

INVERTER WELDER



**MMA 200MF**

**WELDING MACHINE**

***USER MANUAL***

# Welcome to a better way of welding!

For your own and other people's safety, please read the manual carefully before operating. And the user manual must always be available near the welding machine.

## Disclaimer and Warning

Thank you for purchasing our products. The content mentioned in this article concerns your safety and legitimate rights and responsibilities.

The final interpretation of this document belongs to our company. It will be updated without notice.

By using this product, you are deemed to have carefully read the disclaimer and warning, understand, approve and accept all terms and contents of this statement.

You undertake to take full responsibility for the use of this product and any consequences it may cause. You undertake to use the Product only for proper purposes and agree to these terms and any relevant regulations, policies and guidelines established by our company.

## Version

Version: YF-TBE-XXXX, A0. Released on November 30, 2023.

## NOTE

The pictures in this manual are for reference only. If the pictures are inconsistent with the actual product, the actual product shall govern.

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# 1 Safety Guidelines and Precautions

## Security Definitions

 DANGER	It indicates that ignoring safety warnings could result in a major accident, or even death or serious injury.
 WARNING	It indicates that ignoring safety warnings could result in minor injuries or property damage.
 NOTE	It indicates that ignoring safety warnings could result in equipment failure or damage.

## Personal Protection Precautions

- ◆ The installation, operation, maintenance and repair of the power source must be carried out by professionals or persons with relevant knowledge and skills.
- ◆ Personal protective equipment (PPE), such as protective masks, overalls, insulating gloves and insulating shoes, should be worn when working.
- ◆ Keep fire extinguishing equipment at a handy location in the workshop.
- ◆ Repair or replace defective cables immediately.
- ◆ Never watch the arc except through lenses of the correct shade.
- ◆ Supervisors shall be provided for working in high altitude or narrow places, such as boxes, boilers, cabins, etc.
- ◆ In confined spaces, adequate ventilation and constant observation are essential.
- ◆ Those who use cardiac pacemakers shall not approach the power source in use and welding workplaces without the permission of a physician.



DANGER

**The power source shall not be used for pipeline thawing, battery load or motor start-up.**

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## Operational Safety Guidelines



### Electrical Shock

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- ◆ Grounded all working materials.
- ◆ Never touch 'live' electrical parts.
- ◆ Always repair or replace worn or damaged parts.
- ◆ Wearing dry insulated boots, and dry leather gloves.
- ◆ Disconnect power source before performing any maintenance or service.
- ◆ Never change electrodes with bare hands or wet gloves.
- ◆ Never cool electrode holders in water.
- ◆ Never hold the electrode and holder under your arm.
- ◆ Never work in moist or damp areas. If necessary, the floor near the operating table must be covered with rubber insulation pad.



### Fumes and Gases

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- ◆ You must always have enough ventilation in confined spaces. Be alert to this at all times.
- ◆ Fumes from the welding of some metals could have an adverse effect on your health. Don't breathe them in. If you are welding on material such as stainless steel, nickel, nickel alloys or galvanised steel, further precautions are necessary.
- ◆ Keep your head out of the fumes rising from the arc.
- ◆ If necessary, use forced ventilation or local exhaust to remove fumes.
- ◆ Wear a respirator when natural or forced ventilation is insufficient.



### **Welding sparks can cause fire or explosion**

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- ◆ Do not carry out welding operations in degreasing, cleaning and spraying areas.
- ◆ Do not weld/cut gas-filled pipes, sealing grooves (boxes) and other devices, otherwise explosions or fires are likely to occur.
- ◆ Do not weld/cut near flammable gases or devices with flammable substances, otherwise explosion or fire may occur.
- ◆ When not welded, make sure that any component in the wire circuit does not contact the workpiece or the earth, otherwise it may cause overheating and fire.
- ◆ When the welding operation is stopped, remove the electrode in the welding pliers or cut off the welding wire in the nozzle of the torch.



