597074
INVERTER 200AMP DC ARC WELDER

TOOLEX® Industrial

INSTRUCTION MANUAL

CONSUMER SERVICE CENTRE
PO BOX 1012
HAMILTON NSW 2303 AUSTRALIA
Made in P.R.C.

SAVE THIS MANUAL

Keep this manual for the safety warnings and precautions, assembly, operating, inspection, maintenance and cleaning procedures. Write the product's serial number in the back of the manual near the assembly diagram (or month and year of purchase if product has no number). Keep this manual and the receipt in a safe and dry place for future reference.

IMPROTANT SAFETY INFORMATION

In this manual, on the labeling, and all other information provided with this product:

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING: WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION: CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE: NOTICE is used to address practices not related to personal injury.

SAFETY WARNINGS AND PRECAUTIONS

WARNING: When using tool, basic safety precautions should always be followed to reduce the risk of personal injury and damage to equipment.

Read all instructions before using this tool!

WARNING!

READ AND UNDERSTAND ALL INSTRUCTIONS
Failure to follow all instructions listed below may result in electric shock, fire, and/or serious injury.
SAVE THESE INSTRUCTIONS

Work Area Precautions

1. **Keep your work area clean and well lit.** Cluttered benches and dark areas invite accidents.
2. **Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust.** Power tools create sparks which may ignite the dust or fumes.
3. **Keep bystanders, children, and visitors away while operating a power tool.** Distractions can cause you to lose control. Protect others in the work area from debris such as chips and sparks. Provide barriers or shields as needed.

Electrical Safety

1. **Grounded tools must be plugged into an outlet properly installed and grounded in accordance with all codes and ordinances. Never remove the grounding prong or modify the plug in any way. Do not use any adapter plugs. Check with a qualified electrician if you are in doubt whether the outlet is properly grounded.** If the tool should electrically malfunction or break down, grounding provides a low resistance path to carry electricity away from the user.
2. **Double insulated tools are equipped with a polarized plug (one blade is wider than the other). This plug will fit in a polarized outlet only one way. If the plug does not fit fully in the outlet, reverse the plug. If it still does not fit, contact a qualified electrician to install a polarized outlet. Do not change the plug in any way.** Double insulation eliminates the need for the three wire grounded power cord and grounded power supply system.
3. **Avoid body contact with grounded surfaces such as pipes, radiators, ranges, and refrigerators.** There is an increased risk of electric shock if your body is grounded.
4. **Do not expose power tools to rain or wet conditions.** Water entering a power tool will increase the risk of electric shock.
5. **Do not abuse the Power Cord. Never use the Power Cord to carry the tool or pull the Plug from an outlet. Keep the Power Cord away from heat, oil, sharp edges, or moving parts. Replace damaged Power Cords immediately.** Damaged Power Cords increase the risk of electric shock.
6. **When operating a power tool outside, sue an outdoor extension cord marker "W-A" or "W".** These extension cords are rated for outdoor use, and reduce the risk of electric shock.

Personal Safety

1. **Stay alert. Watch what you are doing, and use common sense when operating a power tool. Do not use a power tool while tired or under the influence of drugs, alcohol, or medication.** A moment of inattention while operating power tools may result in serious personal injury.
2. **Dress properly. Do not wear loose clothing or jewelry. Contain long hair. Keep your hair, clothing, and gloves away from moving parts.** Loose clothes, jewelry, or long hair can be caught in moving parts.
3. **Avoid accidental staring. Be sure the Power Switch is off before plugging in.** Carrying power tools with your finger on the Power Switch, or plugging in power tools with the Power Switch on, invites accidents.
4. **Remove adjusting keys or wrenches before turning the power tool on**. A wrench or a key that is left attached to a rotating part of the power tool may result in personal injury.
5. **Do not overreach. Keep proper footing and balance at all times.** Proper footing and balance enables better control of the power tool in unexpected situations.
6. **Use safety equipment. Always wear eye protection.** Dust mask, non-skid safety shoes, hard hat, or hearing

protection must be used for appropriate conditions.

