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2014-07

Processes



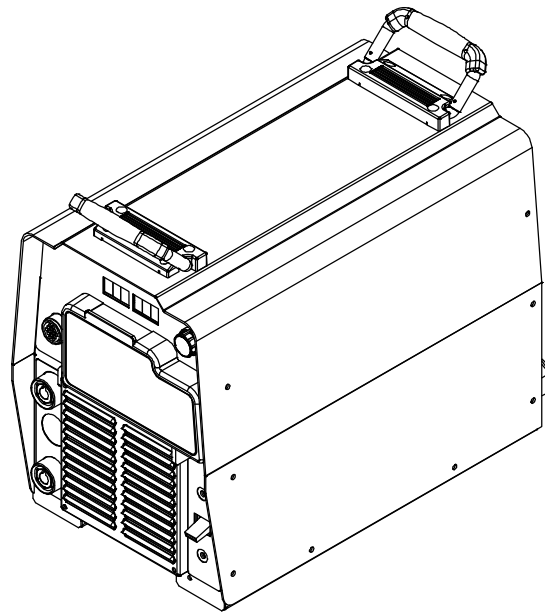
Multiprocess Welding

Description



Arc Welding Power Source

XMT[®] 425 MPa[™] Auto-Line CE



Visit our website at
www.MillerWelds.com

OWNER'S MANUAL

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.



Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001 Quality System Standard.

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 the 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 specification sheets. **To locate your nearest distributor or service agency call 1-800-4-A-Miller, or visit us at www.MillerWelds.com on the web.**



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 425 MPa	907559

Council Directives:

- 2006/95/EC Low Voltage
- 2004/108/EC Electromagnetic Compatibility
- 2011/65/EU Restriction of the use of certain hazardous substances in electrical and electronic equipment

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:

January 2nd, 2013

Massimiliano Lavarini

Date of Declaration

ELECTRONIC ENGINEER R&D TECH. SUPPORT

SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

som 2013–09

 **Protect yourself and others from injury — read, follow, and save these important safety precautions and operating instructions.**

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, ground, and operate 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 and ground conductor for damage or bare wiring – replace immediately if damaged – bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or repaired 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. Disconnect cable for process not in use.
- Use GFCI protection when operating auxiliary equipment in damp or wet locations.

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.

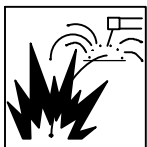
- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use local forced ventilation at the arc to remove welding fumes and gases. The recommended way to determine adequate ventilation is to sample for the composition and quantity of fumes and gases to which personnel are exposed.
- If ventilation is poor, wear an approved air-supplied respirator.
- Read and understand the Safety Data Sheets (SDSs) and the manufacturer's instructions for adhesives, coatings, cleaners, consumables, coolants, degreasers, fluxes, and metals.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watchperson 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 body protection made from durable, flame-resistant material (leather, heavy cotton, wool). Body protection includes oil-free clothing such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.

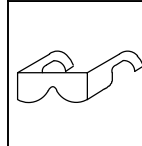


WELDING can cause fire or explosion.

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 burns. 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 containers that have held combustibles, or on closed containers such as tanks, drums, or pipes unless they are properly prepared according to AWS F4.1 and AWS A6.0 (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 body protection made from durable, flame-resistant material (leather, heavy cotton, wool). Body protection includes oil-free clothing 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.
- Read and understand the Safety Data Sheets (SDSs) and the manufacturer's instructions for adhesives, coatings, cleaners, consumables, coolants, degreasers, fluxes, and metals.



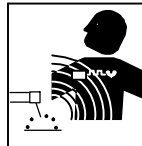
FLYING METAL or DIRT can injure eyes.

- 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.



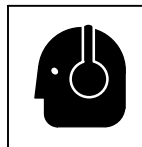
BUILDUP OF GAS can injure or kill.

- 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.

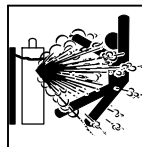
- Wearers of Pacemakers and other Implanted Medical Devices should keep away.
- Implanted Medical Device wearers should consult their doctor and the device manufacturer before going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations.



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. Do not stand in front of or behind the regulator when opening the 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



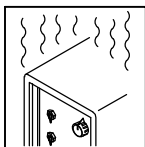
FIRE OR EXPLOSION hazard.

- 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.



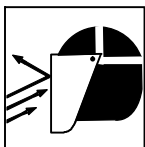
FALLING EQUIPMENT can injure.

- 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.



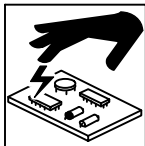
OVERUSE can cause OVERHEATING

- 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.



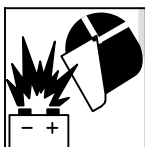
MOVING PARTS can injure.

- 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.



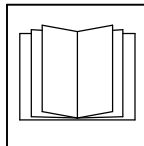
BATTERY EXPLOSION can injure.

- Do not use welder to charge batteries or jump start vehicles unless it has a battery charging feature designed for this purpose.



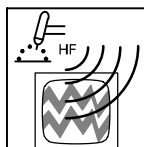
MOVING PARTS can injure.

- 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.



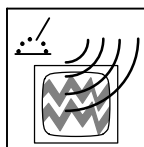
READ INSTRUCTIONS.

- 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.)

 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.**

1-5. Principal Safety Standards

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, is available as a free download from the American Welding Society at <http://www.aws.org> or purchased 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).

Safe Practices for Welding and Cutting Containers that have Held Combustibles, American Welding Society Standard AWS A6.0, 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, 14501 George Carter Way, Suite 103, Chantilly, VA 20151 (phone: 703-788-2700, website: www.cga-net.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 5N5 (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).

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). The current from arc welding (and allied processes including spot welding, gouging, plasma arc cutting, and induction heating operations) creates an EMF field around the welding circuit. EMF fields may interfere with some medical implants, e.g. pacemakers. Protective measures for persons wearing medical implants have to be taken. For example, restrict access for passers-by or conduct 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.


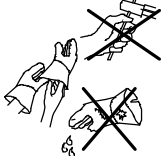
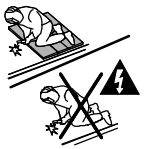
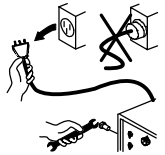
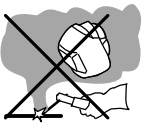
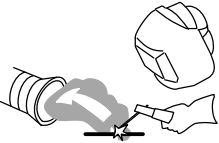
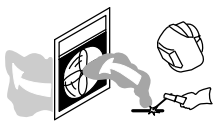
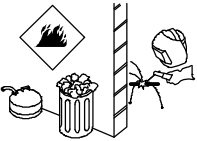


4. Keep head and trunk as far away from the equipment in the welding circuit as possible.
5. Connect work clamp to workpiece as close to the weld as possible.
6. Do not work next to, sit or lean on the welding power source.
7. Do not weld whilst carrying the welding power source or wire feeder.



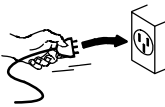
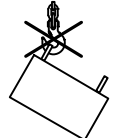


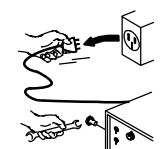
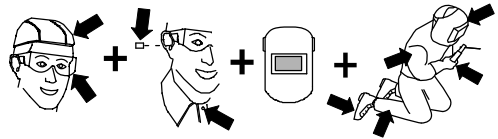
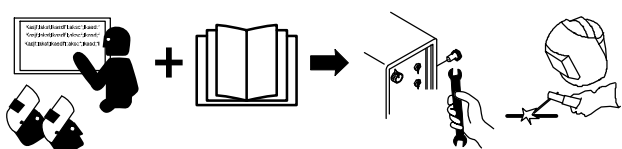
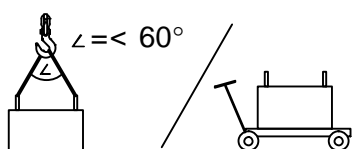
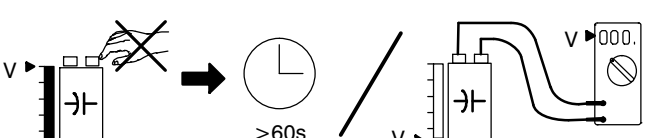
About Implanted Medical Devices:

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.
















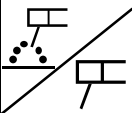
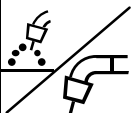
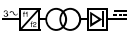







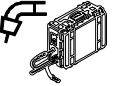



SECTION 2 – DEFINITIONS

2-1. Additional Safety Symbols And Definitions

	<p>Warning! Watch Out! There are possible hazards as shown by the symbols.</p> <p>Safe1 2012-05</p>
	<p>Wear dry insulating gloves. Do not touch electrode with bare hand. Do not wear wet or damaged gloves.</p> <p>Safe2 2012-05</p>
	<p>Protect yourself from electric shock by insulating yourself from work and ground.</p> <p>Safe3 2012-05</p>
	<p>Disconnect input plug or power before working on machine.</p> <p>Safe5 2012-05</p>
	<p>Keep your head out of the fumes.</p> <p>Safe6 2012-05</p>
	<p>Use forced ventilation or local exhaust to remove the fumes.</p> <p>Safe8 2012-05</p>
	<p>Use ventilating fan to remove fumes.</p> <p>Safe10 2012-05</p>
	<p>Keep flammables away from welding. Do not weld near flammables.</p> <p>Safe12 2012-05</p>
	<p>Welding sparks can cause fires. Have a fire extinguisher nearby, and have a watchperson ready to use it.</p> <p>Safe14 2012-05</p>
	<p>Do not remove or paint over (cover) the label.</p> <p>Safe20 2012-05</p>

	<p>When power is applied failed parts can explode or cause other parts to explode.</p> <p>Safe26 2012-05</p>
	<p>Always wear long sleeves and button your collar when servicing unit.</p> <p>Safe28 2012-05</p>
	<p>After taking proper precautions as shown, connect power to unit.</p> <p>Safe29 2012-05</p>
	<p>Do not use one handle to lift or support unit.</p> <p>Safe31 2012-05</p>
	<p>Do not weld on drums or any closed containers.</p> <p>Safe16 2012-05</p>
	<p>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.</p> <p>Safe37 2012-05</p>
	<p>Disconnect input plug or power before working on machine.</p> <p>Safe30 2012-05</p>
	<p>Wear hat and safety glasses. Use ear protection and button shirt collar. Use welding helmet with correct shade of filter. Wear complete body protection.</p> <p>Safe38 2012-05</p>
	<p>Become trained and read the instructions before working on the machine or welding.</p> <p>Safe40 2012-05</p>
	<p>Always lift and support unit using both handles. Keep angle of lifting device less than 60 degrees. Use a proper cart to move unit.</p> <p>Safe44 2012-05</p>
	<p>Hazardous voltage remains on input capacitors after power is turned off. Do not touch fully charged capacitors. Always wait 60 seconds after power is turned off before working on unit, OR check input capacitor voltage, and be sure it is near 0 before touching any parts.</p> <p>Safe42 2012-05</p>

2-2. Miscellaneous Symbols And Definitions

A	Amperage		Panel		Alternating Current (AC)	V	Voltage
	Output		Circuit Breaker		Remote	I	On
	Off		Gas Tungsten Arc Welding (GTAW)	—	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		Setup	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		Arc Control		Gas Type
	Wire Type						

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.

ce-emf 1 2010-10

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 can be potential difficulties in ensuring electromagnetic compatibility in those locations, due to conducted as well as radiated disturbances.

This equipment complies with IEC61000-3-11 and IEC 61000-3-12 and can be connected to public low-voltage systems provided that the public low-voltage system impedance Z_{max} at the point of common coupling is less than 77.84 m Ω (or the short-circuit power S_{sc} is greater than 2,055,437.437 VA). 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 system impedance complies with the impedance restrictions.

ce-emc 1 2014-07

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	RMS Amps Input at Rated Load Output, 50/60 Hz 3-Phase at NEMA Load Voltages and Class I Rating			KVA	KW
					230 V	400 V	460 V		
3-Phase	350 A at 34 VDC, 60% Duty Cycle	10–38 V	5–425 A	75 VDC	36.1	20.6	17.8	14.2	13.6

*See Section 3-7 for Duty Cycle Rating.

3-4. IP Rating

IP Rating	Operating Temperature Range
IP23 This equipment is designed for outdoor use. It may be stored, but is not intended to be used for welding outside during precipitation unless sheltered.	–10 to 40 °C (14 to 104 °F) IP23 2014–06

3-5. Features And Benefits

Auto-Line™ Power Management Technology is circuitry that automatically adapts the power source to the primary voltage being applied (see Section 4-7).

LVC™ Line Voltage Compensation is circuitry that keeps the power source output constant regardless of input power fluctuation.

Wind Tunnel Technology™ circulates air over components that require cooling, not over electronic circuitry, which reduces contaminants and improves reliability in harsh welding environments.

Fan-On-Demand™ cooling system operates only when needed, reducing noise, energy use and the amount of contaminants pulled through the machine.

Thermal Overload Protection automatically shuts down the unit, only when necessary to prevent damage to internal components if the duty cycle is exceeded or air flow and cooling are restricted (see Section 3-7).

Auto Remote Sense enables the unit to automatically sense the connection of a remote control. Operation of the remote control is dependent on the Mode Switch Setting (see Section 5-2).

Lift-Arc™ TIG starts provide a contamination free weld without the use of high frequency in the Lift-Arc TIG Welding Mode (see Section 6-3).

Synergic Pulsed MIG Operation allows single knob control of the arc. As wirefeed speed is increased or decreased, the pulse parameters increase or decrease matching the power output to the wire speed (see Section 5-3).

3-6. Arc Controls

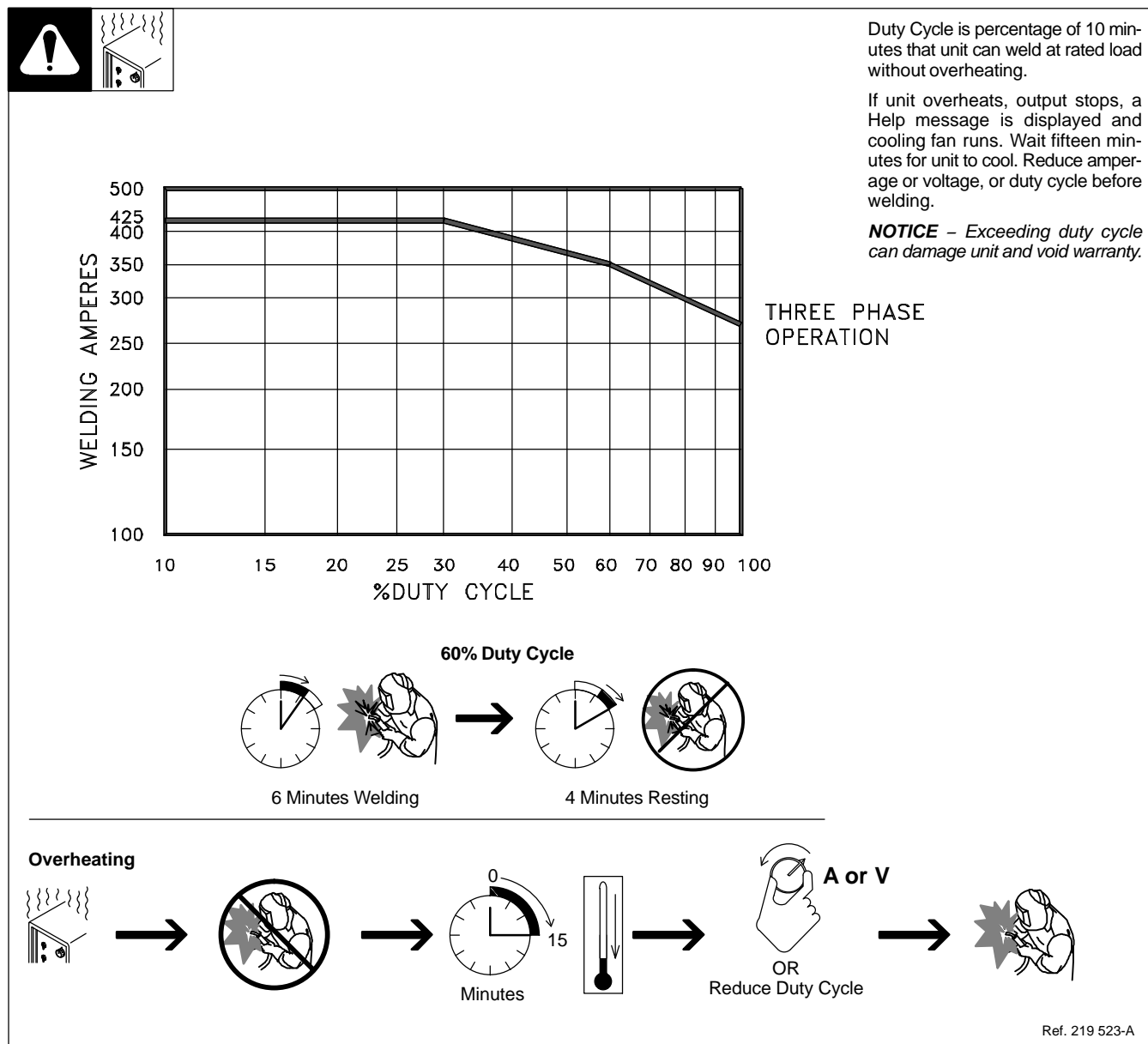
DIG control allows the arc characteristics, soft versus stiff, to be changed for specific applications and electrodes in CC and Stick Welding Modes (see Sections 8-2 and 8-3).

