JASIC ARC200

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1. Safety Precautions

During the welding process, there may be injury to you and others. Take precautions during welding. For details, please refer to Safety Protection Guide for Operators meeting the accident prevention requirements of the manufacturer.



Only trained professionals can operate the equipment!

- Use welding protection supplies recognized by the national safety supervision department!
- The operator must be a special operator with the valid Operation Certificate for Metal Welding (Gas Cutting)!
- Do not operate in live state when maintaining and repairing the welding machine.



Electric shock - may result in serious injury or death!

- Install the grounding device according to the application standard.
- Do not touch live parts when your skin is exposed, you wear wet gloves or wear wet clothes.
- Make sure you are insulated from the ground and the workpiece.
- Confirm that your working position is a safe state.



Smoke - may be harmful to health!

- Keep your head out of the smoke to avoid inhalation of welding gas.
- Use ventilation or exhaust device during welding to maintain good air circulation in the working environment.



Arc radiation - may damage your eyes and burn your skin!

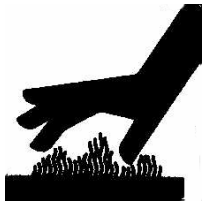
- Wear suitable welding mask and protective clothing to protect your eyes and body.
- Protect bystanders from injury with suitable mask or curtain.



Improper operation may result in fire or explosion

- Welding sparks may cause fire. Please make sure there is no combustible material near the welding position, and pay attention to safety and fire prevention.
- Ensure that the fire extinguishing devices are available nearby and there is a person who can skillfully use these fire extinguishers.
- Do not weld the closed containers!

·**Do not use the machine to unfreeze pipes.**



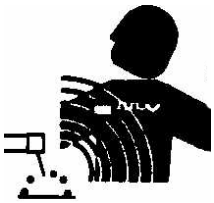
Hot workpieces may cause severe burns

- Do not touch hot workpieces by bare hands.
- Cool the welding torch for a period of time when using it continuously.



Noise - Excessive noise is harmful to hearing

- Protect your ears, wear ear defenders or wear other hearing protectors.
- Warn bystanders of the potential damage to their hearing caused by noise.



Magnetic fields affect cardiac pacemakers

- Pacemaker users shall stay away from the welding site before consulting a doctor.



Moving parts may cause personal injury

- Avoid moving parts (such as fan).
- Close and put protective devices in place, such as doors, panels, covers and baffle plates.



Fault - Seek professional help when you encounter difficulties.

- If you encounter difficulties during installation and operation, troubleshoot according to the relevant contents of this manual.

2. Description of Symbols



Precautions during operation



Objects to be specially described and prompted



There are more detailed instructions in the video



Do not dispose electrical wastes and other common wastes together. Please protect the environment.

3. Product Overview

The unique electrical structure and air duct design inside the machine can accelerate the heat generated by power devices, thereby increasing the duty cycle of the machine. Because of the cooling efficiency of its unique air duct, the damage to power devices and control circuit caused by the dust sucked by the fan can be effectively avoided, greatly improving the reliability of the machine.

The overall appearance of the machine is the plastic shell outer frame, tough lines are used between the front and rear panels, so that the front and rear panels are connected naturally and integrated seamlessly, so that the machine has a superior texture and a tough style.

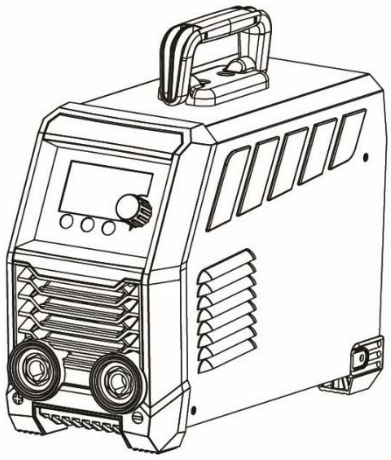


Figure 1

4. Function Overview

- **Multi-functional design**
  - Thermal arc striking function: make manual welding arc striking easier and more reliable
  - Anti-adhesion function: reduce the working intensity during welding
  - Thrust function: easier welding, sufficient long-line current
  - Unified function: Easy to weld, suitable for green hands

5. Performance Characteristics

- **Advanced IGBT inverter technology**
  - The inverter frequency is 45KHz, which significantly reduces the volume and weight of the welding machine.
  - Significantly reduced copper and iron loss obviously improves the efficiency of the whole welding machine, and the energy saving effect is remarkable.
  - The switching frequency is beyond the audio frequency, almost eliminating noise pollution.
- **Leading control mode**
  - The advanced control scheme significantly improves the performance of the welding machine and meet the welding process requirements to a greater extent.
  - The machine can be widely used for welding with acid and basic electrodes.
  - The machine has the characteristics of easy arc striking, little spatter, stable current and good molding.
- **Attractive appearance and structure design**
  - The front and rear panels adopt the plastic shell design, making the overall appearance more attractive.
  - The front and rear panels are made of high strength engineering plastics, which can effectively ensure that the machine works efficiently under harsh conditions such as high impact and drop.
  - Excellent insulation performance.
  - Good three-proof design, anti-static, good corrosion resistance.