Tool Use and Care

1. **Use clamps (not included) or other practical ways to secure and support the workpiece to a stable platform.** Holding the work piece by hand to against your body is unstable and may lead to loss of control.
2. **Do not force the tool. Use the correct tool for your application.** The correct tool will do the job better and safer at the rate for which it is designed.
3. **Do not use the power tool if the Power Switch does not turn it on or off.** Any tool that cannot be controlled with the Power Switch is dangerous and must be replaced.
4. **Disconnect the Power Cord Plug from the power source before making any adjustments, changing accessories, or storing the tool.** Such preventive safety measures reduce the risk of starting the tool accidentally.
5. **Store idle tools out of reach of children and other untrained persons.** Tools are dangerous in the hands of untrained users.
6. **Maintain tools with care. Keep cutting tools maintained and clean.** Properly maintained tools are less likely to bind and are easier to control. Do not use a damaged tool. Tag damaged tools “Do not use” until repaired
7. **Check for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the tool’s operation. If damaged, have the tool serviced before using.** Many accidents are caused by poorly maintained tools.
8. **Use only accessories that are recommended by the manufacturer for your model.** Accessories that may be suitable for one tool may become hazardous when used on another tool.

Service

1. Tool service must be performed only by qualified repair personnel. Service or maintenance performed by unqualified personnel could result in a risk of injury.
2. When servicing a tool, use only identical replacement parts. Use of unauthorized parts or failure to follow maintenance instructions may create a risk of electric shock or injury.

SPECIFIC SAFETY RULES

1. **Maintain labels and nameplates on the tool.** These carry important information. If unreadable or missing, contact TOOLEX INDUSTRIAL for a replacement.
2. **Always wear the approved safety impact eye goggles and heavy work gloves when suing the tool.** Using personal safety devices reduce the risk for injury. Safety impact eye goggles and heavy work gloves are available from Harbor Freight Tools.
3. **Maintain a safe working environment.** Keep the work area well lit. Make sure there is adequate surrounding workspace. Always keep the work area free of obstructions, grease, oil, trash, and other debris. Do not use a power tool in areas near flammable chemicals, dusts, and vapors. Do not use this product in a damp or wet location.

4. **Avoid unintentional starting.** Make sure you are prepared to begin work before turning on the tool.
5. **Never leave the tool unattended when it is plugged into an electrical outlet.** Turn off the tool, and unplug it from its electrical outlet before leaving.
6. **Always unplug the tool from its electrical outlet before performing and inspection, maintenance, or cleaning procedures.**
7. **Prevent eye injury and burns.** Wearing and using the approved personal safety clothing and safety devices reduce the risk for injury.
    a. Wear the approved safety impact eye goggles with a welding helmet featuring at least a number 10 shade lens rating.
    b. Leather leggings, fire resistant shoes or boots should be worn when using this product. Do not wear pants with cuffs, shirts with open pockets, or any clothing that can catch and hold molten metal or sparks.
    c. Keep clothing free of grease, oil, solvents, or any flammable substances. Wear dry, insulating gloves and protective clothing.
    d. Wear an approved head covering to protect the head and neck. Use aprons, cape, sleeves, shoulder covers, and bibs designed and approved for welding and cutting procedures.
    e. When welding/cutting overhead or in confined spaces, wear flame resistant ear plugs or ear muffs to keep sparks out of ears.
8. **Prevent accidental fires.** Remove any combustible material from the work area.
    a. When possible, move the work to a location well away from combustible; protect the combustibles with a cover made of fire resistant material.
    b. Remove or make safe all combustible materials for a radius of 35 feet (10 meters) around the work area. Use a fire resistant material to cover or block all open doorways, windows, cracks, and other openings.
    c. Enclose the work area with portable fire resistant screens. Protect combustible walls, ceilings, floors, etc., from sparks and heat with fire resistant covers.
    d. If working on a metal wall, ceiling, etc., prevent ignition of combustibles on the other side by mobbing the combustibles to a safe location. If relocation of combustibles is not possible, designate someone to serve as a fire watch, equipped with a fire extinguisher, during the welding process and for at least one half hour after the welding is completed.
    e. Do not weld or cut on materials having a combustible coating or combustible internal structure, as in walls or ceilings, without an approved method for eliminating the hazard.
    f. Do not dispose of hot slag in containers holding combustible materials. Keep a fire extinguisher nearby and know how to use it.
    g. After welding or cutting, make a thorough examination for evidence of fire. Be aware that easily visible smoke or flame may not be present for some time after the fire has started. Do not weld or cut in

