JASIC

INVERTER WELDER

OPERATOR'S MANUAL

MODEL: ARC300D(Z290)

Z290B002 SC-A0

Preface

Thank you for choosing JASIC inverter rebar electro slag pressure welder. For your safety and correct operation of the machine, please read this manual carefully before operation and keep it properly for future references.

This product is designed and manufactured according to standards GB15579, ICE60974, EN60974, AS60974,UL6074,etc.

This product conforms to electro compatibility requirements on A class equipments.

All design and manufacturing technologies adopted in this product are under the patents protection.

All products purchased from JASIC TECHNOLOGY CO.,LTD are covered for one-year defect liability period, starting from the purchasing date on sales contract. Jasic can provide a full range of technique supports and after sales services. Please feel free to contact Jasic agents or headquarters for your nearest support in case of any machine related questions.

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Version: A0

SAFETY GUIDANCE

Installation Precautions

	**Beware of electric shock!** ● Install grounding devices 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. ● To avoid electric shock, please close the cover plate before power on. ● Make sure all your working conditions are safe.
	**Beware of fire hazard!** ● To avoid fire hazard, please install the machine on non-combustible materials; ● To avoid fire hazard, please make sure there are no inflammables nearby.
	**Beware of explosion!** ● To avoid explosion, please do not install the machine in an explosive gas environment.

Replacing machine components can be dangerous.

- Only qualified personnel can replace the machine components.
- Make sure the setting is correct after replacing the PCBs; to avoid any damages, please confirm that all setting is correct before turn on the machine.
- Make sure there are no foreign matters such as wire leads, screws, gaskets and metal bars falling into the machine when replacing the components.

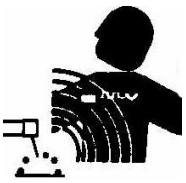
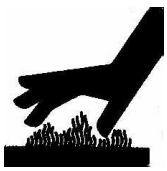
Moving the machine can be dangerous.

- Please make sure the input power switch is turned off before moving the machine.
- Please make sure rings are screwed tightly, machine casing and cover board installed properly while move the machine with crane.
- The lifting handle is only for manual short distance moving. Do not lift the machine from lifting handle so that to avoid falling items hurting people or other losses.
- Do not hoist welder and any other objects at the same time.
- Do not stress the operation panel and cover plate while moving the machine so that to avoid falling items hurting others.
- To avoid possible fire hazard or other damages, please do not install and operate this machine if it's found damaged or lack of components.
- Please make sure hanging rings are screwed tightly, as well as machine enclosure and cover plates

are installed properly while moving the machine with a crane.

- Please hoist the machine with two lifting belts and keep intersection angle between belts and vertical direction being less than 15°.

Operation Precautions

	**Fume and gases can be dangerous!** ● Welding may produce fumes and gases hazardous to health. Please avoid breathing these fumes and gases. ● Keep your head away from fumes and gases during welding. Please use enough ventilation or exhaust to keep fumes and gases away from the breathing zone.
	**Arc rays can burn!** ● Use suitable shield and clothing to protect your eyes and body. ● Protect other nearby personnel with suitable and non-flammable screening from being injured.
	**Magnetic field can be harmful to pacemakers.** ● Electric current flowing through any conductor can create electric and magnetic fields. Welders having peacemakers should consult their doctor before operating this equipment. ● Please stay away from the power source as possible as you can to reduce the interference from magnetic field.
	**Improper operation may cause fire or explosion.** ● Welding spark may cause fire. Please make ensure there are no inflammables in welding area, and always be alert to fire safety. ● Make sure there is fire extinguisher readily available and welders are well trained to operate the fire extinguisher. ● Do not weld air-tight container. ● Do not use this machine for pipe unfreezing.
	**Weld materials can burn.** ● Do not touch hot workpiece with bare hands. ● Cool the welding torch for a while after continuously working.
	**Excessive noise can be harmful to hearing.** ● Wear ear covers or other hearing protectors when welding. ● Give warning to nearby personnel that noise may be potentially hazardous to hearing.

