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2011-04

Processes



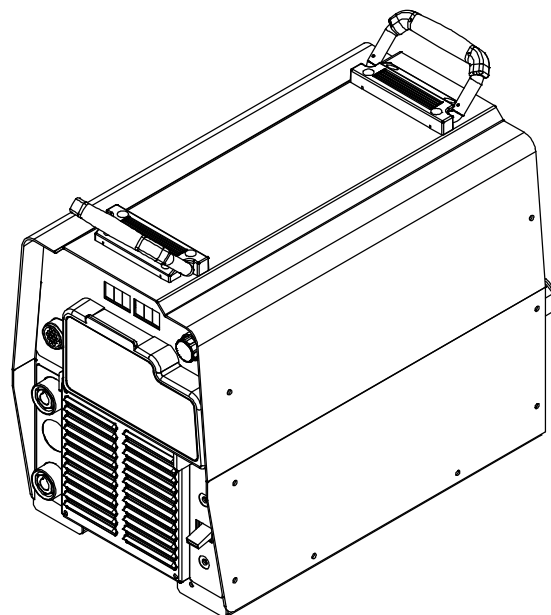
Multiprocess Welding

Description



Arc Welding Power Source

XMT[®] 350 CC/CV Auto-Line[™] CE



OWNER'S MANUAL



Visit our website at

www.MillerWelds.com

File: MULTIPROCESS



From Miller to You

Thank you and congratulations on choosing Miller. Now you can get the job done and get it done right. We know you don't have time to do it any other way.

That's why when Niels Miller first started building arc welders in 1929, he made sure his products offered long-lasting value and superior quality. Like you, his customers couldn't afford anything less. Miller products had to be more than the best they could be. They had to be the best you could buy.

Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite. We've made installation and operation quick and easy. With Miller you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide which exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.



Miller Electric manufactures a full line of welders and welding related equipment. For information on other quality Miller products, contact your local Miller distributor to receive the latest full line catalog or individual catalog sheets.



Working as hard as you do – every power source from Miller is backed by the most hassle-free warranty in the business.



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DECLARATION OF CONFORMITY

for European Community (CE marked) products.

ITW Welding Products Italy S.r.l Via Privata Iseo 6/E, 20098 San Giuliano M.se, (MI) Italy declares that the product(s) identified in this declaration conform to the essential requirements and provisions of the stated Council Directive(s) and Standard(s).

Product/Apparatus Identification:

Product	Stock Number
XMT 350 CC/CV AUTOLINE,CE	907371

Council Directives:

- 2006/95/EC Low Voltage
- 2004/108/EC Electromagnetic Compatibility

Standards:

- IEC 60974-1 Arc Welding Equipment - Welding Power Sources: edition 3, 2005-07.
- IEC 60974-10 Arc Welding Equipment - Electromagnetic Compatibility Requirements: edition 2.0, 2007-08.
- EN 50445:2008 Product family standard to demonstrate compliance of equipment for resistance welding, arc welding and allied processes with the basic restrictions related to human exposure to electromagnetic fields (0Hz-300Hz)

EU Signatory:

December 13th, 2010

Massimiliano Lavarini

Date of Declaration


ELECTRONIC ENGINEER R&D TECH. SUPPORT


SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

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 Protect yourself and others from injury — read and follow these precautions.

1-1. Symbol Usage

 **DANGER!** – Indicates a hazardous situation which, if not avoided, will result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

 Indicates a hazardous situation which, if not avoided, could result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.


NOTICE – Indicates statements not related to personal injury.

 Indicates special instructions.



This group of symbols means Warning! Watch Out! ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

1-2. Arc Welding Hazards

 The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-5. Read and follow all Safety Standards.

 Only qualified persons should install, operate, maintain, and repair this unit.

 During operation, keep everybody, especially children, away.



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 output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Additional safety precautions are required when any of the following electrically hazardous conditions are present: in damp locations or while wearing wet clothing; on metal structures such as floors, gratings, or scaffolds; when in cramped positions such as sitting, kneeling, or lying; or when there is a high risk of unavoidable or accidental contact with the workpiece or ground. For these conditions, use the following equipment in order presented: 1) a semiautomatic DC constant voltage (wire) welder, 2) a DC manual (stick) welder, or 3) an AC welder with reduced open-circuit voltage. In most situations, use of a DC, constant voltage wire welder is recommended. And, do not work alone!
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.

- Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first – double-check connections.
- Keep cords dry, free of oil and grease, and protected from hot metal and sparks.
- Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Do not touch electrode holders connected to two welding machines at the same time since double open-circuit voltage will be present.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal.

SIGNIFICANT DC VOLTAGE exists in inverter welding power sources AFTER removal of input power.

- Turn Off inverter, disconnect input power, and discharge input capacitors according to instructions in Maintenance Section before touching any parts.



HOT PARTS can burn.

- Do not touch hot parts bare handed.
- Allow cooling period before working on equipment.
- To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.



FUMES AND GASES can be hazardous.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use local forced ventilation at the arc to remove welding fumes and gases.
- If ventilation is poor, wear an approved air-supplied respirator.
- Read and understand the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.



ARC RAYS can burn eyes and skin.

Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- Wear an approved welding helmet fitted with a proper shade of filter lenses to protect your face and eyes from arc rays and sparks when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash, glare and sparks; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (leather, heavy cotton, or wool) and foot protection.

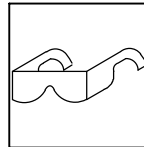


WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and explosions. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Do not weld where flying sparks can strike flammable material.
- Protect yourself and others from flying sparks and hot metal.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Do not weld where the atmosphere may contain flammable dust, gas, or liquid vapors (such as gasoline).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock, sparks, and fire hazards.
- Do not use welder to thaw frozen pipes.

- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.
- After completion of work, inspect area to ensure it is free of sparks, glowing embers, and flames.
- Use only correct fuses or circuit breakers. Do not oversize or bypass them.
- Follow requirements in OSHA 1910.252 (a) (2) (iv) and NFPA 51B for hot work and have a fire watcher and extinguisher nearby.



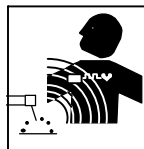
FLYING METAL or DIRT can injure eyes.

- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.



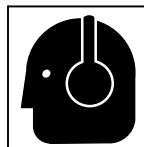
BUILDUP OF GAS can injure or kill.

- Shut off compressed gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.



ELECTRIC AND MAGNETIC FIELDS (EMF) can affect Implanted Medical Devices.

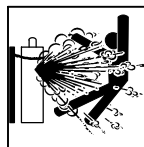
- Wearers of Pacemakers and other Implanted Medical Devices should keep away.
- Implanted Medical Device wearers should consult their doctor and the device manufacturer before going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations.



NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.



CYLINDERS can explode if damaged.

Compressed gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- Protect compressed gas cylinders from excessive heat, mechanical shocks, physical damage, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder – explosion will result.
- Use only correct compressed gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Use the right equipment, correct procedures, and sufficient number of persons to lift and move cylinders.
- Read and follow instructions on compressed gas cylinders, associated equipment, and Compressed Gas Association (CGA) publication P-1 listed in Safety Standards.

1-3. Additional Symbols For Installation, Operation, And Maintenance



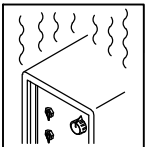
FIRE OR EXPLOSION hazard.

- Do not install or place unit on, over, or near combustible surfaces.
- Do not install unit near flammables.
- Do not overload building wiring – be sure power supply system is properly sized, rated, and protected to handle this unit.



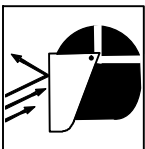
FALLING EQUIPMENT can injure.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.
- Keep equipment (cables and cords) away from moving vehicles when working from an aerial location.
- Follow the guidelines in the Applications Manual for the Revised NIOSH Lifting Equation (Publication No. 94-110) when manually lifting heavy parts or equipment.



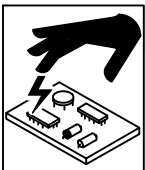
OVERUSE can cause OVERHEATING

- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.



FLYING SPARKS can injure.

- Wear a face shield to protect eyes and face.
- Shape tungsten electrode only on grinder with proper guards in a safe location wearing proper face, hand, and body protection.
- Sparks can cause fires — keep flammables away.



STATIC (ESD) can damage PC boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.



MOVING PARTS can injure.

- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.



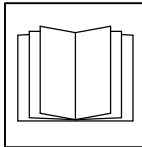
WELDING WIRE can injure.

- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.



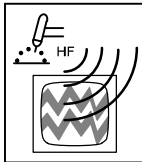
MOVING PARTS can injure.

- Keep away from moving parts such as fans.
- Keep all doors, panels, covers, and guards closed and securely in place.
- Have only qualified persons remove doors, panels, covers, or guards for maintenance and troubleshooting as necessary.
- Reinstall doors, panels, covers, or guards when maintenance is finished and before reconnecting input power.



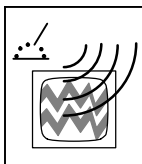
READ INSTRUCTIONS.

- Read and follow all labels and the Owner's Manual carefully before installing, operating, or servicing unit. Read the safety information at the beginning of the manual and in each section.
- Use only genuine replacement parts from the manufacturer.
- Perform maintenance and service according to the Owner's Manuals, industry standards, and national, state, and local codes.



H.F. RADIATION can cause interference.




- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment perform this installation.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.




ARC WELDING can cause interference.

- Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots.
- Be sure all equipment in the welding area is electromagnetically compatible.
- To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
- Locate welding operation 100 meters from any sensitive electronic equipment.
- Be sure this welding machine is installed and grounded according to this manual.
- If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.


1-4. California Proposition 65 Warnings

-  **Welding or cutting equipment produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)**
-  **Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. *Wash hands after handling.***
-  **This product contains chemicals, including lead, known to the state of California to cause cancer, birth defects, or other reproductive harm. *Wash hands after use.***

For Gasoline Engines:

-  **Engine exhaust contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.**

For Diesel Engines:

-  **Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.**

1-5. Principal Safety Standards

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

Safe Practices for the Preparation of Containers and Piping for Welding and Cutting, American Welding Society Standard AWS F4.1, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Quincy, MA 02269 (phone: 1-800-344-3555, website: www.nfpa.org and www.sparky.org).

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 4221 Walney Road, 5th Floor, Chantilly, VA 20151 (phone: 703-788-2700, website: www.cganet.com).

Safety in Welding, Cutting, and Allied Processes, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 5060 Spectrum Way, Suite 100, Ontario, Canada L4W 5NS (phone: 800-463-6727, website: www.csa-international.org).

Safe Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute,

25 West 43rd Street, New York, NY 10036 (phone: 212-642-4900, website: www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B, from National Fire Protection Association, Quincy, MA 02269 (phone: 1-800-344-3555, website: www.nfpa.org).

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, from U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 (phone: 1-866-512-1800) (there are 10 OSHA Regional Offices—phone for Region 5, Chicago, is 312-353-2220, website: www.osha.gov).

