EasyArc

ARC 200/ ZX7-300/ ZX7-400

INVERTER MMA WELDING MACHINE

OPERATION MANUAL

Hong Kong Easyweld Limited

CONTENTS

EC DECLARATION OF CONFORMITY

Hereby we declare that our machines for industrial and professional use as stated below:

Types: EasyArc 200/ EasyArc ZX7-300/ EasyArc ZX7-400

Conform to the Low Voltage Directive: 73/23/EEC and EMC Directive: 89/336/EEC. European Standard: EN60974-1:1 998+A1:2000+A2:2003 and: EN60974-1 0:2003 respectively.

Please read and understand this instruction manual carefully before installation and operation of the equipment.

This revised instruction manual was issued on 1st November 2008.

WARNING

Welding and cutting is dangerous to the operator, other people in, or near, the working area, and the surrounding environment, if the equipment is not correctly operated. Therefore, the performance of welding/cutting must be carried out under the strict and comprehensive observance of all relevant safety regulations.
Please read and understand this instruction manual carefully before the installation and operation

Safety Precautions — Read before using this equipment

ELECTRIC SHOCK can kill
Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the machine is switched on. The input power circuit and machine internal circuits are also live when power cable is connected to the mains supply. Incorrectly installed or improperly earthed equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from the work-piece and ground by using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not touch the electrode if you are in direct contact with the work-piece
- Always make certain that this equipment is correctly earthed
- Check the input cable regularly for damage or bare wiring have it replaced immediately if damaged, by a competent person, remember bare wiring can kill
- Do not use worn, damaged or undersized cables
- Do not drape or wrap cables around your body
- Make sure that all panels and covers are securely in place when using this equipment
- Always make sure that output cables are securely fastened to the output sockets
- Always clamp the work cable with clean metal to metal contact to the work-piece or bench as near to the welding area as possible

Important!
Inverters carry a significant amount of DC voltage even after they have been disconnected from the mains supply. Do not remove the covers or touch any internal components before the input capacitors have been properly discharged by a trained and competent person!

FUMES and GASES can damage your health

The fumes and gases produced when welding can be hazardous to your health. Avoid breathing these fumes

- Keep your head out of the fumes, do not breathe them in.
- If indoors ventilate the area well and/or use local extraction ventilation equipment to remove fumes and gases
- When welding in confined spaces of areas of poor ventilation use an approved air supplied respirator system
- Read and understand the electrode manufacturers' health and safety data sheets
- Do not weld in areas near de-greasing, cleaning or spraying operations. The vapors can react with the heat and rays of the arc to form highly toxic and irritating gases.
- Do not weld on coated metals i.e. galvanized; lead or cadmium plated metals unless the coating has been completely removed from the welding area. The coatings can give off highly toxic fumes if welded.

ARC RAYS can burn the eyes and skin

The welding arc produces intense visible and invisible (Ultraviolet and infrared) rays that will burn the eyes and skin.

- Wear a welding helmet fitted with the correct shade of filter to protect your face and eyes, when welding or watching
- Wear approved safety glasses with side screens under your welding helmet.
- Use protective screens or barriers to shield the working area and protect others from arc-flash and glare; warn others not to watch the arc.
- Wear protective clothing made from leather or thick flame-resistant material. Cover all exposed skin areas.

FLYING PARTICLES can injure eyes.

Welding, chipping, wire brushing and grinding can cause sparks and flying particles. Slag can be thrown off the weld as it cools.

- Always wear approved safety glasses with side shields even under your welding shield.

WELDING can cause fire or explosion

Welding causes sparks to fly off the arc. Hot equipment, flying sparks and the hot work-piece can cause fires and explosions. Welding on closed containers or pipe-work can cause rapid expansion of the gases within them resulting in possible explosion.

- Remove any flammable materials from the welding area. Do not weld in an area where flying sparks can ignite flammable materials.
- Use flame proof blankets to shield any possible causes of ignition from flying sparks or hot metal/slag
- Keep a fire extinguisher nearby and watch for fire, particularly on the hidden side of any working area.
- Do not weld on closed containers, tanks, drums or pipes unless they are properly and safely vented.
- Always wear oil and grease free flame-proof protective clothing.
- Always remove combustible/ flammable materials from the working area prior to commencing any welding operation.

- Connect earth/work cables as close as possible to the welding zone to prevent welding current from traveling long paths and possibly causing electric shocks or fire hazards.

NOISE can damage hearing

Noise from some welding/cutting processes can exceed recognized safe levels causing both temporary and permanent hearing loss.