### **Arc rays can burn eyes and injure skin**

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- ◆ Wear hat and safety glasses. Use ear protection and button shirt collar. Use welding helmet with correct shade of filter.
- ◆ Protective barriers are set around the welding site to prevent arc or welding spatter from injuring others.



### **Electric and Magnetic Fields**

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- ◆ Those who use cardiac pacemakers shall not approach the power source in use and welding workplaces without the permission of a physician.
- ◆ It is strictly forbidden to place or wrap welded cables around the body.
- ◆ Do not place the body between the welding wire and the workpiece cable. If the welding wire cable is on the right side of the body, the workpiece cable should also be on the right side of the body.



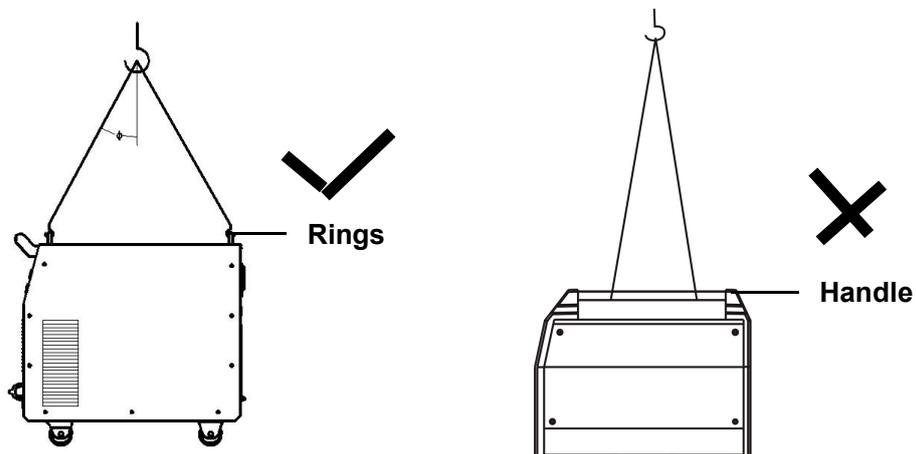
## Noise produced during welding can easily cause hearing loss

- ◆ In order to avoid the harm of noise to you and others, please wear the prescribed protective equipment.



## Matters needing attention in hoisting

- ◆ The power source with strap or hand is prohibited from using strap or hand for lifting.
- ◆ When lifting power source with lifting forklift truck, in order to prevent dumping, please fork-fit and fix it from side.
- ◆ When lifting power source with crane, the cable should be tied to the suspension ring, and the angle between the cable and the vertical direction should not exceed 15 degrees.
- ◆ When the power source with cylinder and wire feeder is hoisted, the two equipments should be unloaded from the power supply first. When moving the power source on the ground, it is necessary to fix the cylinder with a strap or chain to prevent dumping and injuring people.
- ◆ If the wire feeder is hoisted by lifting lugs for welding, it is necessary to ensure that it is firm and insulated.



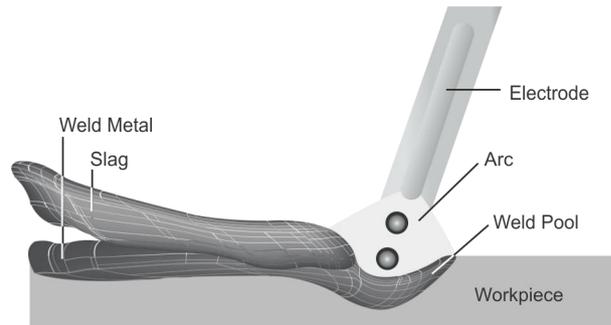
## STOP

**PLEASE NOTE** that under no circumstances should any equipment or parts be altered or changed in any way from the standard specification without written permission given by our company. To do so, will void the Equipment Warranty.

## 2 Overview

### 2.1 Product Introduction

Manual Metal Arc welding is the process of joining metals where an electric arc is struck between the metal to be welded (workpiece) and a flux-coated filler wire (the electrode). The heat of the arc melts the parent metal and the electrode which mix together to form, on cooling, a continuous solid mass.