atmospheres containing

h. Dangerously reactive or flammable gases, vapors, liquids, and dust.
i. Provide adequate ventilation in work areas to prevent accumulation of flammable gases, vapors, and dust. Do not apply heat to a container that has held an unknown substance or a combustible material whose contents, when heated, can produce flammable or explosive vapors. Clean and purge containers before applying heat. Vent closed containers, including castings, before preheating, welding, or cutting.

WARNING

INHALATION HAZARD: Welding and Plasma Cutting Produce

TOXIC FUMES.

Exposure to welding or cutting exhaust fumes can increase the risk of developing certain cancers, such as cancer of the larynx and lung cancer. Also, some diseases that may be linked to exposure to welding or plasma cutting exhaust fumes are:

a. Early onset of Parkinson's Disease
b. Heart disease
c. Ulcers
d. Damage to the reproductive organs
e. Inflammation of the small intestine or stomach
f. Kidney damage
g. Respiratory diseases such as emphysema, bronchitis, or pneumonia

Use natural or forced air ventilation and wear a respirator approved by NIOSH to protect against the fumes produced to reduce the risk of

9. Avoid overexposure to fumes and gases. Always keep your head out of the fumes. Do not breathe the fumes. Use enough ventilation or exhaust, or both, to keep fumes and gases from your breathing zone and general area.
   - Where ventilation is questionable, have a qualified technician take an air sampling to determine the need for corrective measures. Use mechanical ventilation to improve air quality. If engineering controls are not feasible, use an approved respirator.
   - Work in a confined area only if it is well ventilated, or while wearing an air-supplied respirator.
   - Follow OSHA guidelines for Permissible Exposure Limits (PEL's) for various fumes and gases.
   - Follow the American Conference of Governmental Industrial Hygienists recommendations for Threshold Limit Values (TLV's) for fumes and gases.
   - Have a recognized specialist in Industrial Hygiene or Environmental Services check the operation and air quality and make recommendations for the specific welding or cutting situation.
10. **Always keep hoses away from welding/cutting spot.** Examine all hoses and cables for cuts, burns, or worn areas before each use. If any damaged areas are found, replace the hoses or cables immediately.
11. **Read and understand all instructions and safety precautions as outlined in the manufacturer's**

Manual for the material you will weld or cut.

12. **Proper cylinder care.** Secure cylinders to a cart, wall, or post, to prevent them from falling. All cylinders should be used and stored in an upright position. Never drop or strike a cylinder. Do not use cylinders that have been dented. Cylinder caps should be used when moving or storing cylinders. Empty cylinders should be kept in specified areas and clearly marked “empty.”
13. **Never use oil or grease on any inlet connector, outlet connector, or cylinder valves.**
14. **Use only supplied Torch on this Inverter Air Plasma Cutter.** Using components from other systems may cause personal injury and damage components within.
15. People with pacemakers should consult their physician(s) before using this product. Electromagnetic fields in close proximity to a heart pacemaker could cause interference to, or failure of the pacemaker.
16. USE PROPER EXTENSION CORD.

Make sure your extension cord is in good condition. When using an extension cord, be sure to sue one heavy enough to carry the current your product will draw. An undersized cord will cause a drop in line voltage resulting in loss of power and overheating. A 50 foot extension cord must be at least 12 gauges in diameter, and a 100 foot extension cord must be at least 10 gauges in diameter. If in doubt, use the next heavier gauge. The smaller the gauge number, the heavier the cord.

