



INVERTER WELDER

OPERATOR'S MANUAL

MODEL: ARC250(Z230)/ARC250(Z231)/ARC200C(Z232)

FORWARD

Thank you for JASIC inverter welder. In order to ensure your safety and correct operation, please read this manual carefully before operation. Keep this manual properly for future references.

This product is designed and manufactured according to relevant national and international standards, and meets GB15579, ICE60974, EN60974, AS60974 and UL60974 standard. Relevant design plans and manufacturing technologies of this product are patented.

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Version: A0

SAFETY

Precautions for installation









	<p>Beware of electric shock!</p> <ul style="list-style-type: none">● Install grounding device according to application standard.● Do not touch live parts with naked skin, wet gloves or wet clothes.● Be sure you are insulated from ground and workpiece.● Cover the cover plate of the machine before power on to avoid an electric shock.● Confirm the safety of your working position.
	<p>Beware of fire hazard!</p> <ul style="list-style-type: none">● Please install the machine on non-combustible materials to avoid a fire.● Make ensure there are no inflammables near the welding position to avoid a fire.
	<p>Beware of explosion!</p> <ul style="list-style-type: none">● Do not install the machine in an environment with explosive gas to avoid an explosion.



Replacing the components can be dangerous.

- Only professionals can replace the components of the machine.
- Make sure there are no foreign bodies such as wire leads, screws, gaskets and metal bars falling into the machine inside when replacing the components.
- Make sure the connecting wires inside the machine are correctly connected after replacing the PCBs, and then the machine can be run. Otherwise, there is a risk of damage to property.

Precautions for operation

	<p>Smoke-may be harmful to your health!</p> <ul style="list-style-type: none"> ● Keep your head away from the smoke to avoid inhalation of waste gas in welding. ● Keep the working environment well ventilated with exhaust or ventilation equipment when welding.
	<p>Arc radiation-may hurt your eyes and burn your skin!</p> <ul style="list-style-type: none"> ● Use proper welding mask and wear protective clothing to protect your eyes and body. ● Use proper mask or curtain to protect onlooker from being injured.
	<p>Magnetic field can make cardiac pacemaker a bit wonky!</p> <ul style="list-style-type: none"> ● People with cardiac pacemaker should consult the doctor before carrying out welding. ● Stay away from the welding source to reduce the affect of magnetic filed.
	<p>Improper use and operation may result in a fire or an explosion!</p> <ul style="list-style-type: none"> ● Welding spark may result in a fire, so please make ensure there are no inflammables near the welding position, and pay attention to fire safety. ● Ensure there is fire extinguisher nearby, and make sure someone has been trained to operate the fire extinguisher. ● Do not weld closed container. ● Do not use this machine for pipe thawing.
	<p>Hot workpiece can cause severe scald!</p> <ul style="list-style-type: none"> ● Do not touch hot workpiece with bare hands. ● Cool the welding torch for a while after continuously working.
	<p>Excessive noise does great harm to people's hearing!</p> <ul style="list-style-type: none"> ● Wear ear covers or other hearing protectors when welding. ● Give warning to onlooker that noise may be potentially hazardous to hearing.
	<p>Moving parts may injure your body!</p> <ul style="list-style-type: none"> ● Please keep away from moving parts (like fan). ● Each door, panel, cover, baffle plate, and protective device the like should be closed and located correctly.
	<p>Seek professional support when trouble strikes!</p> <ul style="list-style-type: none"> ● When trouble strikes in installation and operation, please inspect according to related contents in this manual. ● If you still cannot understand fully, or you still cannot solve the problem, please contact the dealer or the service center of JASIC to obtain professional support.

Precautions for discard

Pay attention to the following when discarding the welding machine:

- Burning the electrolytic capacitors in the main circuit or on the PCBs may cause an explosion.
- Burning the plastic parts such as the front panel may produce poisonous gas.
- Dispose it as industrial waste.

