

Instruction Manual



Read this manual entirely
before getting down to work
with your new machine



CE

MIG SERIES

1-0 INTRODUCTION

1-1 Instruction Manual

Only first-class material has been used for the development and production of our welding machines. The material are subject to current control and quality supervision and then processed and mounted together into our welding machines.

No matter how good materials we have used and no matter how carefully the mounting has been done. An advanced product as a MIG-SERIES welding machine demands your effort to operate perfectly for years.

Therefore study carefully this instruction before your initial operating. This should assure a profitable use of your new welding machine.

1-2 Equipment Identification

The unit's identification number (specification or part number), model, and serial number usually appear on a nameplate attached to the control panel. Equipment which does not have a control panel such as gun and cable assemblies are identified only by the specification or part number printed on the shipping container. Record these numbers for future reference.

1-3 Receipt of Equipment

When you receive the welding power source, check it against the invoice to make sure it is complete and inspect the power source for possible damage due to shipping.

Include all welding power source identification numbers as described above along with a full description of the parts in error.

Move the equipment to the installation site before uncrating the unit. Use care to avoid damaging the power source when using bars, hammers, etc., to uncrate the avoid damaging the unit.

IMPORTANT

The users are reminded to read carefully the following steps of precaution before carry out welding jobs.



WARNING!!!

THIS MANUAL HAS BEEN WRITTEN FOR EXPORT OPERATORS AND MUST BE READ ENTIRELY BEFORE OPERATING THE EQUIPMENT. PERSONS NOT CONVERSANT WITH METHODS AND OPERATIONS OF THE EQUIPMENT SHOULD CONSULT THE MANUFACTURER.

DO NOT ATTEMPT TO SET UP, OPERATE OR SERVICE EQUIPMENT IF NOT QUALIFIED TO DO SO OR IF THIS MANUAL HAS NOT BEEN READ AND UNDERSTOOD. IF IN DOUBT REGARDING EQUIPMENT INSTALLATION AND USE, CONSULT THE MANUFACTURER (TECHNICAL ASSISTANCE DEPARTMENT).

WELDING OPERATIONS ARE A SOURCE OF RADIATION, NOISE, HEAT AND NOXIOUS FUMES; FOR THIS REASON THE PROTECTION OF THE OPERATOR AND OF THIRD PERSONS MUST BE GUARANTEED WITH SUITABLE SAFETY DEVICES AND PROTECTION. FAILURE TO OBSERVE THESE REGULATIONS DURING OPERATION COULD LEAD TO SERIOUS HEALTH RISKS.

2.0 SAFETY REGULATION

1. During installation and maintenance of equipment must be performed in compliance with local safety standards.
2. Operate the welding power source only on power supply with a reliable earth leakage breaker and well protective connection point.
3. Avoid operate the welding power source near flammable material, and in metallic-dust environment.
4. Use welding helmet dousing glass, gloves and shoes to protect eye, neck, hand, etc. of the user.
5. Always wear safety glasses with side shield, particularly during manual or mechanical removal of removal of slag. High temperature slag may be projected to great distances. Pay attention to fellow workers in the vicinity.
6. Make sure the welding cables and the main power supply in good conditions before carrying out the welding jobs.
7. Use the welding power source only in a dry indoor/outdoor. Location and in a place of limit exposure to sunlight, rain etc. ensure that the surrounding area, including any objects there in and the equipment, is dry.
8. Repair water leakage immediately. Do not spray water or other liquids on the machine.
9. Make sure objects do not obstruct the fan cooling system of the welding power source. Always keep the welding power source well ventilated.
10. Before carry out the servicing and repairing, always make sure that the main power source is disconnected from outlet.

i) Do's and Don'ts during installation

1. Pay attention to the state of wear of socket and plug wiring; renew if necessary. Service the equipment periodically. Use adequately sized wiring.