U.S. Consumer Product Safety Commission (CPSC), 4330 East West Highway, Bethesda, MD 20814 (phone: 301-504-7923, website: www.cpsc.gov).

Applications Manual for the Revised NIOSH Lifting Equation, The National Institute for Occupational Safety and Health (NIOSH), 1600 Clifton Rd, Atlanta, GA 30333 (phone: 1-800-232-4636, website: www.cdc.gov/NIOSH).

1-6. EMF Information

Electric current flowing through any conductor causes localized electric and magnetic fields (EMF). Welding current creates an EMF field around the welding circuit and welding equipment. EMF fields may interfere with some medical implants, e.g. pacemakers. Protective measures for persons wearing medical implants have to be taken. For example, access restrictions for passers-by or individual risk assessment for welders. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

1. Keep cables close together by twisting or taping them, or using a cable cover.
2. Do not place your body between welding cables. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.

4. Keep head and trunk as far away from the equipment in the welding circuit as possible.
5. Connect work clamp to workpiece as close to the weld as possible.
6. Do not work next to, sit or lean on the welding power source.
7. Do not weld whilst carrying the welding power source or wire feeder.

About Implanted Medical Devices:

Implanted Medical Device wearers should consult their doctor and the device manufacturer before performing or going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations. If cleared by your doctor, then following the above procedures is recommended.

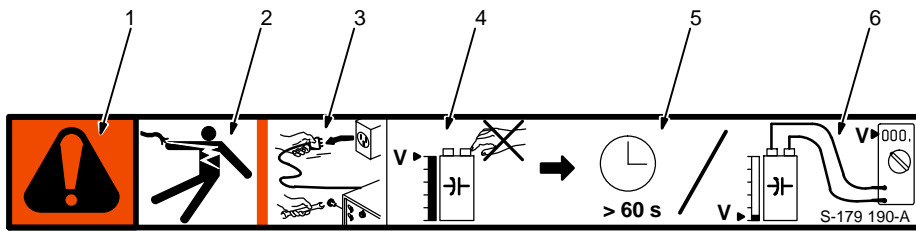
SECTION 2 – DEFINITIONS

2-1. Manufacturer's Warning Label Definitions



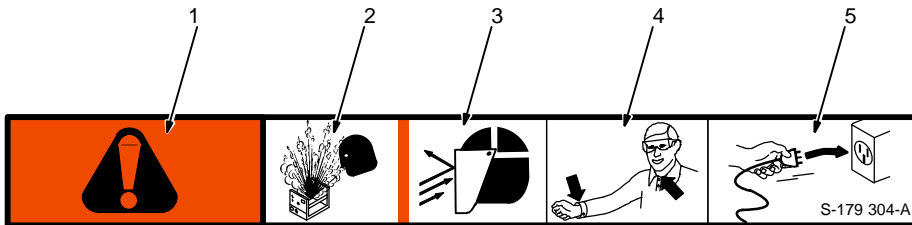
Warning! Watch Out! There are possible hazards as shown by the symbols.

- 1 Electric shock from welding electrode or wiring can kill.
 - 1.1 Wear dry insulating gloves. Do not touch electrode with bare hand. Do not wear wet or damaged gloves.
 - 1.2 Protect yourself from electric shock by insulating yourself from work and ground.
 - 1.3 Disconnect input plug or power before working on machine.
- 2 Breathing welding fumes can be hazardous to your health.
 - 2.1 Keep your head out of the fumes.
 - 2.2 Use forced ventilation or local exhaust to remove the fumes.
 - 2.3 Use ventilating fan to remove fumes.
- 3 Welding sparks can cause explosion or fire.
 - 3.1 Keep flammables away from welding. Do not weld near flammables.
 - 3.2 Welding sparks can cause fires. Have a fire extinguisher nearby, and have a watchperson ready to use it.
 - 3.3 Do not weld on drums or any closed containers.
- 4 Arc rays can burn eyes and injure skin.
 - 4.1 Wear hat and safety glasses. Use ear protection and button shirt collar. Use welding helmet with correct shade of filter. Wear complete body protection.
- 5 Become trained and read the instructions before working on the machine or welding.
- 6 Do not remove or paint over (cover) the label.



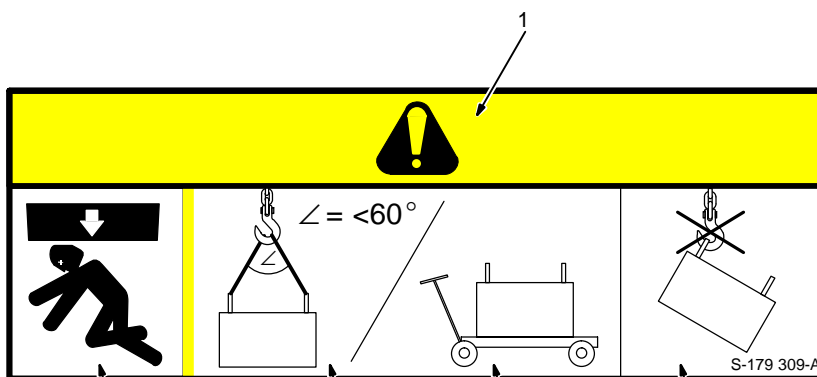
- 1 Warning! Watch Out! There are possible hazards as shown by the symbols.
- 2 Electric shock from wiring can kill.
- 3 Disconnect input plug or power before working on machine.
- 4 Hazardous voltage remains on input capacitors after power is turned off. Do not touch fully charged capacitors.
- 5 Always wait 60 seconds after power is turned off before working on unit, OR
- 6 Check input capacitor voltage, and be sure it is near 0 before touching any parts.

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- 1 Warning! Watch Out! There are possible hazards as shown by the symbols.
- 2 When power is applied failed parts can explode or cause other parts to explode.
- 3 Flying pieces of parts can cause injury. Always wear a face shield when servicing unit.
- 4 Always wear long sleeves and button your collar when servicing unit.
- 5 After taking proper precautions as shown, connect power to unit.

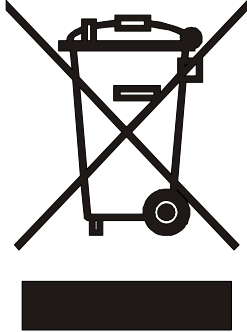
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- 1 Warning! Watch Out! There are possible hazards as shown by the symbols.
- 2 Falling equipment can cause injury and damage to unit.
- 3 Always lift and support unit using both handles. Keep angle of lifting device less than 60 degrees.
- 4 Use a proper cart to move unit.
- 5 Do not use one handle to lift or support unit.

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2-2. WEEE Label (For Products Sold Within The EU)















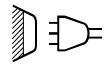

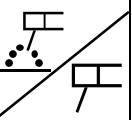
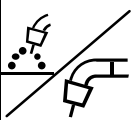
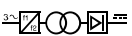

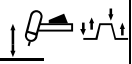





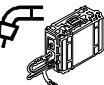


Do not discard product (where applicable) with general waste.

Reuse or recycle Waste Electrical and Electronic Equipment (WEEE) by disposing at a designated collection facility.

Contact your local recycling office or your local distributor for further information.

2-3. Symbols And Definitions

A	Amperage		Panel		Alternating Current (AC)	V	Voltage
	Output		Circuit Breaker		Remote	I	On
	Off		Gas Tungsten Arc Welding	-	Negative		Voltage Input
	Direct Current (DC)	+	Positive		Inductance		Protective Earth (Ground)
	Constant Current		Constant Voltage		Foot Control		Line Connection
	Arc Force		Shielded Metal Arc Welding (SMAW)		Gas Metal Arc Welding (GMAW)		Three Phase Static Frequency Converter-Transformer-Rectifier
U₀	Rated No Load Voltage (Average)	U₁	Primary Voltage	U₂	Conventional Load Voltage	X	Duty Cycle
Hz	Hertz	IP	Degree Of Protection	I₂	Rated Welding Current	%	Percent
	Pulsed		Lift-Arc Trigger Hold Operation (GTAW)	1 	Single Phase	3 	Three Phase
I_{1max}	Rated Maximum Supply Current	I_{1eff}	Maximum Effective Supply Current		Increase		Lift-Arc Operation (GTAW)
	Scratch Start TIG		Voltage Sensing Feeder				

SECTION 3 – INTRODUCTION

3-1. Important Information Regarding CE Products (Sold Within The EU)

A. Information On Electromagnetic Fields (EMF)

⚠ This equipment shall not be used by the general public as the EMF limits for the general public might be exceeded during welding.

This equipment is built in accordance with EN 60974–1 and is intended to be used only in an occupational environment (where the general public access is prohibited or regulated in such a way as to be similar to occupational use) by an expert or an instructed person.

Wire feeders and ancillary equipment (such as torches, liquid cooling systems and arc striking and stabilizing devices) as part of the welding circuit may not be a major contributor to the EMF. See the Owner's Manuals for all components of the welding circuit for additional EMF exposure information.

- The EMF assessment on this equipment was conducted at 0.5 meter.
- At a distance of 1 meter the EMF exposure values were less than 20% of the permissible values.

B. Information On Electromagnetic Compatibility (EMC)

⚠ This Class A equipment is not intended for use in residential locations where the electrical power is provided by the public low-voltage supply system. There may be potential difficulties in ensuring electromagnetic compatibility in those locations, due to conducted as well as radiated disturbances.

This equipment complies with IEC 61000–3–12 provided that the short-circuit power S_{sc} is greater than or equal to 2,055,437.437 at the interface point between the user's supply and the public system. It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with a short-circuit power S_{sc} greater than or equal to 2,055,437.437.

ce-emc 1 2010-10

3-2. Serial Number And Rating Label Location

The serial number and rating information for this product is located on the rear panel. Use rating label to determine input power requirements and/or rated output. For future reference, write serial number in space provided on back cover of this manual.

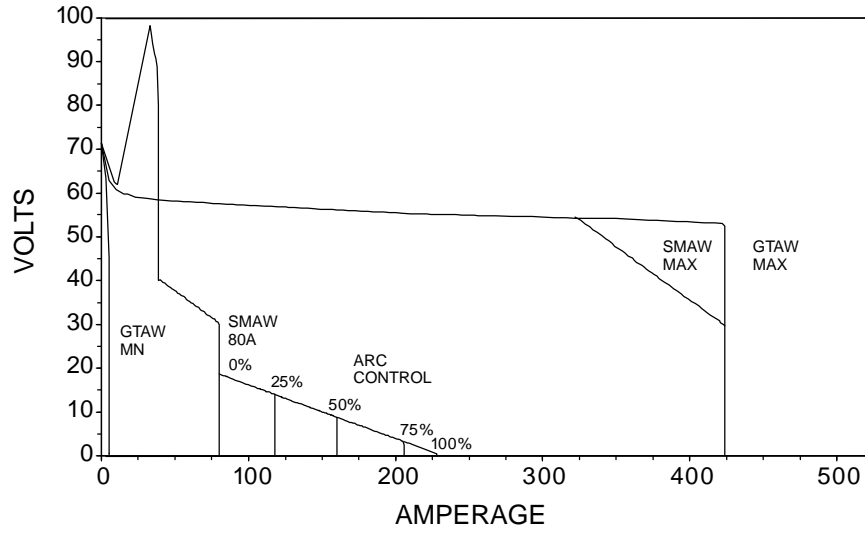
3-3. Specifications

Input Power	Rated Output	Voltage Range in CV Mode	Amperage Range in CC Mode	Max. Open-Circuit Voltage	IP Rating	RMS Amps Input at Rated Load Output, 60 Hz 3-Phase at NEMA Load Voltages and Class I Rating				KVA	KW
						230 V	380 V	400 V	460 V		
3-Phase	350 A at 34 VDC, 60% Duty Cycle	10–38 V	5–425 A	75 VDC	23	36.1	22.3	20.6	17.8	14.2	13.6

*See Section 3-5 for Duty Cycle Rating.

