



OM-277115F

2019-10

Processes



MIG (GMAW) Welding
Pulsed MIG (GMAW-P)
Flux Cored (FCAW) Welding



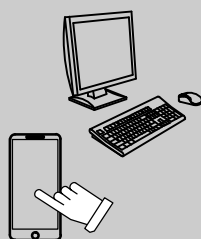
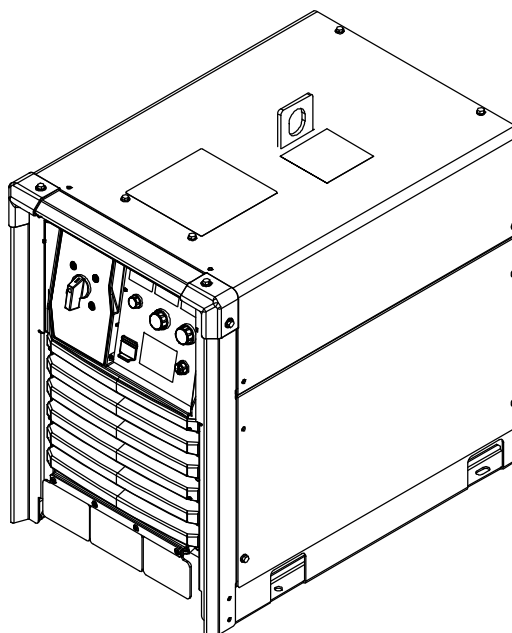
Air Carbon Arc (CAC-A)
Cutting and Gouging

Description



Arc Welding Power Source

Auto-Continuum[®] 350 And 500 w/Insight Core[™] CE



For product information,
Owner's Manual translations,
and more, visit

www.MillerWelds.com

OWNER'S MANUAL

File: Advanced Manufacturing Systems



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.



ISO 9001
Quality

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, and our extensive service network is there to help fix the problem. Warranty and maintenance 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.

MILLER Electric Mfg. Co., 1635 Spencer Street, Appleton, WI 54914 U.S.A. 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
Auto Continuum 350 CE	907660
Auto Continuum 500 CE	907661
Auto Continuum 350 CE DI	907660001
Auto Continuum 500 CE DI	907661001

Council Directives:

- 2014/35/EU Low Voltage
- 2014/30/EU Electromagnetic Compatibility
- 2011/65/EU Restriction of the use of certain hazardous substances in electrical and electronic equipment

Standards:

- IEC 60974-1:2012 Arc welding equipment – Part 1: Welding power sources
- IEC 60974-10:2014 Arc Welding Equipment – Part 10: Electromagnetic compatibility requirements

Signatory:



February 27, 2017

David A. Werba

MANAGER, PRODUCT DESIGN COMPLIANCE

Date of Declaration

EMF DATA SHEET FOR ARC WELDING POWER SOURCE



Product/Apparatus Identification

Product	Stock Number
AUTO-CONTINUUM 350 CE	907660
AUTO-CONTINUUM 350 CE DI	907660001
AUTO-CONTINUUM 500 CE	907661
AUTO-CONTINUUM 500 CE DI	907661001

Compliance Information Summary

Applicable regulation Directive 2014/35/EU

Reference limits Directive 2013/35/EU, Recommendation 1999/519/EC

Applicable standards IEC 62822-1:2016, IEC 62822-2:2016

Intended use ☒ for occupational use ☐ for use by laymen

Non-thermal effects need to be considered for workplace assessment ☒ YES ☐ NO

Thermal effects need to be considered for workplace assessment ☐ YES ☒ NO

☒ Data is based on maximum power source capability (valid unless firmware/hardware is changed)

☐ Data is based on worst case setting/program (only valid until setting options/welding programs are changed)

☐ Data is based on multiple settings/programs (only valid until setting options/welding programs are changed)

Occupational exposure is below the Exposure Limit Values (ELVs) for health effects at the standardized configurations ☒ YES ☐ NO
(if NO, specific required minimum distances apply)

Occupational exposure is below the Exposure Limit Values (ELVs) for sensory effects at the standardized configurations ☐ n.a ☒ YES ☐ NO
(if applicable and NO, specific measures are needed)

Occupational exposure is below the Action Levels (ALs) at the standardized configurations ☐ n.a ☒ YES ☐ NO
(if applicable and NO, specific signage is needed)

EMF Data for Non-thermal Effects

Exposure Indices (EIs) and distances to welding circuit (for each operation mode, as applicable)

	Head		Trunk	Limb (hand)	Limb (thigh)
	Sensory Effects	Health Effects			
Standardized distance	10 cm	10 cm	10 cm	3 cm	3 cm
ELV EI @ standardized distance	0.15	0.09	0.14	0.08	0.18
Required minimum distance	1 cm	1 cm	1 cm	1 cm	1 cm

Distance where all occupational ELV Exposure Indices fall below 0.20 (20%) 6 cm

Distance where all general public ELV Exposure Indices fall below 1.00 (100%) 115 cm

Tested by: Tony Samimi Date tested: 2016-08-05

279066-A

SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

som 2018-01

 **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 equipment. A qualified person is defined as one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated ability to solve or resolve problems relating to the subject matter, the work, or the project and has received safety training to recognize and avoid the hazards involved.