SPECIFICATIONS

Model Specifications	ECO ARC -200
Rated Input Voltage （V）	1/230V
Frequency（HZ）	50/60
Rated Input Power(KVA)	6.2
Rated Input Current（A）	28
No-Load Voltage （V）	DC 54V
Welding Curre（A）	20-200
Output Voltage（V）	20.8-28
Duty Cycle （%）	35%
Efficiency	≥85%
Insulation Grade	F
Cover Protection Grade	IP21S
Dimension（mm）	420*155*300
Weight (kg)	9.5

Duty Cycle

Duty Cycle is the equipment specifications which defines the number of minutes within a 10 minute period that a piece of equipment can safely operate.

ECO (MOSFET) ARC machines have a 35% duty cycle at maximum welding output, which means that it continuously operates for 3.5 minutes at maximum output during a 10 minute period.

CAUTION: Failure to observe the duty cycle limitations of this TIG MACHINE can easily damage this equipment, and will void warranty.

UNPACKING

When unpacking, checks to make sure the following parts are included.

Inverter welding machine with
Ground cable with Clamp
MMA welding cable with clamp

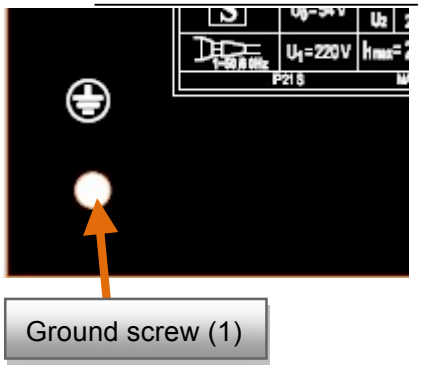
If any parts are missing or broken, please call EACO ELECTRIC at the number on the cover of this manual.

Preparing Your Work Area

1. You must have a sturdy work table that is open below the area you are welding. Molten slag will be blown through the work metal, and must be able to fall away freely
2. Your work table must allow the work metal to be firmly clamped to prevent it accidentally falling or moving.
3. The floor and surrounding area of your work site must not be flammable. A clean cement floor is recommended. The cutting process will eject molten metal slag onto the floor, and it will scatter for 8-10 feet or more in any direction. Have an adequate fire extinguisher available if needed.

ASSEMBLY

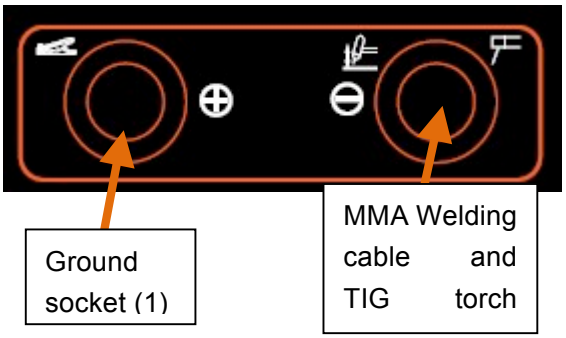
Grounding the tool



1. Attach a ground wire (not supplied) to the screw in the lower the back of the machine. Connect the other end of the wire to an appropriate ground, such as a steel workbench, steel biding member or grounding electrode.

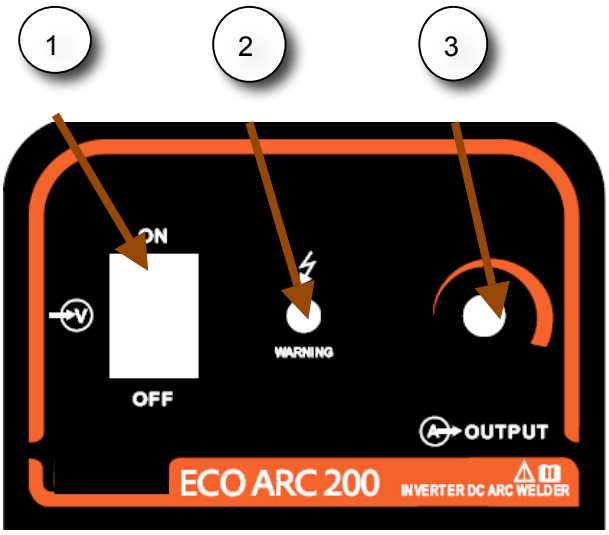
.