The welding power source can offer stronger, more concentrated and more stable arc. When stick and work piece get short, its response will be quicker. It means that it is easier to design into welding machine with different dynamic characteristics, and it even can be adjusted for specialty to make arc softer or harder.

MMA welding machine has the following characteristics: effective, power saving, compact, stable arc, good welding pool, high no-load voltage, and good capacity of force compensation. It can weld stainless steel, alloy steel, carbon steel, copper and other color metal. It can apply to electrode of different specifications and materials, including acidity, alkalescence. It can apply in high altitude, the open air and inside and outside decoration. Compared with the same products of home and abroad, it is compact in volume, light in weight, easy to install and operate.

Thanks for purchasing our product and hope for your precious advice. We will dedicate to produce the best products and offer the best service.

## 2.2 Technical Specifications

Item	Model	MMA 200MF
Power voltage (V)		1PH 220V (±15%)
Frequency (Hz)		50/60Hz
Rated maximum supply current ( $I_{1max}/A$ )		35.6 (MMA) 28 (TIG)
Maximum effective supply current ( $I_{1eff}/A$ )		15.9 (MMA) 12.5 (TIG)
Output current range (A)		30~200 (MMA) 30~200 (TIG)
Output voltage range (V)		21.2~28 (MMA) 11.2~18 (TIG)
Duty cycle (%)		30% (MMA) 60% (TIG)
No-load voltage (V)		58 (MMA) 25 (TIG)
Power factor		0.73
Efficiency (%)		80%
Insulation grade		F
Housing protection grade		IP21
Weight (kg)		4.0
Overall dimensions (mm)		288*138*208

**Note:** The weight in this table is the net weight of the machine. If it is inconsistent with the physical object, the physical object shall prevail.

## 3 Installation

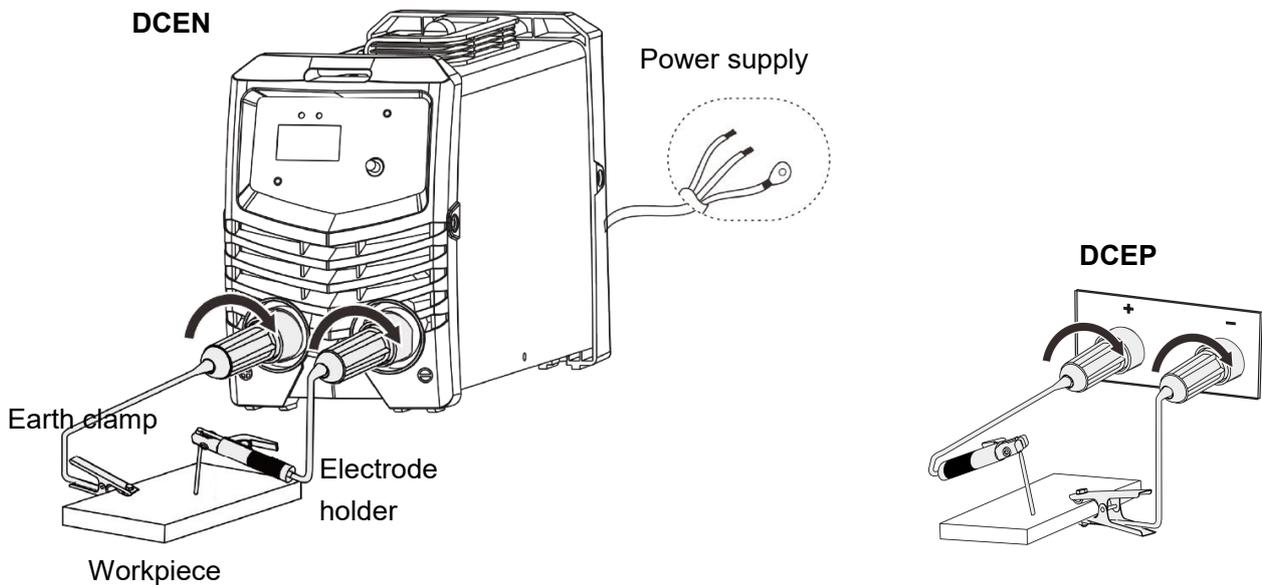
### 3.1 Installation for MMA welding

There are two welding methods for MMA welding, please choose according to the actual needs.