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 weld output in damp, wet, or confined spaces, 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.

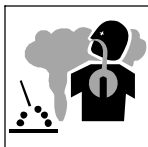
SIGNIFICANT DC VOLTAGE exists in inverter welding power sources AFTER removal of input power.

- Turn off unit, disconnect input power, and discharge input capacitors according to instructions in Manual before touching any parts.



HOT PARTS can burn.

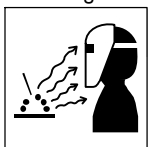
- Do not touch hot parts bare handed.
- Allow cooling period before working on equipment.
- To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.



FUMES AND GASES can be hazardous.

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

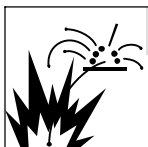
- Keep your head out of the fumes. Do not breathe the fumes.
- Ventilate the work area and/or use local forced ventilation at the arc to remove welding fumes and gases. The recommended way to determine adequate ventilation is to sample for the composition and quantity of fumes and gases to which personnel 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.

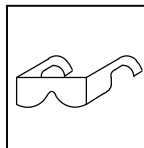


WELDING can cause fire or explosion.

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 cut or weld on tire rims or wheels. Tires can explode if heated. Repaired rims and wheels can fail. See OSHA 29 CFR 1910.177 listed in Safety Standards.
- 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 can 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.



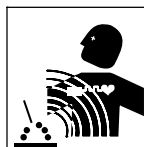
FLYING METAL or DIRT can injure eyes.

- 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.



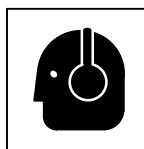
BUILDUP OF GAS can injure or kill.

- 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.

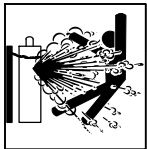
- Wearers of Pacemakers and other Implanted Medical Devices should keep away.
- Implanted Medical Device wearers should consult their doctor and the device manufacturer before going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations.



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 proper equipment, correct procedures, and sufficient number of persons to lift, move, and transport 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



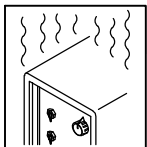
FIRE OR EXPLOSION hazard.

- 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.



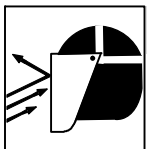
FALLING EQUIPMENT can injure.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
- Use correct procedures and 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.



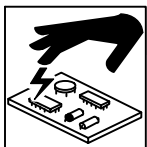
OVERUSE can cause OVERHEATING

- 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.



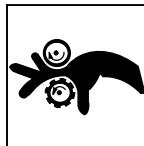
FLYING SPARKS can injure.

- 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.



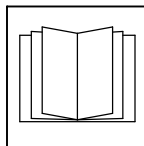
BATTERY EXPLOSION can injure.

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



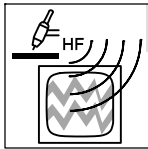
MOVING PARTS can injure.

- 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.



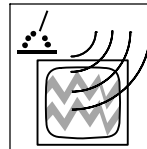
READ INSTRUCTIONS.

- 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 installation, 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

⚠ WARNING: This product can expose you to chemicals including lead, which are known to the state of California to cause cancer and birth defects or other reproductive harm.

For more information, go to www.P65Warnings.ca.gov.

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 02169 (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, Mississauga, Ontario, Canada L4W 5N5 (phone: 800-463-6727, website: www.csagroup.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 02169 (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 1910.177 Subpart N, 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 30329-4027 (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 can 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 – CONSIGNES DE SÉCURITÉ – LIRE AVANT UTILISATION

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⚠ Pour écarter les risques de blessure pour vous-même et pour autrui — lire, appliquer et ranger en lieu sûr ces consignes relatives aux précautions de sécurité et au mode opératoire.

2-1. Symboles utilisés



DANGER! – Indique une situation dangereuse qui si on l'évite pas peut donner la mort ou des blessures graves. Les dangers possibles sont montrés par les symboles joints ou sont expliqués dans le texte.



Indique une situation dangereuse qui si on l'évite pas peut donner la mort ou des blessures graves. Les dangers possibles sont montrés par les symboles joints ou sont expliqués dans le texte.

AVIS – Indique des déclarations pas en relation avec des blessures personnelles.

 Indique des instructions spécifiques.



Ce groupe de symboles veut dire Avertissement! Attention! DANGER DE CHOC ÉLECTRIQUE, PIÈCES EN MOUVEMENT, et PIÈCES CHAUDES. Consulter les symboles et les instructions ci-dessous y afférant pour les actions nécessaires afin d'éviter le danger.

2-2. Dangers relatifs au soudage à l'arc



Les symboles représentés ci-dessous sont utilisés dans ce manuel pour attirer l'attention et identifier les dangers possibles. En présence de l'un de ces symboles, prendre garde et suivre les instructions afférentes pour éviter tout risque. Les instructions en matière de sécurité indiquées ci-dessous ne constituent qu'un sommaire des instructions de sécurité plus complètes fournies dans les normes de sécurité énumérées dans la Section 2-5. Lire et observer toutes les normes de sécurité.