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1. GENERAL DESCRIPTION

1.1 Model coding

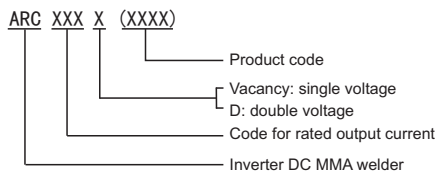


Figure 1-1: Model coding

1.2 Technical parameters

Table 1-1: General technical parameters

Items	Models		
	ARC250 (Z230)	ARC250 (Z231)	ARC250 (Z232)
Rated input power supply	Single-phase AC220V 50Hz		
Rated input capacity (KVA)	12.3	12.3	9.4
Rated input power (KW)	8.6	8.6	8
Rated input current (A)	56.8	56.8	40.8
Rated output (A/V)	250/30	250/30	200/28
No-load voltage (V)	67	78	78
Welding current range (A)	20~250	20~250	20~200
Arc force current range (A)	0~100	0~100	0~100
Cooling mode	Air cooling		
Rated duty cycle (%)	60	60	40
Insulation grade	F		
Enclosure ingress protection	IP21S		
Power factor	0.7	0.7	0.7
Efficiency (%)	85	85	85

1.3 Size and weight

Table 1-2: Overall size and weight of the machine

Model	ARC250(Z230)	ARC250(Z231)	ARC250(Z232)
Overall size (L*W*H)	430*168*312	430*168*312	430*168*312
Weight (Kg)	9.6	9.6	9.5

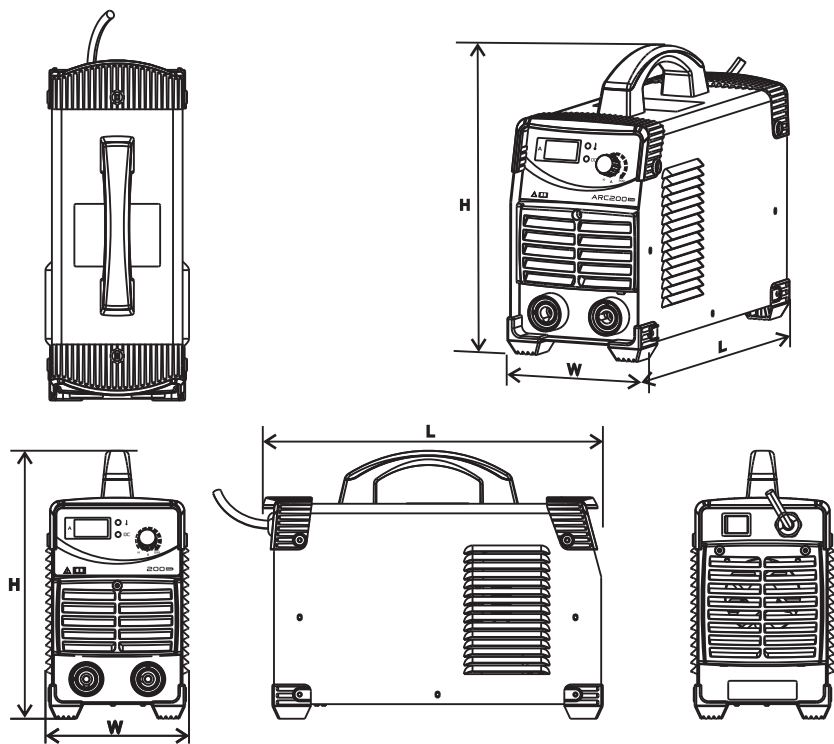


Figure 1-2: Appearance and size of the machine (Unit: mm)