2. Connect the ground lead as near as possible to the operating area. Earth connections to structural parts of the building or to other places distant from the operating area will reduce their effectiveness and increase the danger of electric shock. Do not pass equipment cables through or near lifting chains, crane cables through or near lifting chains, crane cables or electrical lines.
3. Avoid all the direct contact between the skin or wet garments with live metal parts. Check that gloves and protections are dry!



4. Always wear gloves and rubber soled shoes when working in wet areas or standing on metal surfaces.

5. Always turn off equipment when not being used or in the event of power failure. Accidental earth discharge may cause overheating and fire hazards. Do not leave the machine unattended when it is turn on.

ii) User's liability and protection

The user of this welding power source should obey the following terms and regulation.

Welding operations are a source of radiation, noise, heat and noxious fumes; for this reason, the protection of the operator and of third persons must be guaranteed with suitable safety devices and precautions. Never approach arc rays or hot metal without protection. Failure to observe these regulations during operation could lead to serious health risks.

1. The welding power source will perform in conformity with the description contained in the instruction manual provided.

2. It is recommended only the qualified persons are allowed to carry out the repairs and replacement of this machine.

3. Any modifications of the parts of this machine are not encouraged.

4. The user of this welding power source shall have sole liability for any malfunctioning which may result from improper use or unauthorized modification from standard specifications, faulty maintenance, damage or improper repair by any one other than qualified persons approved by the equipment manufacturer or its representative.



5. Wear fire-resistant work gloves, a heavy-duty long-sleeved shirt, trousers without turn-ups and shoes with high uppers or boots to protect the skin from arc rays and metal sparks and a welder's helmet or cap to protect the hair.



6. Use asks with suitable glass filter (at least NR10) to protect eyes. Take measures to protect face, ears and neck. Advise other persons in the vicinity to look away and stand clear of arc rays and hot metal.



7. Wear ear protectors; welding operations are often noisy and may disturb other persons in the work area.



8. Always wear safety glasses with side shield, particularly during manual or mechanical removal of slag. High temperature slag may be projected to great distances. Pay attention to fellow workers in the vicinity.

9. Position a fire-resistant screen around the welding area to protect persons in the vicinity from arc rays, sparks and slag.

10. Compressed gas cylinders are potentially dangerous; consult the supplier for correct handling procedures. Always protect cylinders from direct sunlight flames, sudden temperature changes and low temperatures.

iii) Fire and explosion prevention



Hot slag and sparks can cause fire outbreaks. Explosions and fires can be prevented by following the procedure described below: Clear away or protect inflammable objects and substances (wood, saw dust, clothing, paints, solvents, petrol kerosene, natural gas, acetylene, propane, etc) with fire proof material.

1. Tubes and containers must be opened, emptied and thoroughly cleaned before welding. Welding

operations on these parts must be performed with the utmost caution.

- Keep extinguishing means, such as fire extinguishers, water and sand, within easy reach.
- Never weld or cut closed containers or pipes.
- Never weld or cut containers or pipes (even open) containing or which have contained substances that could give rise to explosions humidity or heat sources.

iv) Metal fume hazards



Welding fumes and gases may be hazardous if inhaled for long periods of time.

- Install a natural or forced-air ventilation system in the work area.
- Use forced-air ventilation system when welding lead, beryllium, cadmium, zinc, zinc coated or painted materials wear a protective mask.
- If the ventilation system is inadequate, use an air respirator.
- Beware of gas leaks. Shield gases such as argon are denser than air, and when used in confined spaces will replace it.
- In the event of welding operations in confined places (e.g. inside boilers, trenches), the welder should be externally accompanied by another person.
- Always observe accident-prevention procedures.
- Keep gas cylinders in a well-ventilated area.
- Close the main valve when gas cylinder is not in use.
- Do not perform welding operations near chlorinated hydrocarbon vapors produced by degreasing or painting: the heat generated by arc may react to form phosgene a highly toxic gas.
- Irritation of the eyes, nose and throat are symptoms of inadequate ventilation. Take immediate steps to improve ventilation. Do not continue welding if symptoms persist.