Programmable Hot Start allows the start amperage and time to be changed for CC and Stick Welding Modes (see Sections 8-2 and 8-3).

Inductance influences the arc stiffness, bead width and appearance, and puddle fluidity in MIG and V-Sense Feeder Welding Modes (see Sections 7-2 and 7-8).

SharpArc™ optimizes the size and shape of the arc cone, bead width and appearance, and puddle fluidity in Pulsed MIG Welding Mode (see Section 7-4).

3-7. Duty Cycle And Overheating



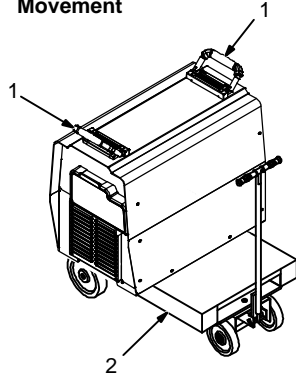
Ref. 219 523-A

SECTION 4 – INSTALLATION

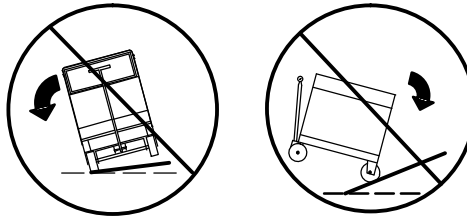
4-1. Selecting a Location



Movement



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



1 Lifting Handles

Use handles to lift unit.

2 Hand Cart

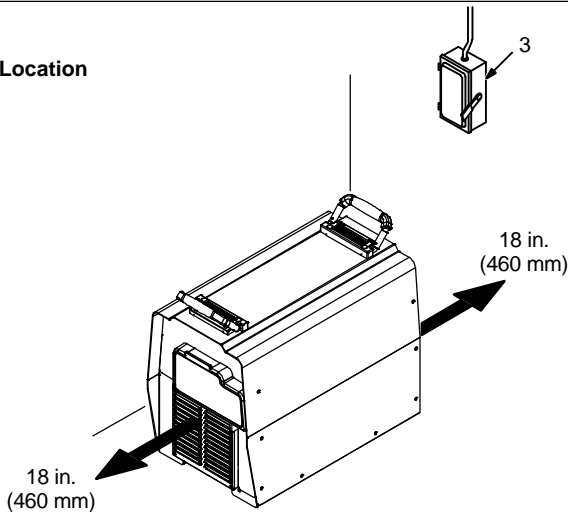
Use cart or similar device to move unit.

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



XMT Location 1

4-2. Dimensions And Weight

Hole Layout Dimensions	
A	11-3/4 in. (298 mm)
B	1-11/16 in. (42 mm)
C	15-3/4 in. (400 mm)
D	19-3/32 in. (485 mm)
E	8-11/16 in. (221 mm)
F	1-17/32 in. (39 mm)
G	1/4-20 UNC -2B thread
Weight	
94.8 lb (43 kg)	

Technical drawing of the unit showing dimensions A, B, C, D, E, F, and G. The drawing is a front view of the unit, showing the mounting holes and the overall dimensions. Dimension A is the total width of the unit. Dimension B is the distance from the bottom edge to the center of the mounting holes. Dimension C is the distance between the centers of the mounting holes. Dimension D is the total height of the unit. Dimension E is the distance between the centers of the mounting holes. Dimension F is the distance from the left edge to the center of the mounting holes. Dimension G is the distance from the right edge to the center of the mounting holes.


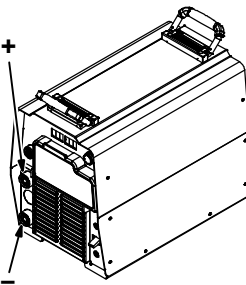
Isometric view of the unit with dimensions: 24 in. (610 mm) width, 17 in. (432 mm) height, and 12-1/2 in. (318 mm) depth. The drawing shows the unit from a three-quarter perspective, highlighting the front panel, the top, and the side. The dimensions are labeled with arrows indicating the measurement points.

804 801-A

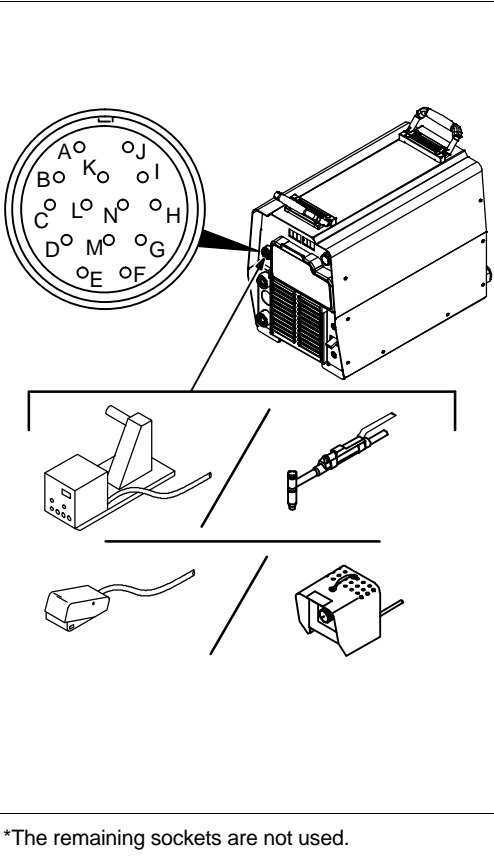

804 801-A

4-3. Weld Output Receptacles 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 100 ft (30 m) from the workpiece, the total cable length in the weld circuit is 200 ft (2 cables x 100 ft). Use the 200 ft (60 m) column to determine cable size.

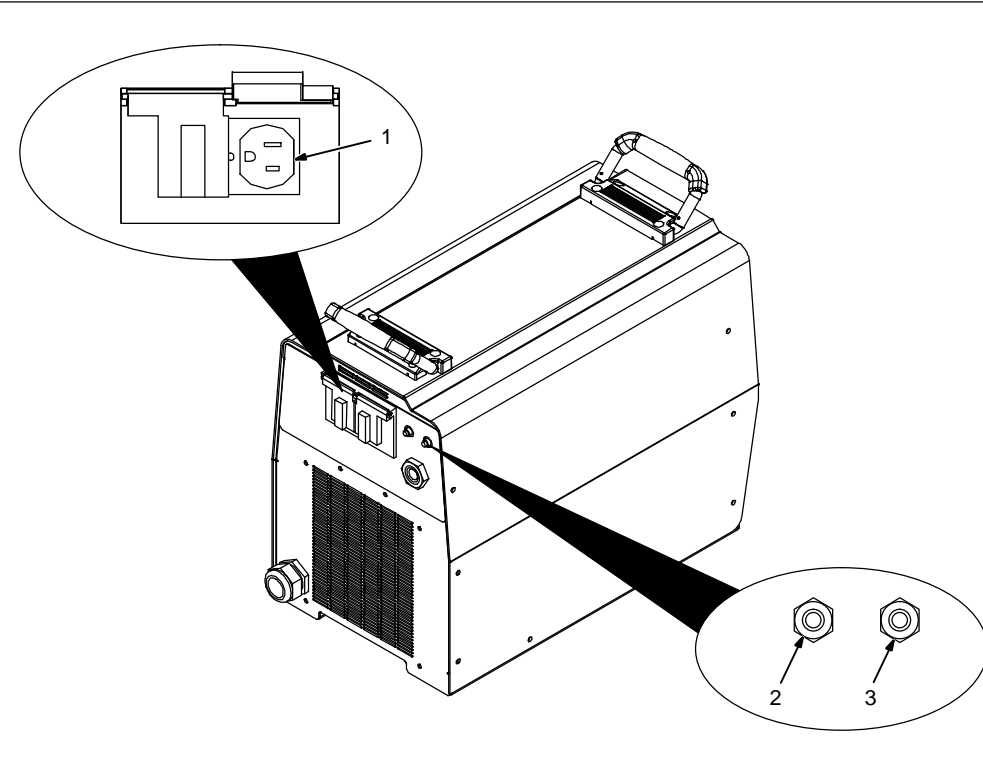
 <p>Weld Output Terminals</p> <p>⚠ Turn off power before connecting to weld output terminals.</p> <p>⚠ Do not use worn, damaged, undersized, or repaired cables.</p>	<p align="center">Weld Cable Size** and Total Cable (Copper) Length in Weld Circuit Not Exceeding***</p>								
	<p align="center">Welding Amperes</p>	<p align="center">30 m (100 ft) or Less</p>		<p align="center">45 m (150 ft)</p>	<p align="center">60 m (200 ft)</p>	<p align="center">70 m (250 ft)</p>	<p align="center">90 m (300 ft)</p>	<p align="center">105 m (350 ft)</p>	<p align="center">120 m (400 ft)</p>
		<p align="center">10 – 60% Duty Cycle mm² (AWG)</p>	<p align="center">60 – 100% Duty Cycle mm² (AWG)</p>	<p align="center">10 – 100% Duty Cycle mm² (AWG)</p>					
 <p align="center">Output Receptacles</p>	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 (2x2/0)	2x70 (2x2/0)
	300	50 (1)	60 (1/0)	70 (2/0)	95 (3/0)	120 (4/0)	2x70 (2x2/0)	2x95 (2x3/0)	2x95 (2x3/0)
	350	60 (1/0)	70 (2/0)	95 (3/0)	120 (4/0)	2x70 (2x2/0)	2x95 (2x3/0)	2x95 (2x3/0)	2x120 (2x4/0)
	400	60 (1/0)	70 (2/0)	95 (3/0)	120 (4/0)	2x70 (2x2/0)	2x95 (2x3/0)	2x120 (2x4/0)	2x120 (2x4/0)
	500	70 (2/0)	95 (3/0)	120 (4/0)	2x70 (2x2/0)	2x95 (2x3/0)	2x120 (2x4/0)	3x95 (3x3/0)	3x95 (3x3/0)
	600	95 (3/0)	120 (4/0)	2x70 (2x2/0)	2x95 (2x3/0)	2x120 (2x4/0)	3x95 (3x3/0)	3x120 (3x4/0)	3x120 (3x4/0)
<p>* This chart is a general guideline and may not suit all applications. If cable overheats, use next size larger cable.</p> <p>**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.</p> <p>***For distances longer than those shown in this guide, call a factory applications representative.</p> <p align="right">Milan Ref. S-0007-K 2013-10</p>									

4-4. Remote 14 Receptacle Information

	 REMOTE 14	Socket*	Socket Information
	24 VOLTS AC OUTPUT (CONTACTOR)	A	24 volts AC. Protected by supplementary protect- or CB2.
		B	Contact closure to A completes 24 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.
		L	Wirefeed speed command, 0 to +10 volts DC out- put signal from wire feeder.
		M	CC/CV Select; 0 to +10 volts DC.
		N	Wirefeed speed common.
	A/V AMPERAGE VOLTAGE	F	Current feedback; +1 volt DC per 100 amperes.
		H	Voltage feedback; +1 volt DC per 10 output recep- tacle volts.
	GND	G	Circuit common for 24 and 115 volts AC circuits.
		K	Chassis common.

*The remaining sockets are not used.

4-5. 115 Volts AC Duplex Receptacle And Supplementary Protectors



1 115 V 60 Hz 10 Amp AC Receptacle

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

2 Supplementary Protector CB1

3 Supplementary Protector CB2

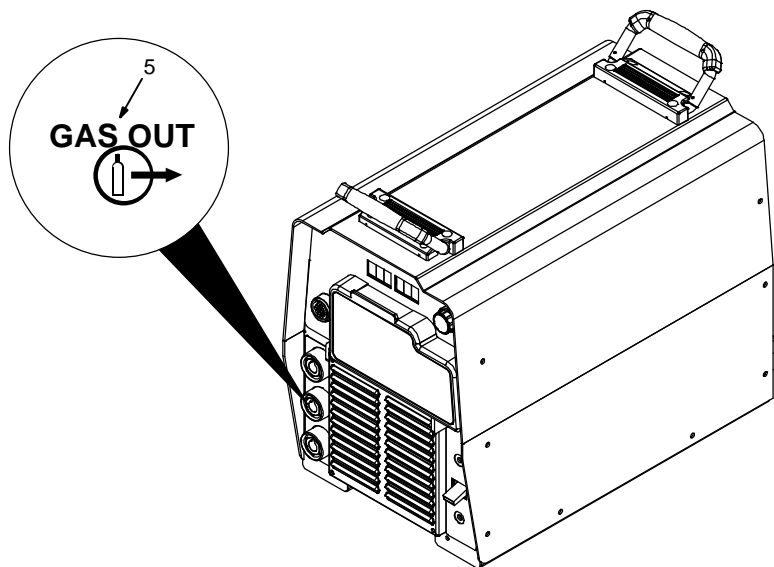
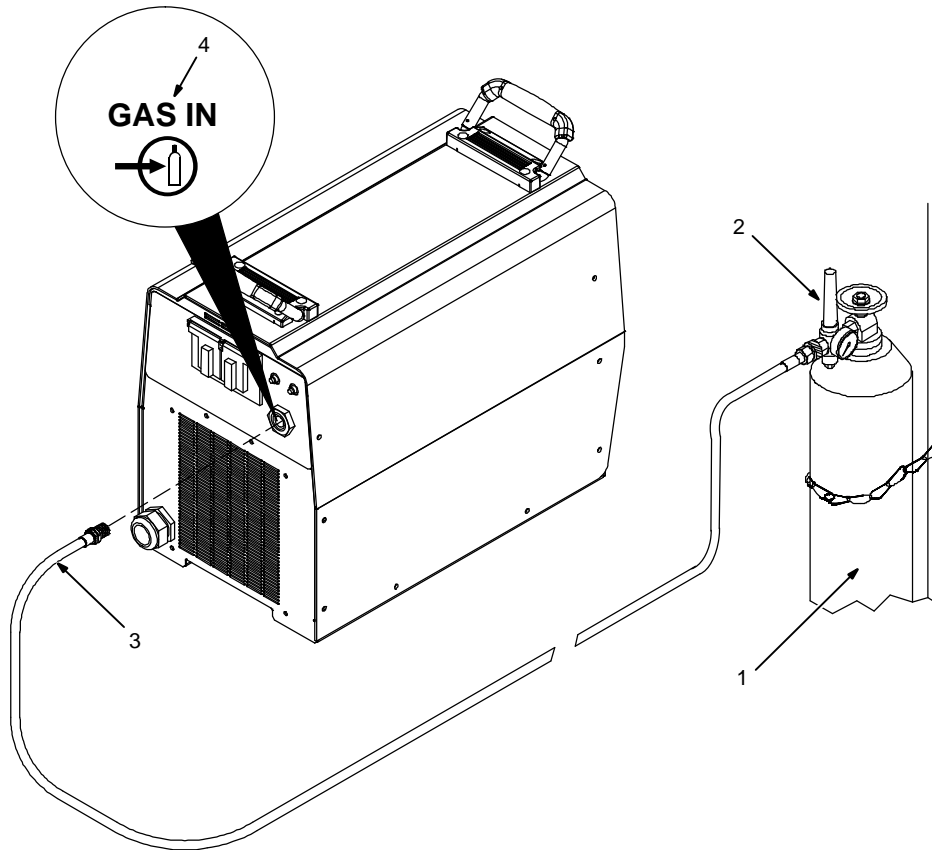
CB1 protects the duplex receptacle from overload.

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

Press button to reset protector.

803 691-C

4-6. 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

Install so face is vertical.

- 3 Gas Hose Connection

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 TIG

Gas flow starts when tungsten touches work (touch sensed).

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).

Elec Serv 2011-08

NOTICE – Actual input voltage should not be 10% less than minimum and/or 10% more than maximum input voltages listed in table. If actual input voltage is outside this range, output may not be available.



In dedicated circuit installations, the National Electrical Code (NEC) allows the receptacle or conductor rating to be less than the rating of the circuit protection device. All components of the circuit must be physically compatible. See NEC articles 210.21, 630.11, and 630.12.