1.4 Composition and configuration of the welding machine system

1) Composition

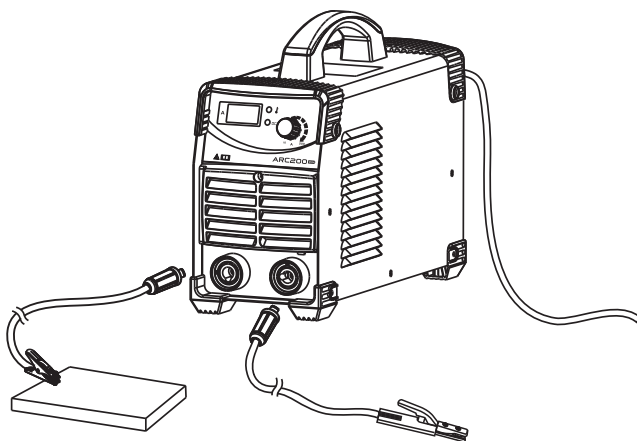


Figure 1-3: Composition of the welding machine system

2) Configuration

Table 1-3: Configuration of ARC250 (Z230)

Name	Material code	Specification	Quantity (pcs)	Remark
Welding machine		ARC250 (Z230)	1	Standard configuration
Quick plug	10004614	DKJ35-50 (black)	2	Standard configuration
Operator's manual		ARC series	1	Standard configuration

Table 1-4: Configuration of ARC250 (Z231)

Name	Material code	Specification	Quantity (pcs)	Remark
Welding machine		ARC250 (Z231)	1	Standard configuration
Quick plug	10004614	DKJ35-50 (black)	2	Standard configuration
Operator's manual		ARC series	1	Standard configuration

Table 1-5: Configuration of ARC200C (Z232)

Name	Material code	Specification	Quantity (pcs)	Remark
Welding machine		ARC200C (Z232)	1	Standard configuration
Quick plug	10004614	DKJ35-50 (black)	2	Standard configuration
Operator's manual		ARC series	1	Standard configuration

1.5 Functions and characteristics of the welding machine

ARC series are inverter welding machines made by our company with advanced inverter technology. These machines are mature models and with stable performance. This series includes several single-voltage and double-voltage models.

★ Advanced VMOS or IGBT inverter technology

- High inverter frequency greatly reduces the volume and weight of the welding machine.
- Great reduction in magnetic and resistance loss obviously enhances the welding efficiency and energy saving effect.
- Working frequency is beyond audiorange, which almost eliminates noise pollution.

★ Leading control mode

- Advanced control technology meets various welding applications and greatly improves the welding performance
- It can be widely used in acid and basic electrode welding.
- Easy arc ignition, little spatter, stable current and good shaping.

★ Common characteristics of MMA welding machines

- Portable, energy saving, with excellent dynamic characteristics and high efficiency, stable arc, molten pool easy to control, higher no-load voltage, better compensation of power and arc force, able to meet various welding requirements, applicable to aerial work, field work, indoor and outdoor decoration, etc.

★ Characteristics of double-voltage models

- It adopts automatic switching mode for voltage.
- Unique circuit design prolongs the service life of the capacitor and IGBT.
- New air duct design balances the temperature inside the machine and prolongs the service life of the components and machine.

1.6 System characteristics

1) Duty cycle

Rated duty cycle refers to the percentage of the normal work time of the machine under rated maximum current holding in the period when taking 10 minutes as a period. The rated duty cycle of this series is 40%~60% depending on different models. Using the welding machine continuously overrunning the rated load may lead to overheating of the machine, and frequently using the machine overrunning the rated load may accelerate the aging of the machine or even burn the machine.