V) Positioning & transporting the power source

Position the equipment in compliance the following indication provided below.

- The operator must have unobstructed access to controls and equipment connections.
- Do not position equipment in confined, closed places. Ventilation of the power sources is extremely important. Avoid dusty or dirty locations, where dust or other debris could be aspirated by the system.
- Equipment (including connecting leads) must not obstruct corridors or work activities of other personnel.
- Position the power source securely to avoid falling or overturning.
- Bear in mind the risk of equipment situated in overhead positions.
- The power source handle or suitable sized nylon welding may carry the machine.
- Always disconnect the power source and accessories from main supply before lifting or handling operations.
- Do not drag, pull or lift equipment by the cable.

2.1 RECOMMENDATION OF REDUCING EMISSIONS



This welding power source has been designed to work for professional and industrial. For other applications please contact the manufacturer/dealer.

- WARNING.** The user is responsible for installing and using the welding equipment according to the

manufacturer instructions. If electromagnetic disturbances are detected then it shall be the responsibility of the user of the welding equipment to resolve the situation with the technical assistance of the dealer or authorize service center. In some cases this remedial action may be as simple as earthing the welding circuit, see ATTENTION. In other cases it could involve constructing an electromagnetic screen enclosing the power source and the work complete with associated input filters. In all cases electromagnetic disturbances must be reduced to the point where they are no longer troublesome.

2. ATTENTION. The welding circuit may or may not be earthed for safety reasons. Changing the earthing arrangements should only be authorized by a person who is competent to assess whether the changes will increase the risk of injury, e.g. by allowing parallel welding current return paths which may damage the earth circuits of other equipment.

3. WARNING. Extra precaution may be required when the welding power source is used in a domestic establishment.

4. WARNING. Special measures shall be taken to achieve compliance with welding power source including HF frequency for arc ignition and stabilizing; it may be required use of shielded cables and in any case to resolve the particular implementation (e.g. with robot, computer and any other electrical and electronic equipment connected to welding power source) to call the technical assistance of the manufacturer.

2.2 ELECTROMAGNETIC FIELD AROUND WORKING AREA



Before installing welding equipment the user shall make an assessment of potential electromagnetic problems in the surrounding area. The following shall be taken into account:

- Other supply cables, control cables, signaling and telephone cables; above, below and adjacent to the welding equipment.
- Radio and television transmitters and receivers.
- Computer and other control equipment.
- Safety critical equipment, e.g. guarding of industrial equipment.
- The health of the people around, e.g. the use of pacemakers and hearing aids.
- The immunity of other equipment in the environment. The user shall ensure that other equipment being used in the environment is compatible. This may require additional protection measures.
- The time of day that welding or other activities are to be carried out.
- The size of the surrounding area to be considered will depend on the structure of the building.
- Other activities that are taking place. The surrounding area may extend beyond the boundaries of the premises.

2.3 WORKING ENVIRONMENT

- Mains supply. Welding equipment should be connected to the mains supply according to the manufacturer recommendations. If interference occurs, it may be necessary to take additional precautions such as filtering of the main supply. It should be taken measures to shielding the supply cable of permanently installed welding equipment, in metallic conduit or equivalent. Shielding should be electrically continuous throughout its length. The shielding should be connected to the welding power source so that good electrical-contact is maintained between the conduit and the welding power source enclosure.
- Maintenance of the welding equipment. The welding equipment should be routinely maintained according to the manufacturer recommendations. All access and service doors and covers should be closed and properly fastened when the welding equipment is in operation. The welding equipment should not be modified in any way except for those changes and adjustments covered in the manufacturers' instructions. In particular, the spark gaps of arc striking and stabilizing devices should be adjusted and maintained according to the manufacturer recommendations.
- Welding cables should be kept as short as possible and should be positioned close together, running at or close to the floor level.
- Earthing of the work piece. Where the work-piece is not bonded to earth for electrical safety, not connected to earth because of its size and position, e.g. ships hull or building steelwork, a connection

bonding the work piece to earth may reduce emissions in some but all instance, Care should be taken to prevent the ear thing of the work piece to earth should be made by a direct connection to the work piece but in some countries where direct connection is not permitted, the bonding should be achieved by suitable capacitance, selected according to national regulations.