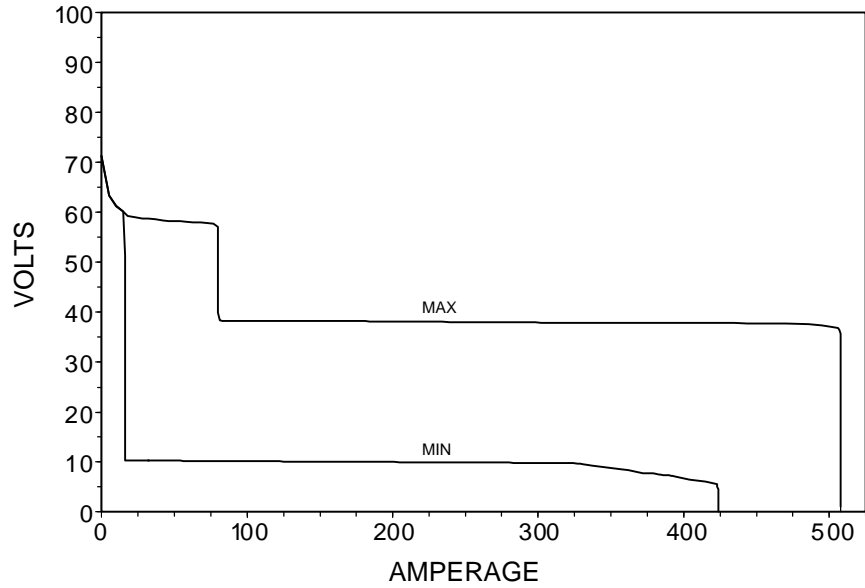
3-4. Volt-Ampere Curves

A. CC Mode



Volt-ampere curves show minimum and maximum voltage and amperage output capabilities of welding power source. Curves of other settings fall between curves shown.

B. CV Mode



217 836-A / 217 837-B

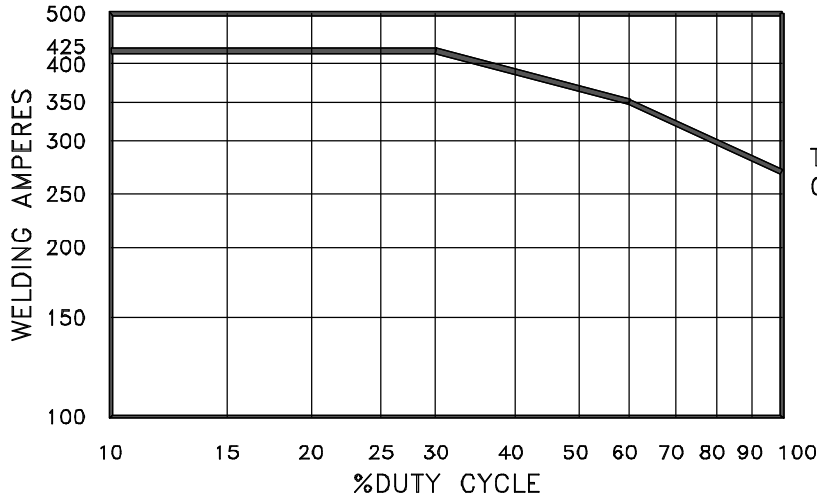
3-5. Duty Cycle And Overheating



Duty Cycle is percentage of 10 minutes that unit can weld at rated load without overheating.

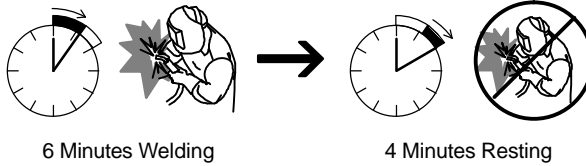
If unit overheats, output stops, a Help message is displayed and cooling fan runs. Wait fifteen minutes for unit to cool. Reduce amperage or voltage, or duty cycle before welding.

NOTICE – Exceeding duty cycle can damage unit and void warranty.

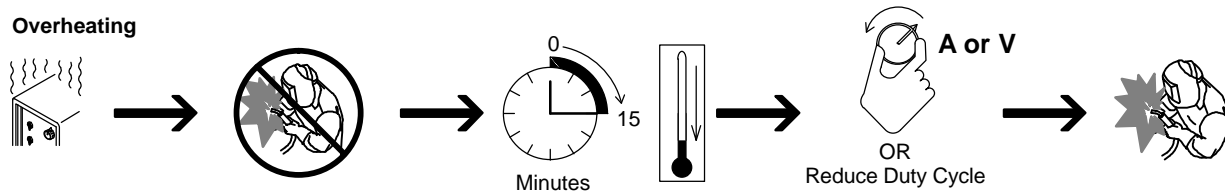


THREE PHASE OPERATION

60% Duty Cycle



Overheating



Ref. 219 523-A

Notes

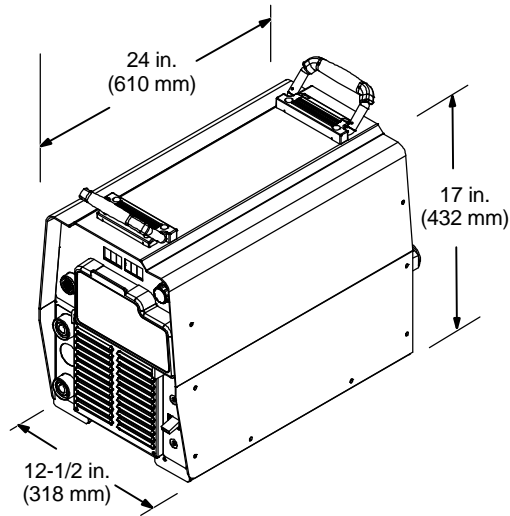
SECTION 4 – INSTALLATION

4-1. Selecting a Location

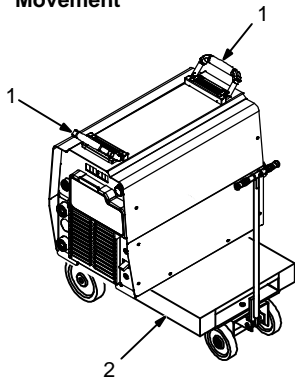


Dimensions And Weight

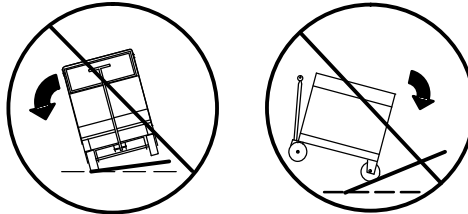
94.8 lb (43 kg)



Movement



⚠ Do not move or operate unit where it could tip.



1 Lifting Handles

Use handles to lift unit.

2 Hand Cart

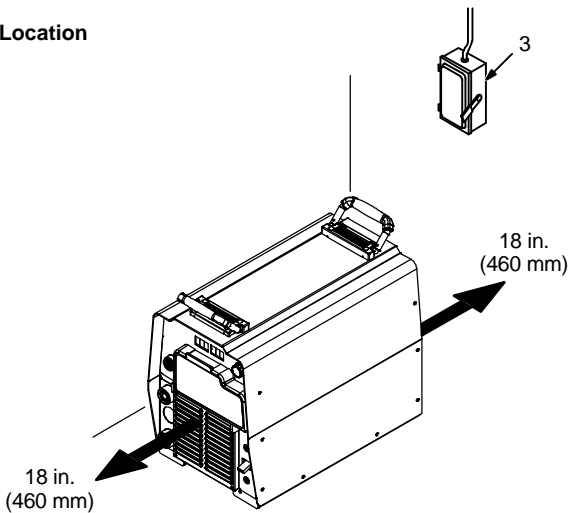
Use cart or similar device to move unit.

3 Line Disconnect Device

Locate unit near correct input power supply.

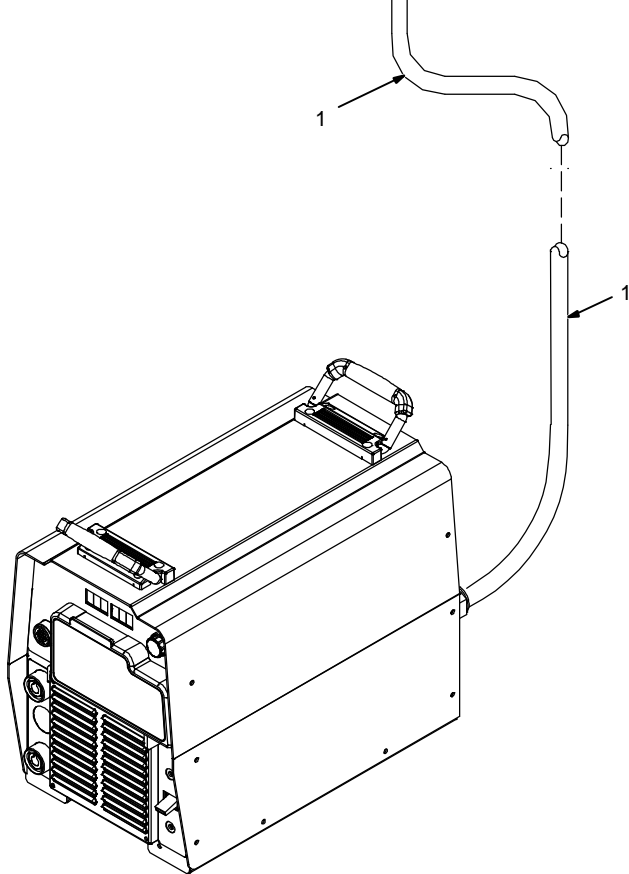
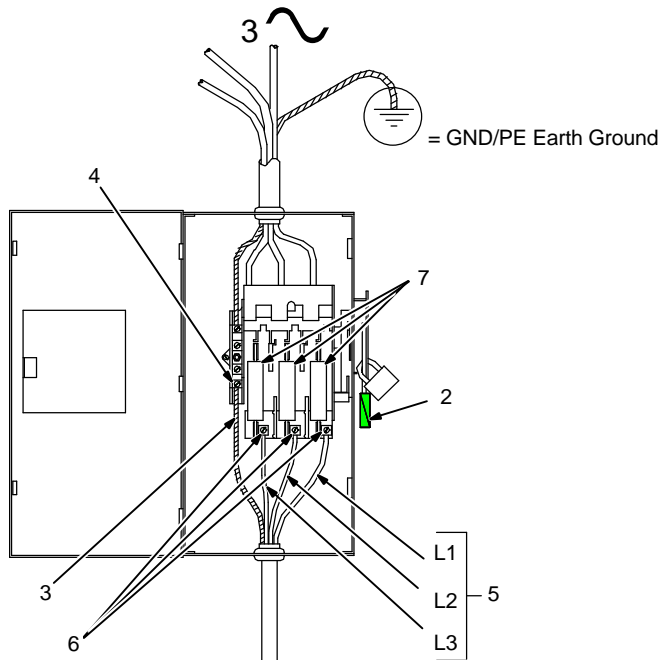
⚠ Special installation may be required where gasoline or volatile liquids are present – see NEC Article 511 or CEC Section 20.