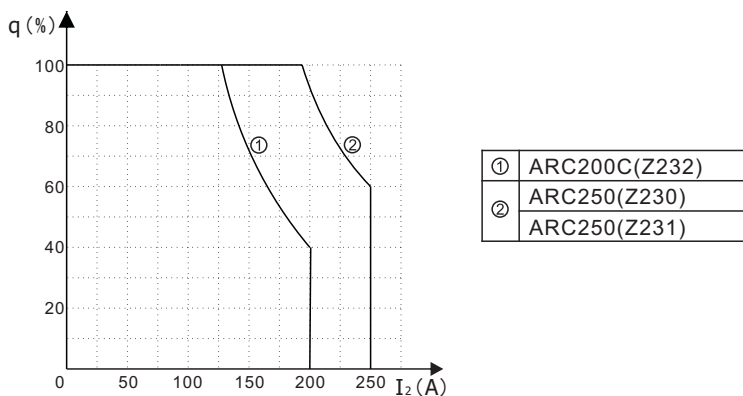


Figure 1-5: Duty cycle

2) Output characteristics

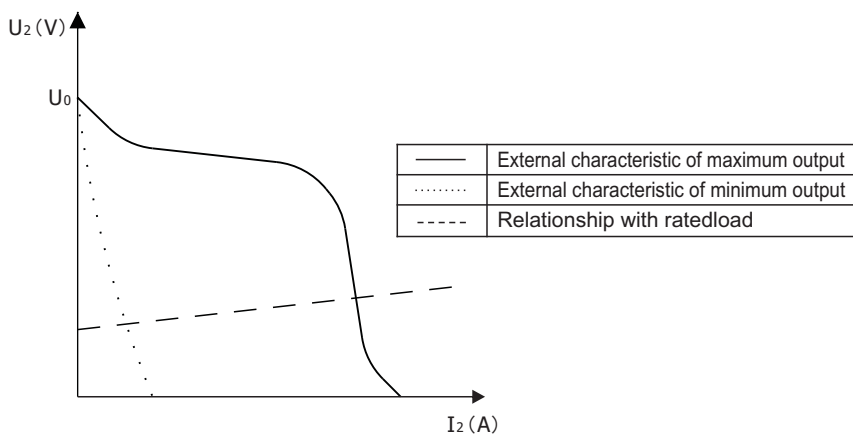


Figure 1-6: Output characteristic curves

2. INSTALLATION AND CONNECTION

2.1 Installation requirements

1) Connection of input cable

In order to ensure personal safety and avoid electric shock, please ground the machine reliably by connecting the ground wire (yellow-green wire) of the machine to the grounding device in the switching box.

A primary power supply cable is available for this welding machine. Connect the power supply cable to the rated input power. The primary cable should be tightly connected to the correct socket to avoid oxidization. Check whether the voltage value varies in acceptable range with a multi-meter.

The cross section of the leads used in the switching box should meet the requirements of the maximum input capacity of the machine.

2) Connection of output cable

Insert the plugs with the cable of the electrode holder and the cable of the earth clamp respectively into the quick sockets on the front panel of the machine, and tighten them to clockwise.

Operator can choose DCEN connection according to workpiece and electrode application requirement. Generally, DCEP connection is recommended for basic electrode, while there is no special requirement for acid electrode.

DCEN: Connect the electrode holder to “-” output terminal, and the workpiece to “+” output terminal.

DCEP: Connect the electrode holder to “+” output terminal, and the work clamp to “-” output terminal.

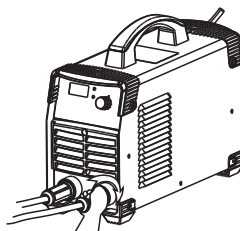


Figure 2-1: Connection of output cable

3) Connection of welding instruments

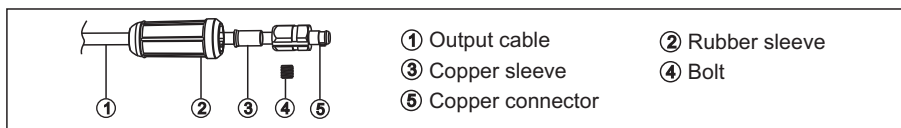


Figure 2-2: Connection of quick plug

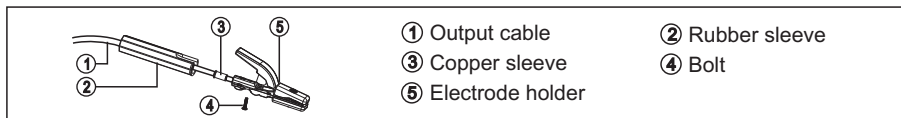


Figure 2-3: Connection of electrode holder

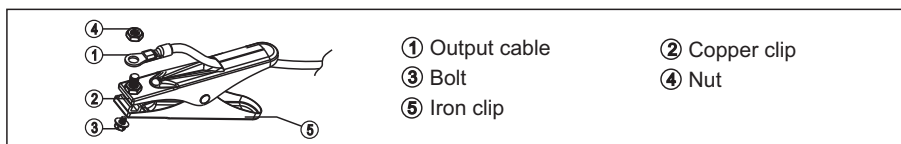


Figure 2-4: Connection of earth clamp

4) Preset the welding current according to the type and size of the electrode, clip the electrode and then welding can be carried out by short circuit arc starting. For welding parameters, please refer to the table below.