	**Moving parts may injure your body.** ● Please keep away from moving parts (such as fan). ● All doors, panel, cover, baffle plate, and other protective device should be closed and well located.
	**Asking for professional support while trouble strikes.** ● When trouble strikes in installation and operation, please resort to this manual for according contents. ● If you are still in lost, or you still cannot solve the problem, please contact the JASIC dealer or the service center for professional support.

Equipment Scrapping Precautions

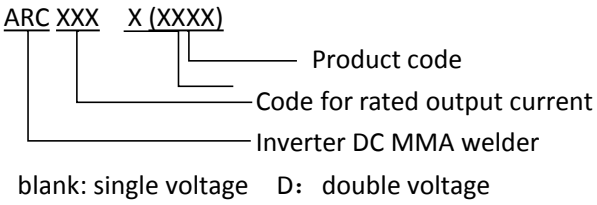
Pay attention to the following when discarding welding machine:

- 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.

CONTENTS

CHAPTER1 GENERAL DESCRIPTION

1.1 Model coding



1.2 Technical specification

Welder specification is as shown in Table 1-1.

Table 1-1 Technical specification

	Model		
	ARC300D (Z290)		
Input voltage	1-PH AC220V	1-PH AC440V	3-PH AC440V
Rated input capacity(KVA)	10.6	9.4	14.1
Rated input capacity(KW)	8.6	7.7	11.4
Rated input current(A)	48	24.8	18.4
Rated output(A/V)	220A/28.8V	200A/28V	280A/31.2V
Rated no load voltage(V)	80	81	81
Welding current range(A)	40-220	40-200	40-280
Arc force range(A)	0-60	0-60	0-60
Cooling type	Air cooling	Air cooling	Air cooling
Rated duty cycle(%)	40%(40°)	30%(40°)	30%(40°)
Insulation grade	F	F	F
Enclosure protection class	IP21S	IP21S	IP21S
power factor	0.73	0.73	0.73
Efficiency(%)	85	85	85