L'installation, l'utilisation, l'entretien et les réparations ne doivent être confiés qu'à des personnes qualifiées. Une personne qualifiée est définie comme celle qui, par la possession d'un diplôme reconnu, d'un certificat ou d'un statut professionnel, ou qui, par une connaissance, une formation et une expérience approfondies, a démontré avec succès sa capacité à résoudre les problèmes liés à la tâche, le travail ou le projet et a reçu une formation en sécurité afin de reconnaître et d'éviter les risques inhérents.



Pendant le fonctionnement, maintenir à distance toutes les personnes, notamment les enfants de l'appareil.



UNE DÉCHARGE ÉLECTRIQUE peut entraîner la mort.

Le contact d'organes électriques sous tension peut provoquer des accidents mortels ou des brûlures graves. Le circuit de l'électrode et de la pièce est sous tension lorsque le courant est délivré à la sortie. Le circuit d'alimentation et les circuits internes de la machine sont également sous tension lorsque l'alimentation est sur Marche. Dans le mode de soudage avec du fil, le fil, le dérouleur, le bloc de commande du rouleau et toutes les parties métalliques en contact avec le fil sont sous tension électrique. Un équipement installé ou mis à la terre de manière incorrecte ou impropre constitue un danger.

- Ne pas toucher aux pièces électriques sous tension.
- Porter des gants isolants et des vêtements de protection secs et sans trous.
- S'isoler de la pièce à couper et du sol en utilisant des housses ou des tapis assez grands afin d'éviter tout contact physique avec la pièce à couper ou le sol.
- Ne pas utiliser de sortie de soudage CA dans des zones humides ou confinées ou s'il y a un risque de chute.
- Se servir d'une source électrique à courant électrique UNIQUEMENT si le procédé de soudage le demande.
- Si l'utilisation d'une source électrique à courant électrique s'avère nécessaire, se servir de la fonction de télécommande si l'appareil en est équipé.
- D'autres consignes de sécurité sont nécessaires dans les conditions suivantes : risques électriques dans un environnement humide ou si l'on porte des vêtements mouillés ; sur des structures métalliques telles que sols, grilles ou échafaudages ; en position coincée comme assise, à genoux ou couchée ; ou s'il y a un risque élevé de contact inévitable ou accidentel avec la pièce à souder ou le sol. Dans ces conditions, utiliser les équipements suivants, dans l'ordre indiqué : 1) un poste à souder DC à tension constante (à fil), 2) un poste à souder DC manuel (électrode) ou 3) un poste à souder AC à tension à vide réduite. Dans la plupart des situations,

l'utilisation d'un poste à souder DC à fil à tension constante est recommandée. En outre, ne pas travailler seul !

- Couper l'alimentation ou arrêter le moteur avant de procéder à l'installation, à la réparation ou à l'entretien de l'appareil. Déverrouiller l'alimentation selon la norme OSHA 29 CFR 1910.147 (voir normes de sécurité).
- Installez, mettez à la terre et utilisez correctement cet équipement conformément à son Manuel d'Utilisation et aux réglementations nationales, gouvernementales et locales.
- Toujours vérifier la terre du cordon d'alimentation. Vérifier et s'assurer que le fil de terre du cordon d'alimentation est bien raccordé à la borne de terre du sectionneur ou que la fiche du cordon est raccordée à une prise correctement mise à la terre.
- En effectuant les raccordements d'entrée, fixer d'abord le conducteur de mise à la terre approprié et contre-vérifier les connexions.
- Les câbles doivent être exempts d'humidité, d'huile et de graisse ; protégez-les contre les étincelles et les pièces métalliques chaudes.
- Vérifier fréquemment le cordon d'alimentation et le conducteur de mise à la terre afin de s'assurer qu'il n'est pas altéré ou dénudé –, le remplacer immédiatement s'il l'est –. Un fil dénudé peut entraîner la mort.
- L'équipement doit être hors tension lorsqu'il n'est pas utilisé.
- Ne pas utiliser des câbles usés, endommagés, de grosseur insuffisante ou mal épissés.
- Ne pas enrouler les câbles autour du corps.
- Si la pièce soudée doit être mise à la terre, le faire directement avec un câble distinct.
- Ne pas toucher l'électrode quand on est en contact avec la pièce, la terre ou une électrode provenant d'une autre machine.
- Ne pas toucher des porte électrodes connectés à deux machines en même temps à cause de la présence d'une tension à vide double.
- N'utiliser qu'un matériel en bon état. Réparer ou remplacer sur-le-champ les pièces endommagées. Entretenir l'appareil conformément à ce manuel.
- Porter un harnais de sécurité si l'on doit travailler au-dessus du sol.
- S'assurer que tous les panneaux et couvercles sont correctement en place.
- Fixer le câble de retour de façon à obtenir un bon contact métal-métal avec la pièce à souder ou la table de travail, le plus près possible de la soudure.
- Isoler la pince de masse quand pas mis à la pièce pour éviter le contact avec tout objet métallique.
- Ne pas raccorder plus d'une électrode ou plus d'un câble de masse à une même borne de sortie de soudage. Débrancher le câble pour le procédé non utilisé.
- Utiliser une protection différentielle lors de l'utilisation d'un équipement auxiliaire dans des endroits humides ou mouillés.