5. Screening and shielding. Selective screening and shielding of other cables and equipment in the surrounding area may alleviate problem of interference. Screening of the entire welding installation may be considered for special applications.



QUALIFIED PERSONS MUST PERFORM INSTALLATION AND MAINTENANCE OPERATIONS ONLY.
BEFORE INSTALLING the Power source, check that the power socket satisfies ampere and voltage requirement (see technical data table)
ENSURE that appropriate fuses and automatic switches protect the socket.
CONNECT an approved standard plug corresponding to the system socket to the power supply cable.

EQUIPMENT INSTALLATION AND MAINTENANCE MUST BE PERFORMED IN COMPLIANCE WITH LOCAL SAFETY STANDARDS			
- Electric shock could be fatal. - Never touch exposed electrical parts. - Switch off and disconnect the power source before installing or opening. - Qualified persons may perform installation only. - Installation procedures must comply with national electricity standard and all other relevant regulations - Welding wire may cause injury. - Do not point the torch toward any part of the body, other persons or any type of metal when unwinding welding wire.	- Use a protective mask with suitable glass filter (at least NR10) to safeguard eyes. - Wear appropriate eye, ear and body protection equipment. - Protect face, ears and neck during persons in the vicinity to look away and stand clear of arcs rays and hot metal.	- Fumes and gases may represent a safety hazard. Fumes and gases generated during welding may be dangerous if inhaled over a long period of time. - Keep clear of fumes. - Ventilate welding area or wear a breathing mask. - Install a natural or forced air ventilation system in the work area.	- Hot areas may cause injury. - Let the power of other parts cool before performing any maintenance or servicing.
- A falling power source or other equipment may cause serious injury to persons or damage to objects. - Always make use of the handle to lift power source/applies to portable models.) - Use eyebolts and adequate lifting equipment to raise the power source.	- WELDING MAY CAUSE FIRES OR EXPLOSIONS. - Never weld near inflammable materials. - Beware of weld flame. Always keep a fire extinguisher close at hand. - Never place welding equipment on inflammable surfaces. - Do not weld in closed containers. - Let welding equipment and material cool before handling them.	- The positioning of welding equipment on inflammable surfaces could lead to fire outbreak or explosion. - Never position equipment on combustible or inflammable surfaces. - Do not install equipment in the vicinity of inflammable liquids.	

3-0 GENERAL DESCRIPTIONS

Ours welding machines, type MIG SERIES have been developed for thin plate welding and car body repair. The MIG-SERIES is designed to single phase 220-240V 50/60Hz mains supply. The main parts of the

machine are the main transformer, the contactor, the rectifier for welding current, the control transformer; the wire feed motor, the solenoid valve and the electronic control. The welding transformer has been dimensioned to obtain optimum welding capacities, and for a working temperature of 180°C.

3-1 Mode of Operation

When the trigger at the welding handle is activated, the contactor will couple voltage to the welding transformer, which will give a secondary voltage decided by the position of the voltage switch. In the rectifier this AC voltage is transformed into a DC voltage, which is applied between welding torch and return cable. At the same time the flow of protection gas and the wire feed motor are started. The adjustment button decides the number of revolutions. When you lift your finger from the trigger the motor will stop and after a short delay the contactor and the welding current are interrupted.

The delay which is called "burn back delay" has the effect that the welding wire will burn back a little from the molten pool and thus does not stick to the pool. The time of delay is controlled by the trim potentiometer at the P.C. assembly board. The electronic control and be set to the functions "continuous", "spot", "stitch".

At "spot" the welding will stop after a delay that can be set by the button "welding time". Using this function you are sure of a uniform stitch welding.