1.3 Dimension and weight

Table 1-2 Machine appearance and weight

Model	ARC300D
Weight	13.6kg
Dimension	500*220*360MM

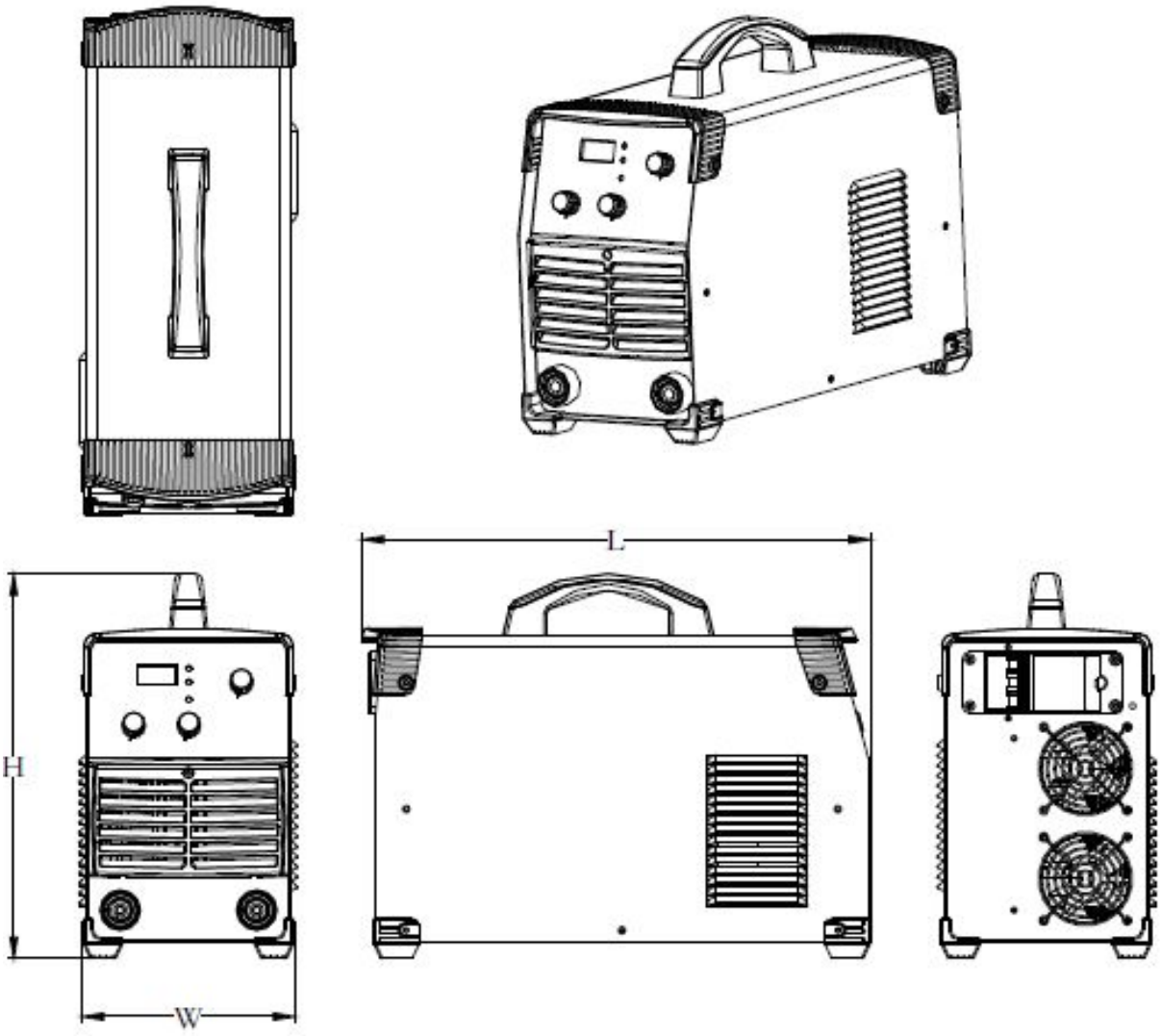


Fig.1-2 Machine dimension（unit：mm）

1.4 Machine configuration

1. Machine configuration

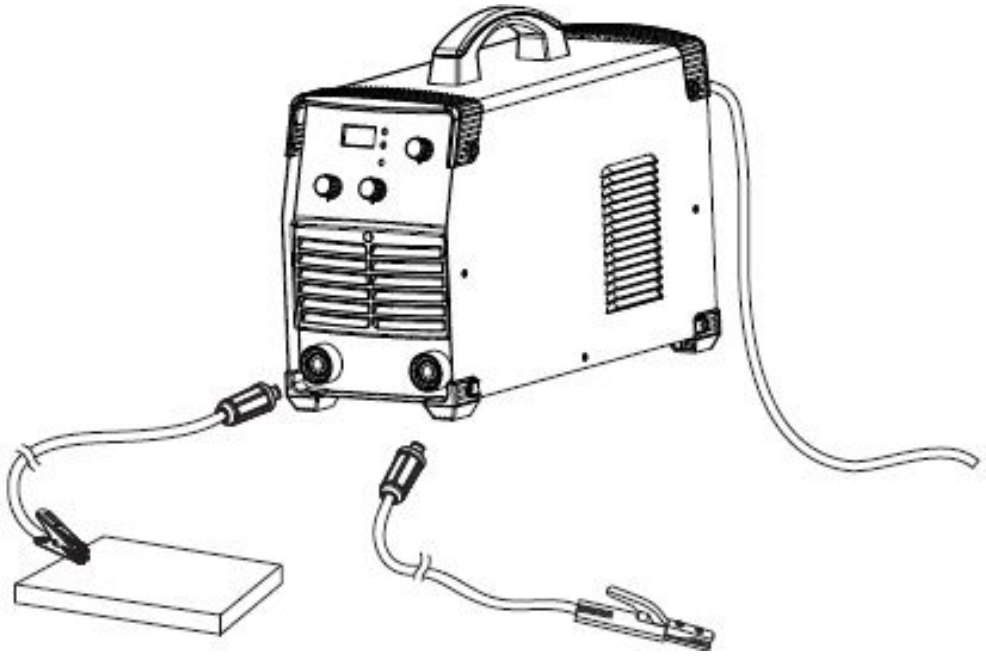


Fig.1-3 Machine configuration

2. Standard factory configuration as shown in Table 1-3

ARC300D(Z290) Standard Factory Configuration			
Name	Specs	Quantity(pcs)	Remark
Welding machine	ARC300D Z290	1	Standard
Quick connector	DKJ35-50 plug	2	Standard
Operator's Manual	English version	1	Standard
Warranty card	English warranty card	1	Standard

1.5 Functions and features

ARC series is Jasic advanced inverter welding machines with mature and reliable performances. This machine is of dual voltages.

The adoption of advanced IGBT technology.

- 41KHz inverter frequency largely reduces machine weight and size.
- Largely reduced copper and core loss improves machine efficiency and more cost-efficient.
- Switch frequency is beyond audio frequency which almost eliminates noise pollution.

Wide voltage and multi-voltage working modes