Connector Instruction



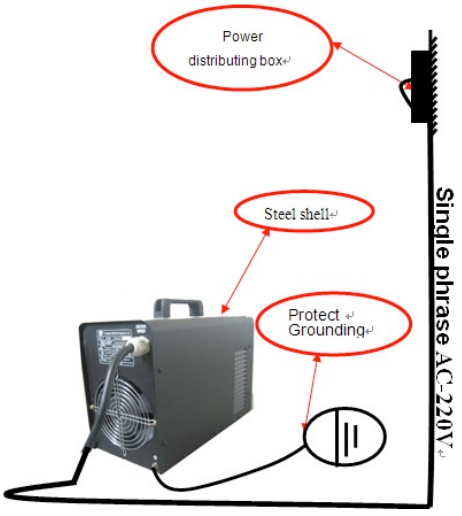
1. **Ground socket:** Plug ground cable to this socket.
2. **MMA Welding cable socket :**Connect MMA Welding cable or the TIG cable plug to this socket

Front Panel



1. **Power Switch.** Up is ON, down is OFF.
2. **Thermal Overload Indicator Lamp.** This light will come on, and the device will shut down if the tool becomes overheated. Stop trying to use the cutter while leaving the power switch onto allow the cooling fan to operate, and the lamp will turn off automatically when the machine cools down. ***Please pay attention to the Rated Duty Cycle discussed on page 8.***
3. **Welding current kob**: It is used for adjusting the welding current

Installation



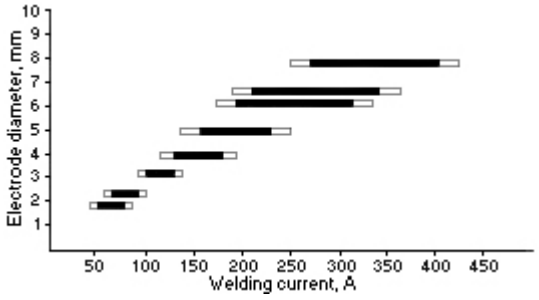
1. Connect welding tongs with output stud terminal (+)
2. Connect ground clamp with output terminal (-)
3. Connect the protection grounding cable.
4. Turn on the distributing box and the switch on the power source on the front panel.
5. Start welding.
6. Finish welding.
7. Turn off the switch on front.
8. Turn off the switch of distributing box

OPERATION

Note: Before beginning, please read and understand all the safety precautions staring on page 1 and especially the section “Specific Safety Rules” starting on page 3.

1. Put the metal to be welded on the metal weeding-cutting table. Ensure the metals to be welded are clean, so good welding efficiency can be promised.
2. Place the MMA welding unit no closer than six feet from the work piece to be welded
3. Connect the MMA torch control, Twist to lock in place.
4. Plug in the Grounding Cable into the Ground Connector on the lower left of the unit front. Twist to lock.
5. Place the metal portion of the welding rod inside the jaws of the Electrode Clamp. Welding rod types vary for welding different metals.
6. Hold the MMA torch and orient yourself to one side of the area to be welded, and move the Welding Helmet Face Shield (not included, see page 4 item 7) over your eyes.
7. Hold the MMA welding rod down and tilt the rod forward.
8. Stroke the work piece lightly to ignite the arc. Does not strike like a match? Never tap the electrode wire to ignite the arc; it will damage the rod.
9. When the arc ignites, tilt the electrode forward and hold it near the work piece.
10. If too much current is drawn from the welder; the Thermal Overload protector will activate, the Overload indicator **or** will light, and the welder will turn off until it cools down. It will automatically reset.

Welding current



Welding current level is determined by the size of electrode - the normal operating range and current are recommended in the manual. Typical operating ranges for a selection of electrode sizes are illustrated in the table. As a rule of thumb when selecting a suitable current level, an electrode will require about 40A per millimeter (diameter). Therefore, the preferred current level for a 4mm diameter electrode would be 160A, but the acceptable operating range is 140 to 180A.