Location

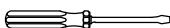


loc_2 3/96 - Ref. ST-151 556 / Ref. 803 879-B

4-2. Connecting 3-Phase Input Power



Tools Needed:



⚠ Installation must meet all National and Local Codes – have only qualified persons make this installation.

⚠ Disconnect and lockout/tagout input power before connecting input conductors from unit.

⚠ Always connect green or green/yellow conductor to supply grounding terminal first, and never to a line terminal.

ℹ The Auto-Line circuitry in this unit automatically adapts the power source to the primary voltage being applied. Check input voltage available at site. This unit can be connected to any input power between 208 and 575 VAC without removing cover to relink the power source.

See rating label on unit and check input voltage available at site.

For Three-Phase Operation

- 1 Input Power Cord.
- 2 Disconnect Device (switch shown in the OFF position)
- 3 Green Or Green/Yellow Grounding Conductor
- 4 Disconnect Device Grounding Terminal
- 5 Input Conductors (L1, L2 And L3)
- 6 Disconnect Device Line Terminals

Connect green or green/yellow grounding conductor to disconnect device grounding terminal first.

Connect input conductors L1, L2, and L3 to disconnect device line terminals.


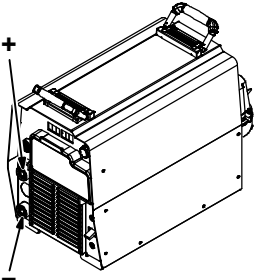
7 Overcurrent Protection

Select type and size of overcurrent protection using Section 4-3 (fused disconnect switch shown).

Close and secure door on disconnect device. Remove lockout/tagout device, and place switch in the On position.

4-4. Weld Output Terminals And Selecting Cable Sizes

NOTICE – The Total Cable Length in Weld Circuit (see table below) is the combined length of both weld cables. For example, if the power source is 30 m (100 ft) from the workpiece, the total cable length in the weld circuit is 60 m (2 cables x 30 m). Use the 60 m (200 ft) column to determine cable size.

 Weld Output Terminals	Weld Cable Size** and Total Cable (Copper) Length in Weld Circuit Not Exceeding***								
	Welding Amperes	10 – 60% Duty Cycle mm² (AWG)	60 – 100% Duty Cycle mm² (AWG)	10 – 100% Duty Cycle mm² (AWG)					
				30 m (100 ft) or Less	45 m (150 ft)	60 m (200 ft)	70 m (250 ft)	90 m (300 ft)	105 m (350 ft)
 Output Receptacles	100	20 (4)	20 (4)	20 (4)	30 (3)	35 (2)	50 (1)	60 (1/0)	60 (1/0)
	150	30 (3)	30 (3)	35 (2)	50 (1)	60 (1/0)	70 (2/0)	95 (3/0)	95 (3/0)
	200	30 (3)	35 (2)	50 (1)	60 (1/0)	70 (2/0)	95 (3/0)	120 (4/0)	120 (4/0)
	250	35 (2)	50 (1)	60 (1/0)	70 (2/0)	95 (3/0)	120 (4/0)	2x70 (2 ea. 2/0)	2x70 (2 ea. 2/0)
	300	50 (1)	60 (1/0)	70 (2/0)	95 (3/0)	120 (4/0)	2x70 (2 ea. 2/0)	2x95 (2 ea. 3/0)	2x95 (2 ea. 3/0)
	350	60 (1/0)	70 (2/0)	95 (3/0)	120 (4/0)	2x70 (2 ea. 2/0)	2x95 (2 ea. 3/0)	2x95 (2 ea. 3/0)	2x120 (2 ea. 4/0)
	400	60 (1/0)	70 (2/0)	95 (3/0)	120 (4/0)	2x70 (2 ea. 2/0)	2x95 (2 ea. 3/0)	2x120 (2 ea. 4/0)	2x120 (2 ea. 4/0)
	500	70 (2/0)	95 (3/0)	120 (4/0)	2x70 (2 ea. 2/0)	2x95 (2 ea. 3/0)	2x120 (2 ea. 4/0)	3x95 (3 ea. 3/0)	3x95 (3 ea. 3/0)
	600	95 (3/0)	120 (4/0)	2x70 (2 ea. 2/0)	2x95 (2 ea. 3/0)	2x120 (2 ea. 4/0)	3x95 (3 ea. 3/0)	3x120 (3 ea. 4/0)	3x120 (3 ea. 4/0)

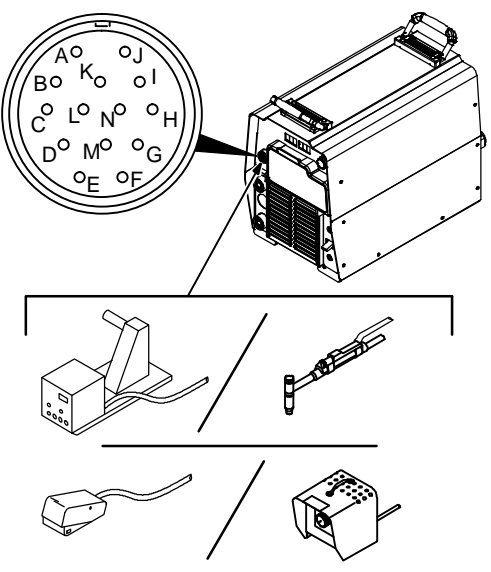


* This chart is a general guideline and may not suit all applications. If cable overheats, use next size larger cable.

**Weld cable size is based on either a 4 volts or less drop or a current density of at least 300 circular mils per ampere.

***For distances longer than those shown in this guide, call a factory applications representative.

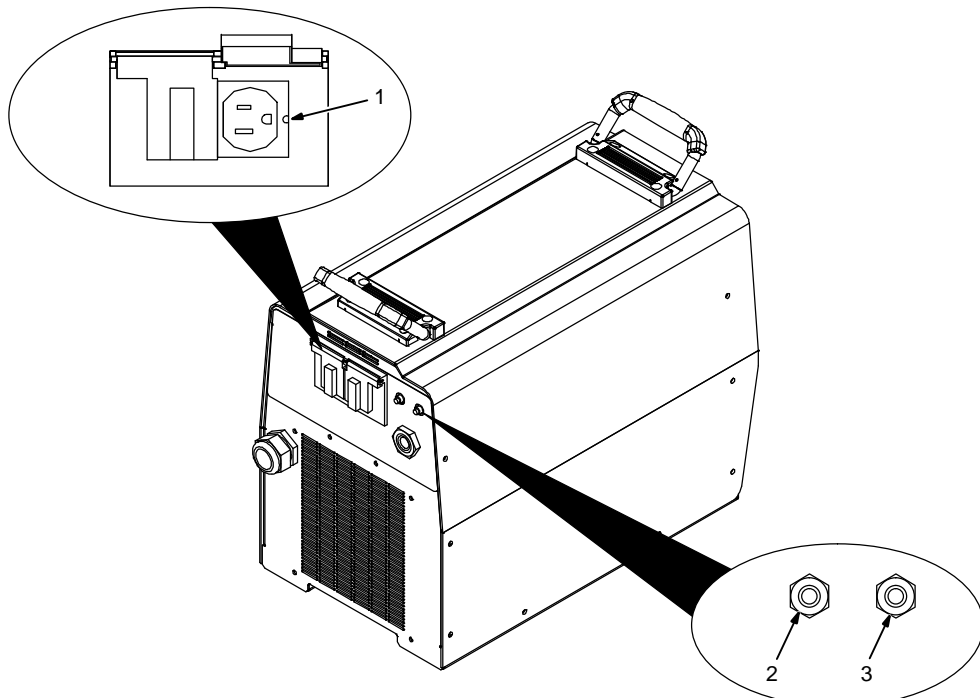
Milan Ref. S-0007-G 2009-08

4-5. Remote 14 Receptacle Information

	REMOTE 14	Socket*	Socket Information
	24 VOLTS AC  OUTPUT (CONTACTOR)	A	24 volts AC. Protected by circuit breaker CB2.
B		Contact closure to A completes 24 volts AC contactor control circuit.	
115 VOLTS AC  OUTPUT (CONTACTOR)	I	115 volts AC. Protected by circuit breaker CB1.	
	J	Contact closure to I completes 115 volts AC contactor control circuit.	
REMOTE OUTPUT CONTROL	C	Output to remote control; 0 to +10 volts DC, +10 volts DC in MIG mode.	
	D	Remote control circuit common.	
	E	0 to +10 volts DC input command signal from remote control.	
A/V AMPERAGE VOLTAGE	M	CC/CV select	
	F	Current feedback; +1 volt DC per 100 weld amperes.	
GND	H	Voltage feedback; +1 volt DC per 10 weld volts.	
	G	Circuit common for 24 and 115 volts AC circuits.	
	K	Chassis common.	

*The remaining sockets are not used.

4-6. 115 Volts AC Duplex Receptacle And Circuit Breakers



1 115 V 10 Amp. AC Receptacle

Power is shared between duplex receptacle and Remote 14 receptacle (see Section 4-5).