6. Main technical parameters

Technical Parameter	Model
	ARC200 (Z2K6B016)
Rated input voltage	AC230V±15% 50/60Hz
Rated input power	9.4
Rated duty cycle	20
No-load voltage	65
Welding current range	20～200
Overall efficiency (%)	85
Housing protection grade	IP21S
Power factor	0.7
Insulation grade	H
Standard	IEC 60974-1
Noise (db)	＜70
Size (L*W*H)	336*152*246mm
Weight (kg)	/
Applicable electrode (mm)	2.5-4.0

The duty cycle is tested at 40℃.

7. Electrical Block Diagram

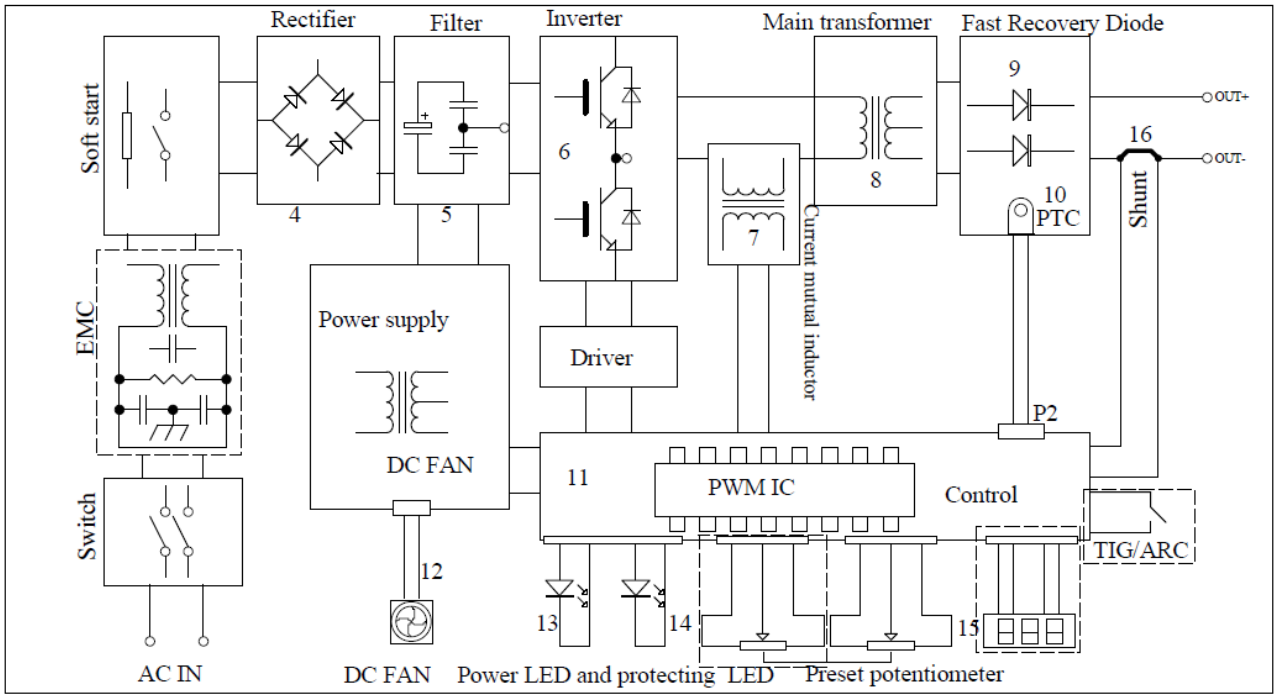


Figure 2

8. Operation Control and Instructions

8.1 Introduction to Functions of ARC200 Front Panel

1. **Digital meter:** To display the welding current and welding parameter.
2. **Welding Mode button:** For MMA/MMA Synergy/Lift-TIG welding mode conversion.
3. **Electrode diameter button:** For electrode diameter conversion.(For MMA Synergy Mode only).
4. **Welding parameter button:** For Welding/Hot start/Arc force current and workpiece thickness conversion.(For MMA mode only)
5. **"+"output terminal:** Connected to earth clamp
6. **Parameter adjustment knob:** Rotate the knob to adjust the parameters
7. **"-"output terminal:** Connected to electrode holder.