In the position "stitch" the wire feed motor will stop with stitch that can be set by the button "welding time" and "pause time". When you put "pauses" into the welding, the average heat volume added is reduced to prevent a burning through on difficult welding tasks.

4-0 INITIAL OPERATING

4-1 Location

For best operating characteristics and longest unit life: take care in selecting an installation site. Avoid locations exposed to high humidity, dust, high ambient temperature, or corrosive fumes. Moisture can condense on electrical components, causing corrosion or shorting of circuits. Dirt on components helps retain this moisture. Adequate air circulation is needed at all times in order to assure proper operation. Make sure that the ventilator openings are not obstructed.

4-2 Mains Connection

Input voltage should be as stated on the type plate of the machine. If dual voltage, the tapping must be checked before mains connection. First make sure that the power supply is appropriately fused (50A slow).

When connecting the mains plug, it is absolutely essential that the green (or green/yellow) wire of the mains cable is connected to the earth screw of the plug. The other two wires should be connected to any of the other two terminals mark L (live) NOTE! Electrical connections should only be made by a fully qualified person.

4-3 Shielding Gas Connection

The shielding gas bottle is mounted on the machine and the regulator on the bottle. If the regulator is equipped with flow meter, the flow rate is adjusted on 5-15 liters/min.

4-4 Welding Hose Connection

The welding hose is put through the hole in the front plate and into the switch on the wire feed console. Keep the inlet nozzle as close to the wire feed roller as possible without letting them touch each other. Fasten the Allen screw and mounted the gas hose and the control wire.

4-5 Fitting the Welding Wire

Turn the tension spring aside and tip it up. Check that the wire feed roller, the wire guide liner and the contact tip correspond to the wire diameter, the wire feed roller is designed for one dimension.

When using aluminum wire use a special guide liner where the internal liner goes the way through the inlet nozzle. This prevents the aluminum wire from being damaged.

The reel of wire is put on the hub, and the wire is put through the wire feed unit and some centimeter into the hose. As the wire gulden liner in order to remove all burrs and it is equally important to straighten out the first 10-15cm. Unscrew contact nozzle. TIP UP THE LEVER. Set the wire speed at 6; press the start button, the wire runs through the hose. When the wire is through the hose, stop the machine and mount the contact nozzle. The pressure of the level is adjusted to allow the wire feed roller just to slide on the wire when this is

stopped at the contact nozzle.

5-0 WELDING TECHNIQUES

5-1 Setting of the Machine

The setting of a MIG SERIES welding machine demands some practice from the welder, the machine having two control points that have to conform. These two are the wire feed speed, and it should correspond to the work piece. The current will increase wire speed, resulting in a shorter arc. Less wire speed will reduce the current and lengthen the arc. Increasing the welding voltage hardly alters the current intensity, but lengthens the arc. By decreasing the voltage a shorten arc is obtained with little change in current intensity.

When using CO₂ as shielding gas, increase the voltage by about 5 volts per 100Amp. When changing the wire diameters, different control settings are required. A thinner wire needs more speed to acquire the same current strength. A satisfactory weld cannot be obtained if extreme values are exceeded.

If the feed speed is too high for the welding voltage, blockage will occur in the torch as the wire dips into the molten pool and does not melt. Welding in these conditions normally gives faults due to lack of fusion. If, however, the welding voltage is too high, large drops will form on the end of the wire, causing spatter. The correct setting of voltage and speed can be seen in an even and calm arc.

5-2 Influence of the Welding Position

The position of the torch and the work piece is important for quality and appearance of the seam.

The diagrams on the next page show some of the many possibilities and indicate schematically the importance of these positions. In practice one of course uses all combinations of welding positions, torch directions and positions of the work piece.

Together with the figures, the diagram below may help when an estimation of the importance of separate factors for welding quality is needed.

The terms drawing weld and thrusting weld mean.

Drawing weld: torch sloped in direction of weld.
Thrusting weld: torch sloped away from direction of weld.

