Orange 1	Inching	Output from the robot to the welding machine. It is effective at a low level. (Default)	Note 2
8	Orange 2	Robot emergency stop signal	Output from the robot to the welding machine. It is effective at a low level. (Default)	Note 2
9	Orange 3	Gas check	Output from the robot to the welding machine. It is effective at a low level. (Default)	Note 2
10	Purple 1	Touch-sensing success	Output from the welding machine to the robot. It is effective at a low level. (Default)	Note 3
11	Purple 2	Welding current	Analog signal, output from the welding machine to the robot, feeding back the actual welding current.	Note 4
12	Purple 3	Setting current	Analog signal, setting welding current from the robot to the welding power source.	Note 6, Note 7
13	Blue 1	Common ground of analog signals	Common ground of analog signals of pin #11, #12, #14 and #15.	
14	Blue 2	Welding voltage	Analog signal, output from the welding machine to the robot, feeding back the actual welding voltage.	Note 5

15	Blue 3	Setting voltage	Analog signal, setting welding VOLTAGE from the robot to the welding power source.	Note 8, Note 9
16	Vacant	Reserved		
17	Vacant	Reserved		
18	Pink 1	JOB input port 1	Output from the automation control or robot to the welding machine. The corresponding JOB channel number is shown in Table 3-37	Note 2
19	Pink 2	JOB input port 2	Output from the automation control or robot to the welding machine. The corresponding JOB channel number is shown in Table 3-37	Note 2
20	Pink 3	JOB input port 3	Output from the automation control or robot to the welding machine. The corresponding JOB channel number is shown in Table 3-37	Note 2
21	Grey 1	Common ground of I/O signals	Common ground of analog signals of pin #18, #19, #20, #22 and #23.	
22	Grey 2	Touch-sensing enabling	Output from the robot to the welding machine. It is effective at a low level. (Default)	Note 2
23	Vacant	Reserved		
24	Vacant	Reserved		
25	Vacant	Reserved		

Table 4-7 Truth Table of JOB Channels

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

Note: in the truth table, 0 indicates that the JOB input port is disconnected to the ground, 1 indicates that the JOB input port is short-circuited to the ground. If you want to activate the analog port JOB mode, "LOAD" shall be enabled in the front panel of the welding power source.

### Definitions of cable colors for analog communication

The definitions of communication cable colors are shown in Fig.4-12.

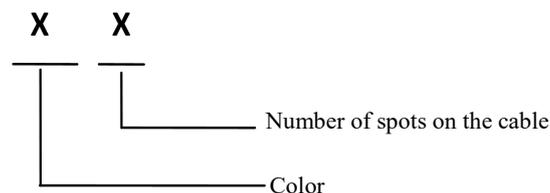


Fig. 4-12 Definitions of cable colors for analog communication

### Example:

Black 3 means there are three spots on the black cable.

**Remarks on pin definitions**

Note 1: Power supply of DC 24 V from the robot or automation control to the welding machine, ranging within the scope of 20~30 V. If the welding machine has a 24 V output, this cable shall not be connected.

Note 2: The equivalent circuit of I/O signal transmission from the robot to the welding machine is shown in Fig. 4-13. It is effective at a low level. That is to say, when the voltage between the + and – terminals of the I/O signal is 0~5V, which is low level, the welding machine will response. When the voltage between + and – terminals of the I/O signal is 18~24V, which is high level, the welding machine does not response. The I/O signal voltage range is limited to 0~30V.

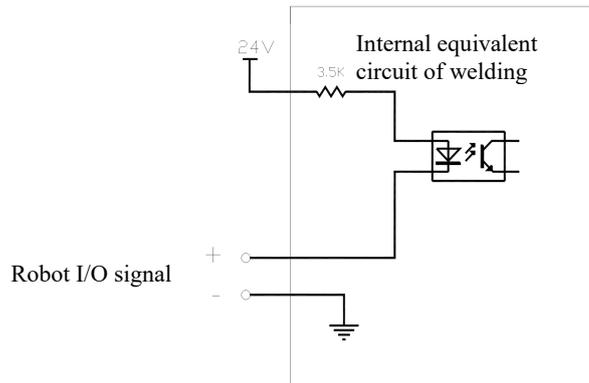


Fig. 4-13 Equivalent circuit of signals

Note 3: The equivalent circuit of I/O signal transmission from the welding machine to the robot is shown in Fig. 4-14. It is effective at a low level. When the I/O signal is output at a low level, the robot responses. When the I/O signal is output at a high level, the robot does not response. The maximum on-load capacity of I/O signals is 200 mA.

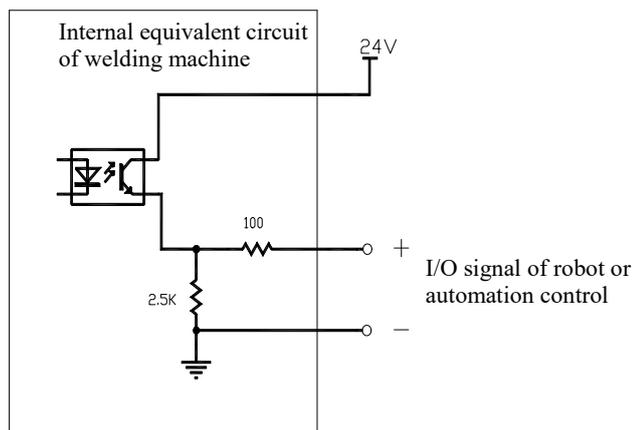


Fig. 4-14 Equivalent circuit of signals

1. The proportional diagram between the real welding current displayed on machine panel and the analog output value for welding current from the machine is shown in Fig. 4-15.

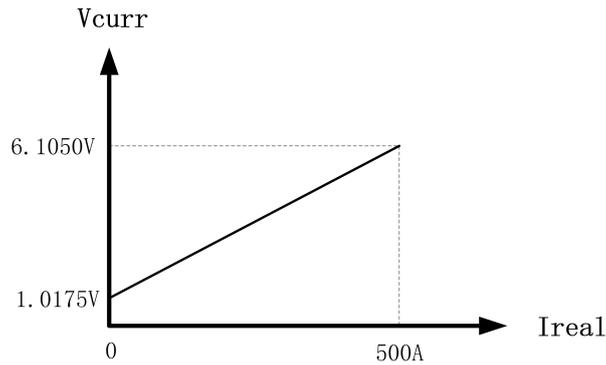


Fig. 4-15 Proportional diagram: real welding current V.S. voltage of analog output signal

2. The proportional diagram correspondence between the real welding voltage displayed on welding machine panel and the analog output value for welding voltage from the machine is shown in Fig. 4-16.

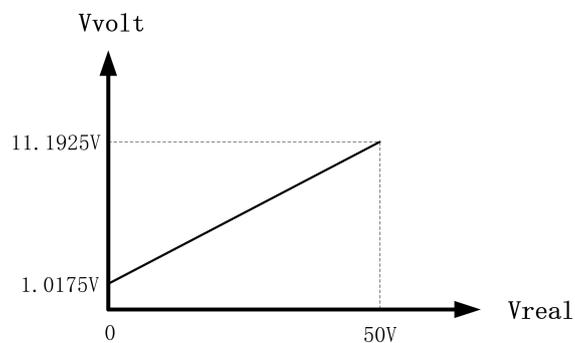


Fig. 4-16 Proportional diagram: real welding voltage V.S. voltage of analog output signal

3. The proportional diagram between the preset welding current and analog output value from the robot to the welding machine is shown in Fig. 4-17.

