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DECLARATION OF CONFORMITY

Hereby we declare that these machines are produced based on relative Chinese and international standards and they conform to the international safety standard IEC974. The design and technology adopted in these machines are under patent protection.

Please read and understand this manual carefully before the installation and operation of these machines.

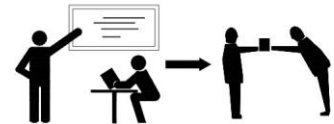
1. The contents of this manual may be revised without prior notice and without obligation.
2. Although carefully checked, there may still be some inaccuracies in this manual. Please consult us if any.
3. This manual is issued in Oct 2009.

1. SAFETY

Welding is dangerous, and may cause damage to you and others, so take good protection when welding. For details, please refer to the operator safety guidelines in conformity with the accident prevention requirements of the manufacturer.

Professional training is needed before operating the machine.

- Use labor protection welding supplies authorized by national security supervision department.
- The operator must be qualified personnel with a valid "metal welding (OFC) operations" operation certificate.
- Cut off power before maintenance or repair.



Electric shock—may lead to serious injury or even death.

- Install earth device according to the application criteria.
- Never touch the live parts when skin bared or wearing wet gloves/clothes.
- Make sure that you are insulated from the ground and workpiece.
- Make sure that your working position is safe.



Smoke& gas—may be harmful to health.

- Keep the head away from smoke and gas to avoid inhalation of exhaust gas from welding.
- Keep the working environment in good ventilation with exhaust or ventilation equipment when welding.



Arc radiation—may damage eyes or burn skin.

- Wear suitable welding masks and protective clothing to protect your eyes and body.
- Use suitable masks or screens to protect spectators from harm.



Improper operation may cause fire or explosion.

- Welding sparks may result in a fire, so please make sure no combustible materials nearby and pay attention to fire hazard.
- Have a fire extinguisher nearby, and have a trained person to use it.
- Airtight container welding is forbidden
- Do not use these machines for pipe thawing.



Hot workpiece may cause severe scalding.

- Do not contact hot workpiece with bare hands.
- Cooling is needed during continuous use of the welding torch.



Magnetic fields affect cardiac pacemaker.

- Pacemaker users should be away from the welding spot before medical consultation.



Moving parts may lead to personal injury.

- Keep yourself away from moving parts such as fan.
- All doors, panels, covers and other protective devices should be closed during operation.



Please seek professional help when encountering machine failure.

- Consult the relevant contents of this manual If you encounter any difficulties in installation and operation.
- Contact the service center of your supplier to seek professional help if you still can not fully understand after reading the manual or still can not solve the problem



2. GENERAL DESCRIPTION

➤ Advanced IGBT inverter technology

- ◆ High inverter frequency greatly reduces the volume and weight of the welder.
- ◆ Great reduction in magnetic and resistance loss obviously enhances the welding efficiency and energy saving effect.
- ◆ Switching 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 starting, less spatter, stable current and good shaping.

➤ Features of ARC series

- ◆ Efficiency, energy saving, portable, stable arc, high no-load voltage, and with good compensation of arc force, are able to meet various welding requirements in field work.

➤ Beautiful appearance for enclosure design

- ◆ Streamline design of the front panel and back panel makes the overall shape more attractive.
- ◆ Front panel and back panel are made of high-intensity engineering plastics, which

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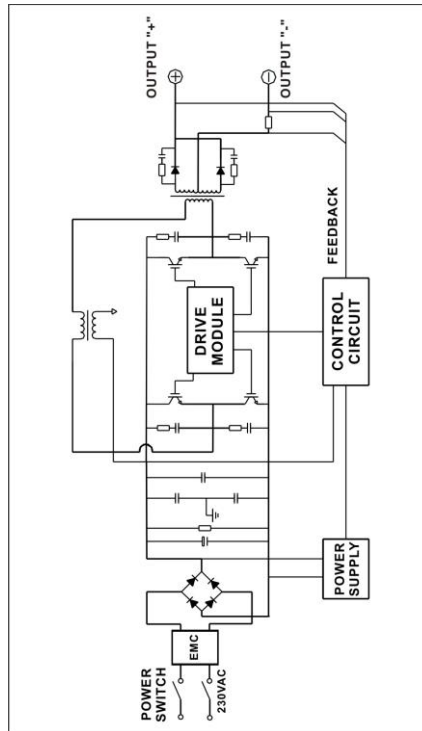
effectively ensures reliable performance of the machines in severe conditions.