- Wear ear protection if noise level exceeds recommended limits.

MAGNETIC FIELDS can affect pacemakers

- The strong magnetic fields caused by the arc welding process and equipment can affect pacemakers.
- Wearers of pacemakers should keep away from the welding area and consult their doctor before going near any arc welding, gouging or cutting processes.

LIMITED WARRANTY

The machine is insured against damage upon shipping. If you machine is damaged in any way when you receive it, you must retain all shipping materials and packing. Call our customer service department and report the damage immediately.

There is a 1 year warranty on all internal electronic parts. The torch, cables, power cord, clamps, air regulator, hoses, case & paint and consumables are not covered under warranty. You must use dry air via the air regulator and empty the reservoir from the water separator frequently to insure proper protection from moisture.

This machine is designed to operate from 200~240VAC/380VAC at 50-60Hz Only. Operating outside of limits will void warranty.

Warranty coverage covers repair or replacement of damaged machine or damaged circuit board. Warranty does not cover shipping from the customer but does cover return shipping within the Cont. United States. If you are going to return a machine to us for repairs, it must be well packed and insured.

Customers who own machines that require warranty coverage should contact our warranty department by email at info@hkweld.com to obtain a return authorization code.

Customers who own an out-of-warranty machine that require repairs should contact us for an estimate.

GENERAL DESCRIPTION

These welding machines are manufactured with advanced inverter technology. With power MOSFET and PWM technology, the inverter converts DC voltage, which is rectified from mains input AC voltage, to high (100 KHz) frequency AC voltage; subsequently, the voltage is transformed and rectified to give a smooth, stable D.C. output. Working at 100 KHz requires a much smaller main transformer and results in a lighter weight inverter welder, with an increased duty cycle. The high frequency oscillation, which enables the output of high frequency DC, is employed in the arc-starting system. The features of this product are as follows: stable current, reliable, completely portable, efficient and low noise output.

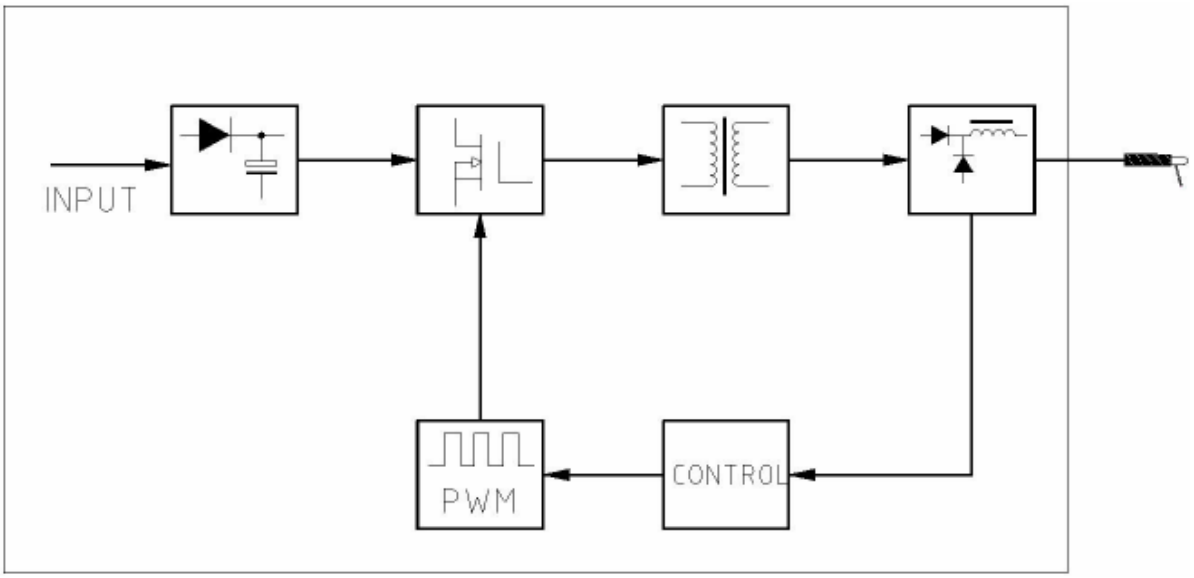
The features of the MMA series are: efficiency, energy saving, portability, excellent dynamic characteristics and stable arc, relatively low no-load voltage, the ability to meet a wide variety welding requirements.

The cases of the EasyArc 200 model are made from a high impact flame resistant engineering plastics material. This results in a more attractive, durable and water resistant machine.