- Automatic recognition of input voltage requires no manual switch.
- Simple and randomness input cable connection results in no wrong connection.
- Wide voltage working range; normal working when fluctuation is within +/-15% of rated voltage.

Different additional external functions

- Adjustable hot start current and arc force current.
- Normal Self-adjusting arc force suitable for various length welding cable
- Anti-sticking function can largely improve welding performances and avoid electrode sticking.
- Intelligent fan; no working while under no load which can prolong the fan life-span.

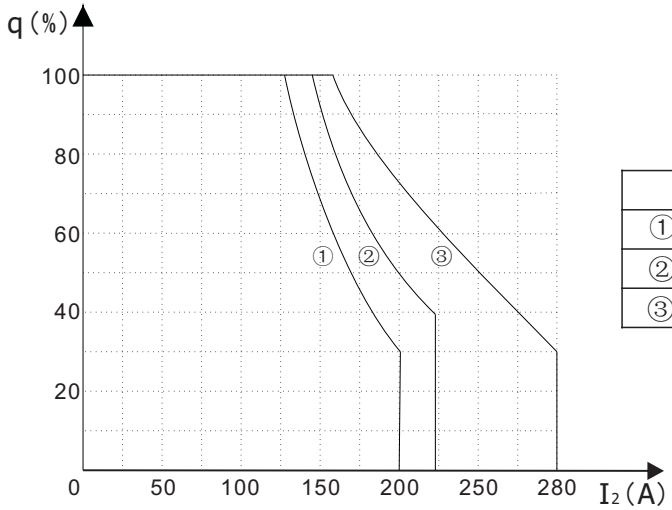
Improved protection class

- Left and right internal electric layout which separates inverter and control part, which is tos ay segregation of high voltage area and low voltage area.
- Optimized complete ventilation design guarantees machine’s well operation after 1 hour 25kg metal dust test.
- Robust mechanical structure makes sure machine can past the X,Y,Z axles high frequency vibration test under 8G acceleration speed with 2mm displacement.