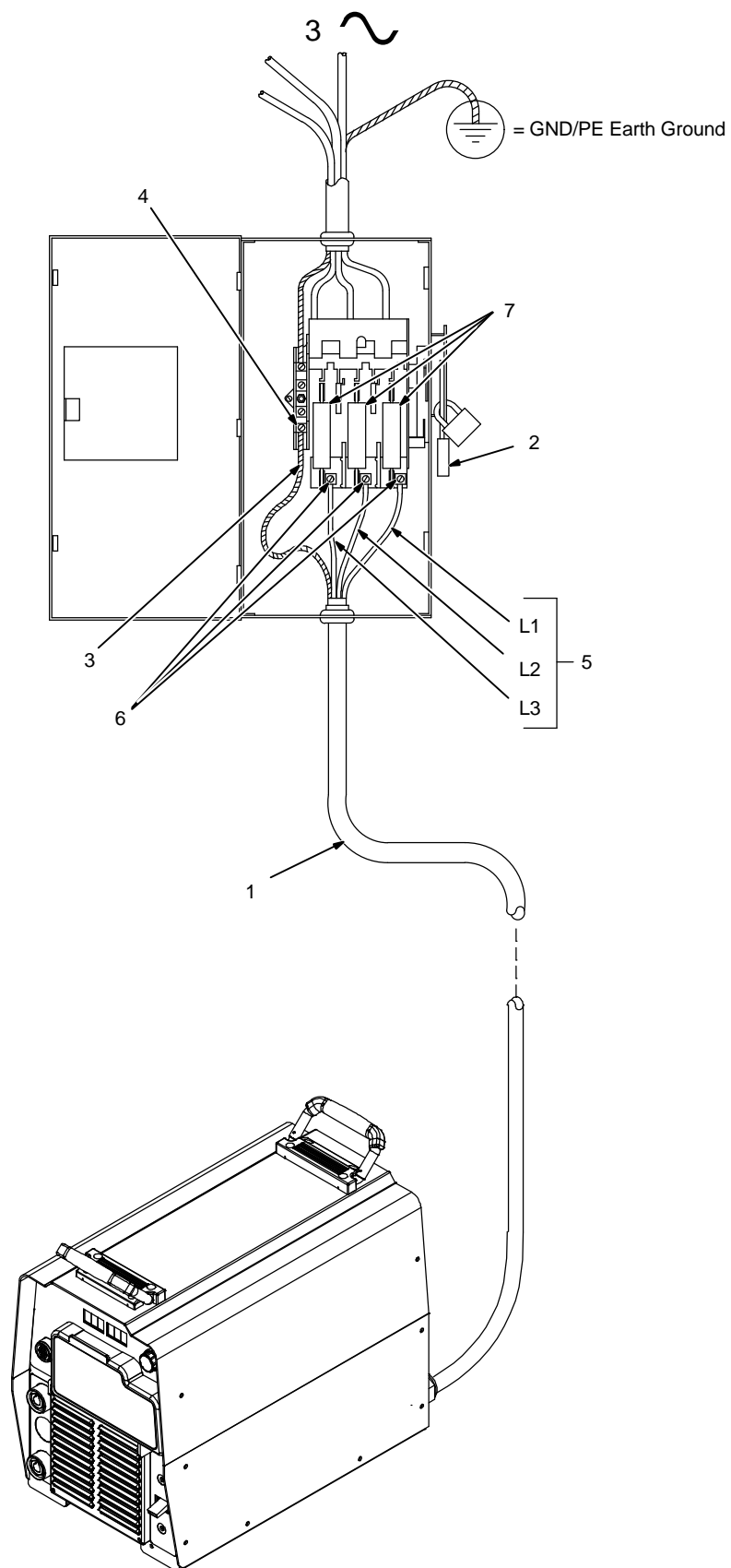
	50/60 Hz Three Phase			
Input Voltage (V)	230	380	400	460
Input Amperes (A) At Rated Output	36.1	22.3	20.6	17.8
Max Recommended Standard Fuse Rating In Amperes ¹				
Time-Delay Fuses ²	40	25	25	20
Normal Operating Fuses ³	50	30	30	25
Min Input Conductor Size In AWG ⁴	10	12	12	14
Max Recommended Input Conductor Length In Feet (Meters)	96 (29)	158 (48)	175 (53)	150 (46)
Min Grounding Conductor Size In AWG ⁴	10	12	12	14

⁴ Conductor data in this section specifies conductor size (excluding flexible cord or cable) between the panelboard and the equipment per NEC Table 310.15(B)(16). If a flexible cord or cable is used, minimum conductor size may increase. See NEC Table 400.5(A) for flexible cord and cable requirements.

Notes

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

4-8. Connecting 3-Phase Input Power



Tools Needed:





NOTICE – The Auto-Line circuitry in this unit automatically adapts the power source to the primary voltage being applied. Check input

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

- Close and secure door on disconnect device. Follow established lockout/tagout procedures to put unit in service.

input2 2012-05

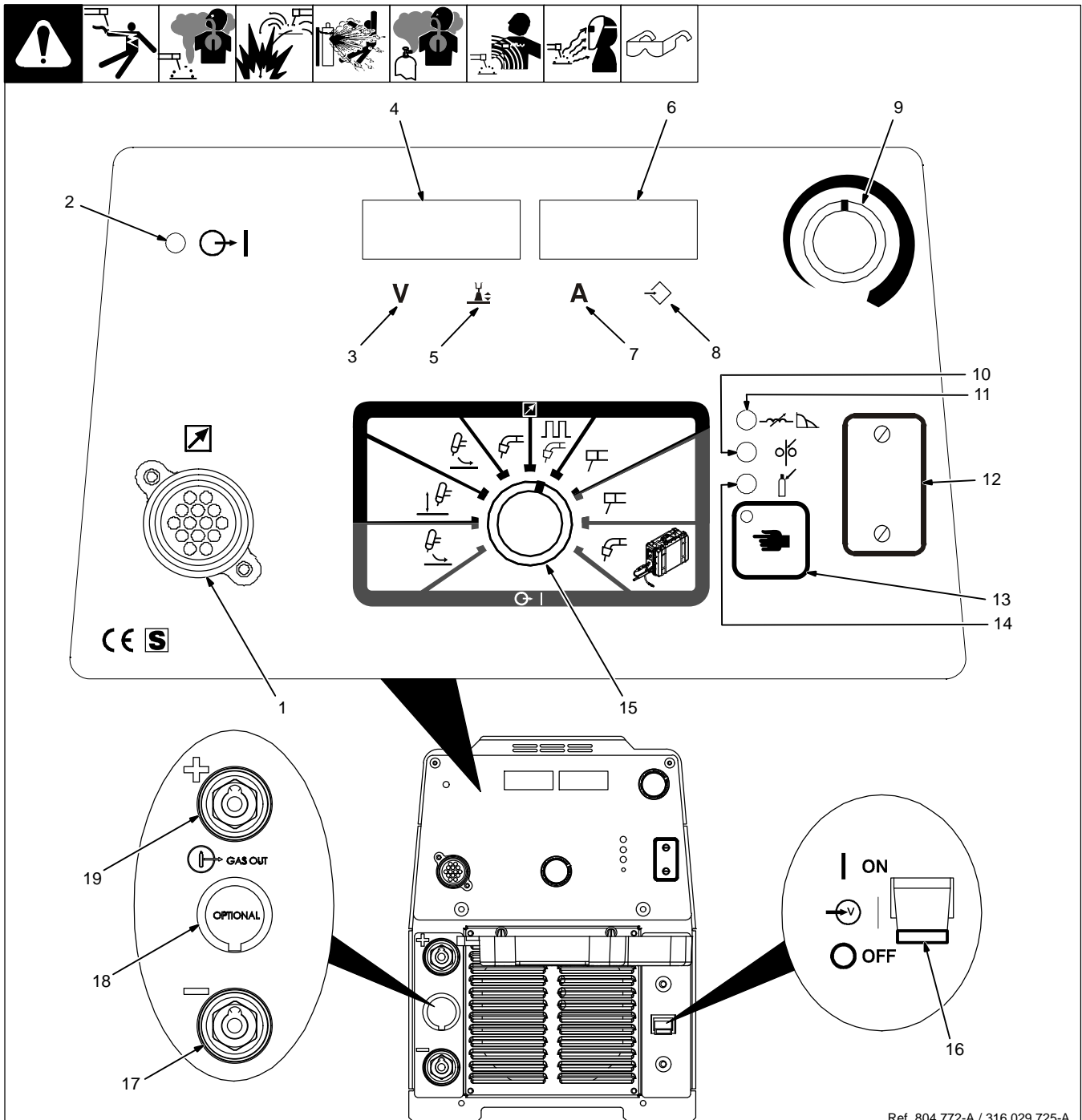
Notes



Pros weld and cut safely. Read the safety rules at the beginning of this manual.

SECTION 5 – GENERAL OPERATION

5-1. Front Panel



Ref. 804 772-A / 316.029.725-A

Weld process operation sections describe functionality of the identified items.









- 1 Remote 14 Receptacle
- 2 Output ON Indicator Light
- 3 Volts Indicator
- 4 Left Display
- 5 Arc Length Indicator
- 6 Right Display

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

- 7 Amps Indicator
- 8 Setup Indicator
- 9 Adjust Control
- 10 Wire Type Indicator
- 11 Arc Control Indicator

- 12 Remote PC Interface
- 13 Setup Button
- 14 Gas Type Indicator
- 15 Mode Switch
- 16 Power Switch
- 17 Weld Output Terminal (-)
- 18 Optional Gas Valve Knockout
- 19 Weld Output Terminal (+)

5-2. Mode Switch Settings

Switch Position		Process	Output Control	Panel Adjust	Remote Adjust
	Scratch Start TIG	GTAW	Electrode Hot	Amps	% Panel Amps*
	Lift-Arc TIG	GTAW	Electrode Hot	Amps	% Panel Amps*
	TIG	GTAW	Remote 14	Amps	% Panel Amps
	MIG	GMAW	Remote 14	Volts	Volts
	Pulsed MIG	GMAW-P	Remote 14	Arc Length (0–100)*	Arc Length (0–100)*
	Stick	SMAW CAC-A	Remote 14	Amps	% Panel Amps
	Stick	SMAW CAC-A	Electrode Hot	Amps	% Panel Amps*
	V-Sense Feeder	GMAW*	Electrode Hot	Volts	Volts
*See Configuration Option Menu (see Section 5-3) For adjustment alternatives.					

Notes

5-3. Configuration Option Menu

316.029.725-A

- 1 Mode Switch
- 2 Remote 14 Receptacle
- 3 Left Display
- 4 Right Display
- 5 Adjustment Control
- 6 Setup Button

Setup

The Configuration Option Menu provides a means to customize some machine features for desired operation.

To enter the Configuration Option Menu, hold the Setup Button down during power up while the unit is displaying 8888 on the Left and

Right Displays. *SET-UP* will be displayed momentarily.

Configuration options are displayed in the Left Display. Settings are displayed in the Right Display. Settings can be changed by turning the Adjust Control. If a setting does not change when the Adjust Control is turned, the option is not configurable. Pressing the Setup Button moves to the next configuration option.

Notes

5-3 Configuration Option Menu (Continued)

V.SEN

MIG

PULS

AUTO

PULS

ARC.L

WFS

MPM

VRD

OFF

PANL

RMT

V-Sense Feeder Weld Process

This option enables MIG (V.SEN MIG) or Pulsed MIG (V.SEN PULS) when the Mode Switch is in the VSENSE FEEDER position. See Section 7-2 for MIG operation or Section 7-4 for Pulsed MIG operation.

Pulsed MIG Manual/Auto Control

This option sets the PULSED MIG control as manual (PULS MAN) or Auto (PULS AUTO) operation. When set to manual operation, the arc length setting on power source and wire speed setting on wire feeder need to be adjusted independently to achieve the desired arc length. When set to Auto operation, once arc length is determined it is not necessary to change the arc length value with changes in wirefeed speed.

The XMT 350 MPa and synergic feeders allow single knob control of the arc. As wirefeed speed is increased or decreased, the pulse parameters increase or decrease matching the power output to the wire speed.

☞ Auto Operation will only work with synergic wire feeders. All other wire feeders will only operate as manual control.

Even when Auto is displayed, operation will be manual when any other feeder is connected. See product literature for a list of compatible synergic feeders.

Pulsed MIG Adjustment

This option allows adjusting the Pulsed MIG process in units of Arc Length (PULS ARC.L) or preset voltage (PULS VOLT).

Wire Feed Speed And Wire Diameter Units

WFS IPM:

WFS is displayed in inches per minute

Diameter is displayed in inches

WFS MPM:

WFS is displayed in meters per minute

Diameter is displayed in millimeters

Voltage Reducing Device (VRD) Mode

This option enables (ON) or disables (OFF) low open circuit voltage (OCV) operation in Stick and Scratch Start TIG modes. See Section 8-4 for Low OCV Operation. When enabled, VRD ON is momentarily displayed after the power-on front panel LED test.

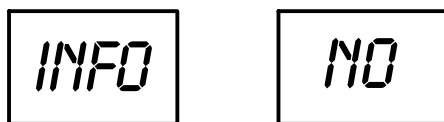
☞ If VRD -ON is displayed with a dash preceding ON, Low OCV Operation is enabled by hardware configuration and cannot be disabled in this menu.

Panel and Remote Adjustment

When the Mode Switch is set to SCRATCH START TIG, LIFT-ARC TIG, or STICK, the remote command behavior is configurable. SCRATCH START TIG and LIFT-ARC TIG default to panel and remote (PANL RMT) amperage adjustment but can be configured for panel only (PANL ONLY) adjustment. The default amperage adjustment for STICK is panel only (PANL ONLY) but can also be configured for panel and remote (PANL RMT) adjustment. All other Mode Switch positions are non-configurable and allow both panel and remote (PANL -RMT) adjustment.

☞ Panel adjustment is made using the Adjust Control on the front panel. Remote adjustment is made using a remote control device connected to the Remote 14 Receptacle.

5-3 Configuration Option Menu (Continued)



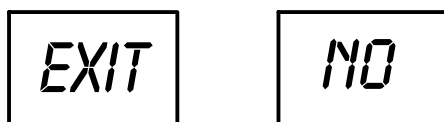
Revision Information

This option identifies the unit's weld library (*INFO LIB*) and firmware revision (*INFO REV*).

Press the Setup Button while the unit is displaying *INFO LIB* to identify the unit's weld library.


Press the Setup Button while the unit is displaying *INFO REV* to identify the unit's firmware revision.

Pressing the Setup Button while the unit is displaying *INFO NO* will move to the next configuration option.



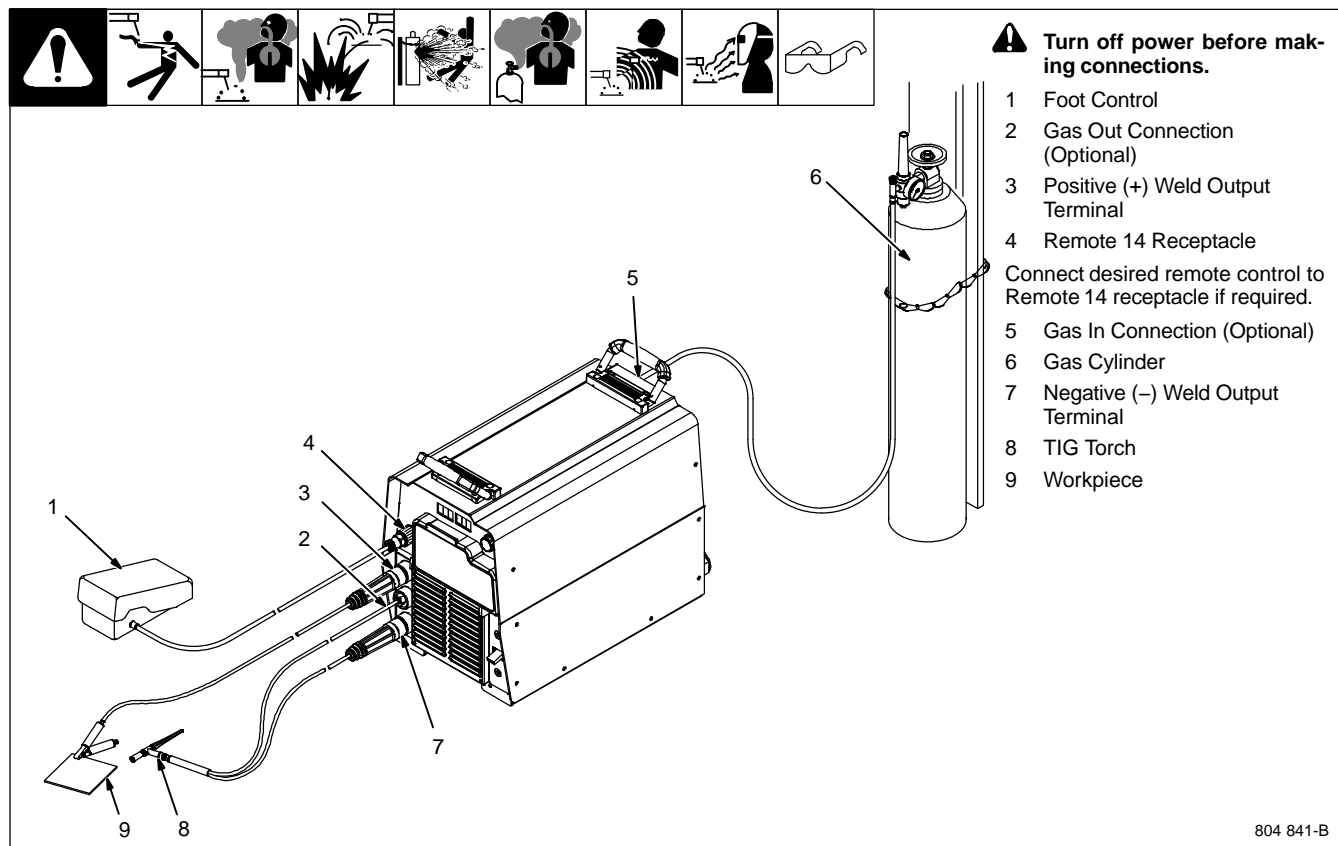
Exit Configuration Option Menu

Press the Setup Button while the unit is displaying *EXIT NO* to return to the first configuration option. Press the Setup Button while the unit is displaying *EXIT YES* to exit the Configuration Option Menu.