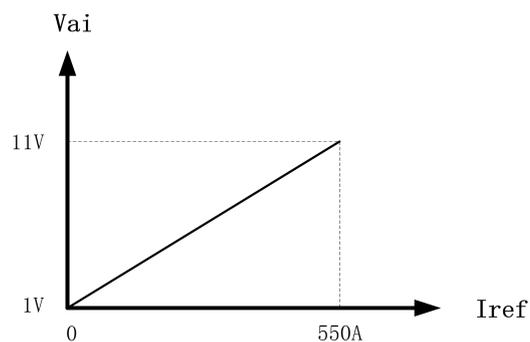


Fig. 4-17 Proportional diagram: preset welding current V.S. voltage of analog signal from robot to welding machine

4. The proportional diagram between the preset welding voltage and analog output value from the robot to the welding machine is shown in Fig. 4-18.

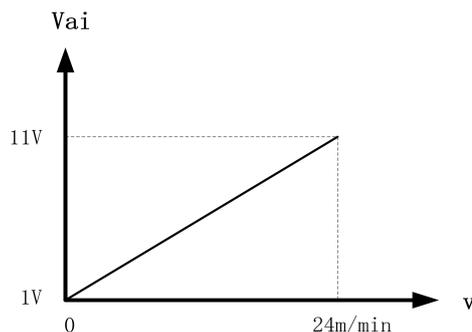


Fig. 4-18 Proportional diagram: preset welding voltage V.S. voltage of analog signal from robot to welding machine

5. Under manual mode (non-synergic), the proportional diagram between the preset welding voltage and analog output value from the robot to the welding machine is shown in Fig. 4-19.

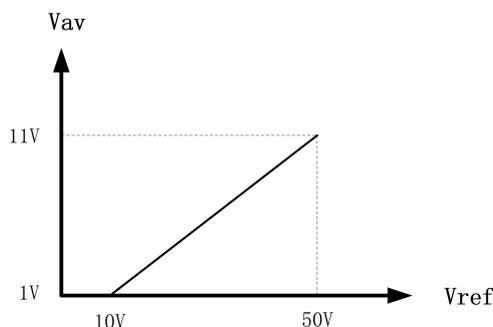


Fig. 4-19 Proportional diagram: preset welding voltage (non-synergic mode) V.S. voltage of analog signal from robot to welding machine

6. Under synergic mode, the proportional diagram between the preset welding voltage and analog output value from the robot to the welding machine is shown in Fig. 4-20.

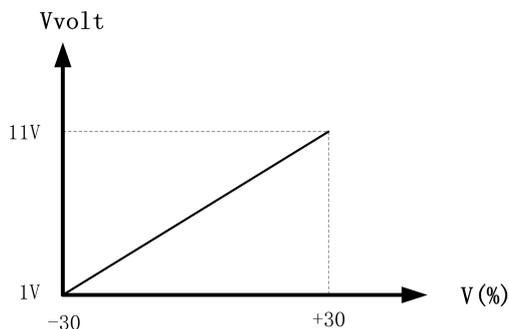


Fig. 4-20 Proportional diagram: preset welding voltage (synergic mode) V.S. voltage of analog signal from robot to welding machine

## 4.4 Communication with robot with DeviceNet

### 4.4.1 Definition of pins in DeviceNet connector

The sequence of pins in **DeviceNet** connector is shown in Fig. 4-21, and pin definitions are given in Table 4-8.

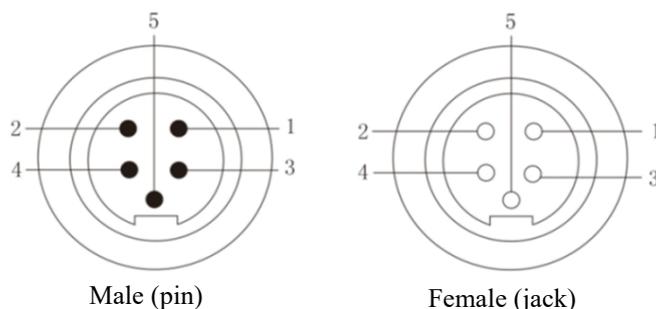


Fig. 4-21 Pin Sequence in DeviceNet Connector

Table 4-8 Pin Definitions in DeviceNet / CANopen / CAN Connector

Pin #	Color	Signal	Function
1	Red (18AWG)	DC 24V power supply	Power supply from welding power source to robot DeviceNet module (Requested for FANUC and KUKA, etc. Not requested for ABB.)
2	White (22AWG)	CAN_ H signal line	Communication line CAN_ H
3	Black (18AWG)	Ground wire	Ground of power supply from robot
4	Blue (22AWG)	CAN_ L signal line	Communication line CAN_ L
5	Shielded wire (18AWG)	Shielded wire	Enclosure PE

#### Tips

1. The welding power source provides a DC 24V power supply. If the robot has a 24V power supply, this cable shall not be connected.
2. A 120  $\Omega$  resistance is required between the high and low levels of the digital port. If the robot already has this resistance, no extra one shall be added.
3. For CANopen communication protocol, the DeviceNet connector on the DeviceNet module will be used for communicating with robot. Pin definitions are the same as given in Table 4-7.

### 4.4.2 Configuration under DeviceNet

The values to be configured under **DeviceNet** is shown on Table 4-9.

Table 4-9 DeviceNet Communication Configuration Information

Pin #	Configuration	Values to set	Remarks
1	Baud rate	125 Kbps (default)	250Kbps and 500Kbps as optional
2	Length of data sent by the master station of polling area	12 byte	Length of data sent by the robot
3	Length of data replied by the slave station of polling area	13 byte	Length of data replied by welding power source

### 4.4.3 Parameter configuration and mapping

The following shows the parameter configuration and mapping in FANUC robot under DeviceNet protocol.

#### Configuration of presetting values for welding machine from robot teach-pendant

1. The proportional diagram of the preset wire-feeding speed is shown in Fig. 4-22.

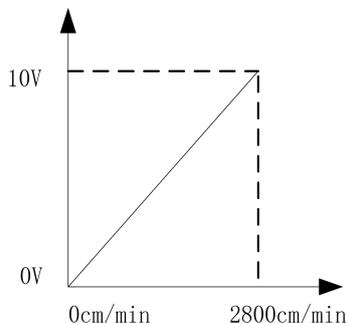


Fig. 4-22 Proportional diagram: preset wire-feeding speed V.S. value from robot to welding machine

2. The proportional diagram of preset welding current is shown in Fig. 4-23.

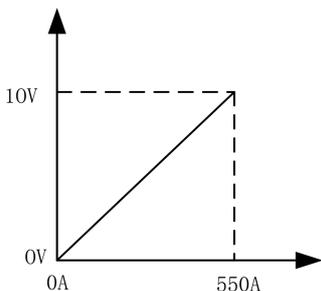


Fig. 4-23 Proportional diagram: preset welding current V.S. value from robot to welding machine