**Direct Current Electrode Negative (DCEN):** The positive output terminal is connected to the workpiece, and the negative output terminal is connected to the electrode holder. The DCEN is suitable for acid electrodes.

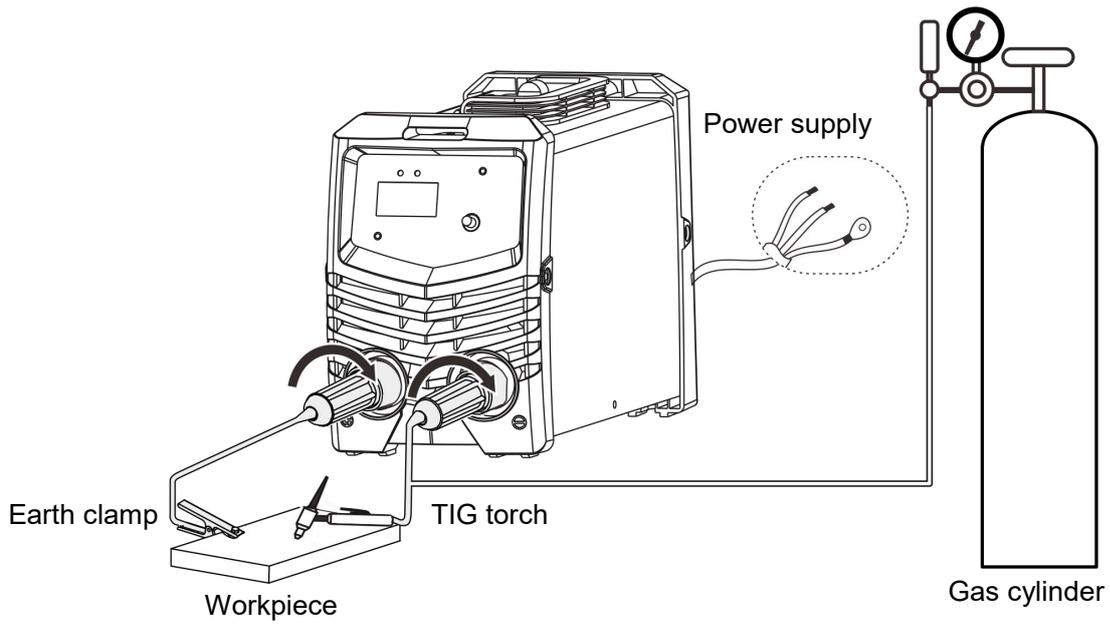
**Direct Current Electrode Positive (DCEP):** The positive output terminal is connected to the electrode holder, and the negative output terminal is connected to the workpiece. The DCEP is suitable for basic electrodes.

**NOTE: When using acid electrodes for welding, if the arc is frequently broken, connect the earth clamp to the negative output terminal and the electrode holder to the positive output terminal.**