 The Configuration Option Menu can be exited at any time by turning the unit off. Only if the unit is turned off after *EXIT NO* is displayed will configuration option changes be saved.

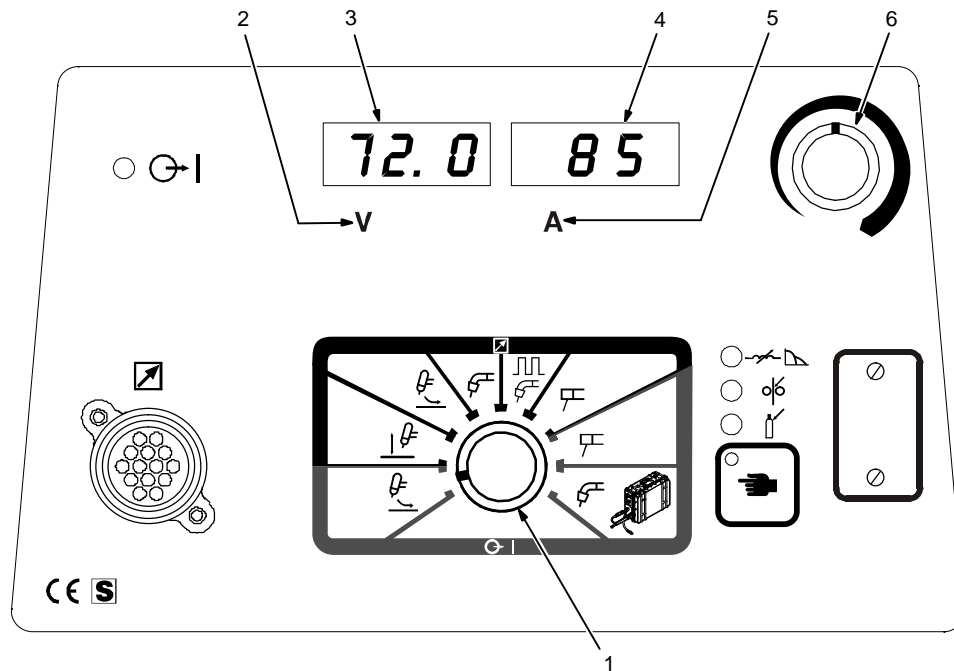
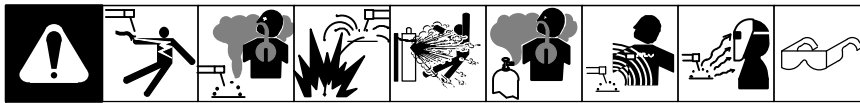
SECTION 6 – GTAW OPERATION

6-1. Typical Connection For GTAW Process



804 841-B

6-2. Scratch Start TIG Welding Mode - GTAW Process



316.029.725-A

⚠ Weld terminals are energized at all times in Scratch Start TIG welding mode.

- 1 Mode Switch
- 2 Volts Indicator
- 3 Left Display
- 4 Right Display
- 5 Amps Indicator
- 6 Adjust Control

Setup

For typical system connections refer to Section 6-1.

Rotate Mode Switch to SCRATCH START TIG position as shown.

The open circuit voltage is shown in the Left Display with the Volts Indicator lit. Preset amperage is shown in the Right Display with the Amps Indicator lit.


Operation

The Adjust Control is used to set desired preset amperage.

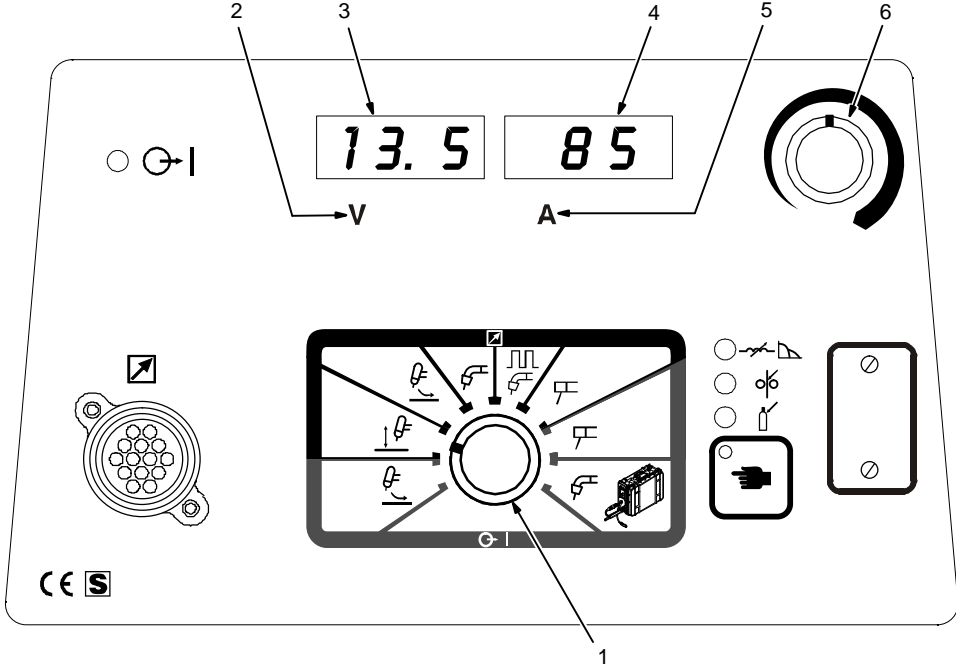
ℹ If a remote control is used for amperage adjustment, the adjustment will function as a percentage of the preset amperage.

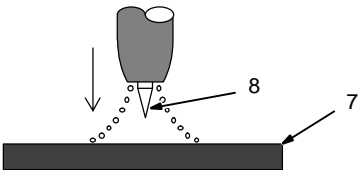
ℹ For best results, gently scratch the tungsten electrode to the work to initiate an arc. To minimize arc flare at the end of the weld, pull back the electrode quickly to extinguish the arc.

6-3. Lift-Arc TIG Welding Mode - GTAW Process

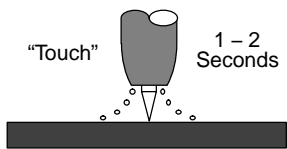


316.029.725-A

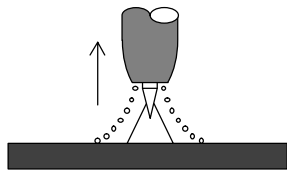




8
7



"Touch" 1 - 2 Seconds



Do NOT Strike Like A Match!

⚠ Weld terminals are energized at all times in Lift Arc TIG welding mode.

- 1 Mode Switch
- 2 Volts Indicator
- 3 Left Display
- 4 Right Display
- 5 Amps Indicator
- 6 Adjust Control
- 7 Workpiece
- 8 Tungsten Electrode

Setup

For typical system connections refer to Section 6-1.

Rotate Mode Switch to LIFT-ARC TIG position as shown.

The preset amperage is shown in the Right Display with the Amps Indicator lit.

Operation

The Adjust Control is used to set desired preset amperage.

A remote control is required to turn on the weld output.

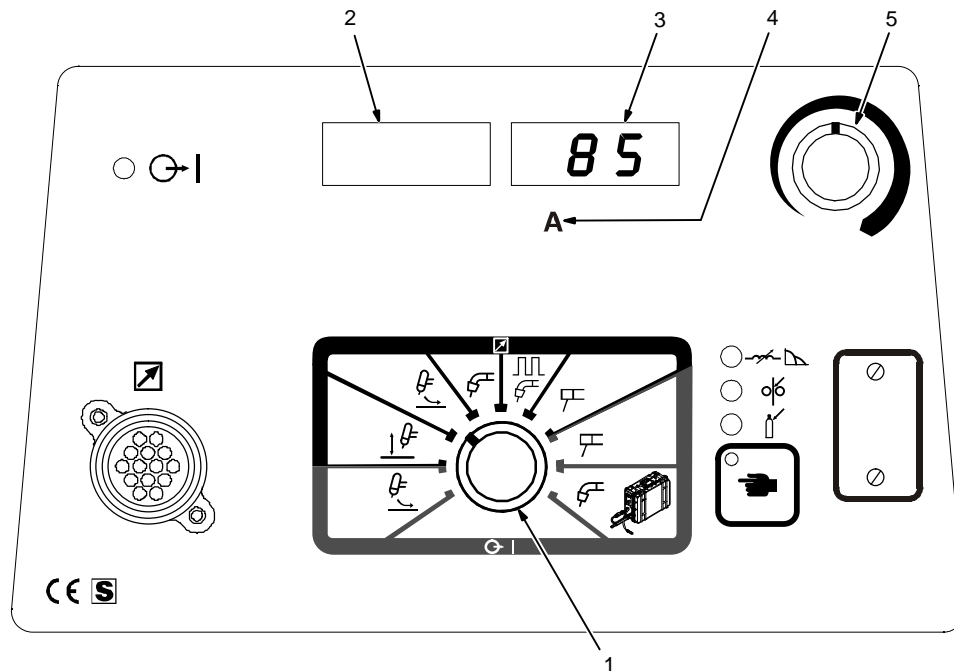
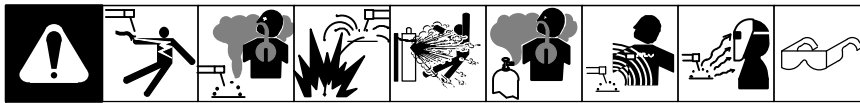
To start welding, momentarily depress output switch. Touch tungsten electrode to workpiece at weld start point. Slowly lift electrode. An arc will form when electrode is lifted. If welding arc is not established within 3 seconds, output will turn off. To stop

welding, momentarily depress output switch and output will shut off.

☞ If a remote control is used for amperage adjustment, the adjustment will function as a percentage of the preset amperage.

☞ For best results, firmly touch the tungsten electrode to the workpiece at the weld start point. Hold electrode to workpiece for 1-2 seconds, and lift electrode. An arc will form when the electrode is lifted. To minimize arc flare at the end of the weld, pull back the electrode quickly to extinguish the arc.

6-4. TIG Welding Mode - GTAW Process



316.029.725-A

⚠ Weld terminals are energized through the remote control in TIG welding mode.

- 1 Mode Switch
- 2 Left Display
- 3 Right Display
- 4 Amps Indicator
- 5 Adjust Control

Setup

For typical system connections refer to Section 6-1.

Rotate Mode Switch to TIG position as shown.

The preset amperage is shown in the Right Display with the Amps Indicator lit.

Operation

The Adjust Control is used to set desired preset amperage.

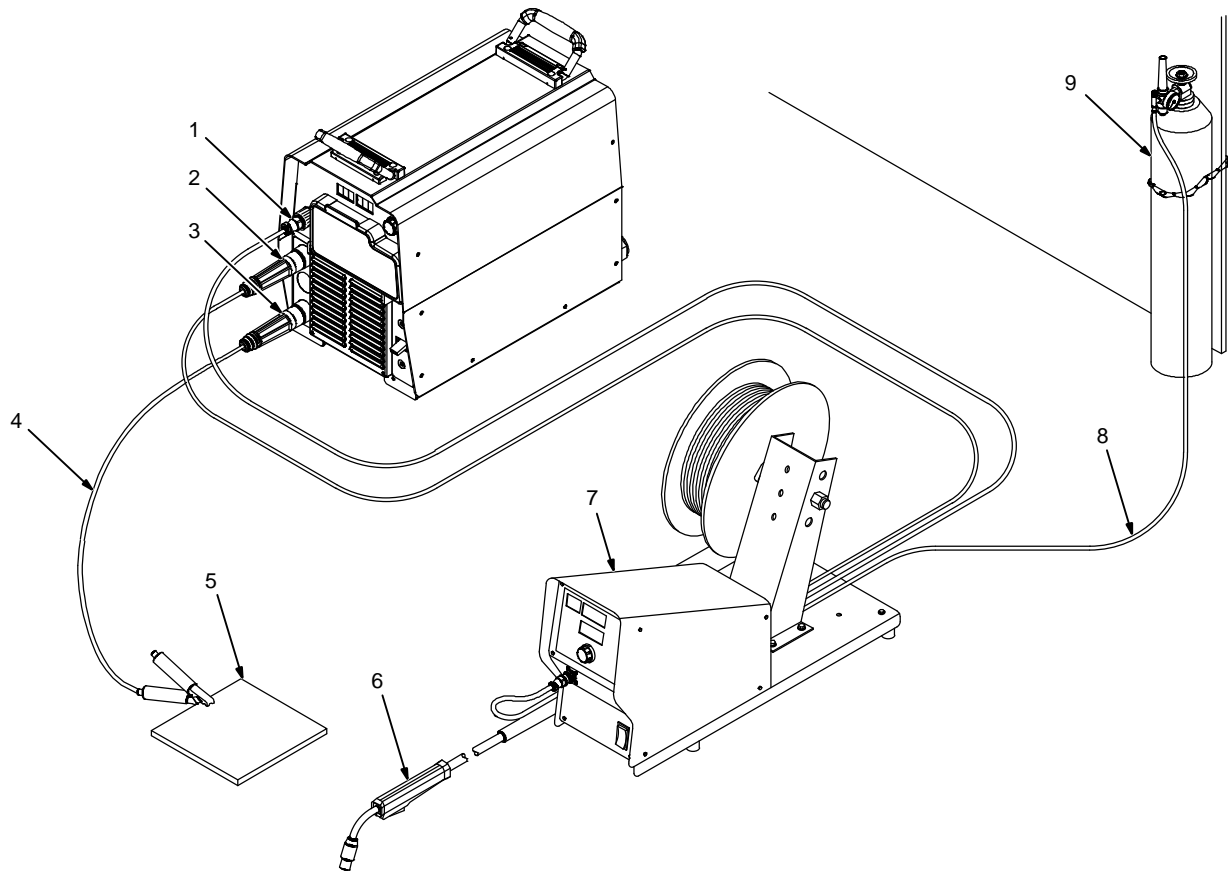
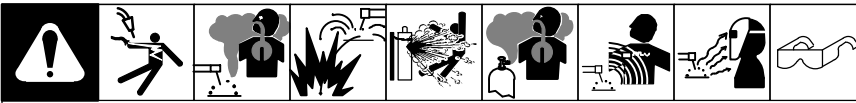
A remote control is required to turn on the weld output.

ℹ If the remote control has an amperage adjustment, the adjustment will function as a percentage of the preset amperage.

ℹ For best results, gently scratch the tungsten electrode to the work to initiate an arc. To minimize arc flare at the end of the weld, pull back the electrode quickly to extinguish the arc.

SECTION 7 – GMAW/GMAW-P/FCAW OPERATION

7-1. Typical Connection For Remote Control Feeder GMAW/GMAW-P/FCAW Process



804 938-A

⚠ Turn off power before making connections.

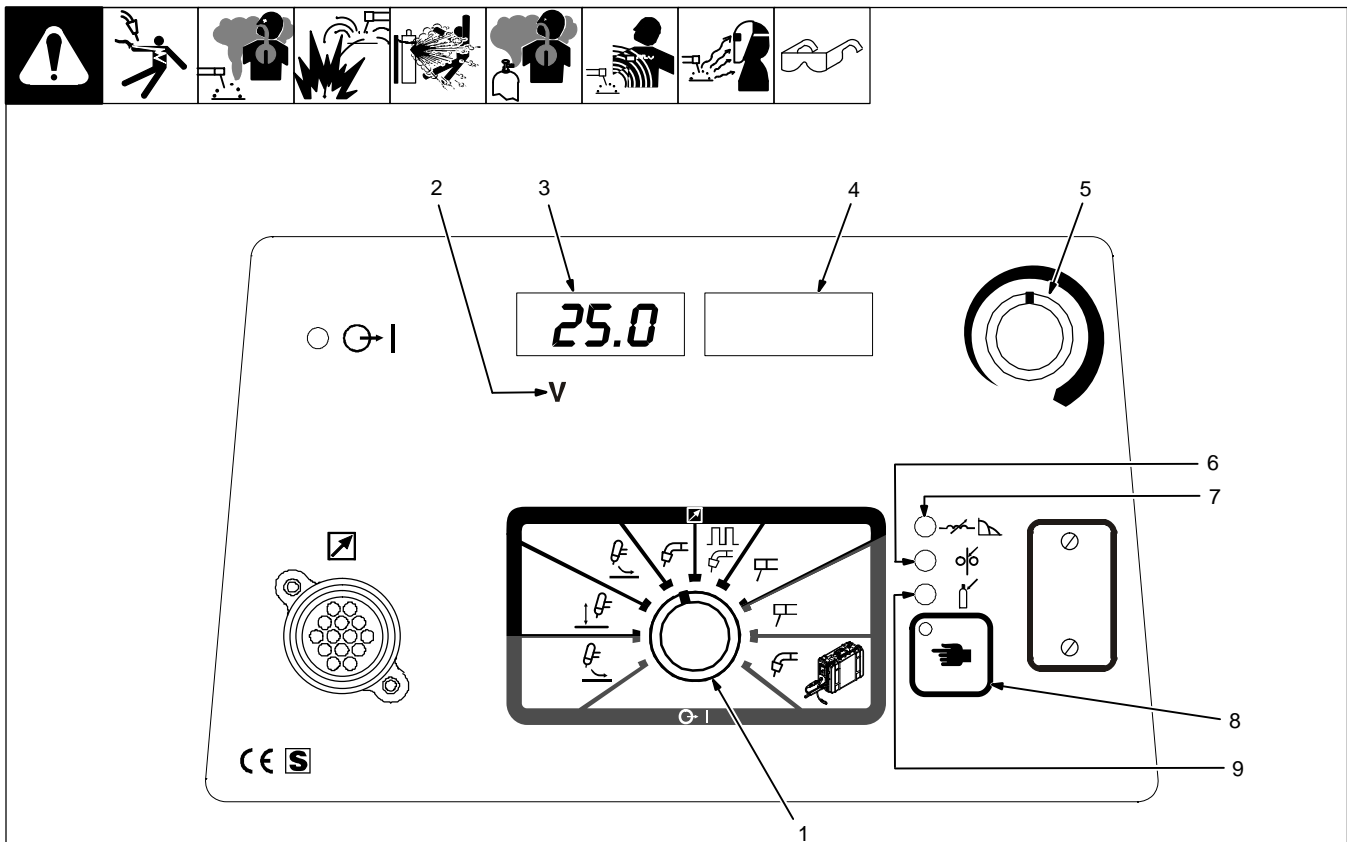
- 1 Remote 14-Receptacle
- 2 Positive (+) Weld Output Terminal
- 3 Negative (-) Weld Output Terminal
- 4 Ground Cable to Workpiece

- 5 Workpiece
- 6 Gun
- 7 Wire Feeder
- 8 Gas Hose
- 9 Gas Cylinder

Use of shielding gas is dependant on Wire Type.