MMA Welding Tips

Thickness(mm)	< 1	2	3	4 ~ 5	6 ~ 12	≥13
Rod dia. (mm)	1.5	2	3.2	3.2 ~ 4	4 ~ 5	5 ~ 6
Current (A)	20 ~ 40	40 ~ 50	90 ~ 110	90 ~ 130	160 ~ 250	250 ~ 400

DANGER! To prevent serious injury and death: If the operator is not holding the Torch, it must be sitting on a nonconductive, nonflammable surface.

A : Connect the welding torch with output stud terminal“ - ” and work piece with terminal

"+" if using alkaline welding rod.

B：Suggesting fixing welding current according to the following expressions：

Welding current = (20+6D) ×D

"D" refers to the diameter of welding rod (mm)

* Note：If some other troubles occur when using our welding machine, please contact with the agency of our company.

MAINTENANCE

WARNING! Make sure the Power Switch of the WELDER is in its "OFF" position and that the tool is unplugged from the electrical outlet before performing any inspection, maintenance, or cleaning procedures.

1. Before each use, inspect the general condition of the Welder. Check for loose cable connections, misalignment or binding of the fan, cracked or broken parts, damaged electrical wiring, and any other condition that may affect its safe operation. If abnormal noise or vibration occurs, have the problem corrected before further use. Do not use damaged equipment.
2. Periodically recheck all nuts, bolts, and screws for tightness.
3. Periodically blow the dust from the cooling vents with compressed air.
4. Verify that the cooling fan is operational before welding.
5. If the unit repeatedly shuts down from thermal overload, stop all use. Have the welder inspected and repaired by a qualified service technician.
6. Store the welder and accessories in a clean and dry location.
7. Periodically disassemble and clean the Torch Head components with steel wool. Replace burnt, cracked, distorted, or coated components, Refer to the assembly drawing on page 11.
8. To gain access to the internal components of the unit, remove screws from Main Body Cover. The home user is strongly advised not to remove the tool covers and not to attempt any electronic repairs. Any repairs must be completed by a qualified technician. Opening the tool will void any warranties, and may result in damage to equipment or possible personal injury. Don't do it.
9. On a daily basis check for any of the following problems: If any are found, take the tool to a qualified repair technician.
   a. Abnormal vibration, sound or smell.
   b. Abnormal heating at any cable connection.
   c. Then fan does not work properly.
   d. Any switch or control does not work properly.
   e. Any damage to cables.

torage: For your safety, please pile up the machines for less than three tiers, and fix them up with ropes.

6) Surrounding requirements:

- Dry and clean in-door place. Do not use in the rain.
- Surrounding temperature: -10°C ~ 40°C
- Relative humidity: ≤50% at 40°C;

≤90% at 20°C

- Altitude level < 1000 m
  - Keep the distance between the machine and walls above 20cm
  - Keep the distance between two machines above 30cm
  - Protect the machine and gas cylinders from shakes and shocks.
  - Store machine in ventilation place and keep away from rain, snow and any caustic material.