Il reste une TENSION DC NON NÉGLIGEABLE dans les sources de soudage onduleur UNE FOIS l'alimentation coupée.

- Éteignez l'unité, débranchez le courant électrique, et déchargez les condensateurs d'alimentation selon les instructions indiquées dans le manuel avant de toucher les pièces.



LES PIÈCES CHAUDES peuvent provoquer des brûlures.

- Ne pas toucher à mains nues les parties chaudes.
- Prévoir une période de refroidissement avant de travailler à l'équipement.

- Ne pas toucher aux pièces chaudes, utiliser les outils recommandés et porter des gants de soudage et des vêtements épais pour éviter les brûlures.



LES FUMÉES ET LES GAZ peuvent être dangereux.

Le soudage génère des fumées et des gaz. Leur inhalation peut être dangereux pour votre santé.

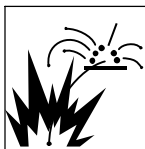
- Eloigner votre tête des fumées. Ne pas respirer les fumées.
- À l'intérieur, ventiler la zone et/ou utiliser une ventilation forcée au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage. Pour déterminer la bonne ventilation, il est recommandé de procéder à un prélèvement pour la composition et la quantité de fumées et de gaz auxquelles est exposé le personnel.
- Si la ventilation est médiocre, porter un respirateur anti-vapeurs approuvé.
- Lire et comprendre les fiches de données de sécurité et les instructions du fabricant concernant les adhésifs, les revêtements, les nettoyants, les consommables, les produits de refroidissement, les dégraisseurs, les flux et les métaux.
- Travailler dans un espace fermé seulement s'il est bien ventilé ou en portant un respirateur à alimentation d'air. Demander toujours à un surveillant dûment formé de se tenir à proximité. Des fumées et des gaz de soudage peuvent déplacer l'air et abaisser le niveau d'oxygène provoquant des blessures ou des accidents mortels. S'assurer que l'air de respiration ne présente aucun danger.
- Ne pas souder dans des endroits situés à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir en présence de vapeurs et former des gaz hautement toxiques et irritants.
- Ne pas souder des métaux munis d'un revêtement, tels que l'acier galvanisé, plaqué en plomb ou au cadmium à moins que le revêtement n'ait été enlevé dans la zone de soudure, que l'endroit soit bien ventilé, et en portant un respirateur à alimentation d'air. Les revêtements et tous les métaux renfermant ces éléments peuvent dégager des fumées toxiques en cas de soudage.



LES RAYONS DE L'ARC peuvent provoquer des brûlures dans les yeux et sur la peau.

Le rayonnement de l'arc du procédé de soudage génère des rayons visibles et invisibles intenses (ultraviolets et infrarouges) susceptibles de provoquer des brûlures dans les yeux et sur la peau. Des étincelles sont projetées pendant le soudage.

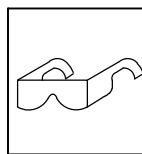
- Porter un casque de soudage approuvé muni de verres filtrants approprié pour protéger visage et yeux pour protéger votre visage et vos yeux pendant le soudage ou pour regarder (voir ANSI Z49.1 et Z87.1 énuméré dans les normes de sécurité).
- Porter des lunettes de sécurité avec écrans latéraux même sous votre casque.
- Avoir recours à des écrans protecteurs ou à des rideaux pour protéger les autres contre les rayonnements les éblouissements et les étincelles ; prévenir toute personne sur les lieux de ne pas regarder l'arc.
- Porter un équipement de protection pour le corps fait d'un matériau résistant et ignifuge (cuir, coton robuste, laine). La protection du corps comporte des vêtements sans huile comme par ex. des gants de cuir, une chemise solide, des pantalons sans revers, des chaussures hautes et une casquette.



LE SOUDAGE peut provoquer un incendie ou une explosion.

Le soudage effectué sur des conteneurs fermés tels que des réservoirs, tambours ou des conduites peut provoquer leur éclatement. Des étincelles peuvent être projetées de l'arc de soudure. La projection d'étincelles, des pièces chaudes et des équipements chauds peut provoquer des incendies et des brûlures. Le contact accidentel de l'électrode avec des objets métalliques peut provoquer des étincelles, une explosion, un surchauffement ou un incendie. Avant de commencer le soudage, vérifier et s'assurer que l'endroit ne présente pas de danger.