Drawing weld is sometimes designated "dragging welding" and thrusting weld "stabbing weld".

	Thrusting weld	Drawing weld
Width of seam	Wider	Narrower
Upper bead	Smaller	Larger
Penetration	Decrease	Increase
Tendency to lack of fusion	Greater	Lesser



Pushing Weld



Pulling Weld



Pushing Weld

Sloping downwards



Pulling Weld
Sloping downwards



Pulling Weld
Sloping upwards

6-0 TECHNICAL DATA

TYPE	MIG 100F	MIG 135	MIG 15	MIG 175	MIG 195	MIG 200C/OMO
DATA	AC	DC	DC	DC	DC	DC
Mains supply	Single phase 50Hz/60Hz	Single phase 50Hz/60Hz	Single phase 50Hz/60Hz	Single phase 50Hz/60Hz	Single phase 50Hz/60Hz	Single phase 50Hz/60Hz
Input voltage	220-240V	220-240V	220-240V	220-240V	220-240V	220-240V
Rated input capacity KVA	3.5	5.6	5.8	6.9	8.1	8.2
Duty Cycle %	100A@10% 32A@100%	135A@10% 43A@60%	150A@10% 60A@60%	175A@10% 71A@60%	195A@10% 79A@60%	200A@15% 90A@60%
Current adjustment A	32-100	35-135	30-150	35-175	40-195	45-200
Working Voltage V	15.6-19	15.7-20.7	15.5-21.5	16.7-22.7	16-23.8	16.2-24
GAS	NO GAS	CO ₂	CO ₂ /NO GAS	CO ₂ /NO GAS	CO ₂ /NO GAS	CO ₂ /NO GAS
Filler wire	flux-cored	solid	flux-cored	flux-cored	flux-cored	solid
Weight of filler wire	1KG	1KG	1KG	1KG	1KG	15KG
Filler wire diameter mm	ø 0.6, ø0.8	ø 0.6, ø0.8	ø 0.6, ø0.8	ø 0.6, ø0.8	ø 0.6, ø0.8	ø 0.8, ø1.0
Wire feeder speed m/min	2.5-16	2.5-16	2.5-16	2.5-16	2.5-16	2.5-16
Dimensions mm	340*180*360	420*225*380	570*305*425	570*305*425	570*305*425	830*480*805

7-0 MAINTENANCE

7-1 Checking Items

The following items demand special attention:

(A) Wire feed unit: This unit is to be checked regularly at the wire feed roller and the wire nozzles, as it is of great importance for a satisfactory welding result and a minimum of wear and tear that the wire passes through the mechanism without any deformations of the wire or the wire feed roller.

The wire nozzle should often be checked and changed if the copper coating of the wire is damaged on its way through the nozzles. Copper dust may totally hinder free passage through the wire liner.

A weekly check and cleaning of the nozzles as well as the wire feed roller is recommended.

(B) Welding hose: Great care should be taken that the welding hose is not overbowed. It should not be pulled over sharp edges, and other heavy machines should not run over it as it may damage the wire lines. The hose should be dismantled every week and blown out with dry air.

(C) Welding torch: There are many parts in the welding torch that have to be cleaned regularly. The main ones are the contact tip and the gas nozzle. The spatter should therefore be removed regularly and spatter remover applied in order to prevent spatter from burning into the nozzles. During the cleaning process, the gas nozzle is removed.