2 Circuit Breaker CB1
3 Circuit Breaker CB2

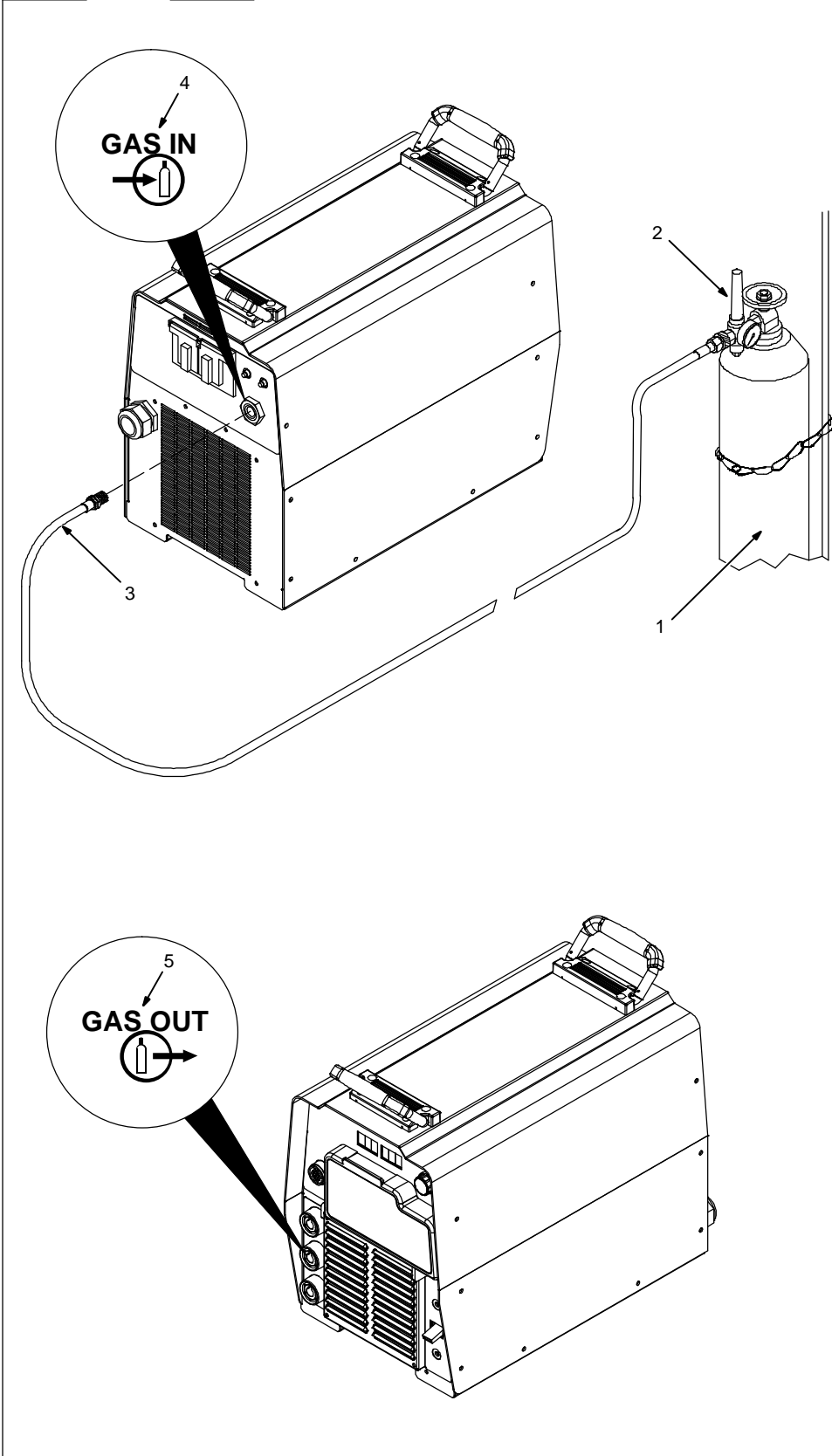
CB1 protects duplex receptacle and 115 volts AC portion of Remote 14 receptacle from overload.

CB2 protects 24 volts AC portion of Remote 14 receptacle from overload.

Press button to reset breaker.

Ref. 803 879-B

4-7. Optional Gas Valve Operation And Shielding Gas Connection



Obtain gas cylinder and chain to running gear, wall, or other stationary support so cylinder cannot fall and break off valve.

- 1 Cylinder
- 2 Regulator/Flowmeter
- 3 Gas Hose Connection

Install so face is vertical. Fitting has 5/8-18 right-hand threads. Obtain and install gas hose.

- 4 Gas In Fitting
- 5 Gas Out Fitting

The Gas In and Gas Out fittings have 5/8-18 right-hand threads. Obtain proper size, type, and length hose and make connections as follows:

Connect hose from shielding gas supply regulator/flowmeter to Gas In fitting.

Connect hose coupler to torch. Connect one end of gas hose to hose coupler. Connect remaining end of gas hose to Gas Out fitting.

Operation

The gas solenoid controls gas flow during the TIG process as follows:

Remote TIG

Gas flow starts with remote contactor on.

Gas flow stops at end of post-flow if current was detected, or with remote contactor off if no current was detected.

Lift-Arc Trigger Hold TIG

Gas flow starts when output switch is depressed.

Gas flow stops at end of post-flow.

Scratch Start TIG

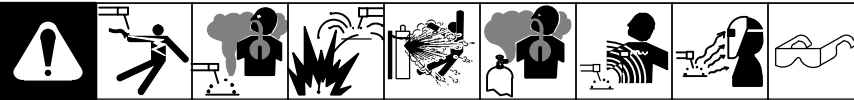
Gas flow starts when current is detected.

Gas flow stops at end of post-flow.

Post-flow time is factory set to 5 seconds per 100 amps of weld current. The minimum post-flow time is 5 seconds. The maximum post-flow is 20 seconds (post flow settings are not adjustable by the end user).

SECTION 5 – OPERATION

5-1. Front Panel Controls



1 Power Switch

The fan motor is thermostatically controlled and only runs when cooling is needed.

2 Voltmeter

3 Ammeter

4 V/A (Voltage/Amperage) Adjustment Control

5 Mode Switch

The Mode switch setting determines both the process and output On/Off control (see Section 5-3).

For Air Carbon Arc (CAC-A) cutting and gouging, place switch in Stick position. For best results, place Arc Control in the maximum position.

6 Remote 14 Receptacle

For remote control, make connections to Remote 14 receptacle. In TIG modes and the REMOTE STICK mode, remote control is a percent of V/A Adjust control setting (value selected on V/A Adjust). In ELECTRODE HOT STICK mode the remote control is not used. In the MIG mode, remote control provides full range of unit output regardless of V/A Adjust control setting.

7 Arc Control

Control adjusts Dig when Stick or CC mode is selected on mode switch. When set towards minimum, short-circuit amperage at low arc

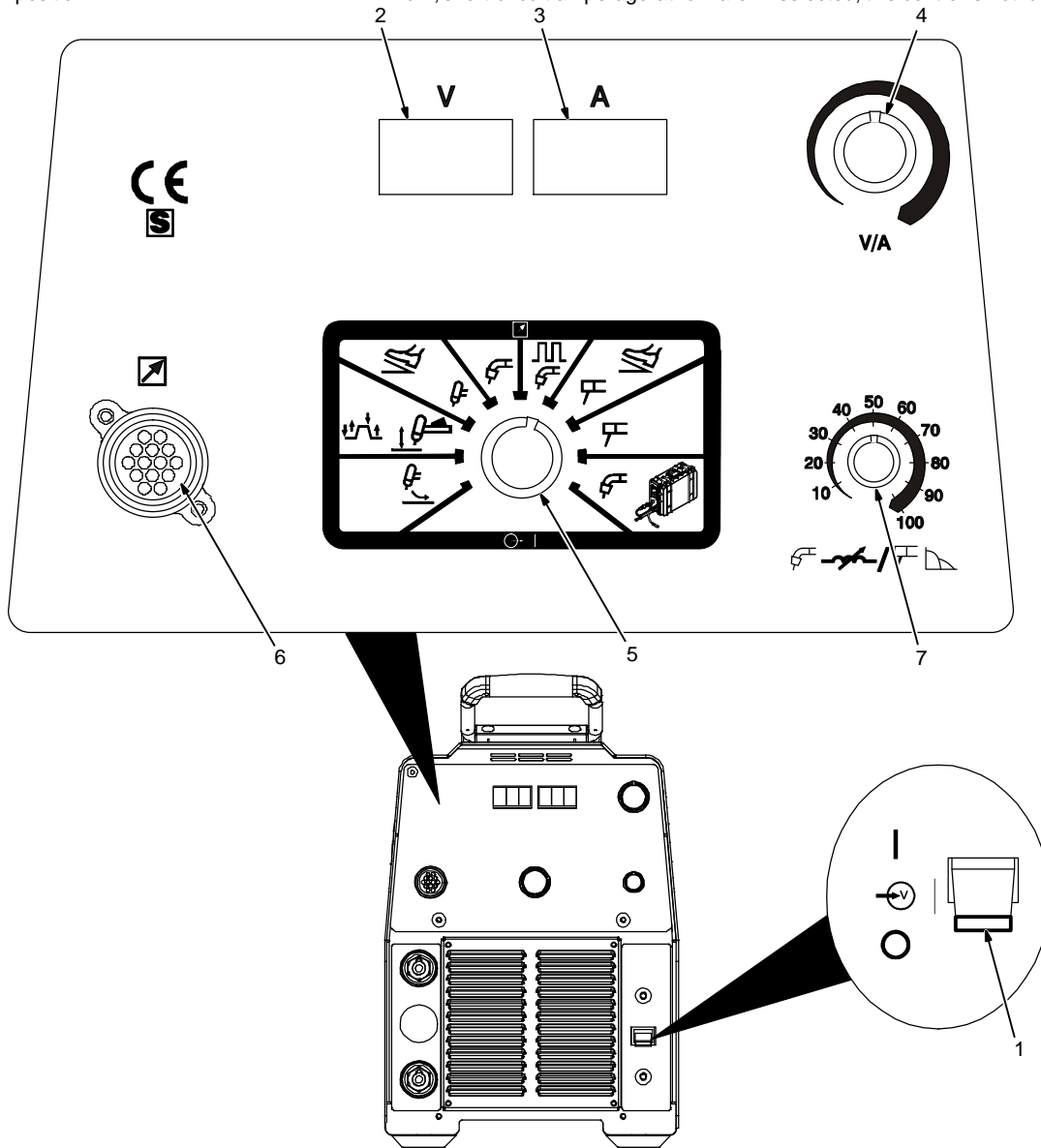
voltage is the same as normal welding amperage.

When set towards maximum, short-circuit amperage is increased at low arc voltage to assist with arc starts as well as reduce sticking while welding.


Select setting best suited for application.

Control adjusts inductance when MIG or V-Sense Feeder position is selected on the mode switch. Inductance determines the “wetness” of the weld puddle. When set towards maximum, “wetness” (puddle fluidity) increases.

When Pulsed MIG or one of the TIG modes is selected, this control is not functional.




5-2. Meter Functions

 The meters display the actual weld output values for approximately three seconds after the arc is broken.

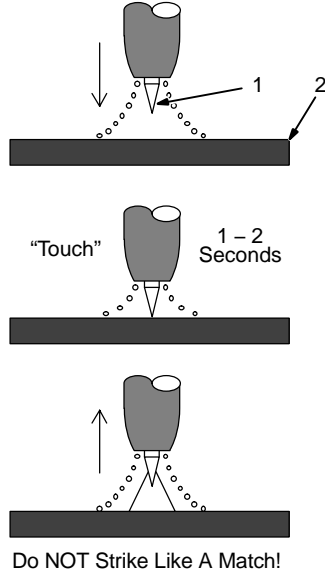
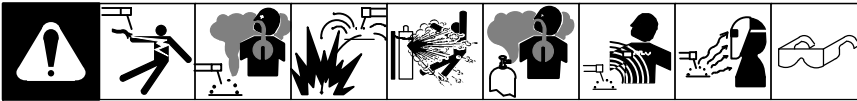
Mode	Meter Reading At Idle		Meter Reading While Welding	
Scratch Start TIG	V 71.7 Actual Volts (OCV)	A 85 Preset Amps	V 10.3 Actual Volts	A 85 Actual Amps
Lift-Arc Trigger Hold TIG	V Blank	A 85 Preset Amps	V 10.3 Actual Volts	A 85 Actual Amps
TIG	V Blank	A 85 Preset Amps	V 10.3 Actual Volts	A 85 Actual Amps
MIG	V 24.5 Preset Volts	A Blank	V 24.5 Actual Volts	A 250 Actual Amps
Pulsed MIG	V PPP Pulse Display	A PPP Pulse Display	V 24.5 Actual Volts	A 250 Actual Amps
CC	V Blank	A 85 Preset Amps	V 24.5 Actual Volts	A 85 Actual Amps
Stick	V 71.7 Actual Volts (OCV)	A 85 Preset Amps	V 24.5 Actual Volts	A 85 Actual Amps
V-Sense Feeder	V 71.7 Flashes OCV And Preset	A Blank	V 24.5 Actual Volts	A 250 Actual Amps

5-3. Mode Switch Settings

 The Stick and CC modes provide the Adaptive Hot Start™ feature, which automatically increases the output amperage at the start of a weld should the start require it. This eliminates electrode sticking at arc start.