3. Under synergic mode, the proportional diagram of voltage correction over synergic value is shown in Fig. 4-24.

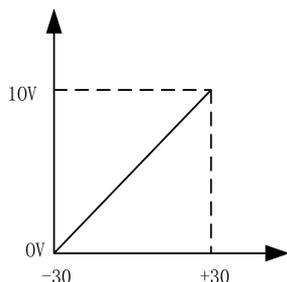


Fig. 4-24 Proportional diagram: preset voltage correction over synergic value under synergic mode V.S. value from robot to welding machine

4. Under non-synergic mode, the proportional diagram of the preset welding voltage is shown in Fig. 4-25.

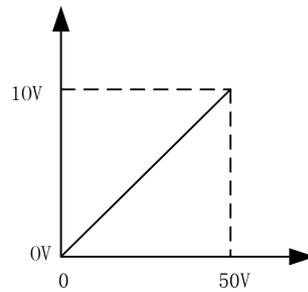


Fig. 4-25 Proportional diagram: preset welding voltage under non-synergic mode V.S. value from robot to welding machine

### Configuration of feed-back values from welding machine to robot controller

5. The proportional diagram of the preset wire-feeding speed is shown in Fig. 4-26.

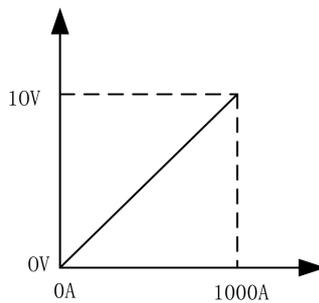


Fig. 4-26 Proportional diagram: real-time welding current V.S. value from welding machine to robot

6. The proportional diagram of feedback of the real-time welding voltage is shown in Fig. 4-27.

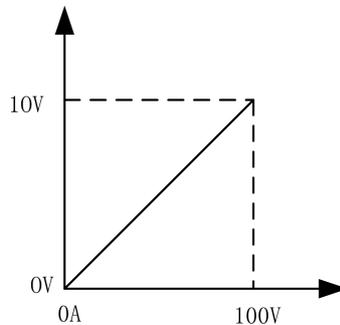


Fig. 4-27 Proportional diagram: real-time welding voltage V.S. value from welding machine to robot

## 4.5 Communication with robot with EtherNet/IP

### 4.5.1 Configuration under EtherNet/IP

The communication configuration information under **EtherNet/IP** protocol is shown in Table 4-10.

Table 4-10 EtherNet/IP Communication Configuration Information

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

### Tips

1. The IP address of the master station is that of the robot, which must be in the same segment as that of the welding power source, but should not be the same as that of the welding power source.
2. The IP address of the slave station is that of the welding power source, which is 192.168.0.2 by default. It can be set arbitrarily in the range of 1-63 through N01 in the internal menu of the welding power source if not repeating the robot's IP address.
3. The type of Ethernet/IP communication is SCN (scanner). If a connection still cannot be established between the welding power source and the robot after the Ethernet/IP communication configuration is completed, it is necessary to ping the IP of the master station (robot) and the slave station (welding power source) on the robot teach pendant page so as to ensure a normal link.

## 4.5.2 Advanced configuration

The advanced communication configuration information of the **EtherNet/IP** communication interface is shown in Table 4-11.

Table 4-11 Advanced Communication Configuration Information under EtherNet/IP

#	Configuration	Value to set	Remarks
1	I/O data type	8-bit bytes	
2	Timeout multiplier	4	
3	Reconnecting	Invalid	
4	Major version	1	
5	Minor version	35	
6	Alarm severity	Stop	
7	Quick links	Invalid	
8	Initiator-to-target RPI	20	
9	Target to-initiator transmission type	Unicast	
10	Target-to-initiator RPI	20	
11	Connection type: type O => T format	Operation/idle data	
12	Connection type: type O => T format	Non-modal	
13	Configuration string status size (bytes)	0	

### 4.5.3 Parameter configuration curve

The following shows the parameter configuration and mapping in FANUC robot under EtherNet/IP protocol.

#### Configuration of presetting values for welding machine from robot teach-pendant

1. The correspondence of the set wire feeding speed is shown in Fig. 4-28.

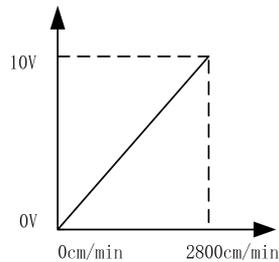


Fig. 4-28 Proportional diagram: preset wire-feeding speed V.S. value from robot to welding machine

2. The proportional diagram of preset welding current is shown in Fig. 4-29.

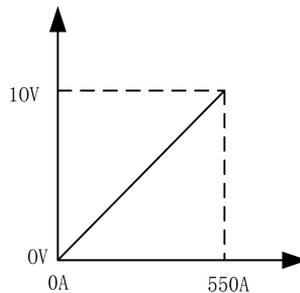


Fig. 4-29 Proportional diagram: preset welding current V.S. value from robot to welding machine

3. Under synergic mode, the proportional diagram of voltage correction over synergic value is shown in Fig. 4-30.

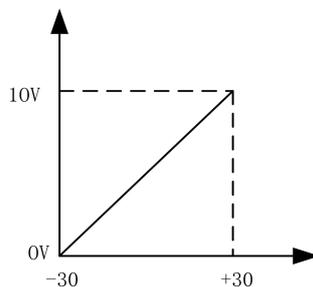


Fig. 4-30 Correspondence of voltage deviation value in Unitary mode

4. Under non-synergic mode, the proportional diagram of the preset welding voltage is shown in Fig. 4-31.

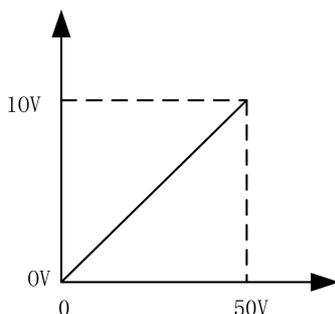


Fig. 4-31 Proportional diagram: preset welding voltage under non-synergic mode V.S. value from robot to welding machine

**Configuration of feed-back values from welding machine to robot controller**

1. The proportional diagram of the preset wire-feeding speed is shown in Fig.4-32.

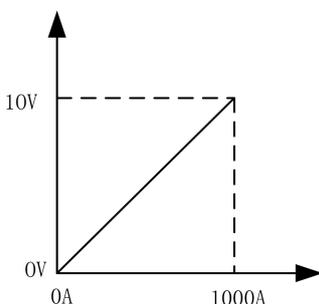


Fig. 4-32 Proportional diagram: real-time welding current V.S. value from welding machine to robot

2. The proportional diagram of feedback of the real-time welding voltage is shown in Fig.4-33.

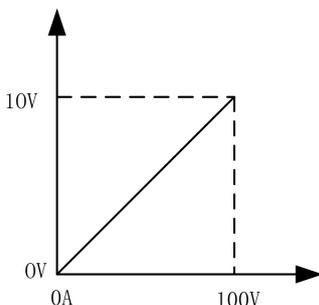


Fig. 4-33 Proportional diagram: real-time welding voltage V.S. value from welding machine to robot

## 4.6 Operational procedures of robotic welding

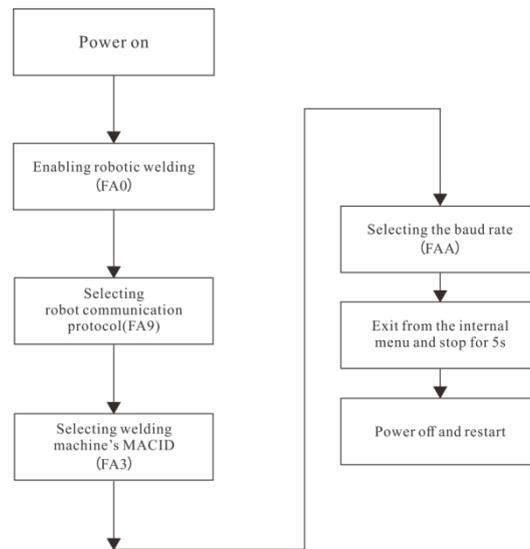


Fig. 4-34 Operational Procedures of Robotic Welding

### Caution

1. In the Job mode, in order to change Job parameters, exit from the Job mode first, then activate the panel control mode (N mode) to change the parameters. Make sure all changed parameters are saved before switching between Job number.
2. After the robot ready signal is reset, the welding power source will enter crater arc first.
3. Refer to the description in the different communication protocols for configuration of the preset and feedback curve.

