



Stick/Mig Capability
Welding Excellence
Modular Construction
Environment Protected
2,000 Watt AC Power for Tools

Arc Welding Safety Precautions

PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. READ AND UNDERSTAND BOTH THE SPECIFIC INFORMATION GIVEN IN THE OPERATING MANUAL FOR THE WELDER AND/OR OTHER EQUIPMENT TO BE USED AS WELL AS THE FOLLOWING GENERAL INFORMATION.

1. HAVE ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR WORK performed only by qualified people.

2. ELECTRIC SHOCK can kill.

Protect yourself from possible dangerous electrical shock:

- a. The electrode and work (or ground) circuits are electrically "hot" when the welder is on. Never permit contact between "hot" parts of the circuits and bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.
- b. Always insulate yourself from the work and ground by using dry insulation. When welding in damp locations, on metal floors, gratings or scaffolds, and when in positions such as sitting or lying, make certain the insulation is large enough to cover your full area of physical contact with work and ground.
- c. Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.
- d. Ground the work or metal to be welded to a good electrical ground.
- e. Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition.
- f. Never dip the electrode in water for cooling.
- g. Never simultaneously touch electrically "hot" parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.
- h. If using the welder as a power source for mechanized welding, the above precautions also apply for the automatic electrode, electrode reel, welding head, nozzle or semiautomatic welding gun.
- i. When working above floor level, protect yourself from a fall should you get a shock.
- j. Also see Items 6c and 8.

3. FUMES AND GASES can be dangerous to your health.

- a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. When welding on galvanized, lead or cadmium plated steel and other metals which produce toxic fumes, even greater care must be taken.

- b. Do not weld in locations near chlorinated hydrocarbon vapours coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapours to form phosgene, a highly toxic gas, and other irritating products.
- c. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.
- d. Read and understand the manufacturer's instructions for this equipment and the consumables to be used, including the material safety data sheet (MSDS) and follow your employer's safety practices.
- e. Also see item 9b.

4. ARC RAYS can injure eyes and burn skin.

- a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to ANSI Z87. 1 standards.
- b. Use suitable clothing made from durable, flame-resistant material to protect your skin and that of your helpers from the arc rays.
- c. Protect other nearby personnel with suitable nonflammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.

5. FIRE OR EXPLOSION can cause death or property damage.

- a. Remove fire hazards well away from the area. If this is not possible cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Have a fire extinguisher readily available.
- b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to "Safety in Welding and Cutting" (ANSI Standard 249.1) and the operating information for the equipment being used.
- c. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.
- d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapours from substances inside. They can cause an explosion even though they have been "cleaned." For information purchase "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances."

AWS F4.1-80 from the American Welding Society.

- e. Vent hollow castings or containers before heating, cutting or welding. They may explode.
 - f. Also see items 6c and 9c.
6. For Welding in General.
- a. Droplets of molten slag and metal are thrown or fall from the welding arc. Protect yourself with oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses when in a welding area. Use glasses with side shields when near slag chipping operations.
 - b. Keep all equipment safety guards, covers and devices in position and in good repair. Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.
 - c. Be sure the work cable is connected to the work as close to the welding area as practical. Work cables connected to the building framework or other locations some distance from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.
7. For Gas-Shielded Arc Welding.
- a. Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.
 - b. Always keeps cylinders in an upright position securely chained to an undercarriage or fixed support.
 - c. Cylinders should be located:
 - Away from areas where they may be struck or subjected to physical damage.
 - A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.
 - d. Never allow the electrode, electrode holder, or any other electrically "hot" parts to touch a cylinder.
 - e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.
 - f. Valve protection caps should always be in place and handtight except when the cylinder is in use or connected for use.
 - g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 "Precautions for Safe Handling of Compressed Gases in Cylinders" available from the Compressed Gas Association, 1235 Jefferson Davis

Highway, Arlington, VA 22202.