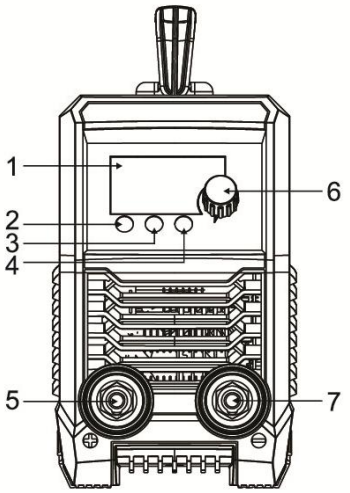


Figure 3

8.2 Introduction to Functions of ARC200 Rear Panel

1. Cable : For power supply input.
2. Power switch: To control the ON/OFF of the input power of the machine.
3. Cooling Fan : For heat dissipation through forced air cooling.

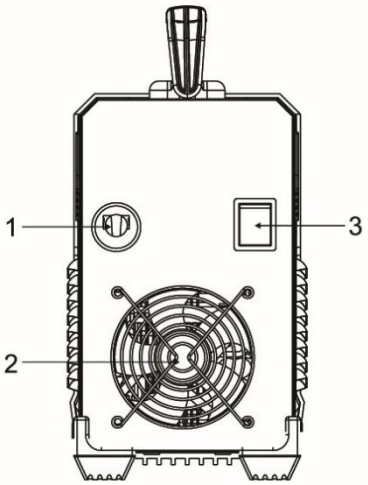


figure 4

8.3Control Panel

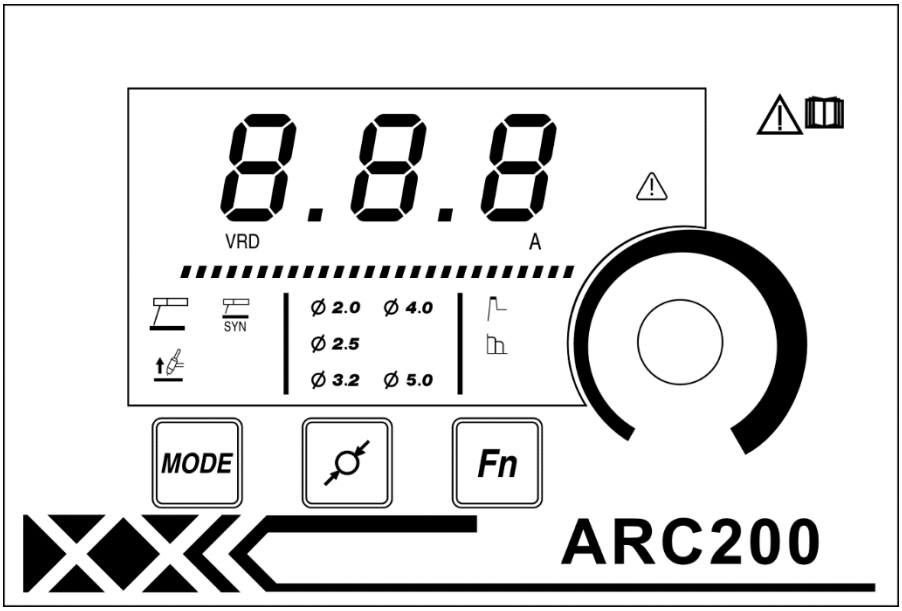


figure 5

No.	Part name	Function
1	Parameter adjustment knob	Rotate the knob to adjust the parameters.
2	Button"MODE"	For MMA/MMA Synergy/Lift-TIG welding mode conversion.
3	Button"Ø"	For electrode diameter "Φ2 Φ2.5 Φ3.2 Φ4.0 Φ5.0" conversion.(For SYN mode only)
4	Button"Fn"	For Welding/Hot start/Arc force current and workpiece thickness conversion.(For MMA mode only)
5	8.8.8	1.Displays the value of the current parameter. 2.If there is no operation after 3-5 seconds,it will automatically display the value of the setting welding current. 3.When the product is not working correctly, an error code is displayed.
6		If the indicator is on, it indicates the MMA mode is selected.
7	SYN	If the indicator is on, it indicates the MMA Synergy mode is selected.
8		If the indicator is on, it indicates the Lift-TIG mode is selected.
9	Ø 2.0 Ø 4.0 Ø 2.5 Ø 3.2 Ø 5.0	MMA synergic electrode diameter selecting indicator.
10		MMA hot start adjusting indicator. When it is blinking, hot start current can be set at present.