Manual metal arc (MMA) welding

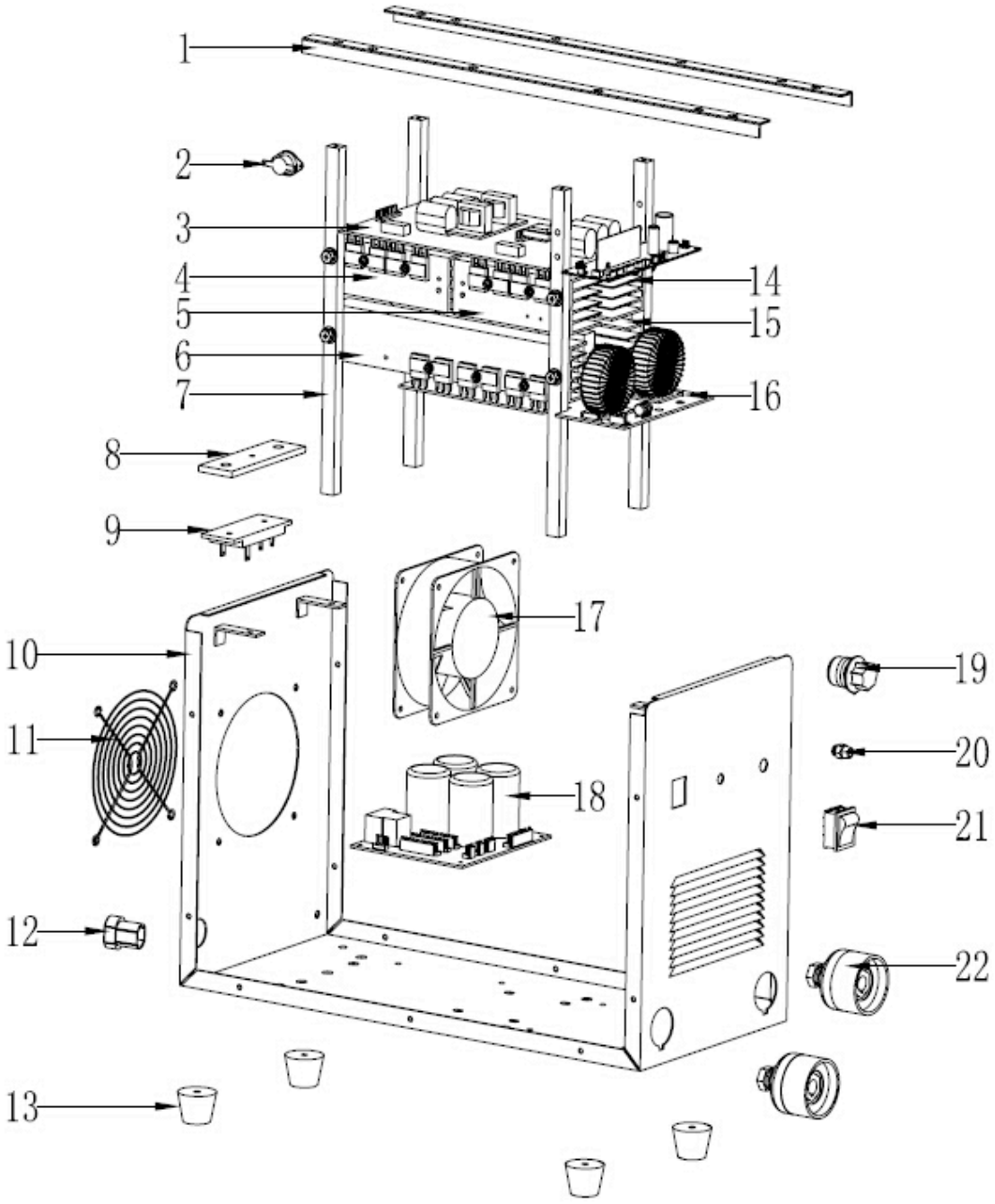
Shielded metal arc welding (SMAW), also known as **manual metal arc (MMA) welding**, **and flux-shielded arc welding** or informally as **stick welding**, is a manual arc welding process that uses a consumable electrode coated in flux to lay the weld. An electric current, in the form of either alternating current or direct current from a welding power supply, is used to form an electric arc between the electrode and the metals to be joined. As the weld is laid, the flux coating of the electrode disintegrates, giving off vapors that serve as a shielding gas and providing a layer of slag, both of which protect the weld area from atmospheric contamination.

Because of the versatility of the process and the simplicity of its equipment and operation, shielded metal arc welding is one of the world's most popular welding processes. It dominates other welding processes in the maintenance and repair industry, and though flux-cored arc welding is growing in popularity, SMAW continues to be used extensively in the construction of steel structures and in industrial fabrication. The process is used primarily to weld iron and steels (including stainless steel) but aluminum, nickel and copper alloys can also be welded with this method.