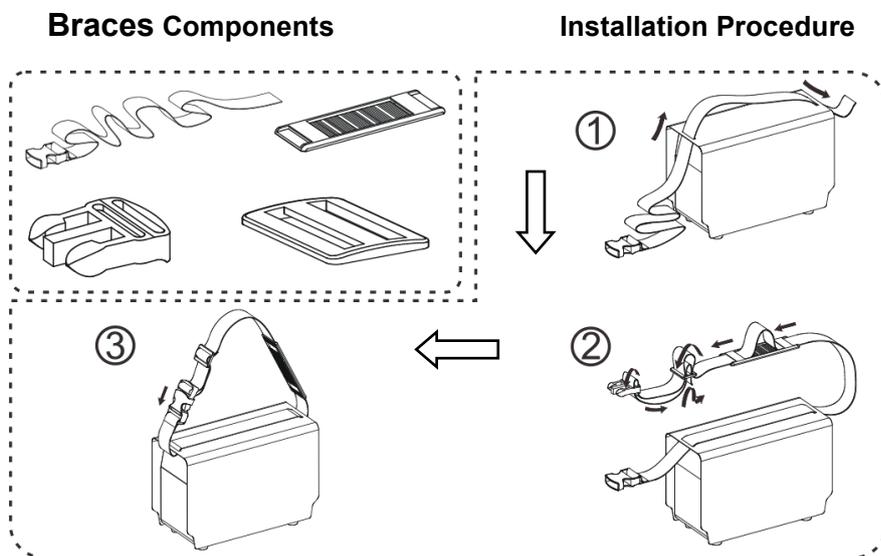
### 3.2 Installation for TIG welding

- Connect the shielded-gas source correctly. The gas supplying route shall include gas cylinder, argon decompression flow meter and gas pipe. The connecting parts of the gas pipe should be fastened by hose clamp or other objects, in order to prevent leakage and air-in.
- Connect the plug of TIG torch to “-“ of the front panel, and fasten it clockwise.
- Connect one end of the earth clamp cable to “+” of the front panel, and fasten it clockwise, the other end clamp the work piece.



### 3.3 Install Accessories - braces (optional)

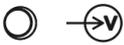
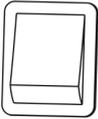
**Note:** Some machines can be equipped with braces. Please refer to the following figure for installation steps.



# 4 Operating Functions

## 4.1 Control Panel

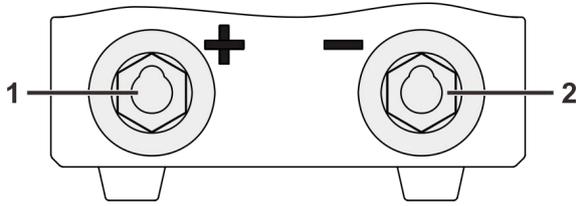
The panel components are described in the following table.

Icons	Name	Description
	Adjusting Knob	Used to adjust welding current.
	Abnormal Indicator	This indicator lights up when the machine is overheated, overcurrent, or other abnormal.
	Power Indicator	Turn on the power supply.
LIFT TIG  MMA	MMA/Lift-TIG switch	Used to switch the MMA and Lift-TIG function.
	Digital display meter	-

**Note:** This table contains all panel components of MMA series power supply. If it is inconsistent with the machine, the physical object shall prevail.

## 4.2 Input/Output Panel

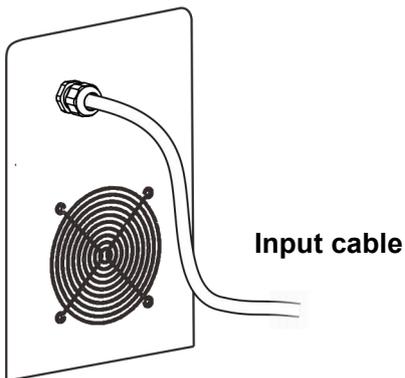
### Output Terminals



No.	Name
1	Positive output terminal
2	Negative output terminal

### Input Cable

The  $I_{1\text{eff}}$  determines the input cable, correct plug and input current required for each machine.



Max. effective supply current ( $I_{1\text{eff}}$ )	Input cable size
$I_{1\text{eff}} \leq 10 \text{ A}$	1.5-2.5 mm <sup>2</sup>
$I_{1\text{eff}} \leq 16 \text{ A}$	1.5-4 mm <sup>2</sup>
$I_{1\text{eff}} \leq 25 \text{ A}$	2.5-6 mm <sup>2</sup>
$I_{1\text{eff}} \leq 35 \text{ A}$	4-10 mm <sup>2</sup>
$I_{1\text{eff}} \leq 50 \text{ A}$	6-16 mm <sup>2</sup>
$I_{1\text{eff}} \leq 63 \text{ A}$	10-25 mm <sup>2</sup>

**Note:** Please check the nameplate or the section “2.2 Technical Specifications” for the value of  $I_{1\text{eff}}$ .

## 5 Operation

### 5.1 Operation Steps for MMA welding

The operations of MMA welding are shown in the table below.