11		MMA arc-force adjusting indicator. When it is blinking, arc-force current can be set at present.
12	A	Unit of current.
13	VRD	The VRD function is on when it is blinking
14		The machine is on alarm state when it is blinking.

9. Installation, Debugging and Operation

Note: Please strictly follow the following steps for installation and debugging!

The electrical connection operation must be carried out after the power switch of the distribution box is turned off!

The protection level of the machine is IP21S. Avoid using in the rain!

9.1 Installation Method:

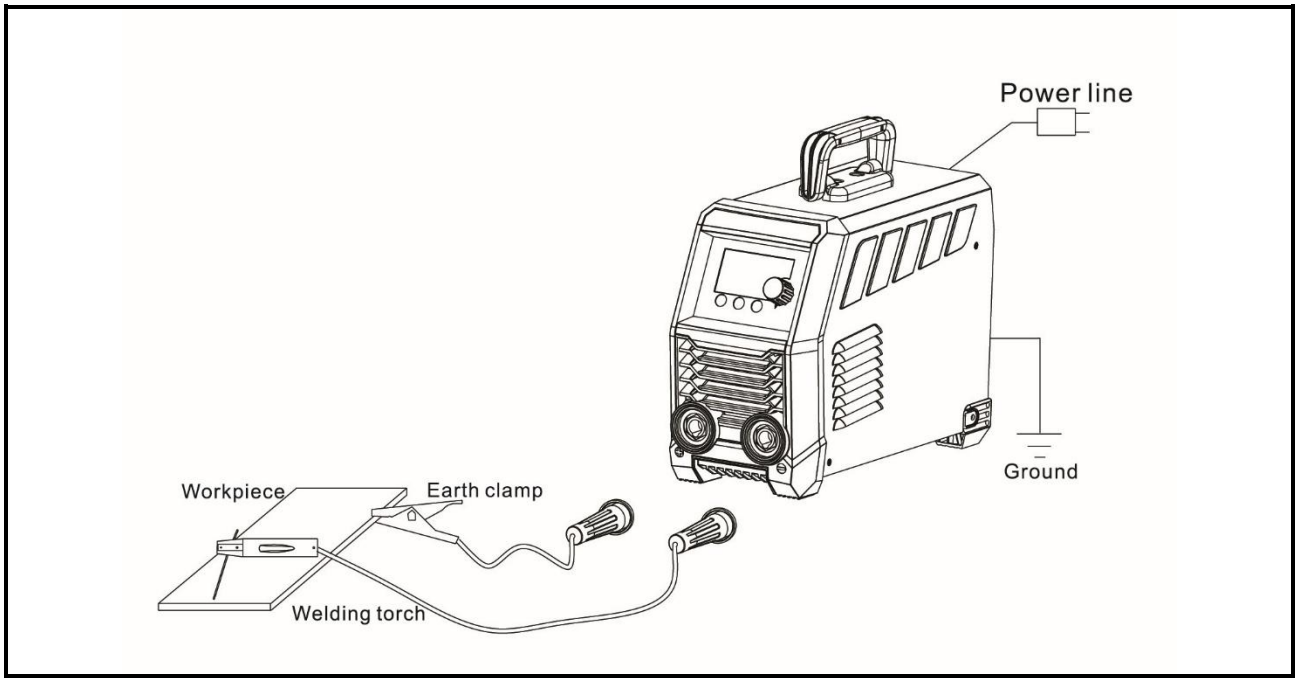


Figure 7 Manual Welding Diagram

1) Each machine is equipped with a primary power line, which shall be connected to the corresponding voltage level according to the input voltage of the welding machine. Do not misconnect the voltage level.

2) The primary power supply shall be in good contact with the corresponding power terminal or socket to prevent

oxidation.

3) Measure whether the input voltage value is within the fluctuation range by use a multimeter.

4) Insert the cable plug with the electrode holder into the positive socket under the front panel of the welding machine and tighten it clockwise.

5) Insert the cable plug with the ground cable clamp into the negative socket under the front panel of the welding machine and tighten it clockwise.

6) Properly ground the power supply.

Items 4) and 5) above are DC reverse connection methods as shown in Figure 6. The operator can also choose DC forward connection method according to the base metal and electrode condition. Generally speaking, DC reverse connection method is recommended for basic electrodes (namely, electrode forward connection). No special requirements are specified for acid electrodes.