Mode Switch Setting	Process	Output On/Off Control
Scratch Start TIG	GTAW	Electrode Hot
Lift-Arc Trigger Hold TIG	GTAW – See Section 5-4	At Remote 14
TIG	GTAW With HF Unit, Pulsing Device, Or Remote Control	At Remote 14
MIG	GMAW	At Remote 14
Pulsed MIG	GMAW-P (Requires an external pulsing device.)	At Remote 14
CC	Stick (SMAW) With Remote On/Off	At Remote 14
Stick	SMAW	Electrode Hot
V-Sense Feeder	MIG (GMAW) With Voltage Sensing Wire Feeder	Electrode Hot

5-4. Lift-Arc Trigger Hold TIG



- 1 TIG Electrode
- 2 Workpiece

☞ Procedure requires:



Start sequence:

- Touch tungsten electrode to workpiece at weld start point.
- Momentarily depress output switch.
- Slowly lift electrode. An arc will form when electrode is lifted.
- To stop welding, momentarily depress output switch and output will shut off.

Note: If output switch is momentarily depressed and tungsten is not touching workpiece:

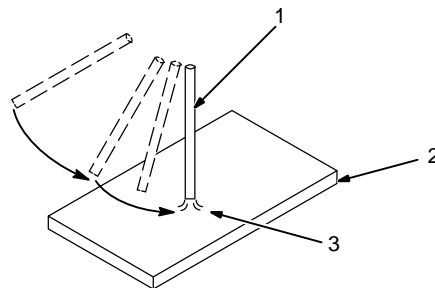
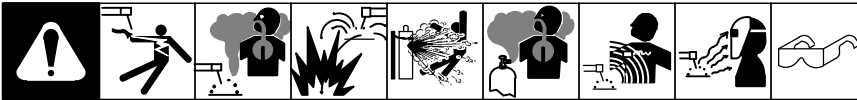
Do not touch tungsten to work.

Output will shut off in 3 seconds.

Start sequence over.

Ref. S-156 279

5-5. Stick Start Procedure



With Stick selected, start arc as follows:

- 1 Electrode
- 2 Workpiece
- 3 Arc

Drag electrode across workpiece like striking a match; lift electrode slightly after touching work. If arc goes out electrode was lifted too high. If electrode sticks to workpiece, use a quick twist to free it.

Low OCV Stick

The unit can be optionally configured for low open circuit voltage (OCV) operation. When the unit is configured for low OCV operation only a low sensing voltage (approximately 15 VDC) is present between the electrode and the workpiece prior to the electrode touching the workpiece. Consult a Factory Authorized Service Agent for information regarding how to configure the unit for low OCV stick welding operation.

SECTION 6 – MAINTENANCE & TROUBLESHOOTING

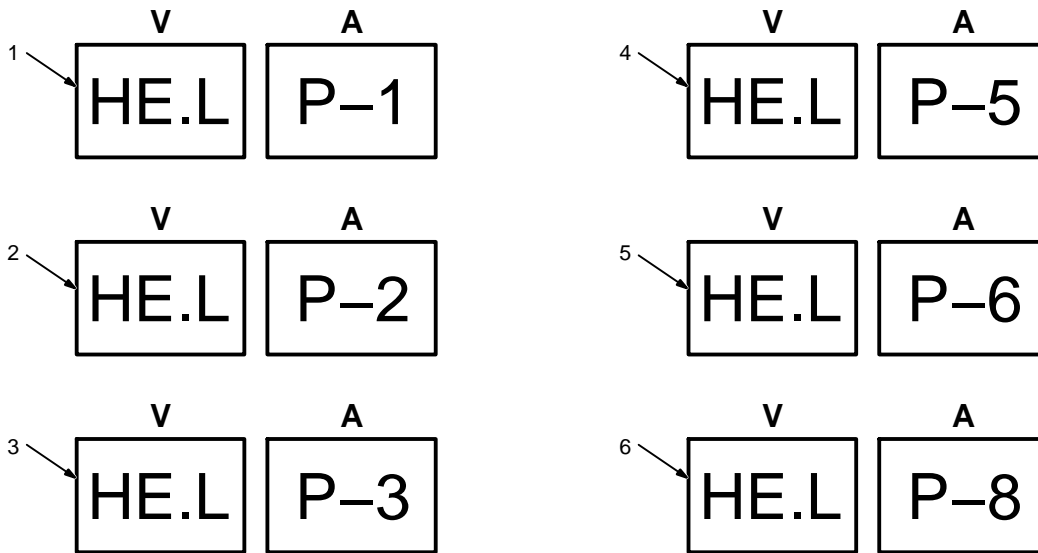
6-1. Routine Maintenance


		Disconnect power before maintaining.		<i>Maintain more often during severe conditions.</i>
3 Months				
		Replace Damaged Or Unreadable Labels		Repair Or Replace Cracked Cables
				Replace Cracked Torch Body
				Repair Or Replace Cracked Cables And Cords
				Clean And Tighten Weld Connections
6 Months				
				Blow Out Inside

6-2. Blowing Out Inside Of Unit

			Do not remove case when blowing out inside of unit.
To blow out unit, direct airflow through front and back louvers as shown.			
Ref. 803 879-B			

6-3. Voltmeter/Ammeter Help Displays



 All directions are in reference to the front of the unit. All circuitry referred to is located inside the unit.

1 Help 1 Display

Indicates a malfunction in the primary power circuit. If this display is shown, contact a Factory Authorized Service Agent.

2 Help 2 Display

Indicates a malfunction in the thermal protection circuitry. If this display is shown, contact a Factory Authorized Service Agent.

3 Help 3 Display

Indicates the left side of the unit has overheated. The unit has shut down to allow the fan to cool it (see Section 3-5). Operation will continue when the unit has cooled.

4 Help 5 Display

Indicates the right side of the unit has overheated. The unit has shut down to allow the fan to cool it (see Section 3-5). Operation will continue when the unit has cooled.

5 Help 6 Display

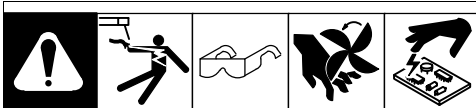
Indicates operation at maximum input current. The unit has a maximum allowable input

current limit. As the line voltage decreases, the required input current increases. If the line voltage is too low, the output power is limited by the input current. When this limit is reached, the unit automatically reduces output power to continue operation. If this display is shown, have a qualified electrician check the input voltage.

6 Help 8 Display


Indicates a malfunction in the secondary power circuit of the unit. If this display is shown, contact a Factory Authorized Service Agent.

6-4. Troubleshooting



Trouble	Remedy
No weld output; unit completely inoperative.	Place line disconnect switch in On position (see Section 4-2).
	Check and replace line fuse(s), if necessary, or reset circuit breaker (see Section 4-2).
	Check for proper input power connections (see Section 4-2).
No weld output; meter display On.	Input voltage outside acceptable range of variation (see Sections 4-2, 4-3).
	Check, repair, or replace remote control.
	Unit overheated. Allow unit to cool with fan On (see Section 3-5).
Erratic or improper weld output.	Use proper size and type of weld cable (see Section 4-4).
	Clean and tighten all weld connections.
	Check for correct polarity.
No 115 volts AC output at duplex receptacle or Remote 14 receptacle.	Reset circuit breaker CB1 (see Section 4-6).
No 24 volts AC output at Remote 14 receptacle.	Reset circuit breaker CB2 (see Section 4-6).

SECTION 7 – ELECTRICAL DIAGRAM

 ⚠ WARNING ELECTRIC SHOCK HAZARD	<ul style="list-style-type: none"> Do not touch live electrical parts. Disconnect input power or stop engine before servicing. Do not operate with covers removed.
	<ul style="list-style-type: none"> Have only qualified persons install, use, or service this unit.