1.6 Machine system characteristics

1. Duty cycle

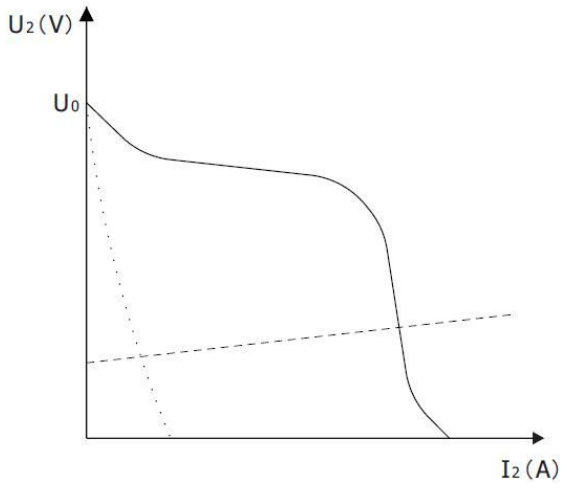
Rated duty cycle refers to the percentage of the normal work time of the machine under rated maximum current holding in the period when taking 10 minutes as a period. The rated duty cycle of this series is 30% or 60% depending on different models. Operating welding machine over rated load may lead to overheating of the machine, and frequent using the machine over rated load may accelerate the aging or even burn the machine.



	ARC-300D(Z290)
①	1~440V
②	1~220V
③	3~440V

Fig 1-5 Duty cycle sketch map

2.Output characteristics



———	External characteristic of maximum output
·····	External characteristic of minimum output
- - - - -	Relationship with rated load

CHAPTER 2 INSTALLATION AND WIRING

2.1 Installation requirements

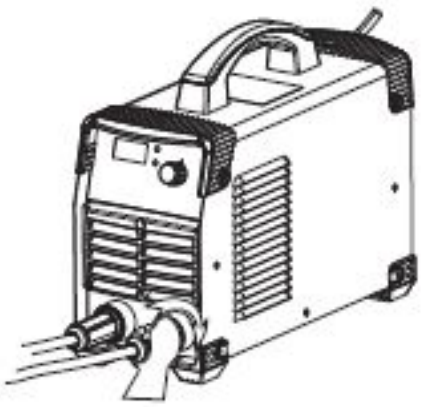
1) Connection of input cable

In order to ensure personal safety and avoid electric shock, please reliably connect the welder ground wire (yellow/green wire) 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 fluctuation is within the limit by using a multi-meter.

2) Connection of output cable

Insert the electrode holder cable quick connector and earth clamp cable quick connector to the machine front panel sockets respectively and tighten them clockwise.



Operator can choose different polarity connection type based on workpiece material and electrode type.

Generally speaking, for it’s suggested to use DCEP for basic electrodes, and no special requirements for rutile electrodes.

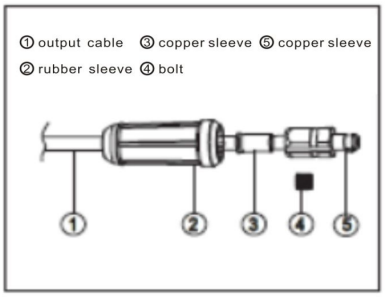
DCEN: electrode holder connected to negative, and workpiece connected to positive.

DCEP: workpiece connected to negative, and electrode holder connected to positive.

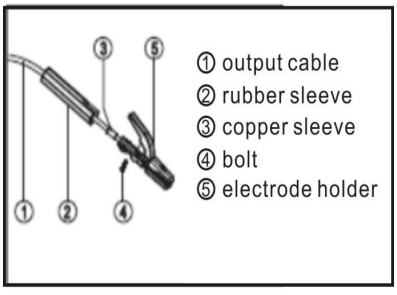
Fig. 2-1 Connection of output cables

3. workpiece connection

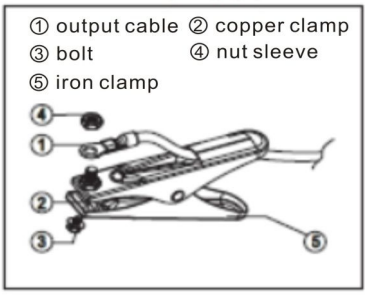
Quick connector copper adaptor



Electrode holder connection



Earth clamp connection



4. Please refer to the below table for welding parameters.

Table 2-1 welding parameters reference table

Electrode specs(mm)	Reconmmended welding current(A)	Voltage(V)
1.6	45-85	21.8-23.4
2.0	60-100	22.4-24
2.5	80-120	23.2-24.8
3.2	110-150	23.3-25
4.0	140-180	25.6-27.2
5.0	180-220	27.2-28.8

2.1 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 occur.
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℃ and 40℃.
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°.