9.2 Operation Method

1) After correct installation according to the above method, turn on the power switch and set the power switch to ON position. At this time, the LCD screen is on, the fan inside the machine starts to rotate, and the welding machine starts to work normally.
2) Pay attention to the wiring polarity. There are two methods of wiring for DC welding machine: forward connection method and reverse connection method. Forward connection method: connect the electrode holder to the negative electrode, and connect the workpiece to the positive electrode; reverse connection method: connect the workpiece to the negative electrode, and connect the electrode holder to the positive electrode. Select according to the workpiece process requirements. In case of improper selection, arc instability, splash and adhesion will occur. In this case, replace the fast plug to change polarity.
3) If the workpiece is far away from the welding machine and the secondary wires (electrode holder wire and ground wire) used are relatively long, the cross-sectional area of the wires shall be larger as far as possible to reduce the cable voltage drop.

Pre-adjust the welding current according to the specification and model of the electrode, clamp the electrode, and strike arc by short circuit. For welding parameters, refer to the following table.

9.3 Welding Process Checklist (this table is for reference only)

Diameter of electrode **(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
6.0	220~260	28.8~30.4

Note: This table is suitable for low carbon steel welding. For other materials, refer to the relevant material and process manual.

10. Cautions

10.1 Operating Environment

1) Welding operation shall be carried out in a relatively dry environment, and the air humidity shall not exceed 90%.

2) The ambient temperature shall be between -10°C and 40°C.

3) Avoid welding in sunlight or rain, and prevent water or rainwater from infiltrating into the welding machine.

4) Avoid welding in the dusty area or corrosive gas environment.

5) Avoid gas shielded welding in an environment with strong air flow.

10.2 Safety Precautions

The overheating protection circuit and the open phase protection circuit have been installed in the welding machine. When the input line loses phase and the output current and the machine temperature exceed the set standard, the welding machine will automatically stop working. However, **excessive use (such as high voltage)** will still cause damage to the welding machine, so you still need to pay attention to the following items:

1) Ensure good ventilation!

The welding machine is an industrial welding machine. A large operating current passes through during operation. Natural ventilation cannot meet the cooling requirements of the welding machine, so two fans are installed to effectively cool the welding machine to make it work smoothly. The user shall confirm that the ventilation area is not covered or blocked, and the distance between the welding machine and the surrounding objects shall not be less than 0.3m. The user shall maintain good ventilation, because it is very important for better operation and longer service life of the welding machine.

2) Do not overload!

The user shall use the welding machine according to the allowable duty cycle (refer to the duty cycle table for the welding machine), maintain the welding current not to exceed the maximum allowable load current. Current overload will significantly shorten the service life of the welding machine, even burn the welding machine.

3) Prohibit excessively high voltage!

The supply voltage is listed in the table of main performance parameters. In general, the automatic voltage compensation circuit in the welding machine will keep the welding current within the allowable range. If the supply voltage exceeds the allowable value, the welding machine will be damaged. The user shall be fully aware of this situation and take corresponding preventive measures.

4) A grounding screw is attached on the back of each welding machine and marked with a grounding mark. Before use, reliably ground the shell of the welding machine with a cable with cross section more than $6mm^2$ to release static electricity or prevent accidents that may occur due to leakage.

5) If the welding machine works beyond the standard duty cycle, the welding machine may be suddenly in the protection state and stop working, which indicates that the welding machine exceeds the standard duty cycle, and excessive heat triggers the temperature control switch to cause the welding machine to stop working. E60 or E61 will be displayed on the front panel. In this case, you need not unplug the power supply so that the cooling fan can work continuously to cool the welding machine. When E60 or E61 returns to normal welding current value and the temperature drops to the standard range, you can restart the welding.

11. Welding Basis

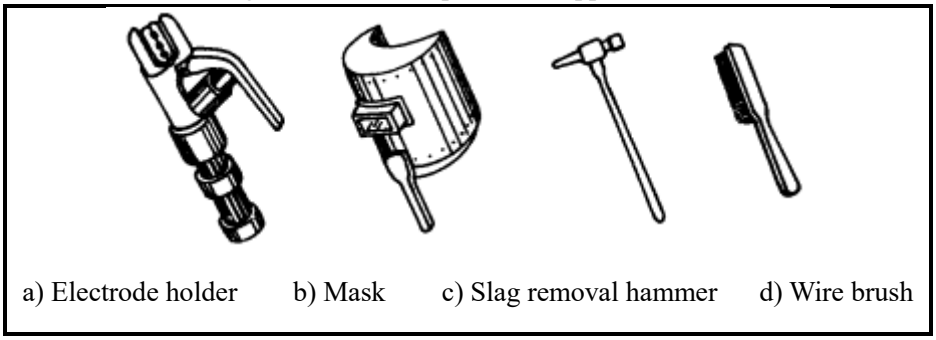
Arc welding by manual operation of electrodes is called manual arc welding, referred to as manual arc welding. The equipment for manual arc welding is simple, easy to operate, flexible and adaptable. It is suitable for welding various metal materials with a thickness of more than 2mm and various shapes and structures, especially for weldments complex structure shapes and short or curved welds and welds of different spatial positions.