8. For Electrically Powered Equipment.
- a. Turn off input power using the disconnect switch at the fuse box before working on the equipment.
 - b. Make the electrical installation in accordance with the National Electrical Code, all local codes and the manufacturer's recommendations.
 - c. Properly ground the equipment in accordance with the National Electrical Code and the manufacturer's recommendations.
9. For Engine Powered Equipment.
- a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.
 - b. Operate the internal combustion engines in open, well ventilated areas or vent the engine exhaust fumes outdoors.
 - c. Do not add the fuel near an open flame, welding arc or when the engine is running. Stop the engine and, if possible, allow it to cool when refuelling to prevent spilled fuel from vaporizing on contact with hot engine parts and igniting. Do not spill fuel when filling tank. If fuel is spilled, wipe it up and do not start engine until fumes have been eliminated.
 - d. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.
 - e. Do not put your hands near the engine fan. Do not attempt to override the governor or idler by pushing on the throttle control rods while the engine is running.
 - f. To prevent accidentally starting gasoline engines while turning the engine or welding generator during maintenance work, disconnect the spark plug wires, distributor cap or magneto wire as appropriate.
 - g. To avoid scalding, do not remove the radiator pressure cap when the engine is hot.

For more detailed information it is strongly recommended that you purchase a copy of "Safety in Welding & Cutting - ANSI Standard 249.1" from the American Welding Society, P.O. Box 351040 Miami, Florida 33135.

OPERATION

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. Make sure that the ventilator openings are not obstructed.

- Connect welding machine to input voltage.
- Set INPUT CONTACTOR CONTROL ON/OFF SWITCH to ON (UP) position.
- For LOCAL control, set the CURRENT CONTROL LOCAL/REMOTE SWITCH to local (OFF) position. Adjust the welding current by the CURRENT CONTROL potentiometer located on the front panel.
- For REMOTE control, set the above switch to remote (ON) position. Adjust the welding current by the potentiometer located in the remote control. For this mode of operation it will be necessary to use a Remote Control Pendant plugged into the REMOTE CONTROL RECEPTACLE.
- THE ARC FORCE CONTROL potentiometer varies the dynamic slope of the volt-amp curves. It essentially changes the short-circuit (arc) current and produces an increase of amperage when the arc is shortened. Strong arc force is best suited for use with 6010 electrodes where there is a tendency for sticking, especially for down hand welding.

MAINTENANCE

- **Lubrication**
The fan motor is permanently lubricated and will never need oil or grease. No other points require lubrication.
- **Cleaning**
For uninterrupted satisfactory service from this welding machine, it is necessary to keep the machine clean, dry and well ventilated. At least every two months or more often as necessary, wipe and blow out all dirt from the machine's internal components with air pressure of not over 25psi. Be sure to wipe the fan blades clean.

TECHNICAL DATA

DIMENSIONS (LxWxH)	680 x 405 x 530 mm 26.8 x 15.9 x 20.9 in
NET WEIGHT	117kg / 258 lbs
DIMENSIONS (in frame)	775 x 535 x 560 mm 30.5 x 21 x 22 in
NET WEIGHT (in frame)	130kg / 285 lbs

CSA APPROVED

RATED OUTPUT	DC
Amperes	250
Volts	30
Duty cycle	60%

WELDING VOLTAGE AND CURRENT RANGE	
Minimum current at 20Volt	20A
Maximum current at 34Volt	350A

INPUT 3 PHASE 60Hz - AT RATED LOAD	
480V - AMPS - OPT	21
600V - AMPS - OPT	17
PRIMARY KW	11

**TABLE 2
RECOMMENDED COPPER CABLE SIZES
AT 60% DUTY CYCLE**

Machine Size in Amps	Cable Sizes for Combined Length of Electrode Plus Work Cable	
	Up to 200 ft.	200 to 250 ft.
250	1	1/0

CONTROL OF WELDING CURRENT

There is one continuous current control which gives you complete adjustment of current from minimum to maximum. For local control make sure the remote control switch is in the "off" position. There is also the possibility of installing a remote control. To control at a distance the remote control switch must be in the "on" position.

There is also an Arc Force control which produces an increase of amperage when the arc length is shortened, such as in a tight groove or in pipe welding. This control provides more arc force and eliminates the tendency of snuffing out the arc.

AUXILIARY POWER

Your E300 3+2 is equipped with AC auxiliary power.