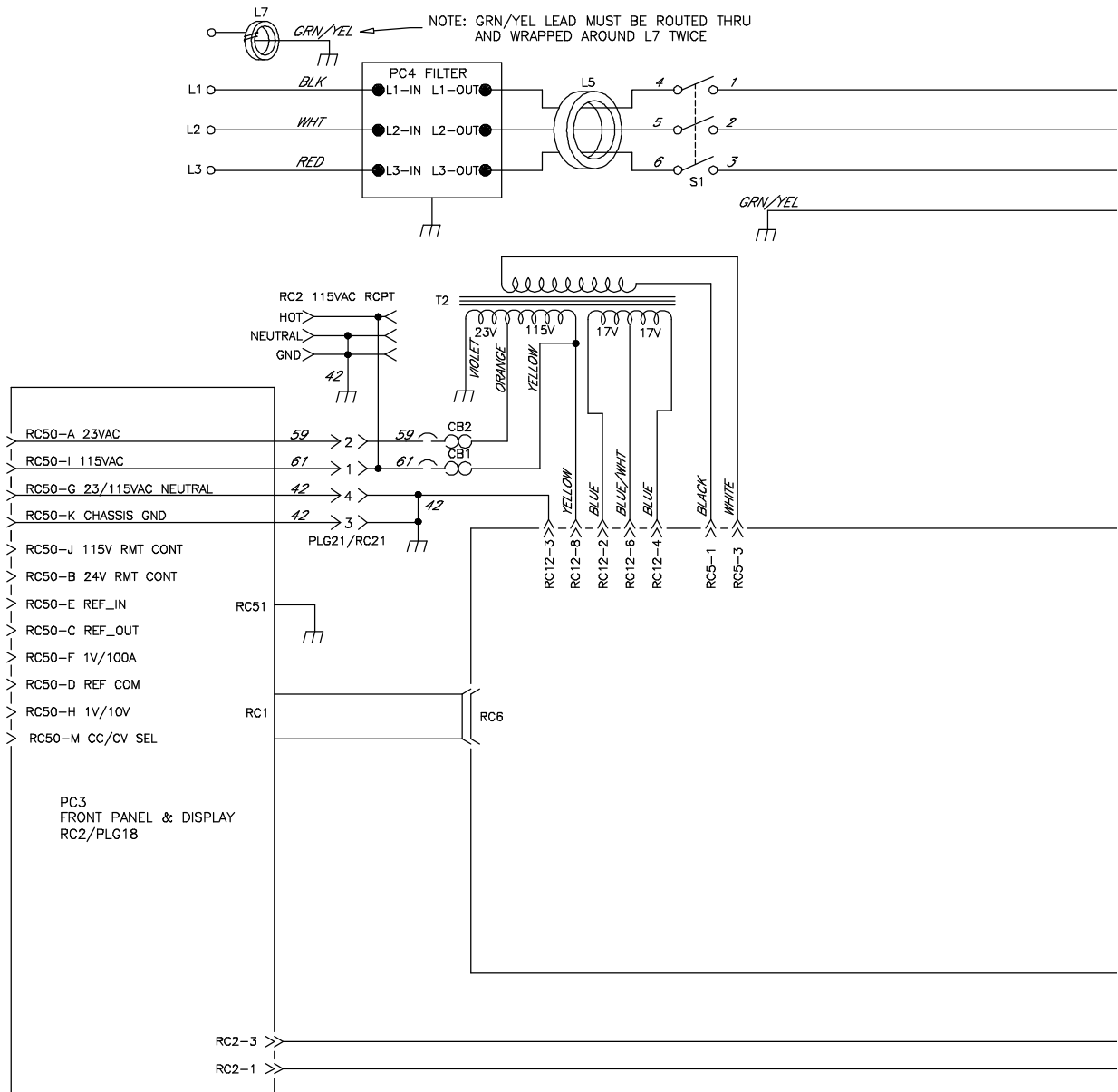
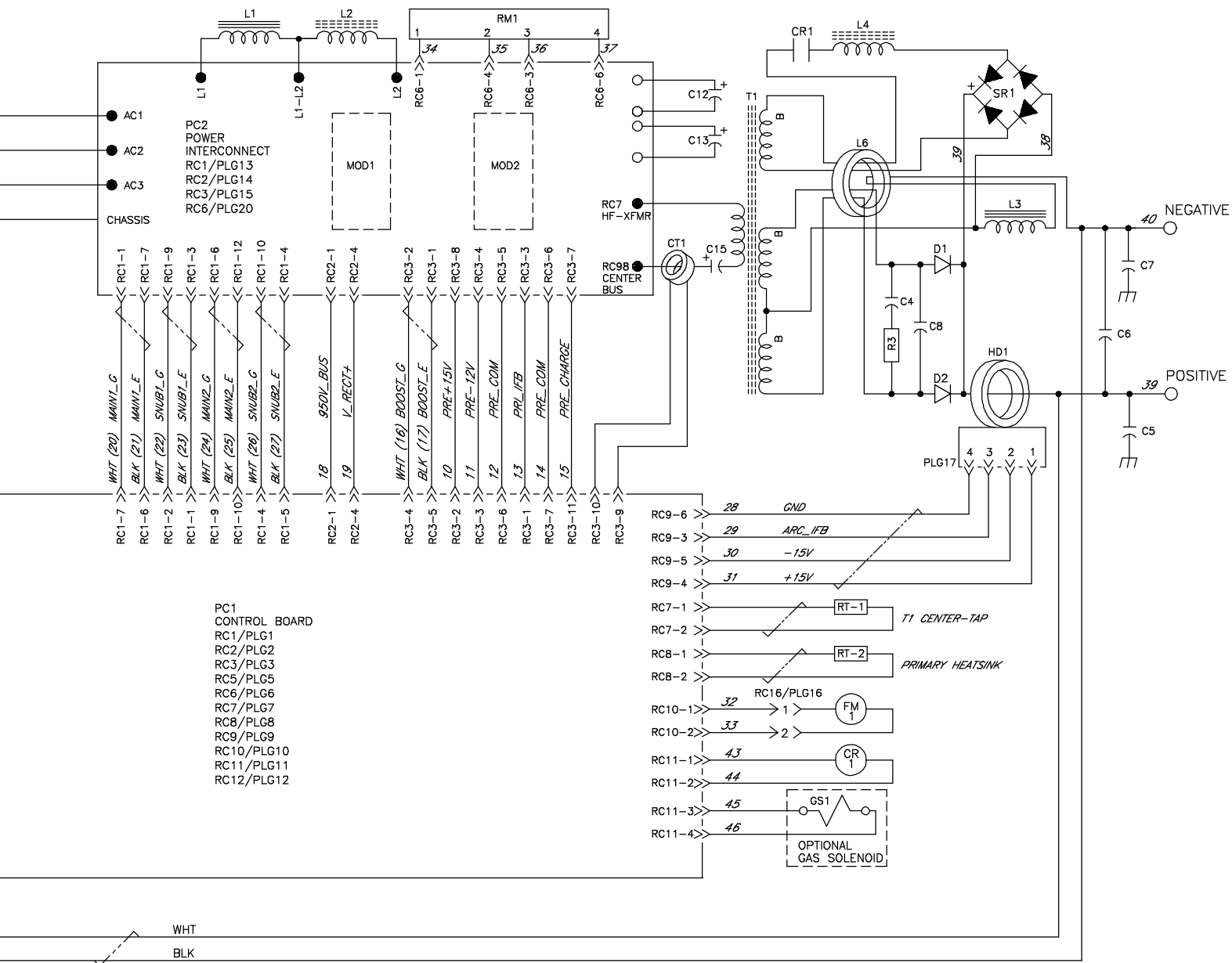
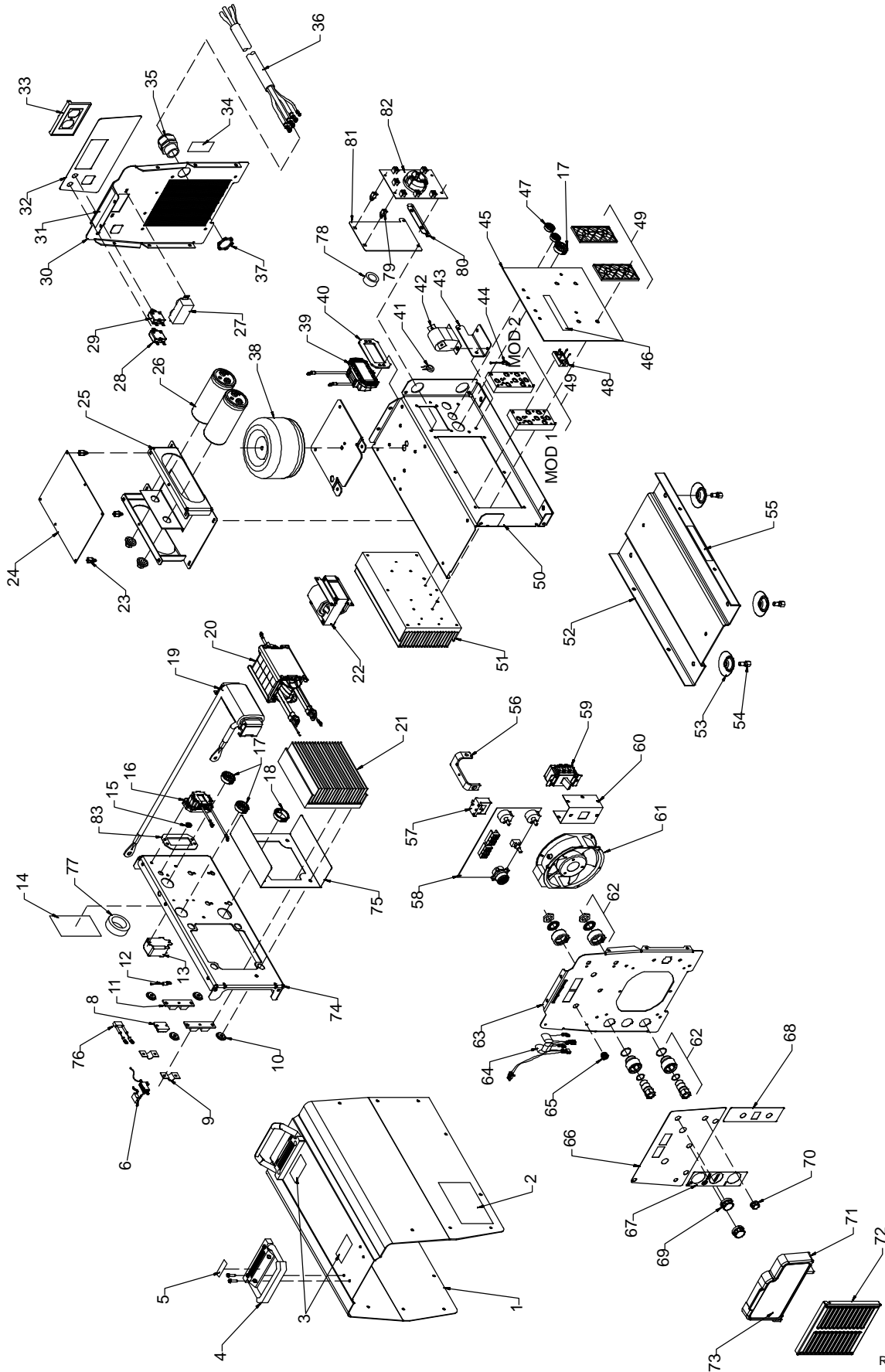