This product is equipped with overcurrent/overvoltage/overheating protection circuit. 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 cutting 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. Welding can be continued after the inner temperature falls into the standard range and the yellow LED is off.

CHAPTER 3 OPERATION

3.1 Panel functions

- After being installed correctly, and turn on the power switch. The power indicator will light up and fan is start working; welding machine is under normal working.
- Please carry out welding according to workpiece and processing requirements. Inappropriate setting can lead to unstable arc, big spatter and electrode sticking. If there is any phenomenon like that, user can switch the quick connector to change the polarity fast and conveniently .
- If the workpiece is far away from the welding machine(50-100m), which means the secondary cables(electrode holder cable and earth cable) are too long, please increase the cable size accordingly so that to lower the cable voltage drop.

3.2 Panel functions description

Fig 3-1 Front panel

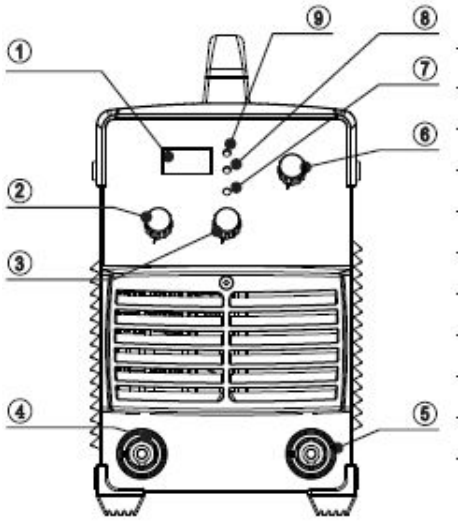
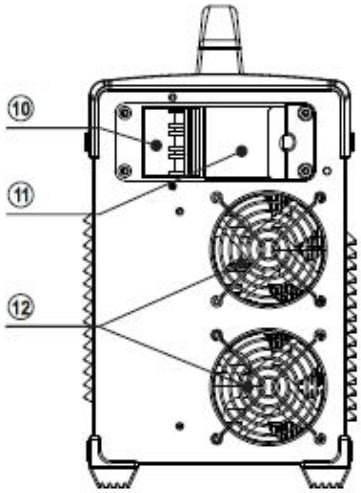


Fig 3-2 Rear pane



No	Name	Function
1	Ampere meter	Output current display
2	Arc force current potentiometer	Adjust arc force current
3	Welding current potentiometer	Adjust welding current
4	Arc start current potentiometer	Adjust hot start current
5	+ Output terminal	“+“ output
6	- Output terminal	“-“ output
7	3ph 440V indicator	To show the working status is 3ph 440V
8	1ph 440V indicator	To show the working status is 1ph 440V
9	1ph 220V indicator	To show the working status is 1ph 220V

Item	Name	Function
10	Power switch	Power supply on/off
11	Connecting box	External connection input power
12	fan	Force 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 abnormity 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.
Side plates	Whether the side plate is loosely fixed.	
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:

	**Safety** 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. 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.
	**Periodic check** 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. Check periodically whether the insulating layer of all cables is in good condition. If there is any dilapidation, rewrap it or replace it.
	**Beware of static** 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.
	**Keep it dry** 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. Put the machine into the original packing in dry location if it is not to be used for a long time.
	**Pay attention to maintenance** 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. 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.
	**Beware of corrosion** Please clean the plastic parts with neutral detergent.