Steps	Description
1 Select electrode	It is suggested to choose the diameter of electrode according to the thickness of the workpiece refer to the following table ( <b><i>Diameter of Electrode</i></b> ).
2 Set welding mode	Switching to MMA through the MMA/Lift-TIG switch.
2 Set welding current	Set welding current according to electrode, workpiece and welding process.

**Note:** Generally, welding current is adequate for electrode, see the “***Appendix A Welding Parameter***” for details.

#### Diameter of Electrode

Thickness of workpiece (mm)	Diameter of electrode (mm)
<4	The diameter of the electrode shall not exceed the thickness of the workpiece.
4~12	3.2~4.0
>12	>4.0

**Note:** 5mm electrode is rarely used for horizontal and vertical welding, and 3.2mm electrode is used for jam welding.

### 5.2 Operation Steps for TIG welding

The operations of TIG welding are shown in the table below.

Steps	Description
1 Set gas pressure	Turn on argon switch, and adjust gas pressure to rated value.
2 Starting up	Turn on the power switch.
3 Set welding mode	Switching to Lift-TIG through the MMA/Lift-TIG switch.
4 Set up parameters	Set welding current, according to workpiece and welding process.

**Note:** Generally, welding current is adequate for electrode, see the “***Appendix A Welding Parameter***” for details.

# 6 Environment and Problems

## 6.1 Environment

**Note:** The power source should not be used in rain or snow environment.

The recommended external environment for welding is as follows:

- Please place the power source in a horizontal position. The inclination of the power source shall not exceed 10°.
- The environment where the equipment is stored should be clean and protected by sand and dust.
- Dust, acids, corrosive gases or substances in the surrounding air do not exceed normal levels, except those produced by the welding process.
- The environment where the equipment is stored needs to be dry. The air relative humidity requirements are as follows:

No more than 50% at 40°C.

No more than 90% at 20°C.

- The environment where the equipment is placed should not be surrounded by heat, fire and welding spatter. The ambient temperature requirements are as follows:

During welding: -10°C ~ +40°C.

During transportation and storage: -20°C ~ +55°C.

## 6.2 Problems During Welding

Fittings, welding materials, environment factor, supply powers maybe have something to do with welding. User must try to improve welding environment.

No.	Problems	Solutions
1	Arc starting is difficult and easy to break.	<ol style="list-style-type: none"> <li>1. Make sure the quality of electrode.</li> <li>2. If the electrode is not dried, it will cause unstable arc, welding defect increases and the quality is down.</li> </ol>
2	Output current not to rated value	<ol style="list-style-type: none"> <li>1. Make sure the quality of electrode.</li> <li>2. If the electrode is not dried, it will cause unstable arc, welding defect increases and the quality is down.</li> <li>3. If use extra-long cable, the output voltage will decrease, so please shorten the cable</li> </ol>
3	Current is not stabilizing when machine is being operated	When power voltage departs from the rated value, it will make the output current not matched with rated value; when voltage is lower than rated value, the max output may lower than rated value.
4	Too much spatter	<ol style="list-style-type: none"> <li>1. Maybe current is too big and electrode diameter is too small.</li> <li>2. Output terminal polarity connection is wrong, it should apply the opposite polarity at the normal technics, which means that the stick should be connected with the negative polarity of power source, and work piece should be connected with the positive polarity. So please change the polarity.</li> </ol>

## 7 Periodic Maintenance

In maintenance of the unit, take into consideration the rate of use and the environment it is used in. When the unit is used properly and serviced regularly you will avoid unnecessary disturbances in use and production.