- ◆ Excellent insulation.

3. MAIN PARAMETERS

MODEL	ARC120	ARC140	ARC160	ARC180
Rated input	AC230V $\pm$ 15% 50/60Hz			
Rated input	5	6	7.11	8
Rated input	22	26	31	35
Rated output	120A/24.8V	140A/25.6V	160A/26.5V	180A/27.2V
Welding current	10~120A	10~140A	10~160A	10~180A
No-load voltage	72	72	72	72
Rated duty cycle	25%@40°C	30%@40°C	30%@40°C	30%@40°C
Efficiency (%)	85	85	85	85
Power factor	0.70	0.70	0.70	0.72
Protection class	IP21S	IP21S	IP21S	IP21S
Insulation class	F	F	F	F
Size (mm)	268×120×198	268×120×198	313×145×220	313×145×220
Weight (Kg)	4.1	4.7	5.2	5.8
Rated input	AC110V $\pm$ 10% 50/60Hz			
Rated input	5	6	7.11	8
Rated input	22	26	31	35
Rated output	110A/24.4	110A/24.4	110A/24.4	110A/24.4
Welding current	10-110A	10-110A	10-110A	10-110A
No-load voltage	72	72	72	72
Rated duty cycle	25%@40°C	30%@40°C	30%@40°C	30%@40°C
Efficiency (%)	85	85	85	85
Power factor	0.72	0.72	0.72	0.72
Protection class	IP21S	IP21S	IP21S	IP21S
Insulation class	F	F	F	F
Size (mm)	268x120x198	268x120x198	315x145x220	315x145x220
Weight (Kg)	4.1	4.7	5.2	5.8

4. ELECTRIC BLOCK DIAGRAM



5. OPERATION CONTROL AND DESCRIPTION

● Front control panel (see Figure 1)

- (1) **"+" output terminal:** To connect the electrode holder.
- (2) **"-" output terminal:** To connect the work clamp.
- (3) **Welding current knob:** To adjust the output current.
- (4) **Power LED:** To indicate the power. Power LED on indicates that the power switch of the machine is on.
- (5) **Overheating LED:** To indicate overheating. Overheating LED on indicates that the temperature inside the machine is too high and the machine is under overheating protection status.
- (6) **MMA/TIG switch:** To toggle between MMA and TIG.

● Back control panel (see Figure 2)

- (7) **Power input:** Power input cable.
- (8) **Power switch:** Power ON/OFF switch.
- (9) **Fan**



Figure 1

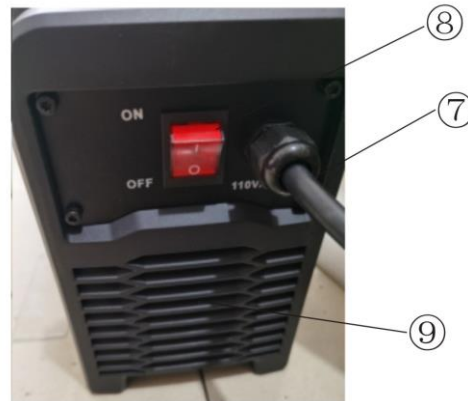


Figure 2

6. INSTALLATION DEBUGGING AND OPERATION

Note: Please install the machine strictly according to the following steps.

Turn off the power supply switch before any electric connection operation.

The protection class of this machine is IP21S, so avoid using it in rain.

6.1 Installation method

- (1) A primary power supply cable is available for this welding machine. Connect the power supply cable to the rated input power.
- (2) The primary cable should be tightly connected to the correct socket to avoid oxidization.
- (3) Check whether the voltage value varies in acceptable range with a multi-meter.
- (4) Insert the cable plug with electrode holder into the “+” socket on the front panel of the welding machine, and tighten it clockwise.
- (5) Insert the cable plug with work clamp into the “—” socket on the front panel of the welding machine, and tighten it clockwise.
- (6) Ground connection is needed for safety purpose.

The connection as mentioned above in 6.1(4) and 6.1(5) is DCEP connection. Operator can choose DCEN connection according to workpiece and electrode application requirement. Generally, DCEP connection is recommended for basic electrode, while no special requirement for acid electrode.