The AC unit provides a Duplex 120Volt receptacle and 2KW of maximum output. The output circuit is protected with circuit breakers.

Power tools should always be grounded to the welded frame unless they are protected by an approved system of double insulation.

MAINTENANCE

Have qualified personnel do the maintenance work. Turn the engine off before working inside the machine. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.

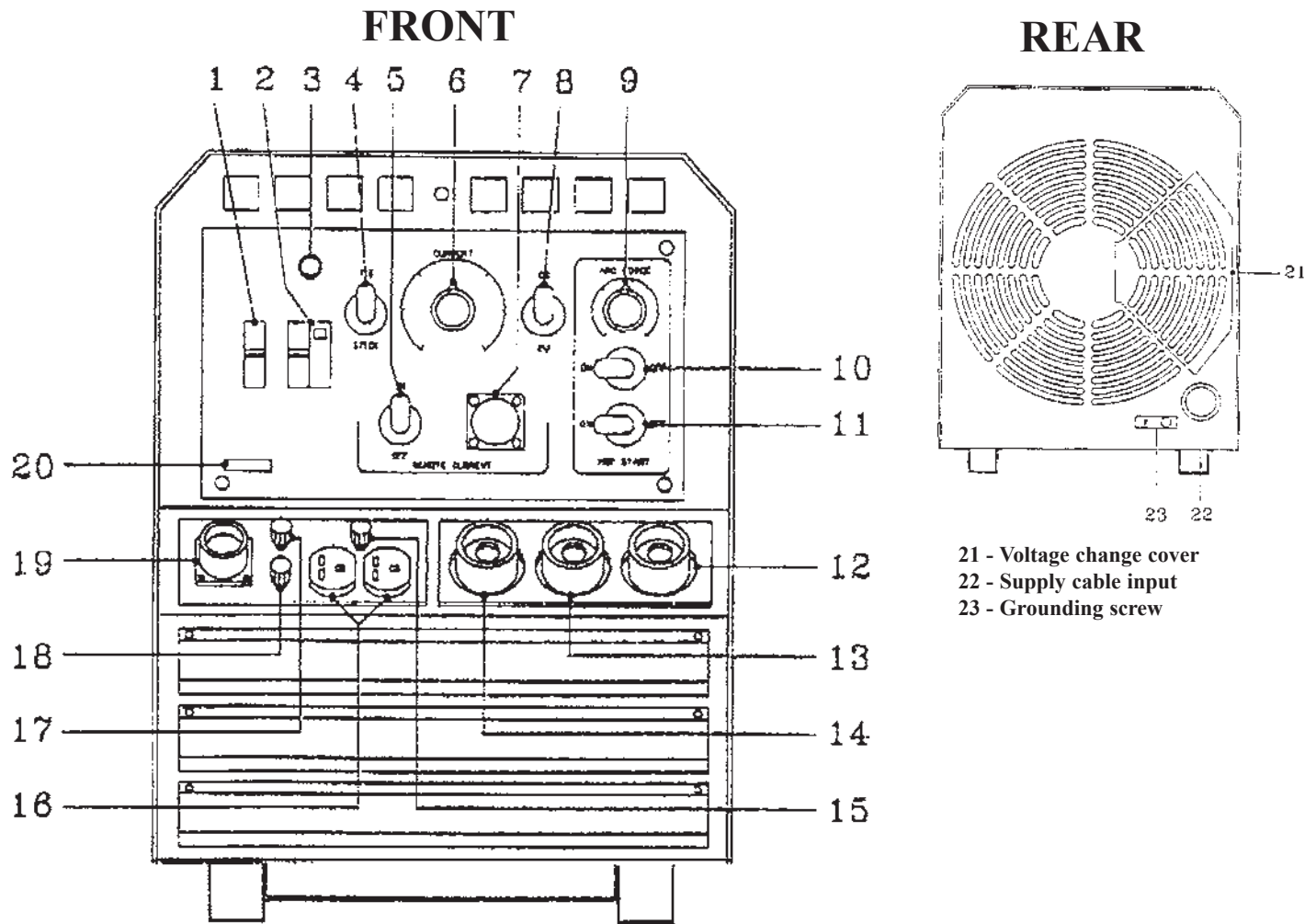
Do not put your hands near the engine or generator fan. If a problem cannot be corrected by following the instructions, take the machine to the nearest **RED-D-ARC** location.