## 4.7 After welding

First turn off the main switch of the gas cylinder, then turn off the input power for the welding machine.

When turning off the power, turn off the power switch in the welding machine first, then turn off the power switch of the main line.

### Tips

To allow the welding power source to cool down, please turn off the power switch 3-5 minutes after welding stops.

# Chapter 5. Fault Diagnosis

## 5.1 Error indication of welding power source

When there is an Error in the welding machine, the red indicator on front panel of welding power source will light.

### Note

When there is a deviation between current and voltage displayed by LED digital tube with set values during welding, it is not necessarily an error. The actual use of gas, welding wire type, wire extension, welding method, etc. will also lead to the phenomenon above.

## 5.2 Error codes and solutions of welding power source

Error code display is shown in Fig. 5-1.

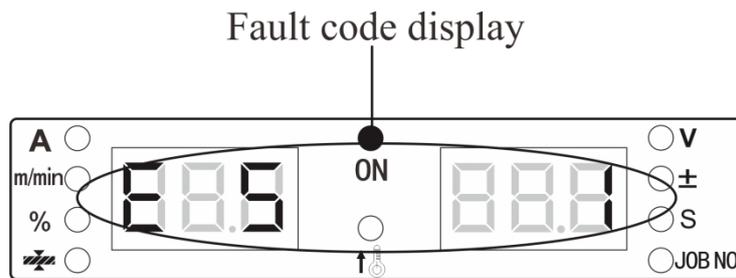


Fig. 5-1 Fault code display

Error code, cause, and solution of welding power source are given in Table 5-1 below.

Table 5-1 Error Codes, Cause and Solution of Welding Power Source

Error type	Fault code display		Error Description and Cause	Solution
	Left Digital Tube	Right Digital Tube		
Power On Self Test	F00		/	/
Welding gun faults	E1		When welding power source is on, welding torch switch is closed or damaged.	Turn welding torch switch to <b>OFF</b> or change welding torch switch.
Abnormal input power	E3	1	The bus is over-voltage.	1. Check whether input cable is correctly connected. 2. Check whether input power is normal. 3. If M1 board is damaged, change main power amplifier board.
	E3	2	The bus is under voltage.	
Over-temperature	E4	1	Over-temperature of output positive terminal: welding torch is not fastened to the European copper tip, which makes the terminal extremely hot.	Tighten the terminal connection.

Error type	Fault code display		Error Description and Cause	Solution
	Left Digital Tube	Right Digital Tube		
	E4	2	The diode at secondary side is over-temperature.	1. Use in strict accordance with the range of rated duty cycle. 2. Check whether the air vent of welding power source is blocked. 3. Clean radiator. 4. Check whether the fan works normally.
	E4	3	The radiator at primary side is over-temperature.	
*Key errors	E5	1~19	Key faults	Check whether the keys on the display board of welding power source are stuck.
*Key errors	E5	20~30	Key faults	Check whether the keys on the display board of wire-feeder are stuck.
Output over-current	E6		1. Output short-circuit or excessive current. 2. Output diode module is damaged.	1. Check whether the output is short circuited (whether the nozzle is bonded with the contact tube, and whether the welding wire is bonded and short circuited with the workpiece). 2. After inspection, press the welding torch switch again to resume the work. 3. Check whether the output diode module is damaged.
Communication error	E7	1	Internal communication errors.	Check whether the terminals of display board U1 and main control board M2 are loose.
		2	Internal communication errors.	Check whether terminals of the display board U1 and the PM wire-feeder display board U3 are loose.
		3	Internal communication errors.	Check whether terminals of display board U1 and the DM wire-feeder sampling board U4 are loose.
		4	Internal communication errors.	Check whether terminals of main control board M2 and robot communication board are loose.
Output over-voltage	E8		The output voltage is too high. The main transformer is damaged. Incorrect output wiring.	1. Check whether other machines are connected to the output port in series. 2. Check whether the main transformer is damaged. 3. Check the output wiring.
Over-current at primary side	E9	2	Main transformer is damaged. Output diode module is damaged. Main power amplifier board is damaged.	1. Check the main transformer. 2. Check the output diode module. 3. Check the main power amplifier board. After inspection, restart welding machine to recover.
Current Hall not inserted	E11		The current Hall connector is not inserted.	Check the current Hall connector.
Wire-feeder error	E13		Over-current of wire-feeder motor	Check whether the welding wire is blocked or stuck.
Fan errors	E15		The fan is short circuited or open circuit	Check whether the fan is stuck or short circuited.

Error type	Fault code display		Error Description and Cause	Solution
	Left Digital Tube	Right Digital Tube		
*Encoding disc faults Dex PM3000	E17		The encoding enclosed board signal terminal is not firmly connected	Check whether the encoding disc signal terminal is firmly connected.
Robot emergency stop	E18		Robot emergency stop signal error	Check whether the robot communication cable is connected correctly.
Robot communication error	E19	1	Communication error between analog port of robot and welding power source	Check communication cable.
Water cooling system protection	E26	1	Water cooling system switch	Check whether water flow circuit is smooth. Check whether water pipe is bent. Check whether water cooling system operates normally.
Heating valve error	E30		Over-current of heating valve	Check whether the heating valve socket is short circuited.
Motor power error	E33		The motor power cable is reversely connected	Check whether the motor power cable is reversely connected.

---

 **Caution**

The error type marked with \* is only applicable to the type of welding machine in brackets.

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# Chapter 6. Maintenance

## 6.1 Daily check

### Warning About Safety

Before daily inspection, power supply of both user's distribution box and the welding machine must be turned off (except the appearance check which do not need to touch conductive parts), to avoid electric shock, burns, personal injuries and other accidents.

- Instructions for usage:
  1. Daily checking is very important for keeping the high performance and safe running of the welding machine.
  2. Do the daily check according to following list and do cleaning or replacing when necessary.
  3. In order to ensure high performance of this welding power source, use the components provided or recommended by **MEGMEET Welding Technology Co., Ltd.** when replacing components.
- Welding machine

Table 6-1 Daily Check for Welding Power Source

Items	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 should be one item for the periodic check. If there is any non-conformity, then internal check of welding power source should be done, or further fixing should be done, or some part should be replaced.
Rear panel	Whether terminal cover of the input power supply is good. Whether ventilation hole is smooth without any foreign object.	
Top plate	Check whether the eye bolt or other bolts are loose.	Fix or replace the component if there is any unqualified situation.
Bottom plate	Check whether the wheel are damaged or loose.	
Side panel	Check whether the side panels are loose	
Routine	Check whether there is any discoloration on the panel. Confirm that is no overheat situation on the panel. Confirm the fan running without any noise. Check whether there is any irregular particular smell, vibration or noise when welding	The internal check should be carried out if there is any problem in routine checking.