- Déplacer toutes les substances inflammables à une distance de 10,7 m de l'arc de soudage. En cas d'impossibilité les recouvrir soigneusement avec des protections homologuées.
- Ne pas souder dans un endroit où des étincelles peuvent tomber sur des substances inflammables.
- Se protéger et d'autres personnes de la projection d'étincelles et de métal chaud.
- Des étincelles et des matériaux chauds du soudage peuvent facilement passer dans d'autres zones en traversant de petites fissures et des ouvertures.
- Surveiller tout déclenchement d'incendie et tenir un extincteur à proximité.
- Le soudage effectué sur un plafond, plancher, paroi ou séparation peut déclencher un incendie de l'autre côté.
- Ne pas couper ou souder des jantes ou des roues. Les pneus peuvent exploser s'ils sont chauffés. Les jantes et les roues réparées peuvent défaillir. Voir OSHA 29 CFR 1910.177 énuméré dans les normes de sécurité.
- Ne pas effectuer le soudage sur des conteneurs fermés tels que des réservoirs, tambours, ou conduites, à moins qu'ils n'aient été préparés correctement conformément à AWS F4.1 et AWS A6.0 (voir les Normes de Sécurité).
- Ne pas souder là où l'air ambiant pourrait contenir des poussières, gaz ou émanations inflammables (vapeur d'essence, par exemple).
- Brancher le câble de masse sur la pièce la plus près possible de la zone de soudage pour éviter le transport du courant sur une longue distance par des chemins inconnus éventuels en provoquant des risques d'électrocution, d'étincelles et d'incendie.
- Ne pas utiliser le poste de soudage pour dégelier des conduites gelées.
- En cas de non utilisation, enlever la baguette d'électrode du porte-électrode ou couper le fil à la pointe de contact.
- Porter un équipement de protection pour le corps fait d'un matériau résistant et ignifuge (cuir, coton robuste, laine). La protection du corps comporte des vêtements sans huile comme par ex. des gants de cuir, une chemise solide, des pantalons sans revers, des chaussures hautes et une casquette.
- Avant de souder, retirer toute substance combustible de vos poches telles qu'un allumeur au butane ou des allumettes.
- Une fois le travail achevé, assurez-vous qu'il ne reste aucune trace d'étincelles incandescentes ni de flammes.
- Utiliser exclusivement des fusibles ou coupe-circuits appropriés. Ne pas augmenter leur puissance; ne pas les ponter.
- Suivre les recommandations dans OSHA 1910.252(a)(2)(iv) et NFPA 51B pour les travaux à chaud et avoir de la surveillance et un extincteur à proximité.
- Lire et comprendre les fiches de données de sécurité et les instructions du fabricant concernant les adhésifs, les revêtements, les nettoyants, les consommables, les produits de refroidissement, les dégraisseurs, les flux et les métaux.



DES PIÈCES DE METAL ou DES SALETES peuvent provoquer des blessures dans les yeux.

- Le soudage, l'écaillage, le passage de la pièce à la brosse en fil de fer, et le meulage génèrent des étincelles et des particules métalliques volantes. Pendant la période de refroidissement des soudures, elles risquent de projeter du laitier.
- Porter des lunettes de sécurité avec écrans latéraux ou un écran facial.



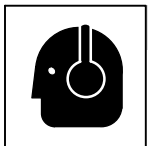
LES ACCUMULATIONS DE GAZ risquent de provoquer des blessures ou même la mort.

- Fermer l'alimentation du gaz comprimé en cas de non utilisation.
- Veiller toujours à bien aérer les espaces confinés ou se servir d'un respirateur d'adduction d'air homologué.



Les CHAMPS ÉLECTROMAGNÉTIQUES (CEM) peuvent affecter les implants médicaux.

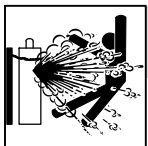
- Les porteurs de stimulateurs cardiaques et autres implants médicaux doivent rester à distance.
- Les porteurs d'implants médicaux doivent consulter leur médecin et le fabricant du dispositif avant de s'approcher de la zone où se déroule du soudage à l'arc, du soudage par points, du gougeage, de la découpe plasma ou une opération de chauffage par induction.



LE BRUIT peut endommager l'ouïe.

Le bruit des processus et des équipements peut affecter l'ouïe.

- Porter des protections approuvées pour les oreilles si le niveau sonore est trop élevé.



LES BOUTEILLES peuvent exploser si elles sont endommagées.

Les bouteilles de gaz comprimé contiennent du gaz sous haute pression. Si une bouteille est endommagée, elle peut exploser. Du fait que

les bouteilles de gaz font normalement partie du procédé de soudage, les manipuler avec précaution.

- Protéger les bouteilles de gaz comprimé d'une chaleur excessive, des chocs mécaniques, des dommages physiques, du laitier, des flammes ouvertes, des étincelles et des arcs.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber ou de se renverser.
- Tenir les bouteilles éloignées des circuits de soudage ou autres circuits électriques.
- Ne jamais placer une torche de soudage sur une bouteille à gaz.
- Une électrode de soudage ne doit jamais entrer en contact avec une bouteille.
- Ne jamais souder une bouteille pressurisée – risque d'explosion.
- Utiliser seulement des bouteilles de gaz comprimé, régulateurs, tuyaux et raccords convenables pour cette application spécifique; les maintenir ainsi que les éléments associés en bon état.
- Tourner le dos à la sortie de vanne lors de l'ouverture de la vanne de la bouteille. Ne pas se tenir devant ou derrière le régulateur lors de l'ouverture de la vanne.
- Le couvercle du détendeur doit toujours être en place, sauf lorsque la bouteille est utilisée ou qu'elle est reliée pour usage ultérieur.
- Utilisez les équipements corrects, les bonnes procédures et suffisamment de personnes pour soulever, déplacer et transporter les bouteilles.
- Lire et suivre les instructions sur les bouteilles de gaz comprimé, l'équipement connexe et le dépliant P-1 de la CGA (Compressed Gas Association) mentionné dans les principales normes de sécurité.