☞ The connection diagram illustrates DCEP (reverse polarity) suitable for all wires except self-shielded FCAW. The majority of self-shielded FCAW wires require DCEN (straight polarity).

7-2. MIG Welding Mode - GMAW/FCAW Process



316.029.725-A

⚠ Weld terminals are energized through the remote control in MIG welding mode.

- 1 Mode Switch
- 2 Volts Indicator
- 3 Left Display
- 4 Right Display
- 5 Adjust Control
- 6 Wire Type Indicator
- 7 Arc Control Indicator
- 8 Setup Button
- 9 Gas Type Indicator

Setup

For typical system connections refer to Section 7-1.

Rotate Mode Switch to MIG position as shown.

The preset voltage is shown in the Left Display with the Volts Indicator lit.

Operation

While the Volts Indicator is lit under the Left Display, the Adjust Control is used to set desired preset voltage.

☞ The preset voltage can be adjusted remotely at the wire feeder if the feeder has a voltage control. This voltage control will override the Adjust Control of preset voltage on the welding power source.

Pressing the Setup Button allows adjustment of Arc Control, Wire Type, Gas Type and preset voltage.

☞ For best results, select the appropriate Wire and Gas Type to match the actual wire and gas being used. Refer to the MIG – Wire and Gas Selection Table for available wires and gases (see Section 7-3).

Selecting a Wire and Gas

Press the Setup Button repeatedly until the Wire Type indicator is lit. The active Wire Type will appear in the Left and Right Display.

Rotate Adjust Control to select desired wire.

Press the Setup Button again so the Gas Type indicator is lit. The active Gas Type will appear in the Left and Right Display.

Rotate Adjust Control to select desired gas.

Press the Setup Button to confirm the selection. The unit will acknowledge a change of wire and gas information by displaying *PROG LOAD* momentarily.

Arc Control (Inductance)

Press the Setup Button repeatedly until the Arc Control indicator is lit. *INDU* appears on the Left Display, and the corresponding inductance setting appears on the Right Display.

Rotate Adjust Control to select desired inductance setting from 0 to 100. Use lower inductance settings to stiffen the arc and reduce puddle fluidity. Use higher inductance settings to soften the arc and increase puddle fluidity.

Refer to the MIG – Wire and Gas Selection Table (see Section 7-3) for suggested inductance setting for the specific wire and gas being used.

Press the Setup Button to return to adjustment of preset voltage.

☞ Each Wire and Gas Type combination has independent preset voltage and inductance settings. These settings are preserved when the unit is turned off.

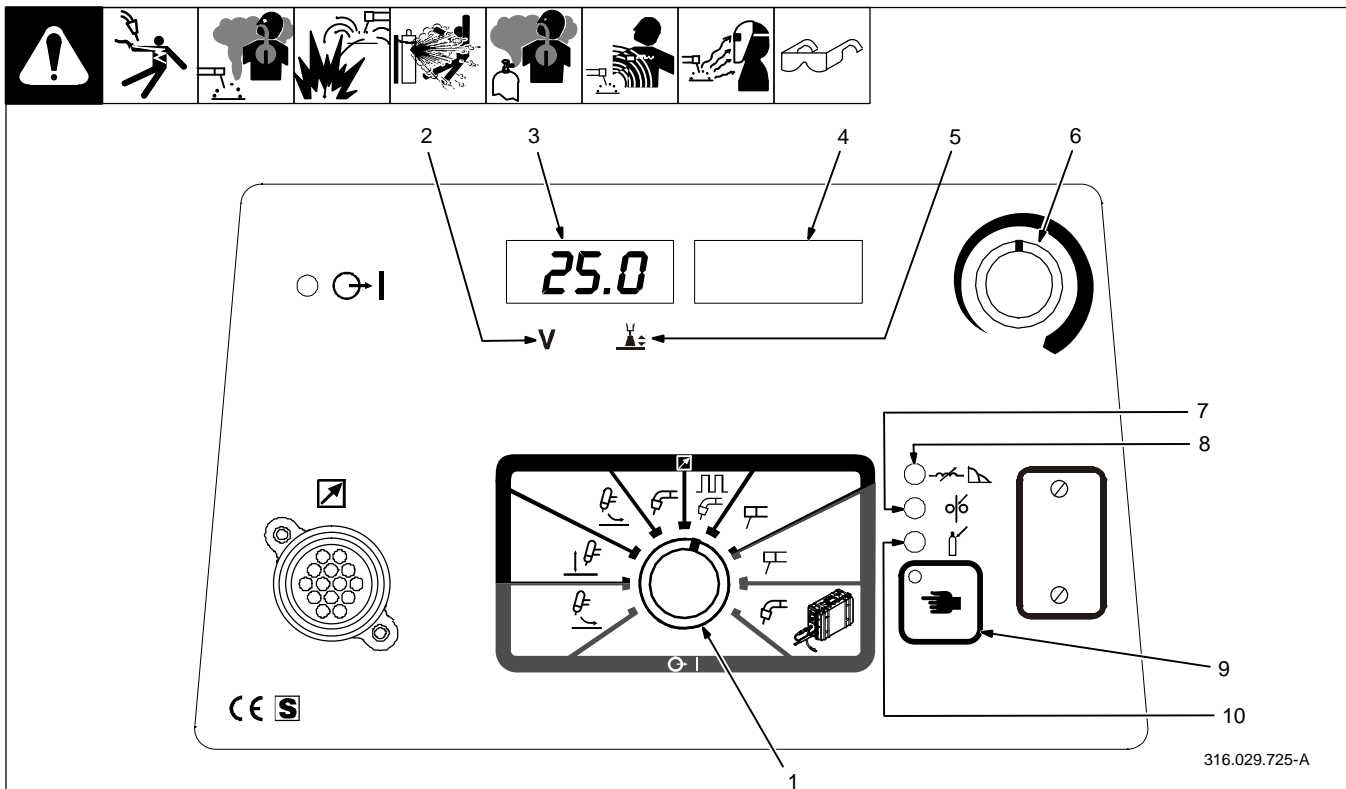
7-3. MIG - Wire and Gas Selection Table

WIRE TYPES**		GAS TYPES	DEFAULT INDUCTANCE
Steel	.035 (0.9) STL .045 (1.2) STL .052 (1.4) STL	ARGN CO2 (ARGON / CARBON DIOXIDE) ARGN OXY (ARGON / OXYGEN)	30
	.035 (0.9) STL .045 (1.2) STL	CO2 (CARBON DIOXIDE)	10
Flux Core	.035 (0.9) FCAW .045 (1.2) FCAW .052 (1.4) FCAW 1/16 (1.6)FCAW	ARGN CO2 (ARGON / CARBON DIOXIDE) * CO2 (CARBON DIOXIDE)	30 *
Metal Core	.045 (1.2) MCOR .052 (1.4) MCOR 1/16 (1.6) MCOR	ARGN CO2 (ARGON / CARBON DIOXIDE)	30
Stainless Steel	.035 (0.9) SSTL .045 (1.2) SSTL	TRI MIX (TRI-GAS MIXTURE) ARGN OXY (ARGON / OXYGEN)	70
Aluminum	.035 (0.9) AL4X (4000 Series) .040 (1.0) AL4X (4000 Series) 3/64 (1.2) AL4X (4000 Series) 1/16 (1.6) AL4X (4000 Series) .035 (0.9) AL5X (5000 Series) .040 (1.0) AL5X (5000 Series) 3/64 (1.2) AL5X (5000 Series) 1/16 (1.6) AL5X (5000 Series)	ARGN (ARGON)	10

*For self-shielded FCAW wires use the ARGN CO2 gas selection and set inductance to less than 10.
**Wire diameter in inches (mm). Refer to section 5-3 to change displayed units.

Notes

7-4. Pulsed MIG Welding Mode - GMAW-P Process



316.029.725-A

⚠ Weld terminals are energized through the remote control in Pulsed MIG welding mode.

- 1 Mode Switch
- 2 Volts Indicator
- 3 Left Display
- 4 Right Display
- 5 Arc Length Indicator
- 6 Adjust Control
- 7 Wire Type Indicator
- 8 Arc Control Indicator
- 9 Setup Button
- 10 Gas Type Indicator

Setup

For typical system connections refer to Section 7-1.

Rotate Mode Switch to PULSED MIG position as shown.

The arc length setting is shown in the Left Display with the Arc Length Indicator lit.

Operation

While the Arc Length Indicator is lit under the Left Display, the Adjust Control is used to set desired arc length setting.

☞ The arc length can be adjusted remotely at the wire feeder if the feeder has a voltage control. This voltage control will override the Adjust Control on the welding power source.

Pressing the Setup Button allows adjustment of Arc Control, Wire Type, Gas Type and Arc Length.

☞ For best results, select the appropriate Wire and Gas Type to match the actual wire and gas being used. Refer to

Pulsed MIG – Wire and Gas Selection Table for available wires and gases (see Section 7-5).

Selecting a Wire and Gas

Press the Setup Button repeatedly until the Wire Type indicator is lit. The active Wire Type will appear in the Left and Right Display.

Rotate Adjust Control to select desired wire.

Press the Setup Button again so the Gas Type indicator is lit. The active Gas Type will appear in the Left and Right Display.

Rotate Adjust Control to select desired gas.

Press the Setup Button again to confirm the selection. The unit will acknowledge a change of wire and gas information by displaying *PROG LOAD* momentarily.

Arc Control (SharpArc)

Press the Setup Button repeatedly until the Arc Control indicator is lit. *SHRP* appears on the Left Display, and the corresponding SharpArc setting appears on the Right Display.

Rotate Adjust Control to select desired SharpArc setting from 0 to 50, default is 25. Adjusting the SharpArc setting changes the welding arc cone. Lower settings widen the arc cone, increases puddle fluidity and flattens the weld bead appearance.

Higher settings narrow the arc cone, reduces puddle fluidity and crowns the weld bead appearance.

☞ Each Wire and Gas Type combination has independent Arc Length and SharpArc settings. These settings are preserved when the unit is turned off.

Arc Length - Pulsed MIG Manual Control (see Section 5-3)

Arc length corresponds to the level of energy needed to burn off the welding electrode. As wire feed speed increases, a higher arc length setting is required to burn off the additional wire. The arc length setting appears in the Left Display when the Arc Length Indicator is lit. Arc length can be adjusted from 0 to 100.

After the welding output terminals are energized, but prior to arc initiation, the unit displays the letter "R" and a reference wire speed (IPM) on the Right Display. The reference wire speed can be used as a starting point for the wire speed setting at the feeder. The wire speed and arc length setting can then be further adjusted to achieve the desired arc length.

The Configuration Option Menu (see Section 5-1) can be used to change the arc length setting (0 to 100) to average arc voltage. Average arc voltage can be used as an alternative method to set the Pulsed MIG welding arc with the same parameters (voltage and wire speed) as a conventional MIG arc. Lower voltage settings correspond to tighter arc lengths while higher voltage settings correspond to longer arc lengths. If the voltage mode is selected, the average voltage preset will be displayed on the Left Display with the Volts Indicator lit.

Arc Length - Pulsed MIG Auto Control (see Section 5-3)

In Auto operation the arc length setting is 0-100. The programs have been developed at 50 arc length setting. Increasing or decreasing the arc length setting from 50 will change the arc length. It is not necessary to change the arc length value when changing wire feed speed settings.

7-5. Pulsed MIG - Wire and Gas Selection Table

WIRE TYPES*		GAS TYPES
Steel	.035 (0.9) STL .045 (1.2) STL	ARGN CO2 (ARGON / CARBON DIOXIDE) ARGN OXY (ARGON / OXYGEN)
Metal Core	.045 (1.2) MCOR .052 (1.4) MCOR	ARGN CO2 (ARGON / CARBON DIOXIDE)
Stainless Steel	.035 (0.9) SSTL .045 (1.2) SSTL	TRI MIX (TRI-GAS MIXTURE) ARGN OXY (ARGON / OXYGEN) ARGN CO2 (ARGON / CARBON DIOXIDE)
Aluminum	.035 (0.9) AL4X (4000 Series) .040 (1.0) AL4X (4000 Series) 3/64 (1.2) AL4X (4000 Series) 1/16 (1.6) AL4X (4000 Series)	ARGN (ARGON)
	.035 (0.9) AL5X (5000 Series) .040 (1.0) AL5X (5000 Series) 3/64 (1.2) AL5X (5000 Series) 1/16 (1.6) AL5X (5000 Series)	ARGN (ARGON) HE AR25 (HELIUM/ARGON)
Nickel	.035 (0.9) NI .045 (1.2) NI	ARGN HE (ARGON / HELIUM) ARGN (ARGON)
Copper Nickel	.035 (0.9) CUNI .045 (1.2) CUNI	HE ARGN (HELIUM / ARGON)
Silicon Bronze	.035 (0.9) SIBR .045 (1.2) SIBR	ARGN (ARGON)

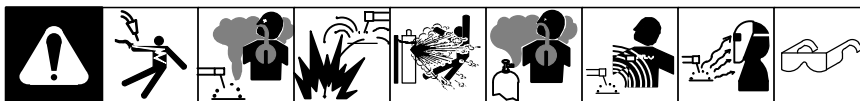
*Wire diameter in inches (mm). Refer to section 5-3 to change displayed units.

☞ Other normal gas mixtures can be used by adjusting arc length and sharp arc. Use the program closest to your gas mixture and wire type and size.


Notes

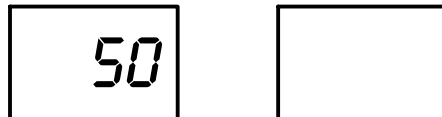
This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

7-6. Remote Process Select



This power source can be used with wire feeders that support Remote Process Select. This feature allows the operator to switch the active welding process between MIG and Pulsed MIG at the wire feeder. To determine if the welding system is Remote Process Select capable, connect the wire feeder to the power source and review the power source display variations shown below.

 When used with an XMT power source, the Process Select knob must be set to Pulsed MIG for Remote Process Select to be active.



Power Source Display – Wire Feeder with Remote Process Select Not Detected

When the power source Right Display is blank, a wire feeder with Remote Process Select is not detected. Set the active weld process at the power source.



Power Source Display – Wire Feeder with Remote Process Select Detected

When the power source Right Display is MIG, a wire feeder with Remote Process Select is detected and set for MIG operation. The active weld process can **only** be changed at the wire feeder.

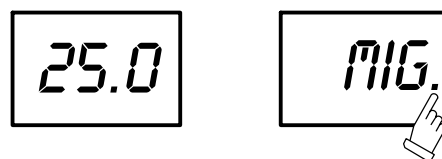


Power Source Display – Wire Feeder with Remote Process Select Detected and Set for Pulsed MIG

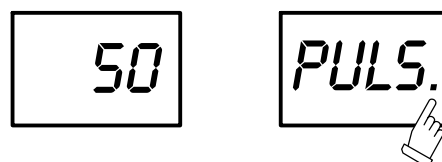
When the power source Right Display is PULS, a Remote Process Select wire feeder is detected and is set for Pulsed MIG operation. The active weld process can **only** be changed at the wire feeder.

Using a Dual Wire Feeder with Remote Process Select

When using a dual wire feeder with Remote Process Select, different weld programs for the left and right side can be selected. The power source MIG and Pulsed MIG programs for the left side of wire feeder are selected with the left side of the wire feeder active. The power source MIG and Pulsed MIG programs for the right side are selected with the right side of the wire feeder active. When the right side of the wire feeder is active, the power source Right Display will show a decimal point in the lower right hand corner as shown.



Decimal point indicates wire feeder right side is active.