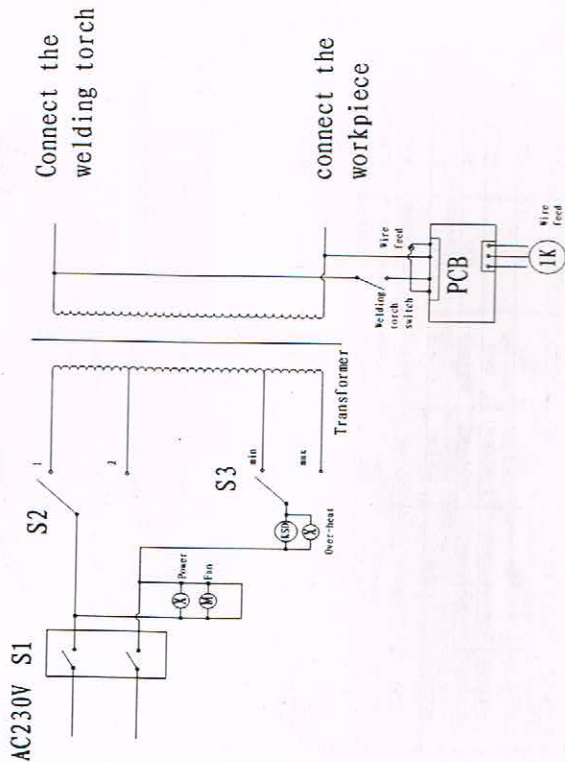
REMEMBER: DO NOT CLEAN BY BEATING THE TORCH.

(D) Power source.

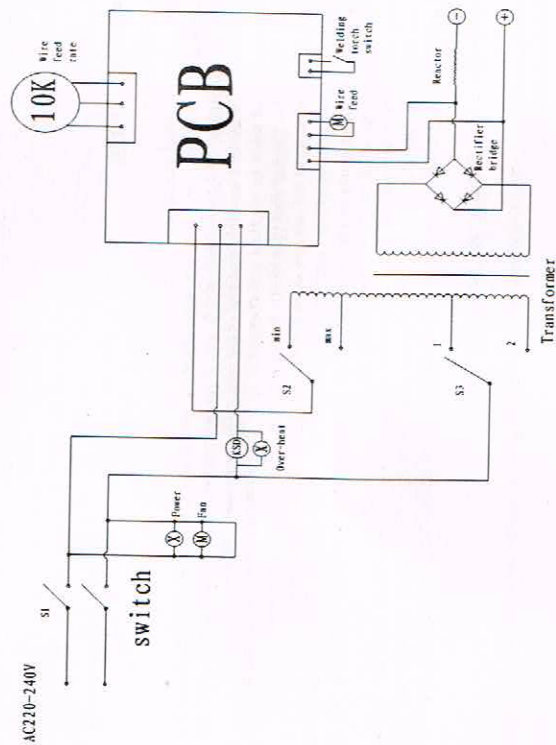
(E) The rectifier and transformer should be blown out with dry air occasionally; otherwise the air circulation will be affected by the dust.