GENERAL INSTRUCTIONS

1. Blow out the welder and controls with an air hose at least once every two months. In particularly dirty locations, this cleaning may be necessary once a week. Use low pressure air to avoid driving dirt into the insulation.

WARNING: Uncovered rotating equipment can be dangerous.
Use care so your hands, hair, clothing or tools do not catch in the rotating parts.

CONTROL PANEL FEATURES



- 1 - On/Off Switch/Breaker 30 AMP
- 2 - Ground fault protector
- 3 - On light
- 4 - Stick/Tig mode select switch (optional)
- 5 - Remote current switch: Switch must be "off" when using machine with no remote control, "ON" when using with remote control.
- 6 - Welding current control: Use to adjust amperage desired.
- 7 - Remote current control receptacle
- 8 - "CC-CV" mode select switch: CC for all Stick and Tig applications CV for most semi automatic Mig applications
- 9 - Arc force control: To use arc force turn switch to "ON" position. Arc force is used mostly when using 6010, 7010 type electrodes, especially for down hand. By using more arc force it makes the arc more forceful and prevents sticking. When a smoother arc is desired , use less arc force.
- 10 - Arc force on/off switch
- 11 - Hot start on/off switch : When the switch is on, a boost of current is applied for a very short time when the arc is struck. This is used in applications when arc starting is difficult. Do not use for Tig applications when soft start is desired.
- 12 - Positive electrode terminal
- 13 - Negative "MIG" terminal - has the least inductance and is recommended for MIG welding and arc air.
- 14 - Negative "stick" terminal - has the most inductance and is recommended for Stick and DC Tig welding.
- 15 - 15Amp circuit breaker
- 16 - 120 V single phase outlet
- 17 - 10Amp fuse for relay 120V
- 18 - 10Amp fuse for fan motor
- 19 - Terminal board for wire feeder connections
- 20 - Serial number
- 21 - Voltage change cover
- 22 - Supply cable input
- 23 - Grounding screw

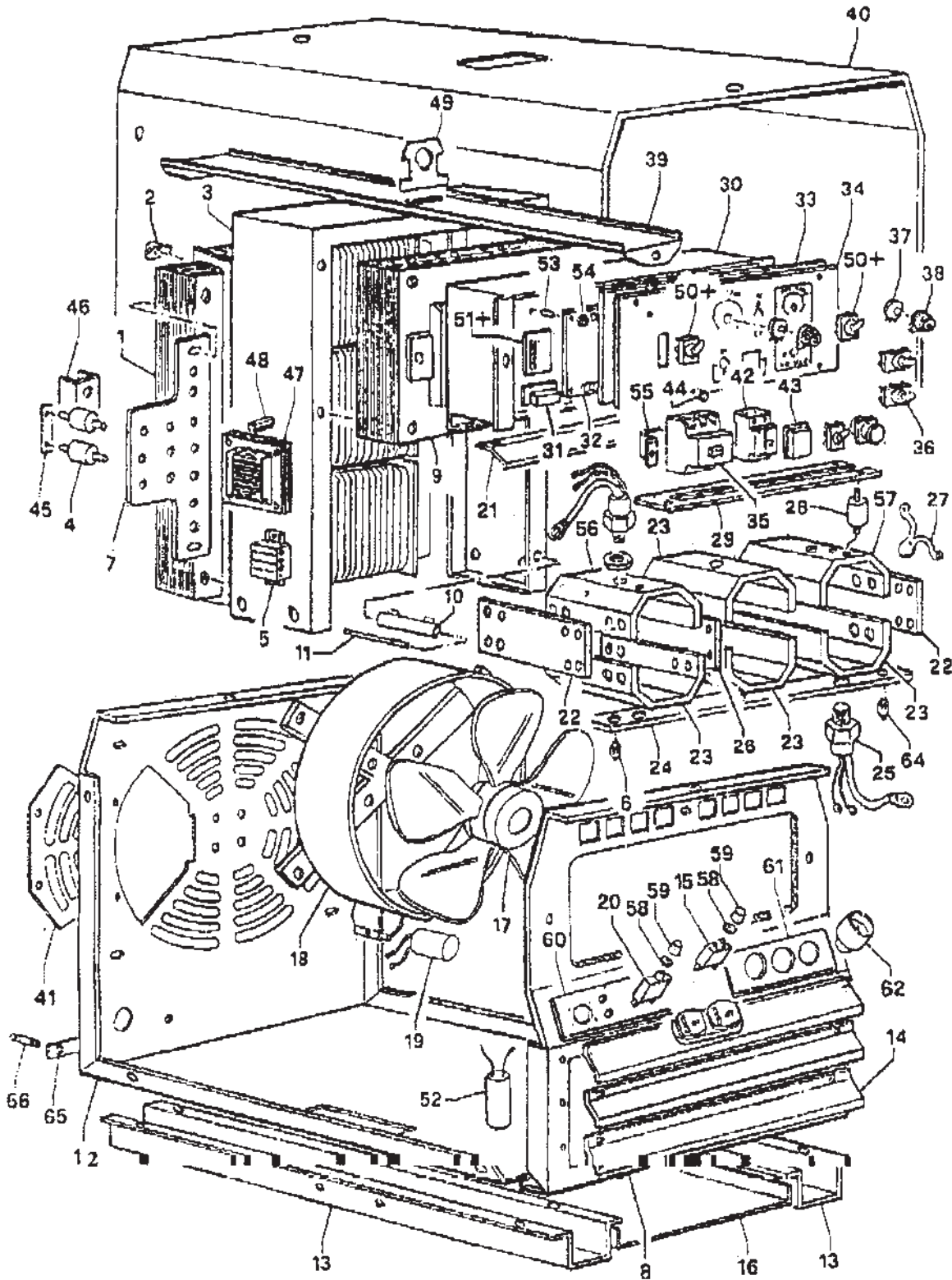
WARNING:

- **Have qualified personnel do the troubleshooting work. Turn the engine off before working inside the machine. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.**
- **Do not put your hands near the engine fan. If a problem cannot be corrected by following the instructions, take the machine to the nearest Red-D-Arc Location.**

TROUBLE	CAUSE	WHAT TO DO
1. Welder does not start Note: It is normal for the Fan not to run when machine is cold.	No input power.	Check power switch.
		Check lines voltage.
		Check power supply and connections.
2. Welder has not output.	Remote control switch is in 'ON' position with no remote OCV=OV.	Put remote switch in 'OFF' position.
3. Welder has abnormal arc.	Defective SCR.	Check OCV. If low check for defective SCRs. Also check all connections.
	Defective PC board.	Check OCV. If low check for defective PC board. Also check all connections.

MISCELLANEOUS ASSEMBLY (SERIAL #s 0880 AND ABOVE)

+ OPTIONALS



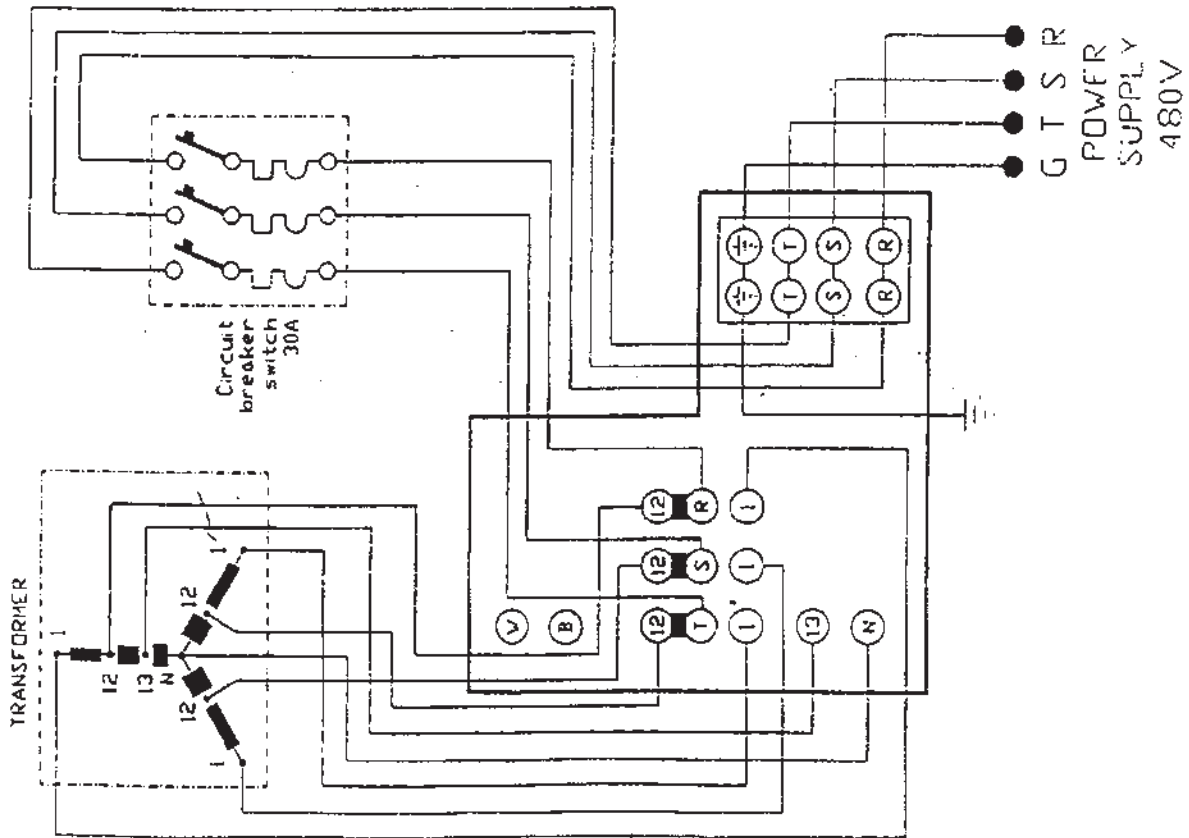
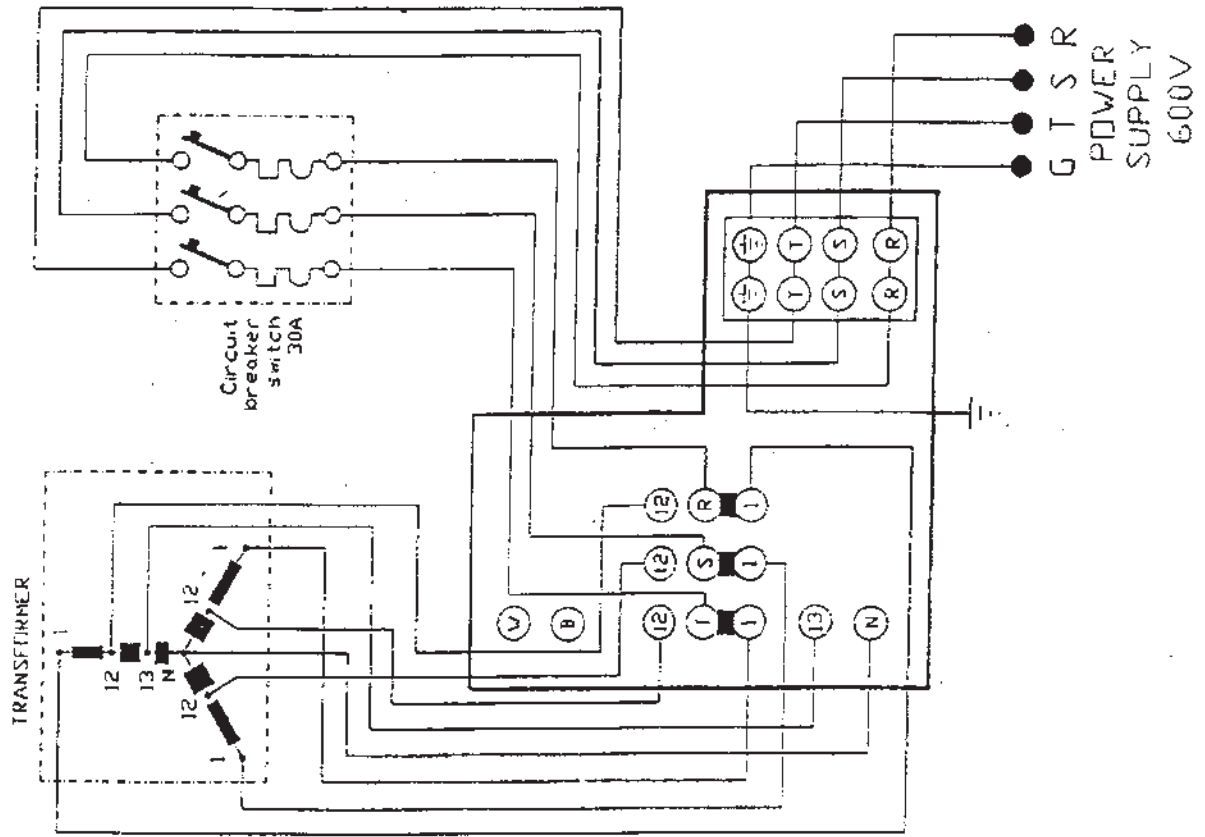
**MISC. ASSEMBLY PARTS LIST
(SERIAL #s 0880 AND ABOVE)**