- Cables

Table 6-2 Daily Check for Cables

Items	Key points of check	Note
Ground cable	Check whether ground cable is connected, including ground cable and PE.	Fix or replace the cable if there is any unqualified situation.
Positive output cable	Check whether insulation layer of cable is worn or any exposure of conductive part. Check whether there is any extension of cable owing to irregular external force. Check whether the connection between working piece and relevant cable is connected firmly.	Follow the actual situation to choose a proper way for checking the cable.

- Other accessories

Table 6-3 Daily Check for Other Accessories

Items	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 cooling system	Carry out daily check according to usage instructions for cooling-unit.	/
Gas meter	Carry out daily check according to usage instructions for gas meter.	/
Gas hose	Check whether connection is form, and when soft clamp is used, check whether there is looseness, whether soft hose is worn or damaged.	Fix or change a gas hose if there is any unqualified situation.

## 6.2 Periodic check

### Warning about Safety

1. In order to ensure safety, periodic check should be done by a qualified professional person.
2. Periodic check should be carried out after disconnecting the power supply of electric distribution box and the power supply of this machine to avoid electric shock, burn and other personal injury.
3. Wait about 5 minutes (capacitor charge) before periodic check.

- Operating instructions

1. Wearing an anti-static device or touching the metal part of machine case to avoid the static damage for semiconductor or circuit board before touching the internal circuit board or any conductor.

2. Do not use solvents other than the neutral detergents for household use to clean the plastic component.

### ● Periodic check plan

1. Periodic check should be carried out to ensure long-term normal use of this welding machine.
2. Periodic check should be thorough, including internal check and cleaning of this welding machine.
3. Periodic check should usually be done on a basis of every 6 months. periodic check should be done on a basis of every 3 months if there is much dust or oily fume on the welding site.
4. The recommended regular inspection schedule is shown in Table 6-4.

Table 6-4 Periodic Check Plan (Year XXXX)

Serial number	Planned Check Date	Actual check date	Inspector
1	XXXX-XX-XX		
2	XXXX-XX-XX		
3	XXXX-XX-XX		
...	...		

### ● Contents of periodic check

(User may add check items according to actual situation except for the following items) :

1. Internal dust removal of welding power source

Firstly, remove the top panel and side panels of welding power source, and then use the dry compressed air to blow the internal spill and dust, which accumulated in the welding power source, finally remove the dirt and foreign object that are hard to blow away.

#### Note

Accumulation of dust will affect the heat dissipation, which may cause the overheat protection.

2. Welding power source checking

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

3. Cables and gas hose checking

Check the ground cable, other cables and gas hose and so on. More thorough check should be done based on the item of daily check, and routinely further tightening and fixing.

### ● Dielectric strength testing and insulation testing

Dielectric strength testing and insulation testing should be implemented by after-sales engineer of our company or someone who has the professional knowledge of electrics and welding power source.

**Steps**

1. Turn off the power supply of distribution box.
2. Remove all safety ground cables from the enclosure.
3. Connect the three wires in the input power cable into one (excluding the green/yellow wire) to short circuit it.
4. Turn the power switch of welding machine to "ON".
5. At the secondary side, connect positive output terminal and negative output terminal with a lead to short circuit it.
6. At the control side, connect the third and eighth pins of communication connection terminal DB9 together with a lead to short circuit it.
7. The leads used above for making a short circuit should be of the same model and their cross-sectional area should not be less than 1.25mm<sup>2</sup>.

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 **Note**

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

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### 6.3 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 should firstly carry out the check according to the contents in **5.2 Error code of welding power source** and solution of **Chapter 6** 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 **MEGMEET Welding Technology Co., Ltd.**

For the product, we provide one year of warranty. Warranty period should be calculated from the date that is recorded on the warranty card or the invoice for purchasing this product. Any product damage caused by improper use by user will not fall within the scope of warranty, but may be treated in a normal repairing manner.

## Appendix I Technical Specifications

Table 1- 1 Technical specifications of welding power source

Manual	Dex DM3000 / PM3000 / CM3000 (Compact)	Dex DM3000S / DM3000SF / PM3000S (With Separated Wire-feeder)
Robotic	-	Dex DM3000R / PM3000R
Control method	Digital Control	
Rated input voltage/phases:	380V AC -15%~+21%	
Input power frequency	45~65Hz	
Power factor	0.94	
Efficiency	91% (210A/24.5V)	
Rated input capacity	9.2KVA/8.7KW	
Duty cycle (DC)	60%@250A/26.5V	
	100%@207A/24.5V	
Output characteristics	CV/CC	
Rated output no-load voltage	54.2V	
Output current range	30A~300A	
Output voltage range	12V~30V	
Degree of enclosure protection	IP23S	
Wire feeding speed	0.5~28 m/min	
Operating temperature	-10°C~40°C(welding power source-can be started up at 39°C)	
Storage temperature	-40°C~70°C	
Class of insulation	H	
Dimensions	L*W*H (mm) 610*260*398	
Weight	25.4 Kg	23.7 Kg
Welding wire reel diameter	300mm (15kg) max	
Certification	CCC (GB/T15579.1-2013)	
	CE (EN60974-10:2014 / EN60974-1:2012)	
CCC (GB/T15579.1-2013)		

Cooling-unit		
Input voltage	V	380V AC±10%
Cooling water capacity	L	6.8L
Cooling water flow rate	L/min	3.5L / min
Maximum cooling water head	m	20m
Cooling capacity	KW	1.5KW(L/min)