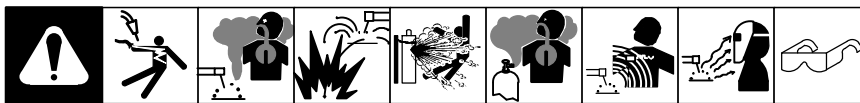


Decimal point indicates wire feeder right side is active.

Power Source Display – Dual Wire Feeder with Right Side Active and Set for MIG

Power Source Display – Dual Wire Feeder with Right Side Active and Set for Pulsed MIG

7-7. Typical Connection For Voltage-Sensing Feeder GMAW/GMAW-P/FCAW Process

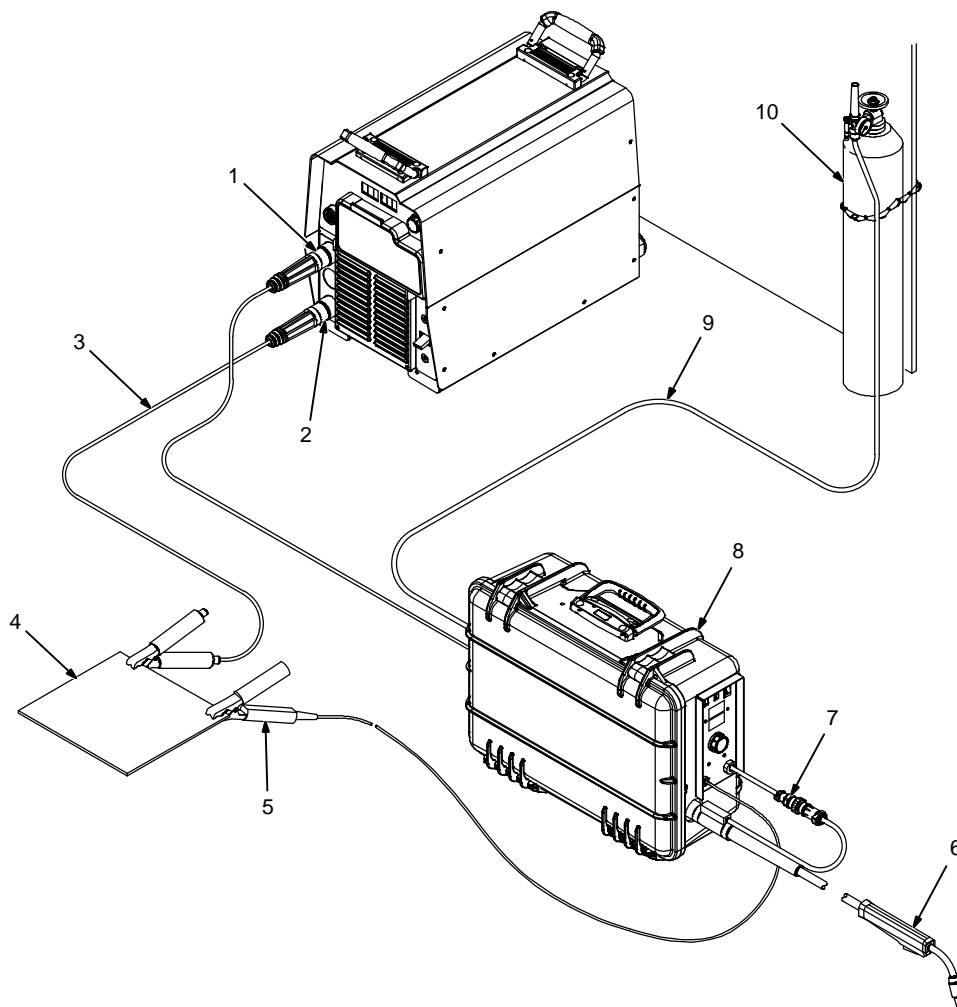


⚠ Turn off power before making connections.

- 1 Positive (+) Weld Output Terminal
- 2 Negative (-) Weld Output Terminal
- 3 Ground Cable to Workpiece
- 4 Workpiece
- 5 Voltage Sensing Clamp
- 6 Gun
- 7 Gun Trigger Receptacle
- 8 Wire Feeder
- 9 Gas Hose
- 10 Gas Cylinder

Use of shielding gas is dependant on Wire Type.

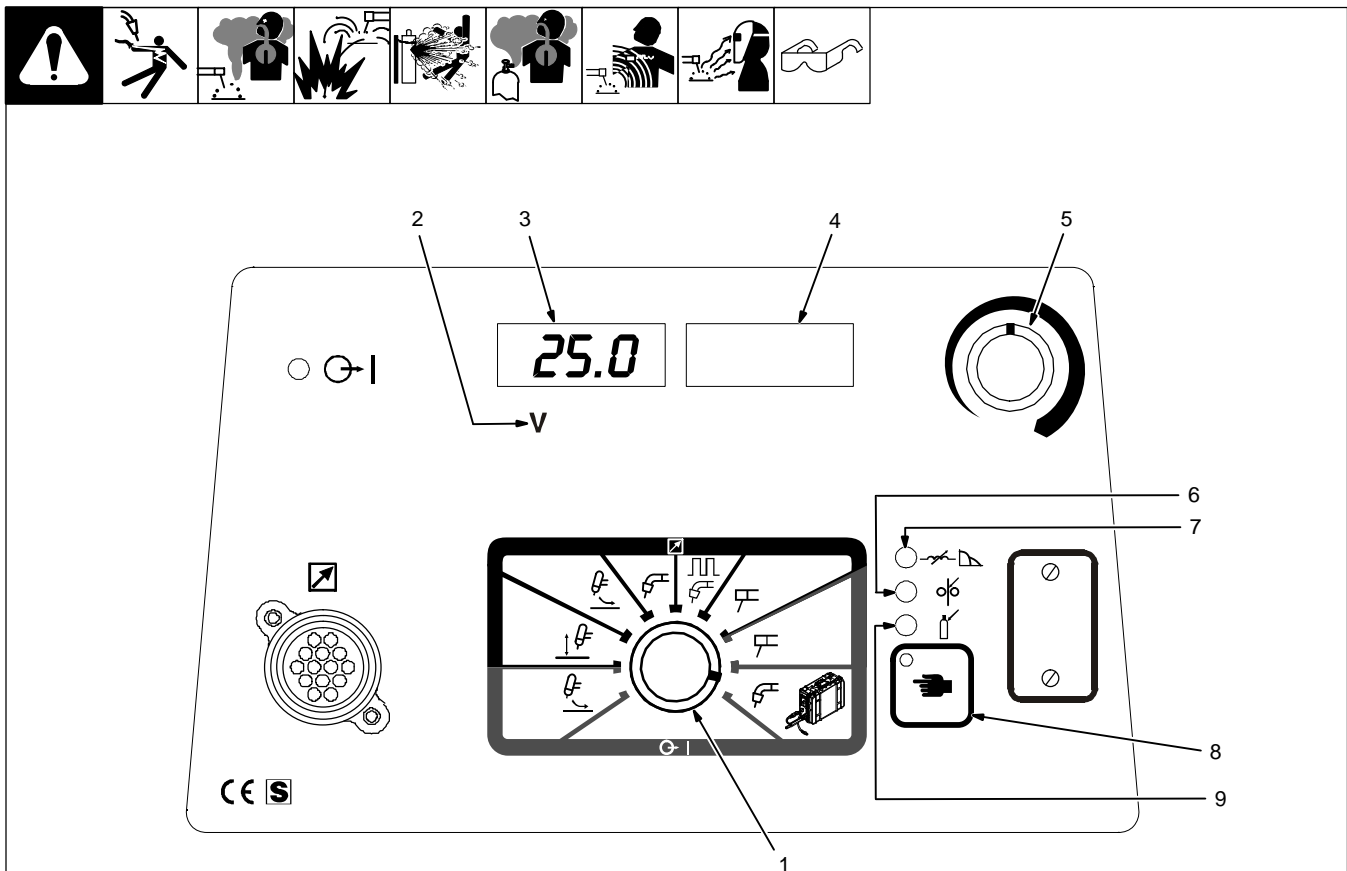
The connection diagram illustrates DCEP (reverse polarity) suitable for all wires except self-shielded FCAW. The majority of self-shielded FCAW wires require DCEN (straight polarity).



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Notes

7-8. V-Sense Feeder Welding Mode - GMAW/FCAW Process



316.029.725-A

⚠ Weld terminals are energized at all times in V-Sense Feeder welding mode.

- 1 Mode Switch
- 2 Volts Indicator
- 3 Left Display
- 4 Right Display
- 5 Adjust Control
- 6 Wire Type Indicator
- 7 Arc Control Indicator
- 8 Setup Button
- 9 Gas Type Indicator

Setup

For typical system setup connections refer to Section 7-7.

Rotate Mode Switch to V-SENSE FEEDER position as shown.

The Left Display toggles between open circuit voltage and preset voltage with the Volts Indicator lit.

Operation

While the Volts Indicator is lit under the Left Display, the Adjust Control is used to set desired preset voltage.

☞ The Left Display toggling momentarily pauses while the preset voltage is adjusted.

Pressing the Setup Button allows adjustment of Arc Control, Wire Type, Gas Type and preset voltage.

☞ For best results, select the appropriate Wire and Gas Type to match the actual wire and gas being used.

Refer to MIG – Wire and Gas Selection Table for available wires and gases (see Section 7-3).

Selecting a Wire and Gas

Press the Setup Button repeatedly until the Wire Type indicator is lit. The active Wire Type will appear in the Left and Right Display.

Rotate Adjust Control to select desired wire.

Press the Setup Button again so the Gas Type indicator is lit. The active Gas Type will appear in the Left and Right Display.

Rotate Adjust Control to select desired gas.

Press the Setup Button again to confirm the selection. The unit will acknowledge a change of wire and gas information by displaying *PROG LOAD* momentarily.

Arc Control (Inductance)

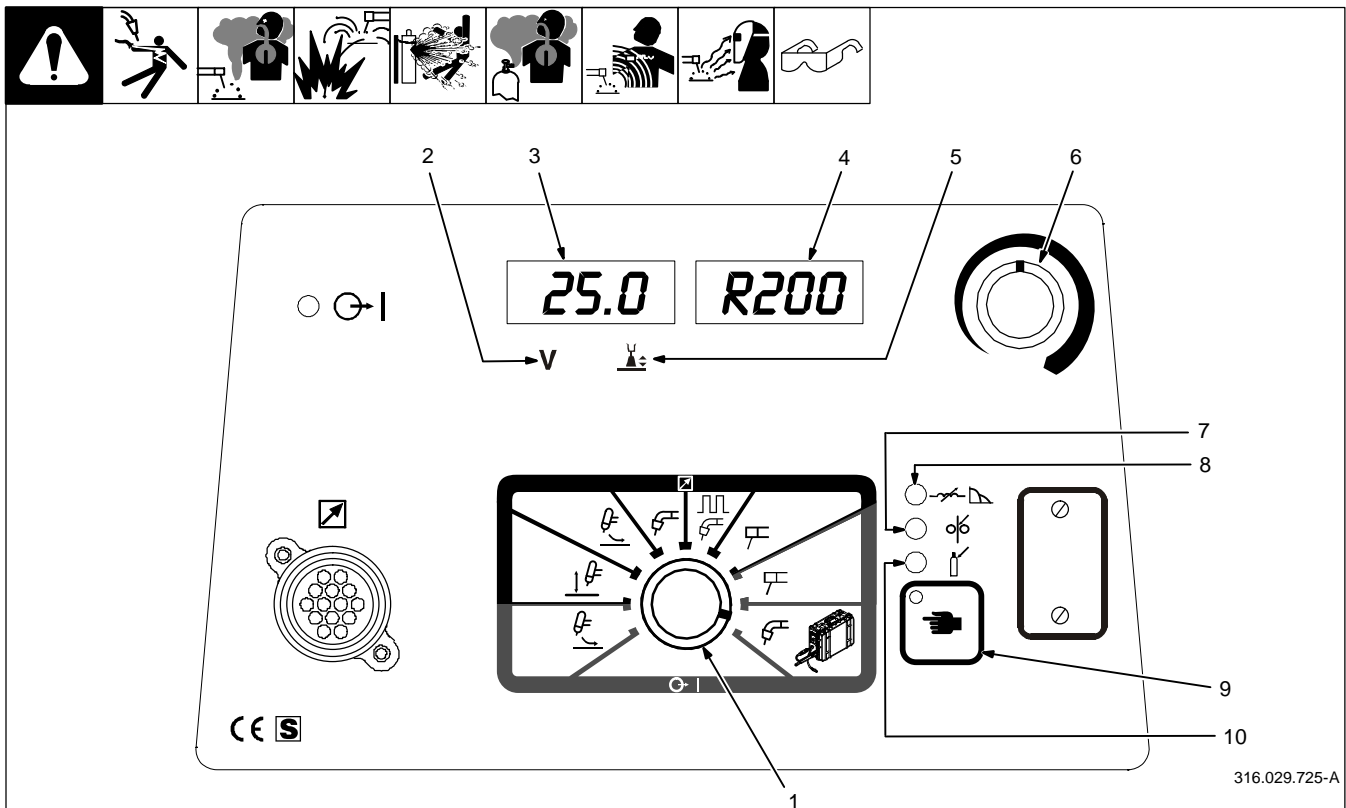
Press the Setup Button repeatedly until the Arc Control indicator is lit. *INDU* appears on the Left Display, and the corresponding inductance setting appears on the Right Display.

Rotate Adjust Control to select desired inductance setting from 0 to 100. Use lower inductance settings to stiffen the arc and reduce puddle fluidity. Use higher inductance settings to soften the arc and increase puddle fluidity.

Refer to the MIG – Wire and Gas Selection Table (see Section 7-3) for suggested inductance setting for the specific wire and gas being used.

☞ Each Wire and Gas Type combination has independent preset voltage and inductance settings. These settings are preserved when the unit is turned off.

7-9. V-Sense Feeder Welding Mode - GMAW-P Process



316.029.725-A

⚠ Weld terminals are energized at all times in V-Sense Feeder welding mode.

- 1 Mode Switch
- 2 Volts Indicator
- 3 Left Display
- 4 Right Display
- 5 Arc Length Indicator
- 6 Adjust Control
- 7 Wire Type Indicator
- 8 Arc Control Indicator
- 9 Setup Button
- 10 Gas Type Indicator

Setup

For typical system setup connections refer to Section 7-7.

Rotate Mode Switch to V-SENSE FEEDER position as shown.

The Left Display toggles between open circuit voltage and the arc length setting. The open circuit voltage is shown while the Volts Indicator is lit, and the arc length setting is shown while the Arc Length Indicator is lit.

Operation

While the Arc Length Indicator is lit under the Left Display, the Adjust Control is used to set desired arc length setting.

☞ The Left Display toggling momentarily pauses while the arc length setting is adjusted.

Pressing the Setup Button allows adjust-

ment of Arc Control, Wire Type, Gas Type and Arc Length.

☞ For best results, select the appropriate Wire and Gas Type to match the actual wire and gas being used.

Refer to Pulsed MIG – Wire and Gas Selection Table for available wires and gases (see Section 7-5).

Selecting a Wire and Gas

Press the Setup Button repeatedly until the Wire Type indicator is lit. The active Wire Type will appear in the Left and Right Display.

Rotate Adjust Control to select desired wire.

Press the Setup Button again so the Gas Type indicator is lit. The active Gas Type will appear in the Left and Right Display.

Rotate Adjust Control to select desired gas.

Press the Setup Button again to confirm the selection. The unit will acknowledge a change of wire and gas information by displaying *PROG LOAD* momentarily.

Arc Control (SharpArc)

Press the Setup Button repeatedly until the Arc Control indicator is lit. *SHRP* appears on the Left Display, and the corresponding SharpArc setting appears on the Right Display.

Rotate Adjust Control to select desired SharpArc setting from 0 to 50, default is 25. Adjusting the SharpArc setting changes the welding arc cone. Lower settings widen the arc cone, increases puddle fluidity and flattens the weld bead appearance.

Higher settings narrow the arc cone, reduces puddle fluidity and crowns the weld bead appearance.

☞ Each Wire and Gas Type combination has independent Arc Length and SharpArc settings. These settings are preserved when the unit is turned off.

Arc Length

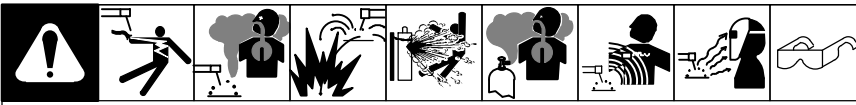
Arc length corresponds to the level of energy needed to burn off the welding electrode. As wire feed speed increases, a higher arc length setting is required to burn off the additional wire. The arc length setting appears in the Left Display when the Arc Length Indicator is lit. Arc length can be adjusted from 0 to 100.

Prior to arc initiation, the unit displays the letter "R" and a reference wire speed (IPM) on the Right Display. The reference wire speed can be used as a starting point for the wire speed setting at the feeder. The wire speed and arc length can then be further adjusted to achieve the desired arc length.

The Configuration Option Menu (see Section 5-3) can be used to change the Arc Length setting from 0 to 100 to average arc voltage. Average arc voltage can be used as an alternative method to set the Pulsed MIG welding arc with the same parameters (voltage and wire speed) as a conventional MIG arc. Lower voltage settings correspond to tighter arc lengths while higher voltage settings correspond to longer arc lengths. If the voltage mode is selected, the average preset voltage will be displayed on the Left Display with the Volts Indicator lit.