2-3. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance



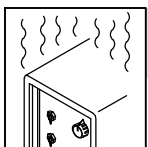
Risque D'INCENDIE OU D'EXPLOSION.

- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces inflammables.
- Ne pas installer l'appareil à proximité de produits inflammables.
- Ne pas surcharger l'installation électrique – s'assurer que l'alimentation est correctement dimensionnée et protégée avant de mettre l'appareil en service.



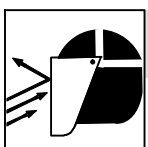
LA CHUTE DE L'ÉQUIPEMENT peut provoquer des blessures.

- Utiliser l'anneau de levage uniquement pour soulever l'appareil, NON PAS les chariots, les bouteilles de gaz ou tout autre accessoire.
- Utilisez les procédures correctes et des équipements d'une capacité appropriée pour soulever et supporter l'appareil.
- En utilisant des fourches de levage pour déplacer l'unité, s'assurer que les fourches sont suffisamment longues pour dépasser du côté opposé de l'appareil.
- Tenir l'équipement (câbles et cordons) à distance des véhicules mobiles lors de toute opération en hauteur.
- Suivre les consignes du Manuel des applications pour l'équation de levage NIOSH révisée (Publication N°94-110) lors du levage manuel de pièces ou équipements lourds.



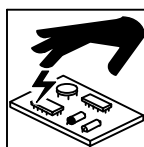
L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

- Prévoir une période de refroidissement; respecter le cycle opératoire nominal.
- Réduire le courant ou le facteur de marche avant de poursuivre le soudage.
- Ne pas obstruer les passages d'air du poste.



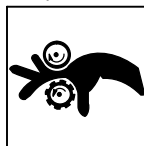
LES ÉTINCELLES PROJÉTÉES peuvent provoquer des blessures.

- Porter un écran facial pour protéger le visage et les yeux.
- Affûter l'électrode au tungstène uniquement à la meuleuse dotée de protecteurs. Cette manœuvre est à exécuter dans un endroit sûr lorsque l'on porte l'équipement homologué de protection du visage, des mains et du corps.
- Les étincelles risquent de causer un incendie – éloigner toute substance inflammable.



LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- Établir la connexion avec la barrette de terre avant de manipuler des cartes ou des pièces.
- Utiliser des pochettes et des boîtes antistatiques pour stocker, déplacer ou expédier des cartes de circuits imprimés.



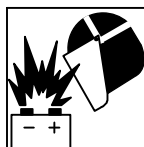
Les PIÈCES MOBILES peuvent causer des blessures.

- Ne pas s'approcher des organes mobiles.
- Ne pas s'approcher des points de coincement tels que des rouleaux de commande.



LES FILS DE SOUDAGE peuvent provoquer des blessures.

- Ne pas appuyer sur la gâchette avant d'en avoir reçu l'instruction.
- Ne pas diriger le pistolet vers soi, d'autres personnes ou toute pièce mécanique en engageant le fil de soudage.



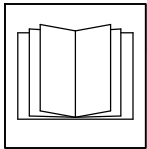
L'EXPLOSION DE LA BATTERIE peut provoquer des blessures.

- Ne pas utiliser l'appareil de soudage pour charger des batteries ou faire démarrer des véhicules à l'aide de câbles de démarrage, sauf si l'appareil dispose d'une fonctionnalité de charge de batterie destinée à cet usage.



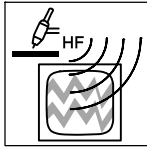
Les PIÈCES MOBILES peuvent causer des blessures.

- S'abstenir de toucher des organes mobiles tels que des ventilateurs.
- Maintenir fermés et verrouillés les portes, panneaux, recouvrements et dispositifs de protection.
- Lorsque cela est nécessaire pour des travaux d'entretien et de dépannage, faire retirer les portes, panneaux, recouvrements ou dispositifs de protection uniquement par du personnel qualifié.
- Remettre les portes, panneaux, recouvrements ou dispositifs de protection quand l'entretien est terminé et avant de rebrancher l'alimentation électrique.



LIRE LES INSTRUCTIONS.

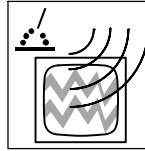
- Lire et appliquer les instructions sur les étiquettes et le Mode d'emploi avant l'installation, l'utilisation ou l'entretien de l'appareil. Lire les informations de sécurité au début du manuel et dans chaque section.
- N'utiliser que les pièces de rechange recommandées par le constructeur.
- Effectuer l'installation, l'entretien et toute intervention selon les manuels d'utilisateurs, les normes nationales, provinciales et de l'industrie, ainsi que les codes municipaux.