## Appendix II Electrical Diagram

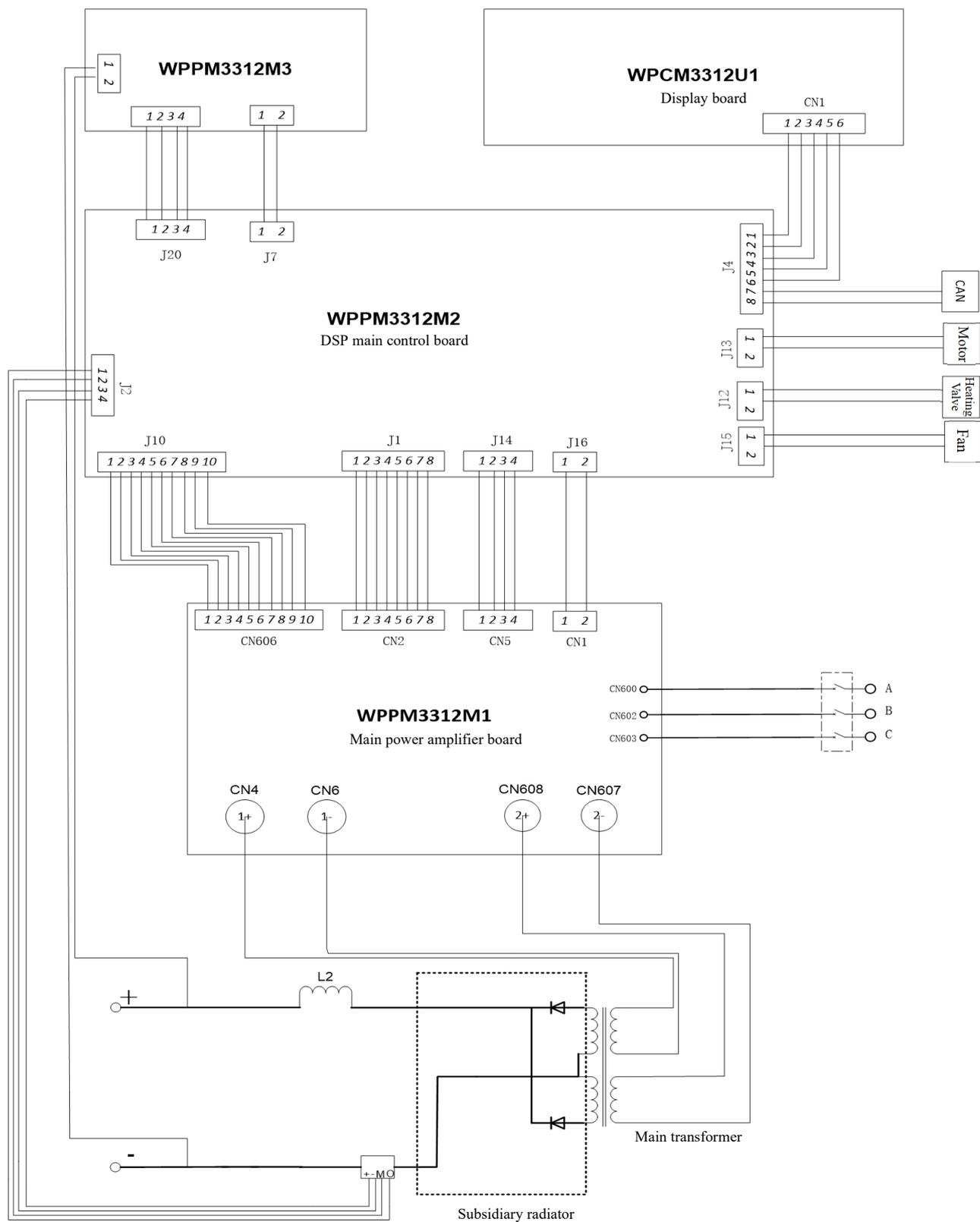


Figure 2-1 Electrical connection diagram

## Appendix III System configuration table

Table 3-1 Configuration table of manual welding source

Configuration				Model			
Name	Configuration	Quantity	Remarks	Dex DM3000	Dex PM3000 Dex PM3000Q	Dex DM3000S Dex DM3000SF	Dex PM3000S Dex PM3000QS
Welding power source	Standard	1		●	●	●	●
Wire-feeder	Standard	1		/	/	●	●
Welding torch	Standard	1		●	●	●	●
Water cooling system	Optional	1		/	○	/	○
Combination cable	Standard	1	Standard 3m	/	/	●	●
Ground Cable	Standard	1	Standard 1.8m	●	●	●	●
Aluminum alloy wire-feeding spare parts package	Standard	1		/	●	/	●
Trolley	Optional	1		○	○	○	○
Gas meter	Optional	1		○	○	○	○

Remarks: ● Standard ○ Optional

Table 3-2 Systematic Configuration of Robotic-type Welding Power Source

Name	Configuration			Model	
	Configuration	Quantity	Remarks	Dex DM3000R	Dex PM3000R Dex PM3000QR
Robot welding power source	Standard	1		●	●
Robot wire-feeder	Standard	1	Optional Panasonic interface or European interface	●	●
Water-cooled connector of robot wire-feeder	Optional	1		/	○
Analog port	Optional	1		○	○
Digital port	Optional	1		○	○
Ethernet port	Optional	1		○	○
Water cooling system	Optional	1		/	○
Combination cable of robotic wire-feeder	Standard	1	Standard 7m	●	●
Ground cable	Standard	1	Standard 3m	●	●
Aluminum alloy wire-feeding spare parts package	Standard	1		/	●
Trolley	Optional	1 set		○	○
Gas meter	Optional	1 piece		○	○

Remarks: ● Standard ○ Optional

Table 3-3 Welding Process Configuration Table of Dex PM3000/PM3000Q/ PM3000S/PM3000QS/ PM3000R/ PM3000QR

Serial number	Welding process	Welding materials	Welding wire diameter (mm)	Welding gas	Remarks
1	DC	Solid carbon steel	0.8/0.9/1.0/1.2	100%CO <sub>2</sub>	
2		Flux cored carbon steel	1.2		
3		<b>Metal cored carbon steel</b>	<b>1.2</b>		Only open to Q version models
4		Solid carbon steel	0.8/0.9/1.0/1.2	80%Ar+20%CO <sub>2</sub>	
5		Solid stainless steel	0.8/0.9/1.0/1.2	97.5%Ar+2.5%CO <sub>2</sub>	
6		Solid carbon steel	0.8/0.9/1.0/1.2	80%Ar+20%CO <sub>2</sub>	Only open to Q version models
7		<b>Flux cored carbon steel</b>	<b>1.2</b>	97.5%Ar+2.5%CO <sub>2</sub>	Only open to Q version models
8		<b>Metal cored carbon steel</b>	<b>1.2</b>		Only open to Q version models
9		Solid stainless steel	0.8/0.9/1.0/1.2		
10	Pulse	Pure aluminum	1.2	100%Ar	
11		Al-Si	1.0/1.2		
12		Al-Mg	1.0/1.2		
13		Solid carbon steel	0.8/0.9/1.0/1.2	80%Ar+20%CO <sub>2</sub>	
14		<b>Flux cored carbon steel</b>	<b>1.2</b>		Only open to Q version models
15		<b>Metal cored carbon steel</b>	<b>1.2</b>		Only open to Q version models
16	Double pulse	Solid stainless steel	0.8/0.9/1.0/1.2	97.5%Ar+2.5%CO <sub>2</sub>	
17		Pure aluminum	1.2		
18		Al-Si	1.0/1.2		100%Ar
19		Al-Mg	1.0/1.2		

Note: **MEGMEET Welding Technology Co., Ltd.** keeps researching, developing and innovating products. In case of any discrepancy between the contents, parameters and figures in this user manual with real subject, real subject shall prevail. The manual is subject to change without notice. **MEGMEET** has the final right to interpret this user manual without prior notice. **The welding process marked in BOLD are only open to Q version models!**

Table 3-3 Welding Process Configurations of Dex DM3000/DM3000S/DM3000SF/DM3000R

Serial number	Welding process	Welding materials	Welding wire diameter (mm)	Welding gas	Remarks
1	DC	Solid carbon steel	0.8/0.9/1.0/1.2	100%CO <sub>2</sub>	
2		Flux cored carbon steel	1.2		
4		Solid carbon steel	0.8/0.9/1.0/1.2	80%Ar+20%CO <sub>2</sub>	
5		Solid stainless steel	0.8/0.9/1.0/1.2	97.5%Ar+2.5%CO <sub>2</sub>	