Guarantee of maintenance for main power source is 12 months, excluding cables, guns, torches and accessory items.

During the guarantee maintenance period, all maintenance is free of charge, but does not include deliberated damage, or damage caused by misuse of this welding equipment. Only qualified technicians are authorized to carry out repairs of this welding equipment in the case of machine breakdown.

BLOCK DIAGRAM

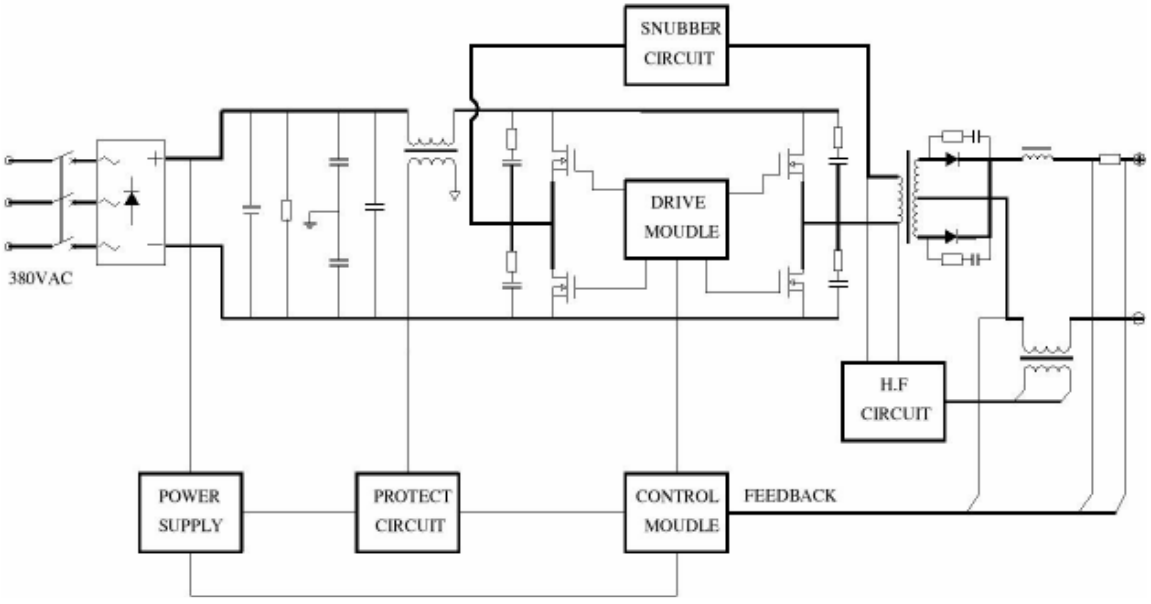


EQUIPMENT SPECIFICATIONS

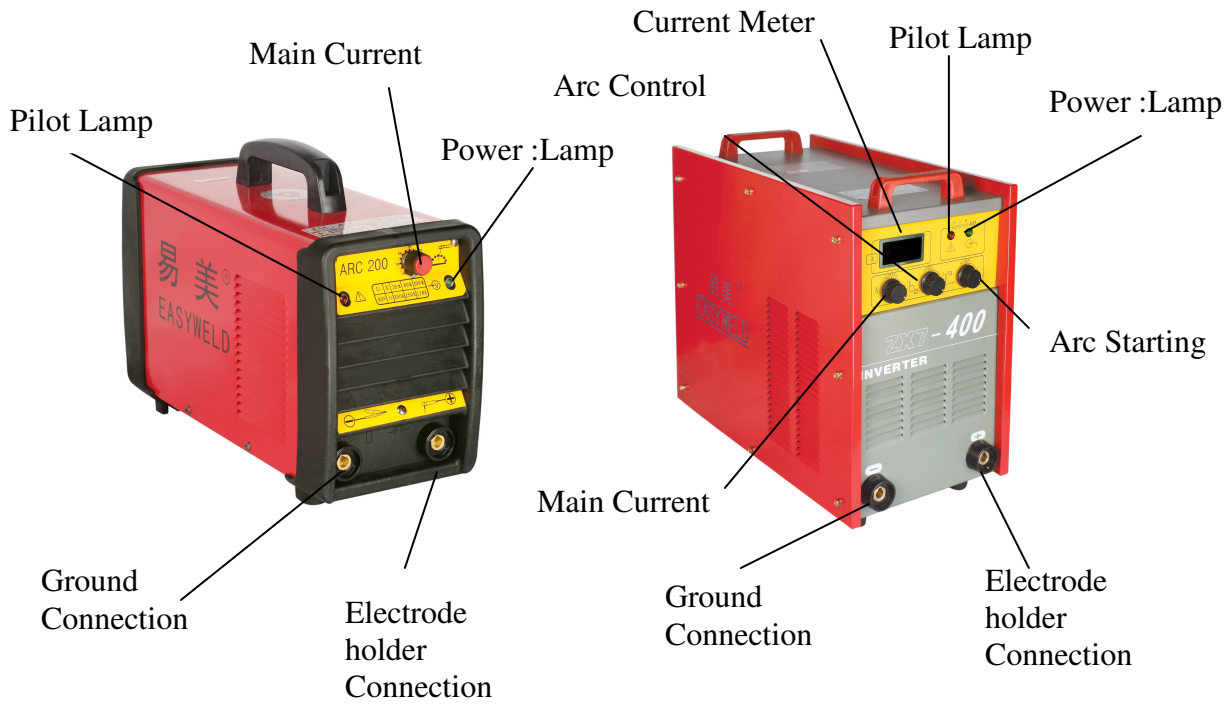
TYPE	EasyArc 160	EasyArc 200	EasyArc ZX7-300	EasyArc ZX7-400
Input voltage(VAC)	220±15%		380±15%	
Input Frequency (Hz)	*50/60*	*50/60*	*50/60*	*50/60*
Rated input(KVA)	5.3	7	12	18
Rated output voltage	27	28	28	27
Output current (A)	20-160	20-200	20-300	20-400
Drive current range (A)	--	--	20-270	20-360
Duty cycle %	60	60	60	60
No-load voltage(V)	70	70	55	65
No-load loss(W)	40	40	40	40
Efficiency %	85	85	85	85
Power factor	0.93	0.93	0.93	0.93
Insulation class	B	B	F	F
Protection class	1P23	1P23	1P23	1P23
Weight(kg)	6.5	6.5	10	8

Table 1

CIRCUIT DIAGRAM (Single-phase input)



INSTALLATION & OPERATION



1. Connection of Power Supply Cables

A primary power supply cable is fitted to this welding equipment. Connect the power supply cable to the correct voltage, as stated on the rating plate attached to the machine. The primary cable should be fitted with the correct plug to avoid overheating.

2. Connection of Output Cables

Two twist lock sockets are situated on the front panel of this welding power source. Insert the output cable plugs and twist to lock firmly. It is possible to damage both the plug and socket, if the plug and the socket are incorrectly or loosely connected.

For MMA welding the electrode holder cable should normally be connected to the positive terminal, while the work piece should be connected to the negative terminal. The two modes of connection of DC welding equipment are as follows:

- Straight polarity: electrode holder to "-", work piece to "+";
- Reverse polarity: electrode holder to "+", work piece to "-"