LE RAYONNEMENT HAUTE FRÉQUENCE (H.F.) risque de provoquer des interférences.

- Le rayonnement haute fréquence (H.F.) peut provoquer des interférences avec les équipements de radio-navigation et de communication, les services de sécurité et les ordinateurs.
- Demander seulement à des personnes qualifiées familiarisées avec des équipements électroniques de faire fonctionner l'installation.
- L'utilisateur est tenu de faire corriger rapidement par un électricien qualifié les interférences résultant de l'installation.
- Si le FCC signale des interférences, arrêter immédiatement l'appareil.

- Effectuer régulièrement le contrôle et l'entretien de l'installation.
- Maintenir soigneusement fermés les portes et les panneaux des sources de haute fréquence, maintenir les éclateurs à une distance correcte et utiliser une terre et un blindage pour réduire les interférences éventuelles.



LE SOUDAGE À L'ARC risque de provoquer des interférences.

- L'énergie électromagnétique risque de provoquer des interférences pour l'équipement électronique sensible tel que les ordinateurs et l'équipement commandé par ordinateur tel que les robots.
- Veiller à ce que tout l'équipement de la zone de soudage soit compatible électromagnétiquement.
- Pour réduire la possibilité d'interférence, maintenir les câbles de soudage aussi courts que possible, les grouper, et les poser aussi bas que possible (ex. par terre).
- Veiller à souder à une distance de 100 mètres de tout équipement électronique sensible.
- Veiller à ce que ce poste de soudage soit posé et mis à la terre conformément à ce mode d'emploi.
- En cas d'interférences après avoir pris les mesures précédentes, il incombe à l'utilisateur de prendre des mesures supplémentaires telles que le déplacement du poste, l'utilisation de câbles blindés, l'utilisation de filtres de ligne ou la pose de protecteurs dans la zone de travail.

2-4. Proposition californienne 65 Avertissements



AVERTISSEMENT : ce produit peut vous exposer à des produits chimiques tels que le plomb, reconnus par l'État de Californie comme cancérigènes et sources de malformations ou d'autres troubles de la reproduction.

Pour plus d'informations, consulter www.P65Warnings.ca.gov.

2-5. Principales normes de sécurité

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 02169 (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 Spec-

trum Way, Suite 100, Mississauga, Ontario, Canada L4W 5N5 (phone: 800-463-6727, website: www.csagroup.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 02169 (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 1910.177 Subpart N, 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 30329-4027 (phone: 1-800-232-4636, website: www.cdc.gov/NIOSH).

2-6. Informations relatives aux CEM

Le courant électrique qui traverse tout conducteur génère des champs électromagnétiques (CEM) à certains endroits. Le courant issu d'un soudage à l'arc (et de procédés connexes, y compris le soudage par points, le gougeage, le découpage plasma et les opérations de chauffage par induction) crée un champ électromagnétique (CEM) autour du circuit de soudage. Les champs électromagnétiques produits peuvent causer interférence à certains implants médicaux, p. ex. les stimulateurs cardiaques. Des mesures de protection pour les porteurs d'implants médicaux doivent être prises: Limiter par exemple tout accès aux passants ou procéder à une évaluation des risques individuels pour les soudeurs. Tous les soudeurs doivent appliquer les procédures suivantes pour minimiser l'exposition aux CEM provenant du circuit de soudage:

1. Rassembler les câbles en les torsadant ou en les attachant avec du ruban adhésif ou avec une housse.
2. Ne pas se tenir au milieu des câbles de soudage. Disposer les

câbles d'un côté et à distance de l'opérateur.

3. Ne pas courber et ne pas entourer les câbles autour de votre corps.
4. Maintenir la tête et le torse aussi loin que possible du matériel du circuit de soudage.
5. Connecter la pince sur la pièce aussi près que possible de la soudure.
6. Ne pas travailler à proximité d'une source de soudage, ni s'asseoir ou se pencher dessus.
7. Ne pas souder tout en portant la source de soudage ou le dévidoir.

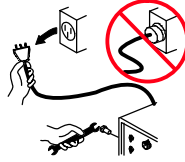
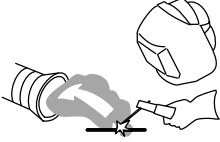
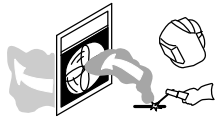
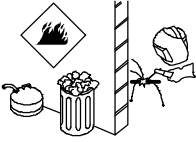
En ce qui concerne les implants médicaux :

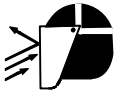
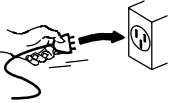
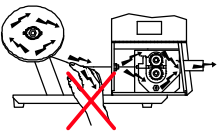
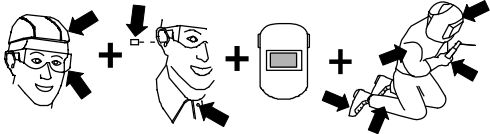
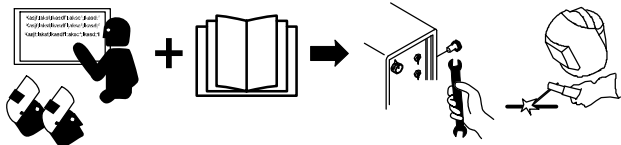
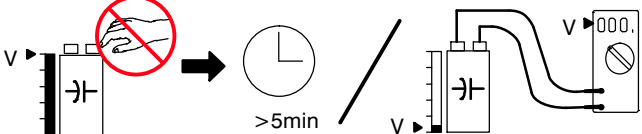
Les porteurs d'implants doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de soudage par points, de gougeage, du coupage plasma ou de chauffage par induction. Si le médecin approuve, il est recommandé de suivre les procédures précédentes.