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

## Appendix IV Structural details

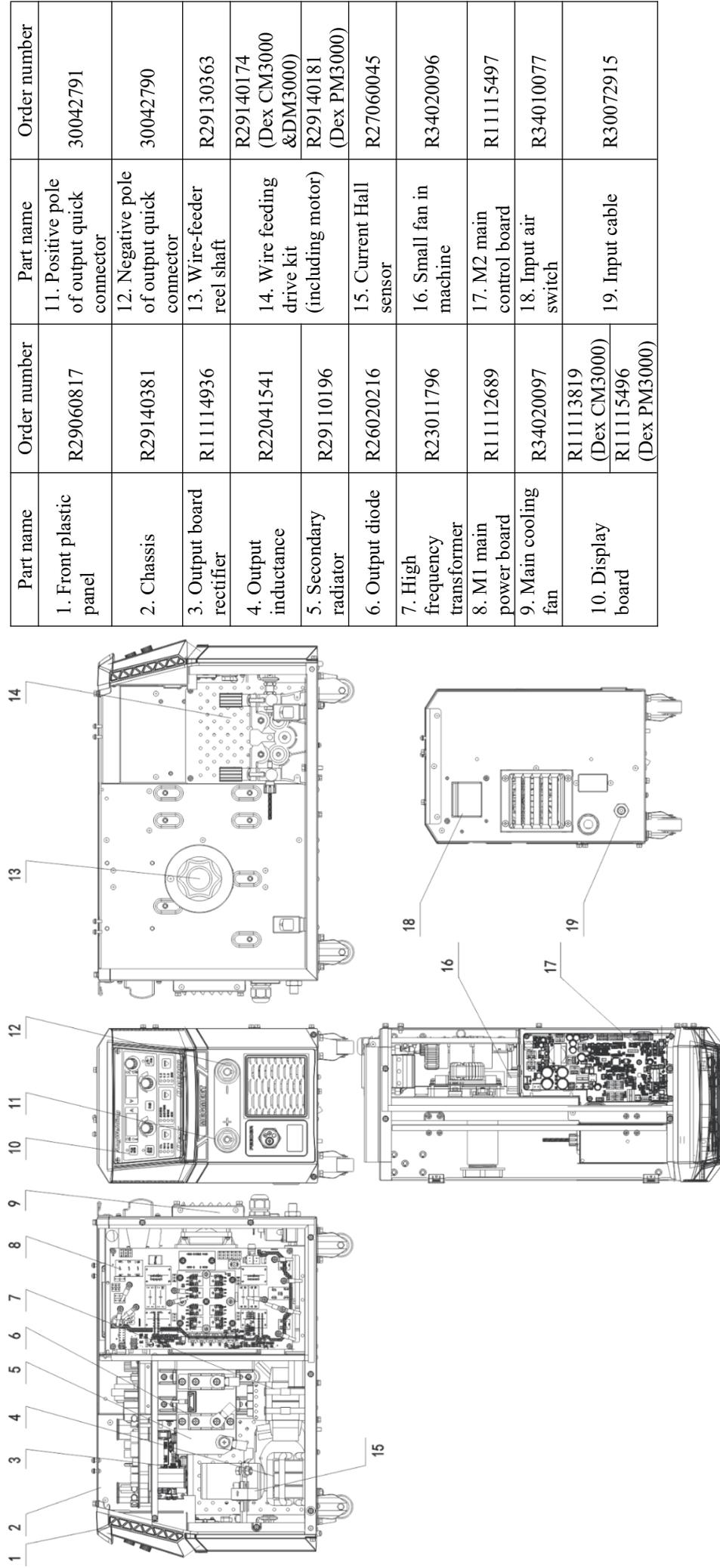


Figure 4-1 Parts of DEX DM/PM3000 (Compact)

Part name	Order number	Part name	Order number
1. Front plastic panel	R29060817	11. Positive pole of output quick connector	30012791
2. Chassis	R29140328	12. Negative pole of output quick connector	30042790
3. Output board rectifier	R11114936	13. Communication box	DeviceNet R13400888
4. Output inductance	R22041541		EtherNet/IP R13400943
			EtherCAT R13401135
			Analog communication box R13401138
5. Secondary radiator	R29110196	14. Wire feeding control board	R11115557
6. Output diode	R26020216	15. Current Hall sensor	R27060045
7. High frequency transformer	R23011769	16. Small fan in the machine	R34020096
8. M1 main power board	R11112689	17. M2 main control board	R11115497
9. Main cooling fan	R34020097	18. Input air switch	R34010077
10. Display board	R11115496	19. Input cable	R30072715
		20. EMC filter board	R11113579