- [for D.C. Tig welding the electrode should be negative (-ve)]

Connect according to the electrode manufacturer's recommendations, (normally displayed on the packet), as incorrect connection may cause unstable arc, spatter or freezing of rod to work piece etc. If the distance between work piece and this power source is over 50 M, it may be necessary to increase the diameter of cable in order to maintain voltage output.

3. Power Supply Switch
While the power supply switch is on, the built-in fan works and current meter displays the current value.

4. Welding Current Output Setting
Set the current output by using the "welding current knob"
Approximate current settings for different electrode sizes are as follows:

Ø1.6: 30-50A; Ø2.0: 40-80A; Ø2.5: 70-bOA; Ø3.2: 110-170A; Ø4.0: 130-240; Ø5.0: 200-360A

5. Pilot Lamp
If the pilot lamp is on, it indicates that the equipment has over heated, which possibly is the consequence of over duty cycle operation. This welding equipment automatically restarts when the temperature inside the machine drops to required level, and the pilot lamp turns off.

6. Current Meter (fitted to EasyArc ZX7-300 and EasyArc ZX7-400)
Digital meter indicates welding current.

Operating duty cycle

The operation of this welding equipment should be strictly accordance with the specification. Please refer to the table of ***Equipment Specifications (Table 1).*** A sudden halt may occur whilst the welding operation is being carried out when this welding machine is in an over-load state. Under this circumstance, the built-in fan works to bring down the temperature inside the welding equipment, therefore it is unnecessary to disconnect the mains input of the welding machine.

CHECKS

- This welding equipment is correctly earthed
- All the connections are made. Particular attention should be drawn to the connection of earth clamp and work piece.
- The output terminals of electrode holder and earth cable are firmly attached.
- The output polarity is correct.
- In cases where an earth leakage switch is used, the maximum earth leakage is less than 30mA.