SECTION 8 – SMAW/CAC-A OPERATION

8-1. Typical Connection For SMAW And CAC-A Process



⚠ Turn off power before making connections.

- 1 Electrode Holder (Carbon Arc)

For CAC-A process connect carbon arc cutting torch to to positive weld output terminal.

- 2 Electrode Holder

- 3 Positive (+) Weld Output Terminal

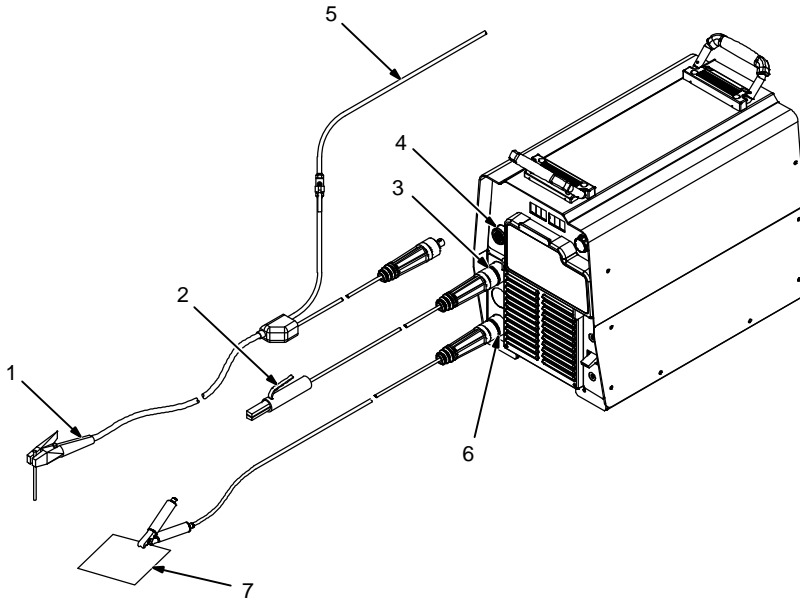
- 4 Remote 14 Receptacle

Connect desired remote control to remote 14 receptacle as required.

- 5 Compressed Air Line

- 6 Negative (-) Weld Output Terminal

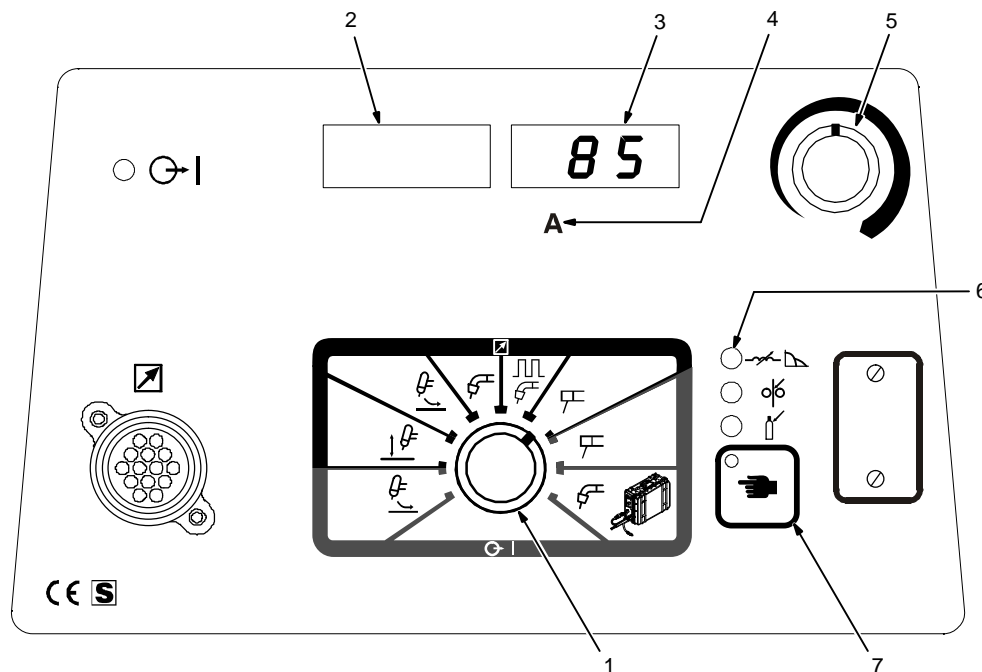
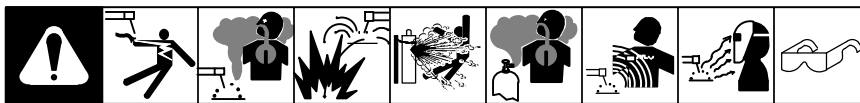
- 7 Workpiece



Ref. 804 842-B

Notes

8-2. Stick Remote Welding Mode - SMAW/CAC-A Process



316.029.725-A

⚠ Weld terminals are energized through the remote control in Stick Remote welding mode.

- 1 Mode Switch
- 2 Left Display
- 3 Right Display
- 4 Amps Indicator
- 5 Adjust Control
- 6 Arc Control Indicator
- 7 Setup Button

Setup

For typical system connections refer to Section 8-1.

Rotate Mode Switch to STICK REMOTE position as shown.

The preset amperage is shown in the Right Display with the Amps Indicator lit.

Operation

While the Amps Indicator is lit under the Right Display, the Adjust Control is used to set desired preset amperage.

A remote control is required to turn on the weld output.

☞ If the remote control has an amperage adjustment, the adjustment will function as a percentage of the preset amperage.

Pressing the Setup Button allows adjustment of Arc Control, Hot Start Current, and Hot Start Time.

☞ For best results at the end of the weld, pull back the electrode quickly to extinguish the arc.

Arc Control (Dig)

Press the Setup Button so the Arc Control indicator is lit. *DIG* appears on the Left Display, and the corresponding dig setting appears on the Right Display.

Rotate Adjust Control to select desired dig setting from 0 to 100.

Dig control allows the arc characteristics, soft versus stiff, to be changed for specific applications and electrodes. Lower the dig setting for smooth running electrodes like E7018 and increase the dig setting for stiffer, more penetrating electrodes like E6010.

Press the Setup Button repeatedly until the Arc Control light goes out to return to adjustment of preset amperage.

Programmable Hot Start

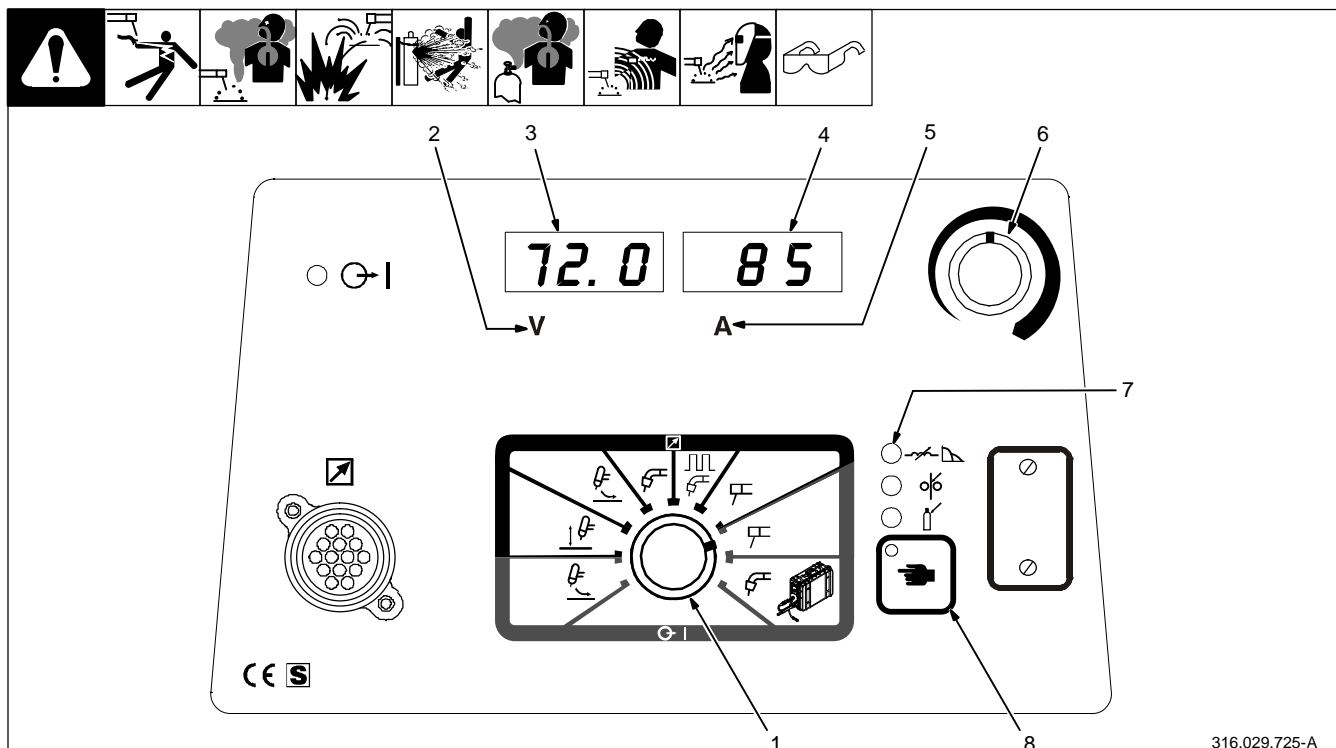
Press the Setup button repeatedly until *HOT.S* appears on the left display. *HOT.S* adjusts the Hot Start Amperage to Adaptive Hot Start (AUTO) or from Min (1) to Max (50). Adaptive Hot Start (AUTO) automatically chooses a default amperage. The Min (1) setting results in no hot start amperage. Higher numbers result in higher start amperage.

Press the Setup button again so *HOT.T* appears on the left display. *HOT.T* adjusts the Hot Start Time to Adaptive Hot Start (AUTO) or from Min (1) to Max (50). Adaptive Hot Start (AUTO) automatically chooses a default time. The Min (1) setting results in no hot start time. Higher numbers result in longer start time.

Press the Setup button to return to adjustment of preset amperage.

☞ Use this mode for Air Carbon Arc (CAC-A) cutting and gouging. For best results, adjust dig setting to maximum.

8-3. Stick Hot Welding Mode - SMAW/CAC-A Process



316.029.725-A

⚠ Weld terminals are energized at all times in Stick Hot welding mode.

- 1 Mode Switch
- 2 Volts Indicator
- 3 Left Display
- 4 Right Display
- 5 Amps Indicator
- 6 Adjust Control
- 7 Arc Control Indicator
- 8 Setup Button

Setup

For typical system connections refer to Section 8-1.

Rotate Mode Switch to STICK HOT position as shown.

The open circuit voltage is shown in the Left Display with the Volts Indicator lit, and the preset amperage is shown in the Right Display with the Amps Indicator lit.

Operation

While the Amps Indicator is lit under the

Right Display, the Adjust Control is used to set desired preset amperage.

Pressing the Setup Button allows adjustment of Arc Control, Hot Start Current, and Hot Start Time.

For best results at the end of the weld, pull back the electrode quickly to extinguish the arc.

Arc Control (Dig)

Press the Setup Button so the Arc Control indicator is lit. DIG appears on the Left Display, and the corresponding dig setting appears on the Right Display.

Rotate Adjust Control to select desired dig setting from 0 to 100.

Dig control allows the arc characteristics, soft versus stiff, to be changed for specific applications and electrodes. Lower the dig setting for smooth running electrodes like E7018 and increase the dig setting for stiffer, more penetrating electrodes like E6010.

Press the Setup Button repeatedly until the Arc Control light goes out to return to adjustment of preset amperage.

Programmable Hot Start

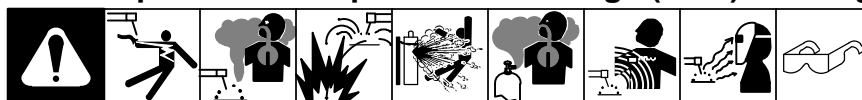
Press the Setup button repeatedly until HOT.S appears on the left display. HOT.S adjusts the Hot Start Amperage to Adaptive Hot Start (AUTO) or from Min (1) to Max (50). Adaptive Hot Start (AUTO) automatically chooses a default amperage. The Min (1) setting results in no hot start amperage. Higher numbers result in higher start amperage.

Press the Setup button again so HOT.T appears on the left display. HOT.T adjusts the Hot Start Time to Adaptive Hot Start (AUTO) or from Min (1) to Max (50). Adaptive Hot Start (AUTO) automatically chooses a default time. The Min (1) setting results in no hot start time. Higher numbers result in longer start time.

Press the Setup button to return to adjustment of preset amperage.

Use this mode for Air Carbon Arc (CAC-A) cutting and gouging. For best results, adjust dig setting to maximum.

8-4. Optional Low Open Circuit Voltage (OCV) Welding Modes



Low OCV Operation

The unit can be optionally configured for low open circuit voltage (OCV) operation in Stick and Scratch Start TIG modes. 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 welding operation.

SECTION 9 – MAINTENANCE & TROUBLESHOOTING

9-1. 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	
6 Months					
Blow Out Inside					


9-2. 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.


9-3. Help Displays

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



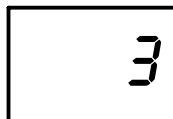
Help 1 Display

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



Help 2 Display

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



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 3-7). Operation will continue when the unit has cooled.



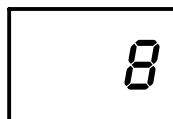
Help 5 Display

Indicates the right side of the unit has overheated. The unit has shut down to allow the fan to cool it (see Section 3-7). Operation will continue when the unit has cooled.



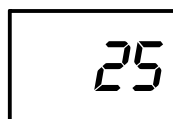
Help 6 Display

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.



Help 8 Display

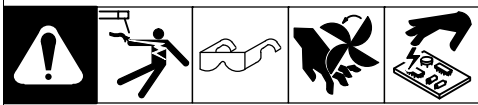
Indicates a malfunction in the secondary power circuit of the unit. If this display is shown, contact a Factory Authorized Service Agent.



Help 25 Display

Indicates machine has reached Duty Cycle limit (See Section 3-7). Unit must be left on to power the fan for cooling. Operation will continue when unit has cooled.

9-4. Troubleshooting




Trouble	Remedy
No weld output; unit completely inoperative.	Place line disconnect switch in On position (see Section 4-8).
	Check and replace line fuse(s), if necessary, or reset circuit breaker (see Section 4-8).
	Check for proper input power connections (see Section 4-8).
No weld output; meter display On.	Input voltage outside acceptable range of variation (see Sections 4-7, 4-8).
	Check, repair, or replace remote control.
	Unit overheated. Allow unit to cool with fan On (see Section 3-7).
Erratic or improper weld output.	Use proper size and type of weld cable (see Section 4-3).
	Clean and tighten all weld connections.
	Check for correct polarity.
No 115 volts AC output at duplex receptacle or Remote 14 receptacle.	Reset supplementary protector CB1 (see Section 4-5).
No 24 volts AC output at Remote 14 receptacle.	Reset supplementary protector CB2 (see Section 4-5).

Notes

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

SECTION 10 – ELECTRICAL DIAGRAM

⚠ WARNING	<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.
 ELECTRIC SHOCK HAZARD	<ul style="list-style-type: none"> Have only qualified persons install, use, or service this unit.