Table 2-1: Welding parameters table (for reference only)

Electrode dia. (mm)	Recommended welding current (A)	Recommended welding voltage (V)
1.0	20 ~ 60	20.8 ~ 22.4
1.6	44 ~ 84	21.76 ~ 23.36
2.0	60 ~ 100	22.4 ~ 24.0
2.5	80 ~ 120	23.2 ~ 24.8
3.2	108 ~ 148	23.32 ~ 24.92
4.0	140 ~ 180	24.6 ~ 27.2
5.0	180 ~ 220	27.2 ~ 28.8
7.0	220 ~ 260	28.8 ~ 30.4

Note: This table is suitable for mild steel welding. For other materials, consult related materials and welding process for reference.

2.2 Precautions

- 1) Make sure the place to install the machine can bear the weight of the welding machine.
- 2) Do not install the machine at places where water droplet splash may be produced, such as near water pipes.
- 3) Welding should be carried out in dry environment with humidity of 90% or less.
- 4) The temperature of the working environment should be between -10°C and 40°C.
- 5) Avoid welding in the open air unless sheltered from sunlight and rain. Keep it dry at all times and do not place it on wet ground or in puddles.
- 6) Avoid welding in dusty area or environment with corrosive chemical gas.
- 7) Do not carry out welding with the welding machine placed on a platform with a pitch greater than 15°.

Overcurrent/overvoltage/overheating protection circuit is installed in this machine. When the mains voltage, output current or inner temperature exceeds the set standard, the machine will stop automatically. However, excessive use (e.g. too high voltage) of machine may also damage the machine, so please note:



Good ventilation

This welding machine can create powerful welding current and has strict cooling requirements that cannot be met with natural ventilation. Therefore the built-in fan is very important in enabling the machine to work stable with effective cooling. The operator should make sure that the louvers be uncovered and unblocked. The minimum distance between the machine and nearby objects should be 30cm.



Overvoltage is forbidden.

This machine is of automatic mains voltage compensation, which ensures that the welding current varies within the given range. In case that the input mains voltage exceeds the tolerance value, it would possibly damage the machine. The operator should understand this circumstance fully and adopt relevant precautions.



Overload is forbidden.

Remember to observe the max load current at any moment (refer to the corresponding duty cycle). Make sure that the welding current should not exceed the maximum load current. Overload could obviously shorten the machine's lifespan, or even damage the machine.

A sudden halt may occur with the yellow LED on the front panel on while the machine is of over-load status. Under this circumstance, it is unnecessary to restart the machine. Keep the built-in fan working to lower the temperature inside the machine. Cutting can be continued after the inner temperature falls into the standard range and the red LED is off.

3. OPERATION

3.1 Operation method

- 1) After being installed correctly, and the power switch being switched on, the machine is started with the power LED on and the fan working.
- 2) Pay attention to the polarity when connecting. Phenomena such as unstable arc, spatter, and electrode sticking could happen if improper mode is selected. Exchange the polarity if necessary.
- 3) Select cable with larger cross section to reduce the voltage drop if the secondary cables (welding cable and earth cable) are long when the distance between the workpiece and welding machine is too big (50~100m).