ITEM	PART NAME & DESCRIPTION	NO. REQ'D	PART NO.
1	Transformer assembly	1	15.077
2	Over load Thermostat 132 degrees C	1	14.277
3	Transformer Support	1	14.886
4	Insulator	13	11.707
5	Terminal Board	1	17.516
6	Over load 63 degrees C	1	14.285
7	Bracket	1	16.967
8	Front panel	1	16.968
9	Reactor	1	16.648
10	Resistor 100 Ohm	1	12.776
11	Rod	1	12.777
12	Frame Assembly	1	16.969
13	Base rails	2	15.081
14	Louvers	3	15.082
15	Circuit breaker 15 A	1	13.640
16	Base plate	1	17.504
17	Fan	1	16.080
18	Fan cover	1	14.878
19	Capacitor 4uF	1	363
20	Circuit breaker 10 A	2	13.728
21	Plate	1	17.505
22	Side Bracket	2	15.086
23	Heatsink	4	14.752
24	Lower Bracket	1	15.083
25	SCR diode IR 171RC40	6	905
26	Inside Bracket	2	14.754
27	Zenamic	6	12.736
28	Insulator	3	954
29	Shunt	1	14.899
30	Control panel frame assembly	1	14.893
31	Relay	1	14.765
32	Electronic panel GS9109b/c CC-CV	1	16.970
33	Front plate	1	14.895
34	Aluminum front name plate	1	17.823
35	Circuit breaker 30 A	1	15.084
36	Switch	4	910
37	Potentiometer 10K	2	12.993
38	Knob	2	14.293
39	Lifting support bracket	1	15.085
40	Stainless Steel Cover	1	14.901
41	Voltage change cover	1	16.972
42	Ground fault protector 25A	1	356
43	Rubber protection cover	1	13.410
44	On light	1	11.221
45	Connection Plate	3	15.419
46	Plate	1	17.506
47	Inductor	1	14.993
48	Rod	8	622
49	Lifting Hook	1	16.973