8. CIRCUIT DIAGRAM MIG SERIES CIRCUIT DIAGRAM

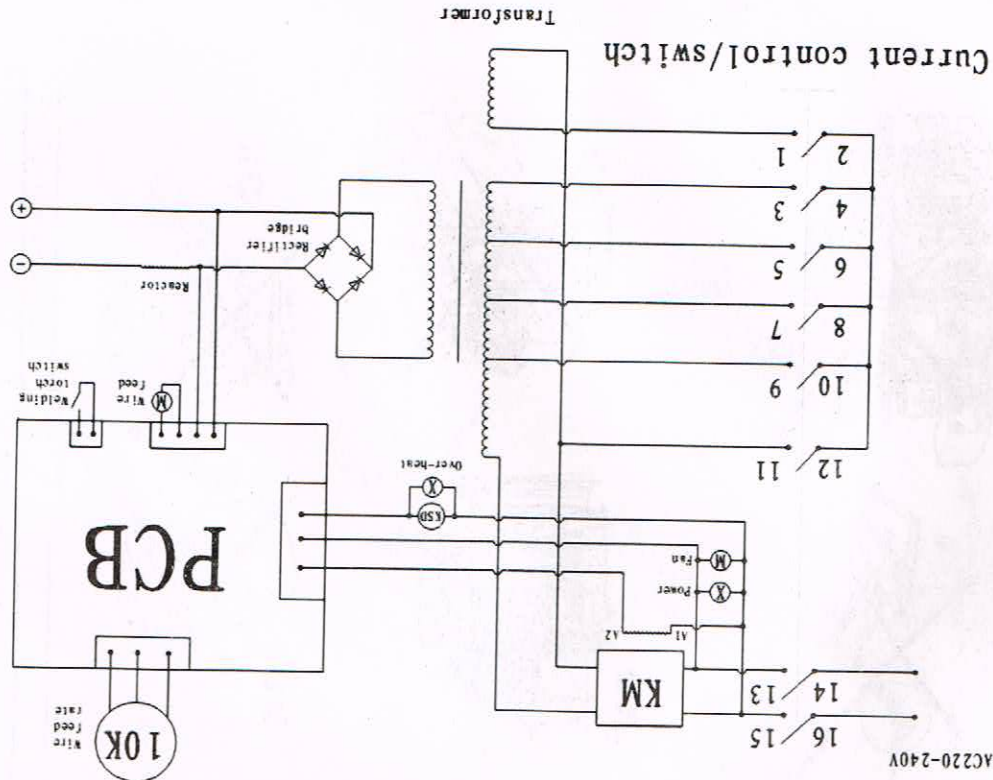
MIG100F Electrical diagrams



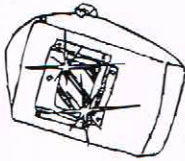
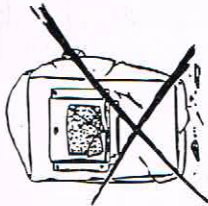
MIG135 Electrical diagrams



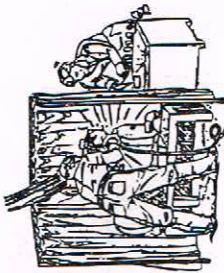
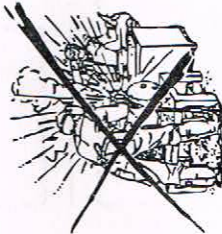
MIG150, 175, 195, 200C0M0 Electrical diagrams



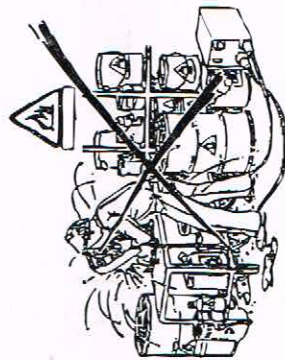
SAFETY OBSERVATION



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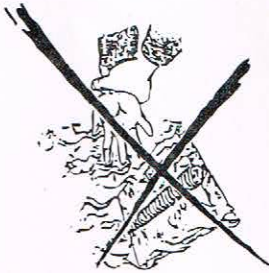


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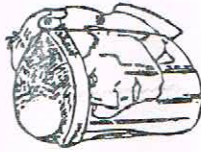
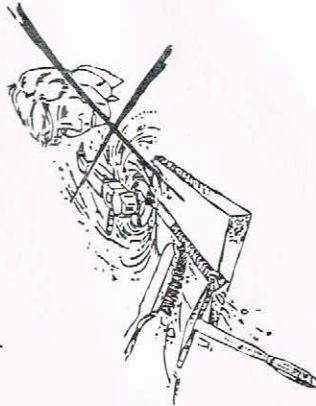


(i)

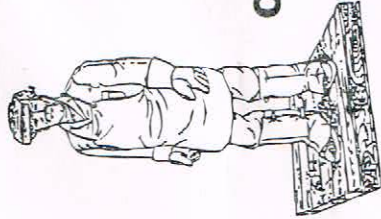
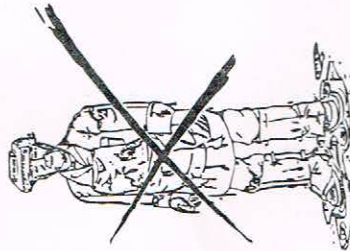
SAFETY OBSERVATION



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(ii)