3.2 Panel functions of ARC250 (Z230/Z231) &ARC200C (Z232)

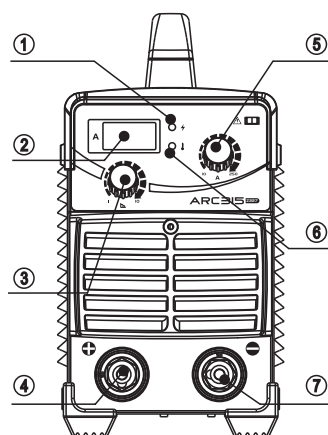


Figure 3-9: Front panel

No.	Part name	Function
1	Power indicator	To indicate the machine is powered on when it illuminates.
2	Digital meter	To display the welding current.
3	Arc force control knob	To adjust the arc force current value.
4	"+" output terminal	To connect the welding output cable.
5	Current control knob	To adjust the output current value.
6	Overcurrent indicator	To indicate the machine is under overcurrent protection status when it illuminates.
7	"-" output terminal	To connect the welding output cable.

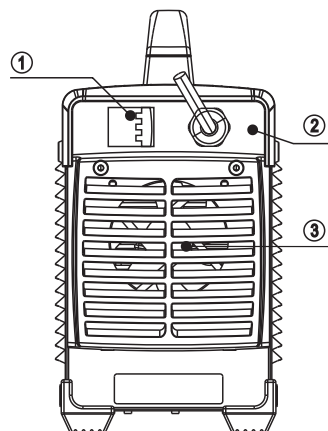


Figure 3-10: Back panel

No.	Part name	Function
1	Power switch	To control the ON/OFF of the input power of the machine.
2	Cable	For power supply input.
3	Cooling fan	For heat dissipation through forced air cooling.

4. MAINTENANCE

4.1 Daily maintenance



WARNING

The power of the switching box and the welding machine should be shut down before daily checking (except appearance checking without contacting the conductive body) to avoid personal injury accidents such as electric shock and burns.

Tips:

- 1) Daily checking is very important in keeping the high performance and safe operation of this welding machine.
- 2) Do daily checking according to the table below, and clean or replace components when necessary.
- 3) In order to ensure the high performance of the machine, please choose components provided or recommended by Shenzhen Jasic Technology Co., Ltd. when replacing components.

Table 4-1: Daily checking of the welding machine

Items	Checking requirements	Remarks
Front panel	Whether any of the components are damaged or loosely connected; Whether the output quick sockets are tightened; Whether the abnormality indicator illuminates.	If unqualified, check the interior of the machine, and tighten or replace the components.
Back panel	Whether the input power cable and buckle are in good condition; Whether the air intake is unobstructed.	
Cover	Whether the bolts are loosely connected.	If unqualified, tighten or replace the components.
Chassis	Whether the screws are loosely connected.	
Routine	Whether the machine enclosure has color fading or overheating problems; Whether the fan sounds normal when the machine is running; Whether there is abnormal smell, abnormal vibration or noise when the machine is running.	If abnormal, check the interior of the machine.

Table 4-2: Daily checking of the cables

Items	Checking requirements	Remarks
Earth cable	Whether the grounding wires (including workpiece GND wire and welding machine GND wire) break off.	If unqualified, tighten or replace the components.
Welding cable	Whether the insulating layer of the cable is worn, or the conductive part of the cable is exposed; Whether the cable is drawn by an external force; Whether the cable connected to the workpiece is well connected.	Use appropriate methods according to the work site situation to ensure safety and normal welding.

4.2 Periodic check



WARNING

Periodic check should be carried out by qualified professionals to ensure safety. The power of the switching box and the welding machine should be shut down before periodic check to avoid personal injury accidents such as electric shock and burns. Due to the discharge of capacitors, checking should be carried out 5 minutes after the machine is powered off.