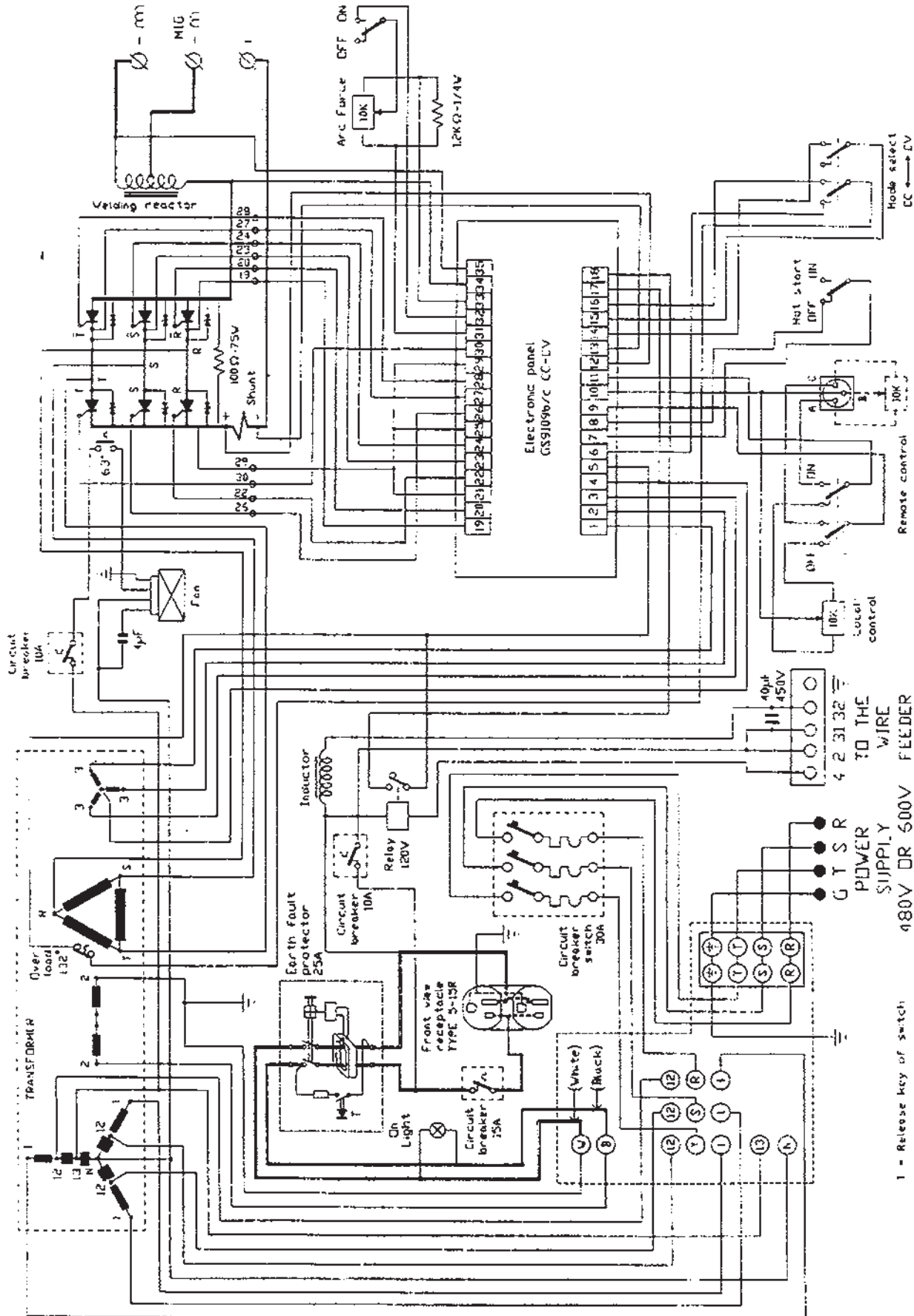
MISC. ASSEMBLY PARTS LIST CONTINUED (SERIAL #s 0880 AND ABOVE)

ITEM	PART NAME & DESCRIPTION	NO. REQ'D	PART NO.
50	CC-CV / Tig-Stick mode select switch (Optional lift arc)	2	13.152
51	Electronic panel lift arc GS9414 (Optional lift arc)	1	17.629
52	Capacitor 40uF 450V	1	17.094
53	Tie rod	6	17.507
54	Nut	6	17.508
55	Circuit breaker support	1	16.305
56	Left heatsink	1	17.509
57	Right heatsink	1	17.510
58	Washer	3	14.270
59	Rubber protection cover	3	14.658
60	Plate	1	17.824
61	Output connector plate	1	17.512
62	Female Euro connector	3	836
64	Overload Thermostat 100 degrees C	1	17.513
65	Plate	1	17.514
66	Grounding screw	1	17.515

PRIMARY WIRING DIAGRAM



WIRING DIAGRAM



1 - Release key of switch

WIRING DIAGRAM WITH OPTIONAL TIG PC BOARD