To strike the electric arc, the electrode is brought into contact with the work piece by a very light touch with the electrode to the base metal then is pulled back slightly. This initiates the arc and thus the melting of the work piece and the consumable electrode, and causes droplets of the electrode to be passed from the electrode to the weld pool. As the electrode melts, the flux covering disintegrates, giving off shielding gases that protect the weld area from oxygen and other atmospheric gases. In addition, the flux provides molten slag which covers the filler metal as it travels from the electrode to the weld pool. Once part of the weld pool, the slag floats to the surface and protects the weld from contamination as it solidifies. Once hardened, it must be chipped away to reveal the finished weld. As welding progresses and the electrode melts, the welder must periodically stop welding to remove the remaining electrode stub and insert a new electrode into the electrode holder. This activity, combined with chipping away the slag, reduce the amount of time that the welder can spend laying the weld, making SMAW one of the least efficient welding processes. In general, the operator factor, or the percentage of operator's time spent laying weld, is approximately 25%.

The actual welding technique utilized depends on the electrode, the composition of the work piece, and the position of the joint being welded. The choice of electrode and welding position also determine the welding speed. Flat welds require the least operator skill, and can be done with electrodes that melt quickly but solidify slowly. This permits higher welding speeds. Sloped, vertical or upside-down welding requires more operator skill, and often necessitates the use of an electrode that solidifies quickly to prevent the molten metal from flowing out of the weld pool. However, this generally means that the electrode melts less quickly, thus increasing the time required to lay the weld.

ASSEMBLY DIAGRAM



PART LIST (ECO ARC 200)

Item	Code	Name	Description	Unit	Remark
1	205014022	transom		PCS	2
2	303021027	Thermostat	KSD301-80℃ (	PCS	1
7	305002076	epoxy strip	228*12*10mm	PCS	2
7	305002073	epoxy strip	110*12*10mm	PCS	2

8	206001018	radiator	TIG-160/200、STICK-200	PCS	1
9	303008069	rectifier bridge	MDQ60A/1500V	PCS	1
10	205013064	base cover		PCS	1
12	305006001	Line card	7N-2 (	PCS	1
13	305007016	Rubber feet	6 #	PCS	4
18	202000432	Power PCB	FHP01410403-1	PCS	1
19	303002036	potentiometer	2W/1K	PCS	1
19	303028001	knob	MF-B01	PCS	1
20	303022001	indicator light	5R4HD	PCS	1
21	303017107	Power switch	R210-C5L-BR	PCS	1
22	301008117	speed plug	10-25	PCS	2
11、17	303023005	fan	G12038HA2BL	PCS	1
3	202000471	Control PCB	FHP01310403-4	PCS	1
4、5、14	301004390	radiator	ARC 200-1	PCS	1
16	202000588	Rectifier PCB	FHP01340403-8	PCS	1
6、15	301004391	radiator	ARC 200-2	PCS	1

TROUBLESHOOTING

IMPORTANT!

Be CERTAIN to shut off the welder and disconnect it from power and air before adjusting, cleaning, or repairing the unit. A technician should discharge all capacitors before performing and internal procedures.

NO.	Abnormal phenomena	Fault cause	Excluding way

1	Fan doesn't work when turn on the machine, no output display	1. Lacks power phase 2. Line broken 3. Fuse (10A) is broken	1. Check power supply 2. Check connection 3. Change fuse
2	Gas switch on back panel is broken when in normal working	1. IGBT module、rectifier bridge、output diode、or other components may damaged 2. Drive board damaged 3. Short circuit between line	Check-up and replace
3	Welding current is unstable	1. Lacks phase 2. Potentiometer may damaged 3. Main PCB may damaged	1.Check-up power supply 2.Check-up and replace
4	Welding current can be adjusted	1.Current adjust potent -meter may damaged 2.Main control board may damaged 3.Switch on front panel may damaged	Check-up an replace
5	Over heat indicator will light	Overabundance used	Use welding machine according to its rated duty cycle.
6	Unsteady electric arc or unsatisfied welding effect	1.The polarity is wrongly connected 2. Output or input circuit is not well connected somewhere. 3.Welding current does not match for the diameter of welding rod	1. Check and correct it. 2. Examine and repair to have it firmly connected.