- Check electrical connections of unit at least twice a year. Repair or replace broken/damaged cables.
- Clean oxidised connections and tighten.
- Inner parts of machine should be cleaned with a vacuum cleaner and soft brush.
- Avoid water or moisture in the machine, if water or moisture should be blown dry in time, and use megohm meter to measure the insulation condition, qualified before use.
- If it is not used after welding for a long time, it should be returned to the original packing box and placed in a dry environment without direct sunlight.

## 8 Trouble Shooting

**IMPORTANT:** Only authorised repair agents with valid certifications should carry out repairs and internal servicing.

Faults symptom	Reasons	Solutions
1 Fan is not working 2 No welding current output	1 Power switch is broken. 2 The silicon bridge is damaged. 3 There is malfunction occurs in the supplementary power source on control board.	1 Replace the power switch 2 Replace the silicon bridge. 3 If problem persists, please contact a service agent.
1 Fan works normally; 2 No welding output	1 There is open circuit or badness of connect at the joint of output terminal. 2 The control cable on the torch is broken off or the switch is damaged. 3 The control circuit is damaged.	1 Check if all the sockets in the machine are connected well. 2 Replace the torch. 3 If problem persists, please contact a service agent.
1 Fan is not working 2 It has abnormal indication	1 The fan is broken. 2 Internal fault.	1 Replace the fan. 2 If problem persists, please contact a service agent.
1 Fan is working, it has abnormal indication 2 No welding current output	1 Overheat protection. 2 The circuit of auxilliary power supply is broken.	1 The machine will automatically return to normal in 5–10 minutes. 2 If problem persists, please contact a service agent.
1 Power switch doesn't work	1 Power switch is broken. 2 Three phase rectifier bridge is broken.	1 Replace the power switch. 2 Replace the three phase rectifier bridge. 3 Check if there is any short circuit of inner-machine.

## Appendix A Welding Parameter

Please refer to the following table for the welding process parameters of MMA welding, and the details shall be subject to the actual conditions.

Electrode type	Electrode model	Connection type	Welding post	Diameter (mm)	Current range (A)			
Structural steel electrode - acid electrode	E4313/ J421	DCEN	Flat position	2.5	50~90			
				3.2	90~140			
				4.0	150~210			
				5.0	210~270			
	E4303/ J422		DCEN	Horizontal position	3.2	90~120		
					4.0	120~180		
					Vertical position	3.2	90~110	
						4.0	120~150	
						Overhead position	3.2	95~120
							4.0	120~180
Structural steel electrode - basic electrode	E4315/ J427	DCEP	Flat position	2.5	50~90			
	E4316/ J426			3.2	80~125			
	E5015/ J507			4.0	140~180			
	E5016/ J506			5.0	180~240			
	E5018/ J506LMA		DCEP	Horizontal position	3.2	80~120		
	E5015-G/ J507R				4.0	140~170		
	E5015-G/ J507RH			Vertical position	3.2	80~105		
	E5515-G/ J557				4.0	120~150		
	E6015-D1/ J607				3.2	80~120		
	E8015-G/ J807				Overhead position	4.0	120~170	
E8515-G/ J857CrNi	4.0	120~170						
E9015-G/ J907	4.0	120~170						
Stainless steel electrode	A112	DCEN / DCEP	Flat position	2.5	50~80			
	E308-16/ A102			3.2	80~110			
	E347-16/ A132			4.0	110~160			
	E309-16/ A302			5.0	160~200			
Surfacing electrode	EDPCrMo-A2-03/ D132	DCEN / DCEP	Flat position	3.2	90~110			
	EDPMn2-15/ D107			4.0	140~180			
	EDCoCr-A-03/ D802	DCEN / DCEP	Flat position	5.0	180~220			
				4.0	120~160			
				5.0	140~190			

**DCEN:** Direct Current Electrode Negative.

**DCEP:** Direct Current Electrode Positive.