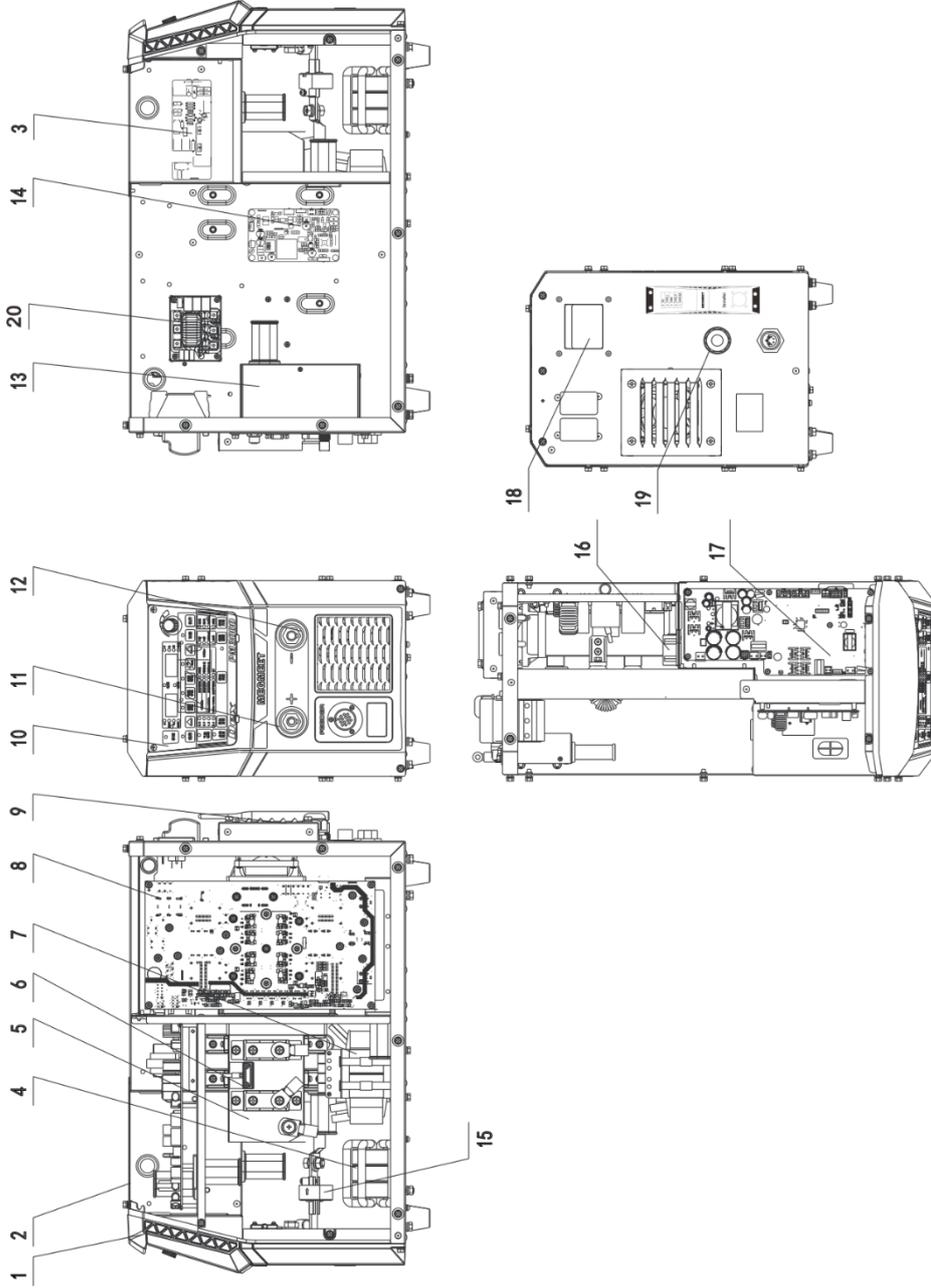


Figure 4-2 Parts of DEX DM/PM3000 (with Separated Wire-feeder)

**MEGMEET** MEGMEET Welding Technology Co., Ltd.

## Warranty Card for Welding

### Power Source

User name:	
Address:	
Postal code:	Contact:
Tel.:	Fax:
Machine model:	
Power:	Machine number:
Contract No.:	Date of purchasing:
Service entity:	
Contact:	Tel.:
Repairer:	Tel.:
Date of repairing:	
Users' evaluation of service quality: <input type="checkbox"/> <b>Very good</b> <input type="checkbox"/> <b>Good</b> <input type="checkbox"/> <b>Fair</b> <input type="checkbox"/> <b>Bad</b>	
Other comments:	
User's signature:	date:
Revisit records by Customer Service Centre: <input type="checkbox"/> <b>Telephone re-visit</b> <input type="checkbox"/> <b>Letter re-visit</b>	
Others:	
Technical support engineer's signature:	
date:	

**Note: This card will be invalid if user cannot be revisited.**

**MEGMEET** MEGMEET Welding Technology Co., Ltd.

## Warranty Card for Welding

### Power Source

User name:	
Address:	
Postal code:	Contact:
Tel.:	Fax:
Machine model:	
Power:	Machine number:
Contract No.:	Date of purchasing:
Service entity:	
Contact:	Tel.:
Repairer:	Tel.:
Date of repairing:	
Users' evaluation of service quality: <input type="checkbox"/> <b>Very good</b> <input type="checkbox"/> <b>Good</b> <input type="checkbox"/> <b>Fair</b> <input type="checkbox"/> <b>Bad</b>	
Other comments:	
User's signature:	date:
Revisit records by Customer Service Centre: <input type="checkbox"/> <b>Telephone re-visit</b> <input type="checkbox"/> <b>Letter re-visit</b>	
Others:	
Technical support engineer's signature:	
date:	

**Note: This card will be invalid if user cannot be revisited.**

## Notes for Users

1. The warranty scope means only welding power source.
2. Warranty period is 12 months. 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 should 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.

**MEGMEET Welding Technology Co., Ltd.**  
Customer Service Center

Floor 5th, 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: 400-666-2163

## Notes for Users

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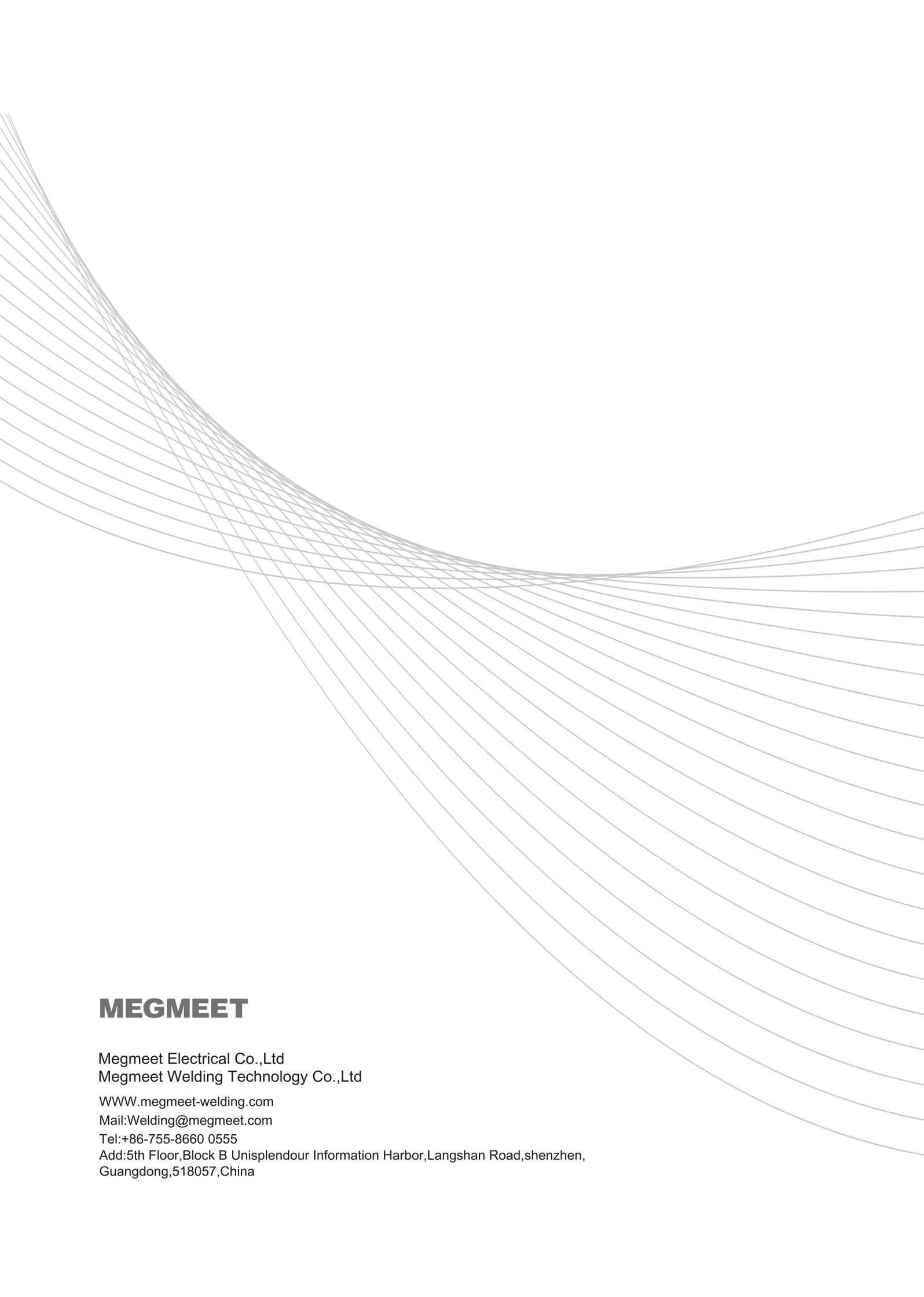
- Welding power source failure due to any operation not complying with User Manual.
- Welding power source damage due to fire, flood or irregular voltage.
- Welding power source damage due to abnormal function using.

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

# MEGMEET

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