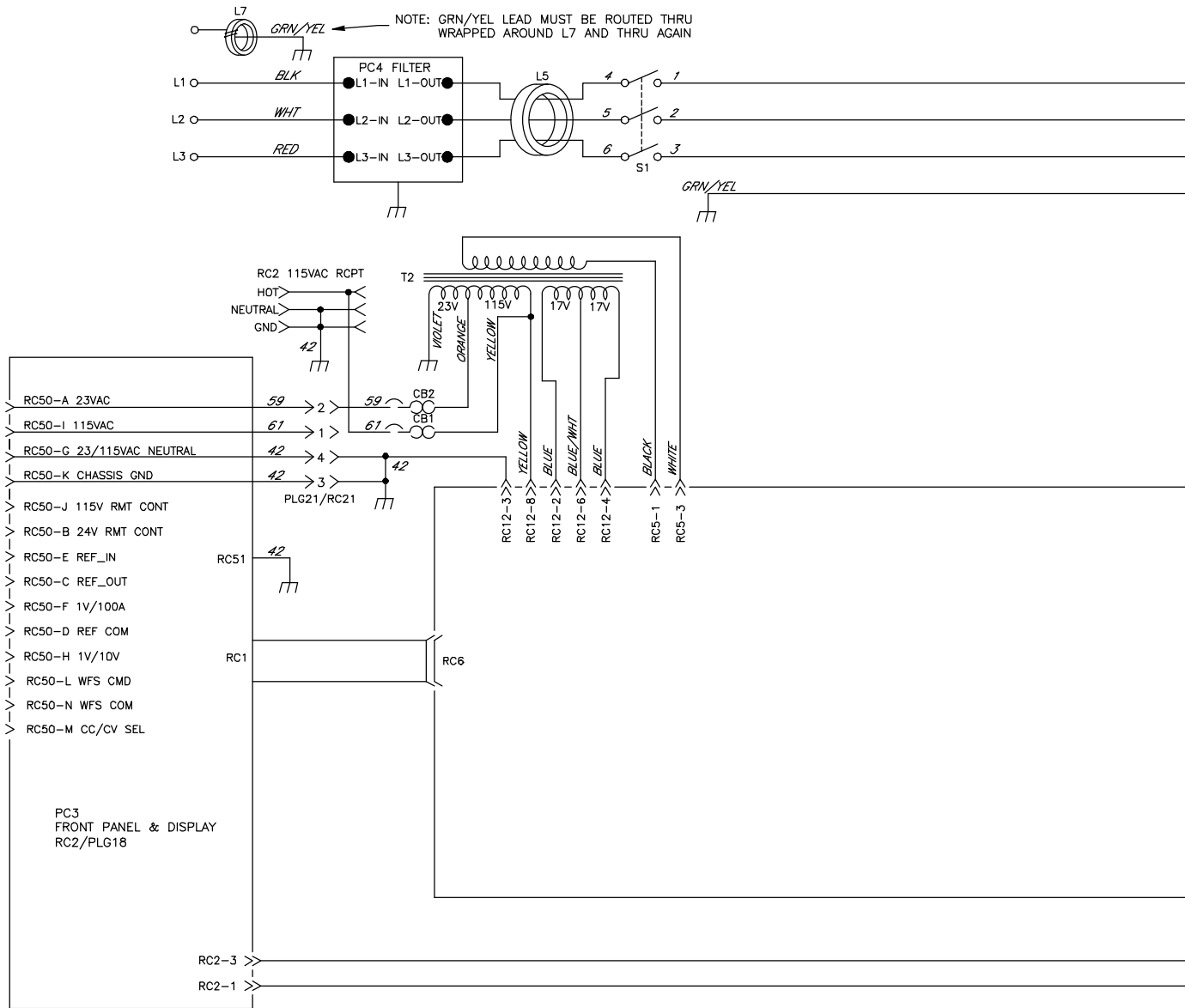
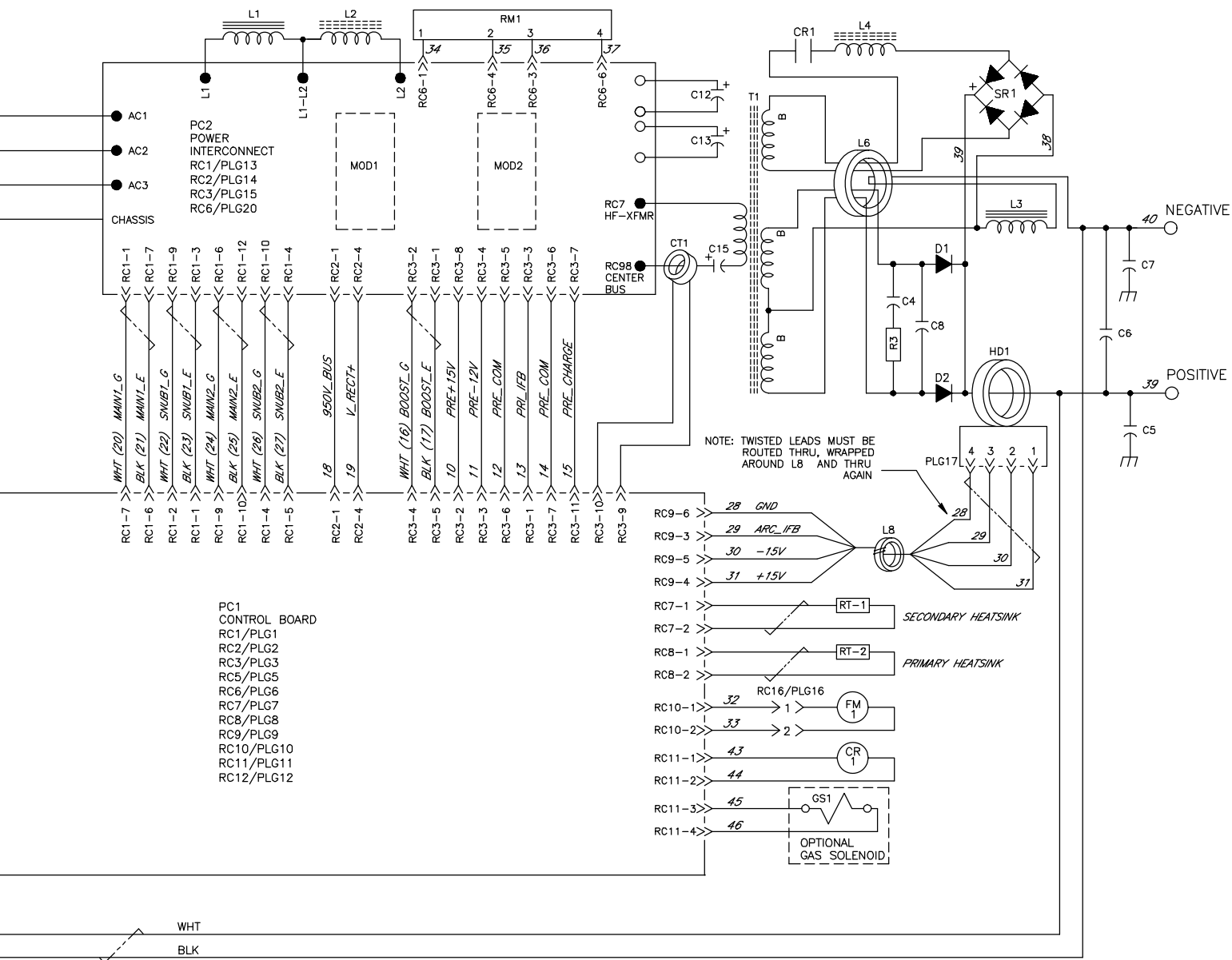
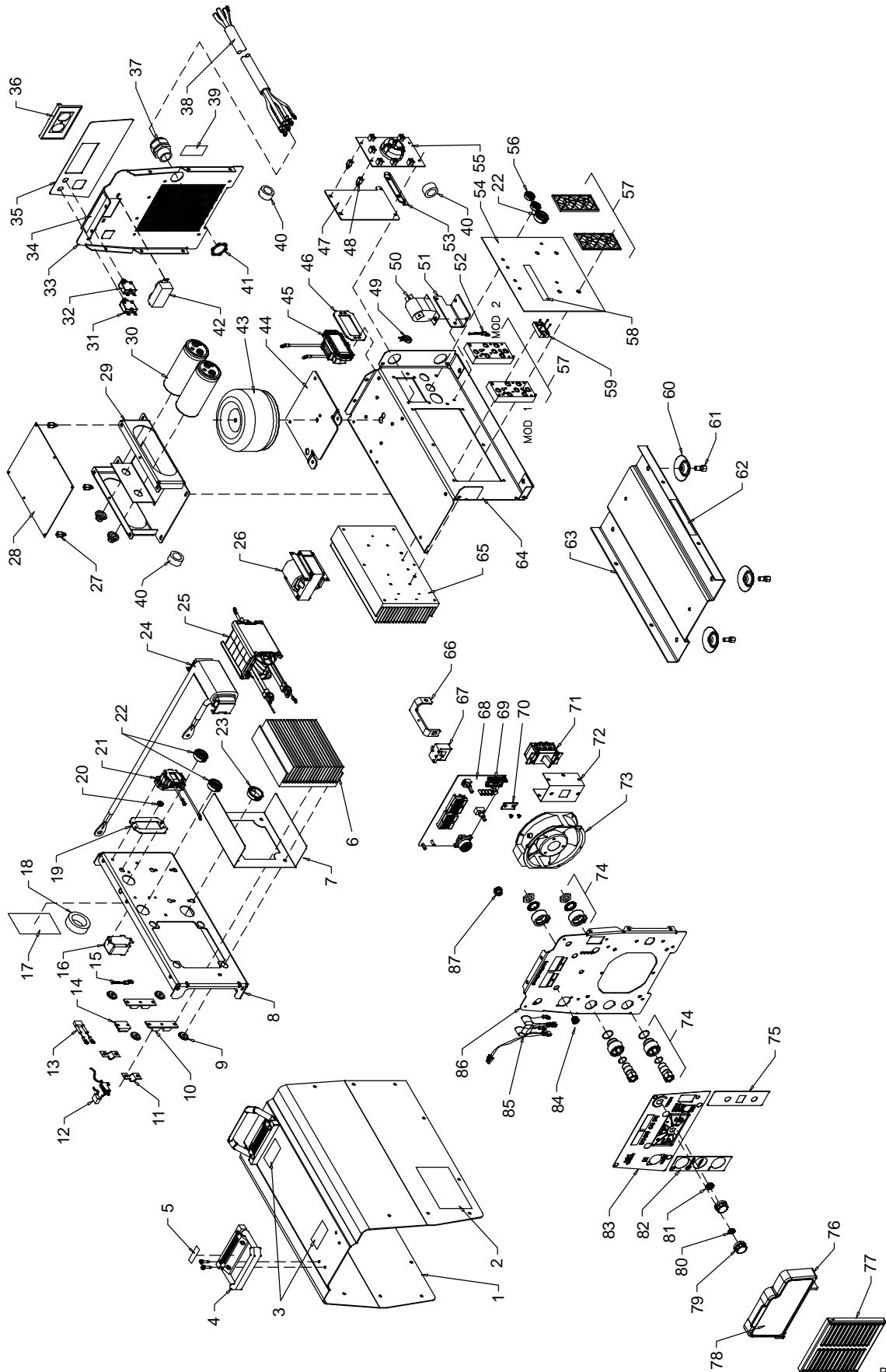


Figure 10-1. Circuit Diagram



SECTION -11 – PARTS LIST



Ref. 244 004-B

Figure 11-1. Parts Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
Figure 11-1. Parts Assembly				
1		216 034	Wrapper W/Insulators	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		208 015	Handle, Rubberized Carrying	2
5		135 483	Label, Important Remove These Two Handle Screws	2
6		225 097	Heat Sink, Lh Rect	1
7		211 503	Insulator, Heat Sink	1
8		+212 207	Windtunnel, Lh	1
9		196 355	Insulator, Screw	4
10	D1,D2	201 531	Kit, Diode Power Module	2
11		199 840	Bus Bar, Diode	2
12	R3/C4	233 052	Resistor/Capacitor	1
13	C8	219 191	Capacitor, Polyp Film .001 UF 2000V W/Terms	1
14	SR1	201 530	Kit, Diode Fast Recovery Bridge	1
15	RT1	199 798	Thermistor, NTC 30K Ohm @ 25 Deg C 18In Lead	1
16	CR1	198 549	Relay, Encl 24VDC Spst 35A/300VAC 4Pin Flange Mtg	1
17		227 927	Label, Warning Electric Shock/Exploding Parts–Wdles	1
18	L6	131 447	Core, Toroidal 1.332 id X 1.932 od X .625 Thk	1
19		227 746	Gasket, Inductor Mounting	1
20		010 546	Bushing, Snap-In Nyl .375 Id X .500 Mtg Hole	1
21	L4	218 020	Inductor, Boost	1
22		179 276	Bushing, Snap-In Nyl 1.000 Id X 1.375 Mtg Hole Cent	3
23		170 647	Bushing, Snap-In Nyl 1.312 Id X 1.500 Mtg Hole	1
24	L3	212 150	Inductor, Output	1
25	T1	212 132	XFMR, HF Litz/Litz W/Boost	1
26	L1	212 091	Inductor, Input	1
27		083 147	Grommet, Scr No 8/10 Panel Hole .312 Sq .500 High	4
28	PC1	242 341	Circuit Card Assy, Control 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
29		212 072	Bracket, Mtg Capacitor/PC Board	1
30	C12,13	245 614	Capacitor ElcItl 1800Uf 500 VDC Can 2.53 Dia	2
31	CB2	083 432	Supplementary Protector, Man Reset 1P 10A 250VAC Frict	1
32	CB1	083 432	Supplementary Protector, Man Reset 1P 10A 250VAC Frict	1
33		+219 470	Panel, Rear W/Aux	1
34		219 335	Label, Warning Electric Shock Can Kill Wordless	1
35			Nameplate, Rear Aux (Order by Model and Serial Number)	1
36		217 297	Cover, Receptacle Weatherproof Duplex Rcpt	1
37		215 980	Bushing, Strain Relief .709/.984 Id X1.375 Mtg Hole	1
38		244 628	Cable, Power 12 Ft 8Ga 4C (Non-Stripped End)	1
39		212 945	Label, Warning Incorrect Connections Wordless	1
40	L5,7,8	199 122	Core, Toroidal .750 Id X 1.450 Od X .544 Thk	3
41		234 126	Nut, Conduit 1.000 Npt Knurled	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
Figure 11-1. Parts Assembly (Continued)				
42	RC2	604 176	Rcpt, Str Dx Grd 2P3W 15A 125V *5-15R	1
43	T2	211 968	XFMR, Control Toroidal 665 VAC Pri 1536 Va 60 Hz	1
44		212 947	Plate, Mtg Toroid XFMR	1
45	L2	218 018	Inductor, Pre-Regulator	1
46		218 566	Gasket, Inductor Mounting	1
47		219 471	Bracket, Mtg Filter Board	1
48		083 147	Grommet, Scr No 8/10 Panel Hole .312 Sq .500 High	2
49	CT1	196 231	XMFR, Current Sensing 200/1	1
50	C15	196 143	Capacitor, Polyp Met Film 16. Uf 400 VAC 10%	1
51		219 472	Bracket, Mtg Capacitor Series	1
52	RT2	199 798	Thermistor, NTC 30K Ohm @ 25 Deg C 18in Lead	1
53		219 473	Bracket, Mtg CE Filter Ground Plane	1
54	PC2	224 661	Circuit Card Assy, Power Interconnect	1
		219 335	Label, Warning Electric Shock Can Kill Wordless	1
		223 343	Clip, Wire Std .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
55	PC4	229 989	Circuit Card Assy, Filter	1
56		153 403	Bushing, Snap-In Nyl .750 Id X 1.000 Mtg Hole Cent	2
57		261 556	Kit, Input/Pre-Regulator And Inverter Module (Includes)	1
			MOD 1, SKiip 83 HEC	1
			MOD 2, SKiip 83 EC	1
58		219 335	Label, Warning Electric Shock Can Kill Wordless	1
59	RM1	205 751	Module, Power Resistor W/Plug	1
60		229 325	Foot, Mtg Unit	4
61		176 736	Screw, Mtg Foot	4
62		212 073	Label, Warning Exploding Parts Can Wordless	1
63		+175 132	Base	1
64		212 206	Windtunnel, Rh	1
65		196 330	Heat Sink, Power Module	1
66		212 074	Bus Bar, Output	1
67	HD1	182 918	Transducer, Current 400A Module Supply V +/- 15V	1
68	PC3	242 895	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
69		230 943	Enclosure, Connector DB-9	1
70		230 944	Cover, Enclosure Connector DB-9	1
71	S1	244 920	Switch, TGL 3PST 40A 600VAC SCR Term Wide TGL	1
72		176 226	Insulator, Switch Power	1
73	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
74		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
		178 548	Terminal, Connector Friction	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 11-1. Parts Assembly (Continued)

... 74	♦218 183	.. Rcpt Assy, Tw Lk Insul Fem (Tweco Type) (Fac-op) (Includes)	2
...	209 473	... Receptacle, Twist Lock Tweco Style (Female) Power	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
...	178 548	... Terminal, Connector Friction	1
... 75		Nameplate, Power (Order by Model and Serial Number)	1
... 76	218 041	.. Door, W/Quick Access Ball Fasteners	1
... 77	175 138	.. Box, Louver	1
... 78		Label, (Order by Model and Serial Number)	1
... 79	174 991	.. Knob, Pointer 1.250 Dia X .250 Id W/Spring Clip-.21	2
... 80	231 468	.. Nut, 375-32 .56Hex .22H Brs Conical Knurl	1
... 81	231 469	.. Nut, 500-28 .69Hex .28H Brs Conical Knurl	1
... 82		Nameplate, Connection (Order by Model and Serial Number)	1
... 83		Nameplate (Order by Model and Serial Number)	1
... 84	216 112	.. Fastener, Panel Receptacle Quick Access	2
... 85	C5,6,7	233 668 .. Capacitor Assy, W/Plug And Leads (Voltage Feedback)	1
... 86	226 590	.. Panel, Front Standard	1
... 87	231 470	.. Nut, Adapter Encoder Shaft Mtg 375-32 To 500-28	1

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

♦Part of Tweco Type Connector Option.

BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.



Effective January 1, 2014
(Equipment with a serial number preface of ME 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 twelve 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 with exclusion of STR, Si, STI, STH and MPI series.
2. 3 Years — Parts and Labor
 - * Engine Driven Welding Generators
(NOTE: Engines are warranted separately by the engine manufacturer.)
 - * 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 175
 - * HF Units
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
 - * 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
 - * Cables and Non-Electronic Controls

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.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT TORT OR ANY OTHER LEGAL THEORY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.





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.

ITW Welding Italy S.r.l.

Via Privata Iseo, 6/E
20098 San Giuliano
Milanese, Italy

Phone: 39 (0) 2982901

Fax: 39 (0) 298290-203

email: miller@itw-welding.it