6.2 Operation method

- (1) After being installed according to the above method, 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) When switching the MMA/TIG switch to MMA mode, normal welding can be carried out under rated output current. When switching the MMA/TIG switch to TIG position and using lift arc ignition, arc can be successfully started under rated arc ignition current, and normal welding can be carried out under rated welding current.
- (4) Select cable with larger cross-section to reduce the voltage drop if the secondary cables (welding cable and earth cable) are long.

- (5) 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 6.3.

6.3 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
6.0	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.

7. CAUTION

1. Working Environment

- (1) Welding should be carried out in dry environment with its humidity of 90% or less.
- (2) The temperature of the working environment should be between -10°C to 40°C.
- (3) Avoid welding in the open air unless sheltered from sunlight and rain. Keep it dry anytime and do not place it on wet ground or in puddles.
- (4) Avoid welding in dusty area or environment with corrosive chemical gas.
- (5) Gas shielded arc welding should be operated in environment without strong airflow.

2. Safety Tips

Over-current/over-voltage/over-heating protection circuit is installed in this machine. If the input voltage or the output current is too high or machine inside temperature over heating inside, the machine will stop automatically. However, excessive use (e.g. too high voltage) of machine may also damage machine, so please note:

2.1 Ventilation

High current passes when welding is carried out, thus natural ventilation can not satisfy the machine's cooling requirement. Maintain good ventilation through the louvers of the machine. The minimum distance between the machine and any other objects in or near the working area should be 30cm. Good ventilation is of critical importance for the normal performance and lifespan of the machine.

2.2 Welding operation is forbidden while the machine is overload. 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 max load current. Overload could obviously shorten the machine's lifespan, or even damage the machine.

2.3 Over-voltage is forbidden.

Regarding the power supply voltage range of the machine, please refer to "Main Parameters"

table. This machine is of automatic voltage compensation, which enables the maintaining of the voltage range within the given range. In case that the input voltage exceeds the stipulated value, it would possibly damage the components of the machine.

2.4 A sudden halt may occur while the machine is of overload status. Under this circumstance, it is unnecessary to restart the machine. Remain the built-in fan working to lower the temperature inside the machine.

8. MAINTENANCE

WARNING



The following operation requires sufficient professional knowledge on electric aspect and comprehensive safety knowledge. Operators should be holders of valid qualification certificates which can prove their skills and knowledge. Make sure the input cable of the machine is cut off from the electricity utility before uncovering the welding machine.

- (1) 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.
- (2) Keep hands, hair and tools away from the moving parts such as the fan to avoid personal injury or machine damage.
- (3) Clean the dust periodically with dry and clean compressed air. If welding environment with heavy smoke and pollution, the machine should be cleaned daily. The pressure of compressed air should be at a proper level in order to avoid the small parts inside the machine to be damaged.
- (4) Avoid rain, water and vapor infiltrate the machine. If there is, dry it and check the insulation with equipment (including that between the connections and that between the connection and the enclosure). Only when there are no abnormal phenomena anymore, then the machine can be used.
- (5) Check periodically whether the insulation cover of all cables is in good condition. If there is any dilapidation, rewrap it or replace it.
- (6) Put the machine into the original packing in dry location if it is not to be used for a long time.

9. TROUBLESHOOTING

WARNING



The following operation requires sufficient professional knowledge on electric aspect and comprehensive safety knowledge. Operators should be holders of valid qualification certificates which can prove their skills and knowledge. Make sure the input cable of the machine is cut off from the electricity utility before uncovering the welding machine.

Common Malfunction Analysis and Solution:

Malfunction Phenomena	Cause and Solution
Turn on the machine, the power LED is off,	(1) Check if the power switch is closed.

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the fan doesn't work, and no welding output.	(2) No input power.
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. If any, reconnect.
Turn on the machine, the power LED is on, the fan works, but no welding output.	(1) Check if any loose contact exists inside the machine. (2) Open circuit or loose contact occurs at the joint of output terminal. (3) The overheating LED is on. a) The machine is under over-heating protection status. It can recover automatically after the welding machine is cooled. b) Check if the thermal switch is ok. Replace it if damaged.
The electrode holder becomes very hot.	The rated current of the electrode holder is smaller 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.

We are still constantly improving this welder, therefore, some parts of this welder may be changed in order to achieve the better quality, but the main functions and operations will not be alternated and changed. Your understanding would be greatly appreciated.