11.1 Welding Process of Manual Arc Welding

Firstly, connect the output poles of the welding machine respectively to the weldment and the electrode holder, and hold the electrode with the electrode holder. Strike arc between the electrode and the weldment during welding, and the high temperature arc melts the electrode end and the weldment locally and forms a molten pool. Then the molten pool is cooled and solidified rapidly to form a weld, so that the two separated weldments are firmly connected into a whole. The coating of the electrode is melted to form a slag covering the molten pool, and the slag is cooled to form a slag shell to protect the weld. Finally, remove the slag shell. The welding of the joint is completed.

11.2 Tools for Manual Arc Welding

Common tools for manual arc welding include electrode holder, mask, slag removal hammer and wire brush, as shown in Figure 5-8, as well as welding cable and labor protection appliances.



a) Electrode holder b) Mask c) Slag removal hammer d) Wire brush

Figure 8 Tools for Manual Arc Welding

a) Electrode holder: It is a tool used to hold the electrode and conduct the current. There are two types commonly used: 300A and 500A.

b) Mask: It is a tool used to protect eyes and face from arc light and metal splash. There are two types: hand-held and head-mounted. The colored chemical glass is installed on the observation window of the mask to filter ultraviolet and infrared rays. During arc burning, the arc burning situation and the molten pool condition can be observed through the observation window, which is convenient for operation.

c) Slag removal hammer (pointed hammer): It is used to remove slag shell on the weld surface.

d) Wire brush: Before welding, it is used to remove dirt and rust at the joint of weldments; after welding, it is used to clean the weld surface and spatter.

e) Welding cable: It is normally multi-strand fine copper cable. Generally, YHH rubber jacket welding cable or THHR rubber jacket high flexible welding cable is used. A cable is connected between the electrode holder and the welding machine, called holder wire (live wire). Another cable (ground wire) is connected between the welding machine and the workpiece. The exterior of the electrode holder is made of insulating material, which has the function of insulation.

11.3 Basic Operation for Manual Arc Welding

1. Cleaning at welded joint

Before welding, rust and oil stain shall be removed from the joint, so as to strike arc, stabilizer arc and ensure the weld quality. When the rust removal requirements are not high, the wire brush can be used; when the requirements are high, grinding wheel shall be used.

2. Operation posture

Take the downward welding of butt joint and T-joint from left to right as an example, as shown in Figure 9. The operator shall be on the right side in the forward direction of the weld; hold the mask by the left hand, and hold the electrode holder by the right hand; put the left elbow on the left knee to keep the upper part of the body from following up downwards; the upper arm must be free from the ribs without support and shall be extended freely.

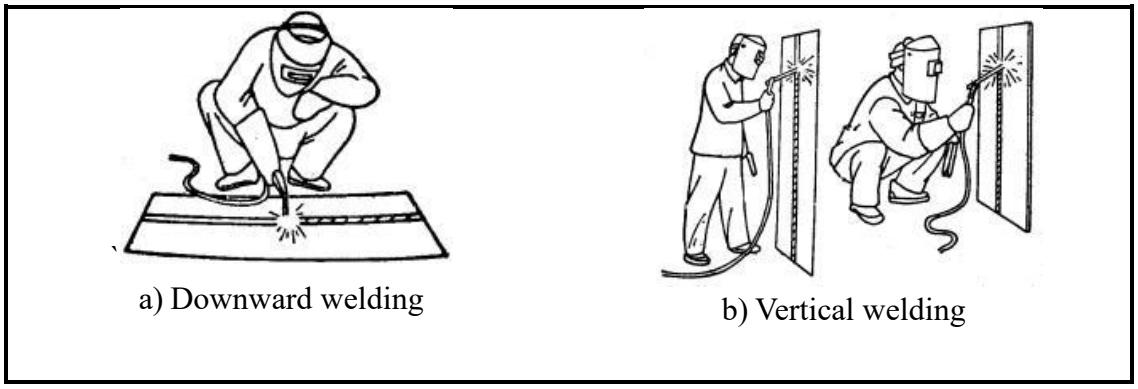


Figure 9 Operation posture during welding

3. Arc striking

Arc striking is the process of generating stable electric arc between the electrode and the weldment to heat the electrode and the weldment for welding. There are two commonly used arc striking methods: scratching method and knocking method, as shown in Figure 10. During welding, the electrode end and the weldment surface form a short circuit by scratching or tapping contact, and the electrode is lifted by 2-4mm to ignite the arc. The electrode is in contact with the weldment but no arc is struck, because the coating at the electrode end interferes with conduction. At this time, blow for several times, and remove the insulation materials until the welding core metal surface is exposed.