CAUTIONS

1. Working Environment
   1.1 The location in which this welding equipment is installed should be free of excessive dust, corrosive chemical/ gases, flammable gas or materials etc, and of maximum 80% relative humidity.

1.2 Avoid the operation of welding in the open air unless the working area sheltered from the sun, rain water and snow etc; the temperature of working environment should be maintained within -10°C to +40°C.

1.3 The minimum distance of this welding equipment and any wall or other object should be 30 cm.

1.4 Keep the working environment well ventilated.

2. Safety Tips

2.1 Ventilation: This welding equipment is small in size, compact in structure, and of excellent output current performance. Fans are to extract heat generated by this welding equipment while the operation of welding is carried out.

Caution: Keep the louvers of this equipment clear. The minimum distance between this welding equipment and any other objects in or near the working area should be 30 cm. Good ventilation is of critical importance for the normal performance and service life of this apparatus.

2.2 Welding operation is interrupted whilst this welding equipment is in over-load state. A sudden halt may occur to the welding operation if this welding machine is overloaded. Under this circumstance, it is unnecessary to restart this welding equipment. Keep the apparatus switched on and the built-in fan working to bring down the temperature inside this welding equipment.

2.3 Over-voltage operation is prohibited. The power supply voltage range of the welding machine is stated in ***Table: 1.*** This welding equipment automatically compensates for input voltages within the given range. In cases where the input voltage of the power supply exceeds the stipulated value, it is possibly damaging to the components of this welding equipment.

2.4 It is strongly recommended not to touch the output terminals when the welding operation is performed. An electric shock can occur.

Maintenance

Exposure to extremely dusty, damp, or corrosive air can be damaging to the welding machine. In order to prevent any possible failure or fault occurring with this welding equipment, blow out the dust at regular intervals with clean and dry compressed air. (Be sure to wear suitable respiratory, eye, hand and hearing protection whilst performing this operation).

Please note that: lack of maintenance can invalidate the warranty of this welding equipment and that there are no user serviceable parts contained within this equipment. Warranty will be invalidated if the factory seals have been broken.

TROUBLESHOOTING

Caution: Only the qualified technicians are authorized to undertake the repair task of this welding equipment in case of machine fault.

Fault Symptoms	Diagnosis	Corrective Action
While this welding equipment is operated, the pilot lamp is off, no output, built-in fan unavailable.	1. Possible failure of input voltage. 2. Possible failure of input power supply. 3. This welding equipment is possibly defective or damaged.	1. Check and rectify. 2. Check mains fuse and replace if necessary. 3. Contact qualified repairer.
While this welding equipment is operated, pilot lamp is off, no output, the built-in fan unavailable. A sudden shutdown of the welding of the welding equipment occurs.	1. The connection of power supply switch and bottom board is unavailable, 2. This welding equipment is in protection state due to over-voltage on input supply. 3. Power supply input is unstable. 4. This welding equipment is in over-voltage protection state due to continuous power on and power off of the welding equipment. 5. Relay of 24V of power board is possibly defective. Replace it. 6. Power supply failure to of top PCB.	1. Rectify the connection failure. 2. Disconnect from mains supply and check input voltage using a digital multi-meter. 3. Have power supply checked by a competent person. 4. Disconnect the power supply, for at least 5 minutes, reconnect & restart the equipment. 5. Check and replace if necessary. 6. Check and repair if necessary.
While this welding equipment is operated, pilot lamp is off, no output, however built-in fan is functioning.	1. Faulty Connection inside the welding equipment. 2. Faulty control module, drive circuit or drive module. 3. Check MOSFET, transformers, diode of rectifier and connections.	1. Check and reconnect. 2. Replace as necessary. 3. Repair or Replace as necessary.
While this welding equipment is operated, pilot lamp is on, however no output.	1. The welding equipment is in over heating protection state, 2. This welding equipment is in over current input protection state. 3. Possible function failure of inverter unit. Disconnect the power supply cable from the centre PCB. 3.1 If the fault indicator is on, MOSFET of top PCB is possibly defective. 3.2 if fault indicator is off: 3.2.1 Possible damage of transformer of centre PCB. 3.2.2 Possible damage of secondary rectifier of transformer. 4. Possible damage of feed back circuit.	1. Leave switched on and allows cooling for several minutes, re-trying. 2. Have checked by a trained service technician. 3. 3.2 Replace it, if necessary. 3.2.1 Replace it if necessary. 3.2.2 Replace it if necessary.