5. TROUBLESHOOTING

5.1 Welder Failure and welding problems

Table 5.1 ARC300D Z290 Welder failure and welding process problems

Malfunction Phenomena	Solution
Power indicator is not lighting up; Fan is not working and no welding output	a) Please make sure the power switch is turned on. b) Please make sure there is power supply from the input cable.
Power indicator is on, fan is not working and no welding output	a) It's normal that the fan is not working and no welding output within 10s when machine is powered on. b) Digitally-controlled fan; when the machine temperature is not high enough, fan is not going to work. c) There is still no output when turning on the machine after 10s, please check the connection between control board and filter board; and check if the drive wire and feedback wire from control board to inverter board are under good condition and if there is any worn or loosing part.

Power indicator is on; fan is working, but no welding output.	a) Please check all connection wires inside the machine are under good condition and if there is any damage part. b) Please check if there is any poor connection for all output connection. c) Display shows E-1 that means machine is under over-heat protection; if this is the case, there is no need to pull out the plug, but only need to wait the machine to cool off; welding can be resumed when E-1 turned back to normal values. d) Display shows E-1, but machine won't resume to normal welding; or it shows E-1 quickly after recovery. If this is the case, please check if two fans are working; if there is non-working fan, please check if the fan wire is under good condition; if the wire is under good condition, please replace the non-working fan. e) If there is no E-1 abnormal code displaying, please turn off the machine and use a multimeter diode to check whether the two output ports are short-circuited or not, if yes, please check the center board's diode and transformers are under good condition or short-circuited; if there is any short circuit, please replace. Please check whether audion (8050) Q10, Q11 on control board PK-323 are under good condition or not; if not, please replace them. Please check whether the stabilivolt Z8 (5.1V) is damaged or not; if yes, please replace it.
When input voltage is 1ph AC220V, but the 1ph AC440V indicator is on	a) Check if it is connected to the correct power system and voltage. Whether one input line is connected to a neutral line, a live line can be measured with a multimeter. b) If the measured access voltage is AC220V, but 440 indicator is still on, check whether the D3 and D4 lines on the switch power supply board PS-42 are obviously damaged, if any, please replace them; c) Check if the U5 on the control board PK-323 is damaged or hot, if any, replace it;

When input voltage is 1ph AC440V, but the 1ph AC220V indicator is on	a) Check if it is connected to the correct power system and voltage. If the input line is connected to two live lines (when the three-phase 440 is connected, arbitrarily connect two, that is 1ph 440), it can be measured with a multimeter; b) If the measured access voltage is AC440V, but 220 indicator is still on, check whether the D3 and D4 lines on the switch power supply board PS-42 are obviously damaged, if any, please replace them; c) Check whether the U5 on the control board PK-323 is damaged or hot. If it is, please replace it. Check if the load resistance R13 (3W/22R) is obviously burnt. If it is, please replace it.
When input voltage is three-phase AC440V, but the 1ph AC440V indicator is on	a) Check if it is connected to the correct power system and voltage, whether the three primary input lines are plugged in well, and whether there is any poor connection. The voltage between each two lines can be measured by a multimeter; b) Check whether the connection line from the filter board PZ-149 to VH-08 of control board PK-323 is well connected, whether there is a single drop or damaged, if any, please replace it; c) Check if R22 and R23 (3W/100K) on the filter board PZ-149 are damaged. If yes, please replace them.
Error code indication	E-1: Overheat protection E-2: Overcurrent protection E-3: Overvoltage protection E-4: +15VDC power abnormal protection E-5: Uneven current protection

5.2 After-sales service

Warranty card

Please read the warranty card carefully and fill in the related information.

Please keep the warranty card properly.

Maintenance

For welder failures and welding process problems, please refer to “Table 5.1 Welder failure and welding process problems”.

Please contact local Jasic agents for maintenance and components replacement.

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