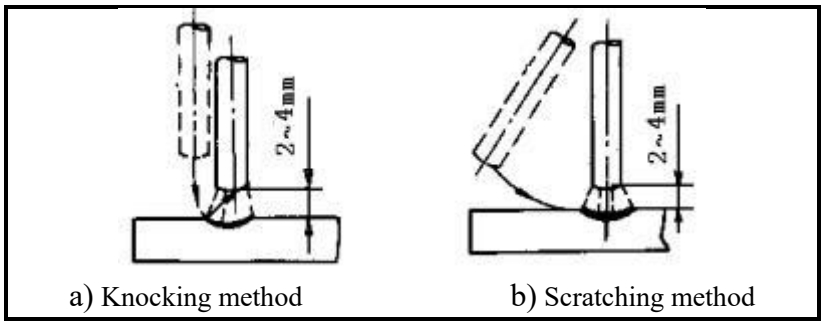


Figure 10 Arc striking method

4. Tack welding

In order to fix the relative position of the two weldments for welding, short welds of 30-40mm are welded every certain distance so that the weldments are fixed. This process is called tack welding or positioned welding.

5. Electrode manipulation

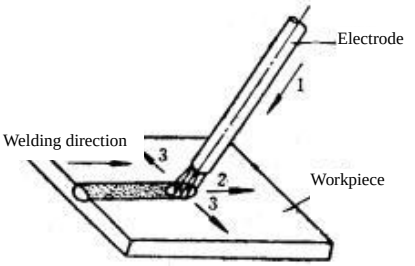
The operation movement of the electrode is referred to as electrode manipulation. The operation movement of the electrode is actually a synthetic movement, that is, the electrode completes the movement in three basic directions at the same time: the electrode gradually moves along the welding direction; the electrode is gradually fed to the molten pool direction; the lateral oscillation of the electrode is shown in Figure 11. When the arc is struck, the electrode shall be manipulated correctly in three movement directions. Moreover, the operation essentials for the most used butt welding in the downward position are made, and electrode angle, arc length and welding speed shall be mastered.

⑴ Welding angle: As shown in Figure 12, the electrode should be tilted forward for 70-80 degrees.

⑵ Arc length: A reasonable arc length is approximately equal to the electrode diameter.

⑶ Welding speed: Suitable welding speed should make the weld width of the weld bead about twice the

diameter of the electrode, its surface is smooth, and the corrugation is fine. When the welding speed is too high, the weld bead is narrow and high, the ripple is rough, and the fusion is poor. When the welding speed is too low, the weld width is too large, and the weldment is easily burnt. At the same time, note that the current should be appropriate, the electrode should be aligned, the arc should be low, the welding speed should not be fast and should be uniform.



1- Feed downwards 2- Move along the welding direction 3- Laterally oscillate

Figure 11 Three basic movement directions of electrode

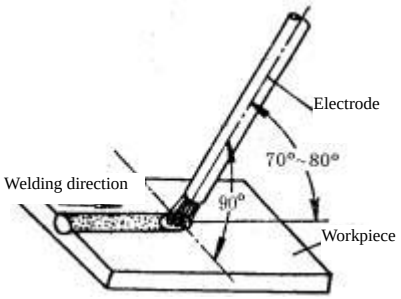
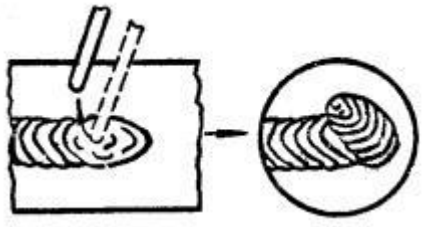


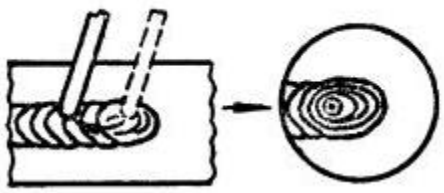
Figure 12 Electrode angle of downward welding