Figure 7-1. Circuit Diagram



SECTION 8 – PARTS LIST



Ref. 803 850-F

Figure 8.1. Parts Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
Figure 8.1. Parts Assembly				
1		216 034	Wrapper (Includes Insulators and Safety Labels)	1
		175 256	Insulator, Side Rh (Not Shown)	1
		178 551	Insulator, Side (Not Shown)	1
2		179 310	Label, General Precautionary Wordless, Intl, Small	2
3		179 309	Label, Caution Falling Equipment Can Injure—wordles	2
4		195 585	Handle, Rubberized Carrying	2
5		135 483	Label, Important Remove These Two Handle Screws	2
6	R3/C4	233 052	Resistor/Capacitor	1
7		Deleted		
8	SR1	201 530	Kit, Diode Fast Recovery Bridge	1
9		199 840	Bus Bar, Diode	2
10		196 355	Insulator, Screw	4
11	D1,D2	201 531	Kit, Diode Power Module	2
12	RT1	219 343	Thermistor, NTC 30K Ohm @ 25 Deg C 18in Lead	1
13	CR1	198 549	Relay, Encl 24VDC Spst 35A/300VAC 4Pin Flange Mtg	1
14		227 927	Label, Warning Electric Shock/Exploding Parts—wdles	1
15		010 546	Bushing, Snap-In Nyl .375 Id X .500 Mtg Hole	1
16	L4	218 020	Inductor, Boost	1
17		179 276	Bushing, Snap-In Nyl 1.000 Id X 1.375 Mtg Hole Cent	3
18		170 647	Bushing, Snap-In Nyl 1.312 Id X 1.500 Mtg Hole	1
19	L3	212 150	Inductor, Output	1
20	T1	212 132	XFMR, HF Litz/Litz W/Boost	1
21		225 097	Heat Sink, Lh Rect	1
22	L1	212 091	Inductor, Input	1
23		083 147	Grommet, Scr No 8/10 Panel Hole .312 Sq .500 High	4
24	PC1	242 341	Circuit Card Assy, Control/Aux Power W/Program	1
		216 113	Stand-Off Support, PC Card .187 Dia W/P&I .375	2
	PLG1	115 091	Housing Plug+Pins (Service Kit) RC1	1
	PLG2	201 665	Housing Plug+Pins (Service Kit) RC2	1
	PLG3	131 056	Housing Plug+Pins (Service Kit) RC3	1
	PLG5	131 204	Housing Plug+Pins (Service Kit) RC5	1
	PLG7	131 054	Housing Plug+Pins (Service Kit) RC7	1
	PLG8	131 054	Housing Plug+Pins (Service Kit) RC8	1
	PLG9	115 093	Housing Plug+Pins (Service Kit) RC9	1
	PLG10	115 094	Housing Plug+Pins (Service Kit) RC10	1
	PLG11	115 094	Housing Plug+Pins (Service Kit) RC11	1
	PLG12	115 092	Housing Plug+Pins (Service Kit) RC12	1
25		212 072	Bracket, Mtg Capacitor/Pc Board	1
26	C12,13	219 930	Kit, Capacitor Elctlt Replacement (Includes)	1
		193 738	Capacitor, Elctlt 1800 Uf 500 VDC Can 2.52 Dia	2
		217 040	Nut, Nylon M12 Thread Capacitor Mounting	2
27	RC2	604 176	Rcpt, Str Dx Grd 2P3W 15A 125V *5-15R	1
28	CB2	083 432	Circuit Breaker, Man Reset 1P 10A 250VAC Frict	1
29	CB1	083 432	Circuit Breaker, Man Reset 1P 10A 250VAC Frict	1
30		+219 470	Panel, Rear CE W/Aux	1
31		219 335	Label, Warning Electric Shock Can Kill CE Wordless	1
32			Nameplate, Rear Aux/Gas/CE (Order by Model and Serial Number)	1
33		217 297	Cover, Receptacle Weatherproof Duplex Rcpt	1
34		212 945	Label, Warning Incorrect Connections CE Wordless	1
35		215 980	Bushing, Strain Relief .709/.984 Id X1.375 Mtg Hole	1
36		244 628	Cable, Power 12Ft 8Ga 4C (Non-Stripped End)	1

+When ordering a component originally displaying a precautionary label, the label should also be ordered.
BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
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Figure 8.1. Parts Assembly (Continued)

37		234 126	Nut, Conduit 1.000 Npt Knurled	1
38	T2	211 968	XFMR, Control Toroidal 665 VAC Pri 1536 Va 60 Hz	1
		212 947	Plate, Mtg Toroid XFMR	1
39	L2	218 018	Inductor, Pre-Regulator	1
40		218 566	Gasket, Inductor Mounting	1
41	CT1	196 231	XMFR, Current Sensing 200/1	1
42	C15	196 143	Capacitor, Polyp Met Film 16. Uf 400 VAC 10%	1
43		219 472	Bracket, Mtg Capacitor Series	1
44	RT2	199 798	Thermistor, NTC 30K Ohm @ 25 Deg C 18in Lead	1
45	PC2	229 987	Circuit Card Assy, Interconnect W/Label & Clips (Includes)	1
46		219 335	Label, Warning Electric Shock Can Kill Ce Wordless	1
		223 343	Clip, Wire Stdf .40-.50 Bndl .156Hole .031-.078Thk	2
	PLG13	130 203	Housing Plug+Pins (Service Kit) RC1	1
	PLG14	201 665	Housing Plug+Pins (Service Kit) RC2	1
	PLG15	115 092	Housing Plug+Pins (Service Kit) RC3	1
	PLG20	115 093	Housing Plug+Pins (Service Kit) RC6	1
47		153 403	Bushing, Snap-In Nyl .750 Id X 1.000 Mtg Hole Cent	3
48	RM1	205 751	Module, Power Resistor W/Plug	1
49		217 625	Kit, Input/Pre-Regulator And Inverter Module (Includes)	1
			MOD 1, SKiip 83 HEC	1
			MOD 2, SKiip 83 EC	1
50		212 206	Windtunnel, Rh	1
51		196 330	Heat Sink, Power Module	1
52		+175 132	Base	1
53		229 325	Foot, Mtg Unit	4
54		176 736	Screw, Mtg Foot	4
55		212 073	Label, Warning Exploding Parts Can CE Wordless	1
56		212 074	Bus Bar, Output	1
57	HD1	182 918	Transducer, Current 400A Module Supply V +/- 15V	1
58	PC3	229 985	Circuit Card Assy, Front Panel & Display W/Program	1
	PLG18	131 204	Housing Plug+Pins (Service Kit) RC2	1
	RC50	210 233	Rcpt, W/Pins (Service Kit)	1
	PLG21	212 088	Plug, W/Leads	1
	RC21	167 640	Housing Plug+Pins (Service Kit)	1
59	S1	231 191	Switch, Tgl 3Pst 50A 600VAC Scr Term Wide Tgl	1
60		176 226	Insulator, Switch Power	1
61	FM1	196 313	Fan, Muffin 115V 50/60Hz 3000 RPM 6.378 Mtg Holes	1
	PLG16	131 054	Housing Plug+Pins (Service Kit)	1
	RC16	135 635	Housing Plug+Pins (Service Kit)	1
62		208 967	Rcpt Assy, Tw Lk Insul Fem (Dinse Type) 50/70 Series (Includes)	2
		208 968	Rcpt, Tw Lk Insul W/O-Ring	1
		185 712	Insulator, Bulkhead Front	1
		185 713	Insulator, Bulkhead Rear	1
		185 714	Washer, Tooth 22mmid X 31.5mmod 1.310-1mmt Intern	1
		185 717	Nut, M20-1.5 1.00Hex .19H Brs Locking	1
		185 718	O-Ring, 0.989 Id X 0.070 H	1
		186 228	O-Ring, 0.739 Id X 0.070 H	1
63		212 070	Panel, Front Standard	1
64	C5,6,7	233 668	Capacitor Assy, W/Plug & Leads (Voltage Feedback)	1
65		216 112	Fastener, Panel Receptacle Quick Access	2
66			Nameplate (Order by Model and Serial Number)	1
67			Nameplate, Connection (Order by Model and Serial Number)	1
68			Nameplate, Power (Order by Model and Serial Number)	1
69		174 991	Knob, Pointer 1.250 Dia X .250 Id W/Spring Clip-.21	2

+When ordering a component originally displaying a precautionary label, the label should also be ordered.
BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
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Figure 8.1. Parts Assembly (Continued)

... 70		174 992	.. Knob, Pointer .840 Dia X .250 Id W/Spring Clip-.21	1
... 71		218 041	.. Door, W/Quick Access Ball Fasteners	1
... 72		175 138	.. Box, Louver	1
... 73			Label (Order by Model and Serial Number)	1
... 74		+212 207	.. Windtunnel, Lh	1
... 75		211 503	.. Insulator, Heat Sink	1
... 76	C8	219 191	.. Capacitor, Polyp Film .001 Uf 2000V W/Terms	1
... 77	L6	131 447	.. Core, Toroidal 1.332 Id X 1.932 Od X .625 Thk	1
... 78	L5,L7	199 122	.. Core, Toroidal .750 Id X 1.450 Od X .544 Thk	2
... 79		083 147	.. Grommet, Scr No 8/10 Panel Hole .312 Sq .500 High	2
... 80		219 471	.. Bracket, Mtg Filter Board	1
... 81		219 473	.. Bracket, Mtg CE Filter Ground Plane	1
... 82	PC4	229 989	.. Circuit Card Assy, Filter	1
... 83		227 746	.. Gasket, Inductor Mounting	1

+When ordering a component originally displaying a precautionary label, the label should also be ordered.
BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

TRUE BLUE® WARRANTY

Effective January 1, 2011
(Equipment with a serial number preface of MB or newer)

This limited warranty supersedes all previous Miller warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY – Subject to the terms and conditions below, ITW Welding Products Italy warrants to its original retail purchaser that new Miller equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Miller. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Miller will provide instructions on the warranty claim procedures to be followed.

Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date the equipment was delivered to the original retail purchaser or one year after the equipment is shipped to a European distributor or eighteen months after the equipment is shipped to an International distributor.

1. 5 Years Parts — 3 Years Labor
 - * Original main power rectifiers only to include SCRs, diodes, and discrete rectifier modules
2. 3 Years — Parts and Labor
 - * Engine Driven Welding Generators
(NOTE: Engines are warranted separately by the engine manufacturer.)
 - * HF Units
 - * Inverter Power Sources (Unless Otherwise Stated)
 - * Process Controllers
 - * Semi-Automatic and Automatic Wire Feeders
 - * Transformer/Rectifier Power Sources
3. 2 Years — Parts
 - * Auto-Darkening Helmet Lenses (No Labor)
 - * Migmatic 171
4. 1 Year — Parts and Labor Unless Specified
 - * Automatic Motion Devices
 - * Field Options
(NOTE: Field options are covered under True Blue® for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
 - * Induction Heating Power Sources, Coolers, and Electronic Controls/Recorders
 - * Motor Driven Guns (w/exception of Spoolmate Spoolguns)
 - * Positioners and Controllers
 - * Powered Air Purifying Respirator (PAPR) Blower Unit (No Labor)
 - * Racks
 - * Running Gear and Trailers
 - * Subarc Wire Drive Assemblies
 - * Water Coolant Systems (Hydramate 1 and 2)
 - * Water Coolant Systems (USA Models, Non-Integrated)
 - * Work Stations/Weld Tables (No Labor)
5. 6 Months — Parts
 - * Batteries

6. 90 Days — Parts
 - * Accessory (Kits)
 - * Canvas Covers
 - * Induction Heating Coils and Blankets
 - * MIG Guns
 - * Remote Controls
 - * Replacement Parts (No Labor)
 - * Spoolmate Spoolguns

Miller's True Blue® Limited Warranty shall not apply to:

1. **Consumable components; such as contact tips, cutting nozzles, contactors, brushes, switches, slip rings, relays or parts that fail due to normal wear.**
2. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

MILLER PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at Miller's option: (1) repair; or (2) replacement; or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Miller's option of repair or replacement will be F.O.B., Factory at ITW Welding Products Group Europe or F.O.B. at a Miller authorized service facility as determined by Miller. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

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Owner's Record

Please complete and retain with your personal records.

Model Name

Serial/Style Number

Purchase Date

(Date which equipment was delivered to original customer.)

Distributor

Address

Country

Zip/Postal Code



For Service

Contact a *DISTRIBUTOR* or *SERVICE AGENCY* near you.

Always provide Model Name and Serial/Style Number.

Contact your Distributor for:

Welding Supplies and Consumables

Options and Accessories

Service and Repair

Replacement Parts

Owner's Manuals

Contact the Delivering Carrier to:

File a claim for loss or damage during shipment.

For assistance in filing or settling claims, contact your distributor and/or equipment manufacturer's Transportation Department.

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