Tips:

	<p>Safety</p> <p>All maintenance and checking should be carry out after the power is completely cut off. Make sure the power plug of the machine is pulled out before uncovering the welding machine.</p> <p>When the machine is powered on, keep hands, hair and tools away from the moving parts such as the fan to avoid personal injury or machine damage.</p>
	<p>Periodic check</p> <p>Check periodically whether inner circuit connection is in good condition (esp. plugs). Tighten the loose connection. If there is oxidization, remove it with sandpaper and then reconnect.</p> <p>Check periodically whether the insulating layer of all cables is in good condition. If there is any dilapidation, rewrap it or replace it.</p>
	<p>Beware of static</p> <p>In order to protect the semiconductor components and PCBs from the static damage, please wear antistatic device or touch the metal part of the enclosure to remove static in advance before contacting the conductors and PCBs of the machine internal wiring.</p>
	<p>Keep it dry</p> <p>Avoid rain, water and vapor infiltrating the machine. If there is, dry it and check the insulation of the welding machine (including that between the connections and that between the connection and the enclosure) with an ohmmeter. Only when there are no abnormal phenomena anymore, can the machine be used.</p> <p>Put the machine into the original packing in dry location if it is not to be used for a long time.</p>
	<p>Pay attention to maintenance</p> <p>Periodic check should be carried out to ensure the long-term normal use of the machine. Be careful when doing the periodic check, including the inspection and cleaning of the machine interior.</p> <p>Generally, periodic check should be carried out every 6 months, and it should be carried out every 3 months if the welding environment is dusty or with heavy oily smoke.</p>
	<p>Beware of corrosion</p> <p>Please clean the plastic parts with neutral detergent.</p>

5. TROUBLESHOOTING

Table 5-1: Troubleshooting for ARC250(Z230/231)&ARC200C(Z232)

Malfunction Phenomena	Cause and Solution
The power indicator/meter display does not illuminate; the fan does not work; no welding output.	<ul style="list-style-type: none"> a. Make sure that the mains voltage is normal. b. Make sure that the input cable is reliably connected to the power switch, and that the power switch can be switched on or off normally. c. Check whether any of the silicon bridge, IGBT tube or rectifier diode are damaged, and whether the gate resistor is burned out. Replace them if necessary. d. Check whether the connecting wires on PCBs are reliably connected. e. Power it on, and switch the digital multimeter to DC 1000V. Check if there is 310V DC at both terminals of the DC bus XT1/XT2 on the top PCB. If there is, replace the top PCB. Otherwise, replace the bottom PCB.
The power indicator/meter display illuminates; the fan does not work; no welding output.	<ul style="list-style-type: none"> a. The power switch is continuously switched on and off in a short time, which leads to overvoltage protection. Shut down the machine and restart it after 5~10 minutes, and then it will recover. b. The wire connecting the power switch with the power PCB breaks is loosely connected. Tighten it. c. The 24V relay on the power PCB is damaged or not closed. Check the 24V power supply and the relay. Replace the relay if necessary.
The fan works; the output current is unstable or cannot be controlled by potentiometer when welding.	<ul style="list-style-type: none"> a. Make sure that the mains voltage is normal. b. Check if the connecting wires on the control PCB are reliably connected. c. Check if the current adjustment potentiometer is damaged, and replace it if necessary. d. Replace the control module on the top PCB.
The fan works; the power indicator and meter display are normal; no welding output.	<ul style="list-style-type: none"> a. Open circuit or poor contact problems exit at the joints of output terminals. b. There is about DC 310V from the power PCB to XT1/XT2 on the top PCB. Check if the silicon bridge breaks or is not well connected. 2) Check if any of the 6 big electrolytic capacitors (470uF/400V) have leakage problem, and replace them if necessary. c. Check if the driving MOSFET (Z24/9Z24) for VT1-VT4 on the top PCB is damaged, and replace it if necessary. d. The control circuit fails. Please contact your distributor or JASIC.
The fan works; the abnormality indicator illuminates; no welding output.	<ul style="list-style-type: none"> a. Overheating protection occurs. It will recover automatically after 5~10 minutes. b. The feedback circuit (wire) fails.
The electrode holder becomes very hot.	<ul style="list-style-type: none"> a. The rated current of the electrode holder is smaller than its actual working current. Replace it with a bigger rated current. b. Check if the screw or wire of the electrode holder is reliably connected.
Excessive spatter in MMA welding.	The output polarity connection is incorrect. Exchange the polarity.



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