6. Arc extinguishing (quenching)

In the welding process, arc extinguishing is inevitable. If arc extinguishing is poor, a very shallow molten pool will be formed, and the density and strength of the weld metal are poor, so it is easy to form defects such as cracks, pores and slag inclusion. During arc extinguishing, draw the electrode end gradually to the groove and gradually raise the arc at the same time to narrow the molten pool and reduce the amount of metal and heat, so that the defects such as cracks and porosity are not generated during arc extinguishing. During arc extinguishing, stack the weld metal of the arc pit so that the molten pool transits fully. After welding, file away or remove excess parts. The arc extinguishing methods are shown below:



a) Arc extinguishing outside the weld bead



b) Arc extinguishing on the weld bead

Figure 13 Arc extinguishing methods

7. Weldment cleaning

After welding, clean up welding slags and spatters with a steel wire brush and other tools.

12. Maintenance

WARNING



Safety warning: The operator for the following operations shall have sufficient electrical expertise and comprehensive safety knowledge and have valid qualification documents to prove his/her ability and knowledge. Before opening the shell, make sure that the input cable of the welding machine is disconnected from the power grid.

1) Regularly inspect the internal circuit connection of the welding machine, confirm that the line is connected correctly, and the connectors are firm (especially the inserted joints or components). If rust and loosening are found, remove the rust layer or oxide film with sand paper, reconnect and tighten.
2) When the machine is powered on, keep hands, hair, and tools away from the charged devices in the machine, such as fan, in order to avoid injury or damage to the machine.
3) Blow away dust regularly with dry and clean compressed air. If the welding machine is used in an environment with heavy smoke and air pollution, dust shall be removed from the welding machine every day. The pressure of the compressed air shall be at a reasonable level so as not to damage the small components in the welding machine.
4) Prevent water or water vapor from entering into the welding machine. If this situation occurs, the welding machine shall be dried inside. Then, measure the insulation of the welding machine (including the insulation between the connecting nodes and between the connecting points and the shell) with a megohmmeter. Welding can be continued only if there are no abnormal conditions.
5) Regularly inspect whether all cable insulation sheath of the welding machine is damaged, wrap it or replace the cable.
6) If the welding machine is not used for a long time, the welding machine shall be put back into the original packing box and stored in a dry environment.

13. Fault and Maintenance

WARNING



Safety warning: The operator for the following operations shall have sufficient electrical expertise and comprehensive safety knowledge and have valid qualification documents to prove his/her ability and knowledge. Before opening the shell, make sure that the input cable of the welding machine is disconnected from the power grid.

Malfunction Phenomena	Causes and Solutions
Turn on the machine, the power indicator is off, the fan doesn't work, and no welding output.	1) Check if the power switch is closed. 2) Make sure there is power for input cable.
Turn on the machine, the fan works, but the output current is unstable and can't be controlled by potentiometer when welding.	1) The current potentiometer fails. Replace it. 2) Check if any loose contact exists inside the machine, especially connector, etc. If any, check.

Turn on the machine, the power indicator is on, the fan works, but no welding output.	1) Check if any poor contact exists inside the machine. 2) Open circuit or poor contact occurs at the joint of output terminal. 3) The abnormity indicator is on. A. The machine is under over-heating protection status due to long time operation. For this situation, it is unnecessary to unplug the power plug so that cooling fan can continue to cool down the welder. Welding can be continued after indicator is off; B. Check if the thermal switch is ok. Replace it if damaged. C. Check if the thermal switch connection is under good contact. D. It is possible for welder to be under over-current protection status if indicator is on for a long time. For this situation, please do not restart the machine, but contact local agent for professional assistance.
The electrode holder becomes very hot.	The rated current of the electrode holder is lower than its actual working current. Replace it with a bigger rated current.
Excessive spatter in MMA welding.	The output polarity connection is incorrect. Exchange the polarity.
Error code	E10: Over-Current protection E31: +15V Low-Voltage protection E60: Over-Temperature protection

1) Analysis and removal of common faults:
2) List of spare parts to be repaired

Appendix A Packing, Transportation and Storage

A.1 Packing of ARC200

No.	Name	Unit	Quantity
1	Manual arc welding machine	Set	1
2	User Manual for Manual Welding Series (English)	Set	1
3	Earth clamp	Set	1
4	Welding torch	Set	1

Remark: * indicates that not all products contain this accessory.

A.2 Transportation

When moving the machine, handle it with care and do not allow it to be severely impacted. Protect the machine from damp and rain during transportation.

A.3 Storage

Storage temperature: -25 ° C to +50 ° C
Storage humidity: Relative humidity: ≤90%
Storage life: 12 months
Storage site: ventilated room with no corrosive gas