SECTION 3 – DEFINITIONS

3-1. Additional Safety Symbols And Definitions

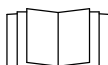
 Some symbols are found only on CE products.

	Warning! Watch Out! There are possible hazards as shown by the symbols. Safe1 2012-05
	Wear dry insulating gloves. Do not touch electrode with bare hand. Do not wear wet or damaged gloves. Safe2 2017-04
	Protect yourself from electric shock by insulating yourself from work and ground. Safe3 2017-04
	Disconnect input plug or power before working on machine. Safe5 2017-04
	Keep your head out of the fumes. Safe6 2017-04
	Use forced ventilation or local exhaust to remove the fumes. Safe8 2012-05
	Use ventilating fan to remove fumes. Safe10 2012-05
	Keep flammables away from welding. Do not weld near flammables. Safe12 2012-05
	Welding sparks can cause fires. Have a fire extinguisher nearby, and have a watchperson ready to use it. Safe14 2012-05
	Do not weld on drums or any closed containers. Safe16 2017-04

	Do not remove or paint over (cover) the label.	Safe20 2017-04
	When power is applied failed parts can explode or cause other parts to explode.	Safe26 2012-05
	Flying pieces of parts can cause injury. Always wear a face shield when servicing unit.	Safe27 2012-05
	Always wear long sleeves and button your collar when servicing unit.	Safe28 2012-05
	After taking proper precautions as shown, connect power to unit.	Safe29 2012-05
	Drive rolls can injure fingers.	Safe32 2012-05
	Welding wire and drive parts are at welding voltage during operation – keep hands and metal objects away.	Safe33 2017-04
	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.	Safe37 2017-04
	Wear hat and safety glasses. Use ear protection and button shirt collar. Use welding helmet with correct shade of filter. Wear complete body protection.	Safe38 2012-05
	Become trained and read the instructions before working on the machine or welding.	Safe40 2012-05
	Hazardous voltage remains on input capacitors after power is turned off. Do not touch fully charged capacitors. Always wait 5 minutes 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.	Safe43 2017-04

3-2. Miscellaneous Symbols And Definitions

 Some symbols are found only on CE products.

V	Voltage
I	On
	Voltage Input
	Protective Earth (Ground)
	Arc Force
X	Duty Cycle
%	Percent
3~	Three Phase
	Cold Jog (Inch) Towards Workpiece
	Read Instructions
	Program
t	Time
	Alternating Current (AC)
	Remote
-	Negative
	Variable Inductance
	Gas Metal Arc Welding (GMAW)
U₂	Conventional Load Voltage
I₂	Rated Welding Current
	Three Phase Static Frequency Converter-Transformer-Rectifier

A	Amperage
	Off
	Arc Force
	Increase
U₀	Rated No Load Voltage (OCV)
Hz	Hertz
U₁	Primary Voltage
IP	Degree Of Protection
	Suitable for Some Hazardous Locations
I_{1eff}	Maximum Effective Supply Current
	Constant Current
I₁	Primary Current
	Wire Type
	Trigger Hold On Indicator Light
	Output
	Wire Feed
	Trigger Hold Off
	Sequence
	Gas Type
	Trigger Hold Off Indicator Light

	Cold Jog (Inch) Away From Workpiece
I_{1max}	Rated Maximum Supply Current
	Purge By Gas
	Locked
	Process
	Arc Control
	Direct Current (DC)
	Input
+	Positive
	Constant Voltage
	Line Connection

SECTION 4 – SPECIFICATIONS

4-1. Serial Number And Rating Label Location

The serial number and rating information for this product is located on the back. 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.

4-2. Software Licensing Agreement

The End User License Agreement and any third-party notices and terms and conditions pertaining to third-party software can be found at <https://www.millerwelds.com/eula> and are incorporated by reference herein.

4-3. 350 Model Specifications

 Do not use information in unit specifications table to determine electrical service requirements. See Sections 5-10 and 5-11 for information on connecting input power.

 This equipment will deliver rated output at an ambient air temperature up to 104 °F (40 °C).

Input Power	Rated Welding Output	Amperage Range CC Mode	Voltage Range CV Mode	Maximum Open-Circuit Voltage	Amperes Input At Rated Load Output 50/60 Hz, Three-Phase		KVA		KW	
					380 V	400 V	380 V	400 V	380 V	400 V
Three Phase	350 A @ 34 V DC, 100% Duty Cycle	20-400 A	10-44 V	75	21.8 (0-1A*)	20.8 (0-1A*)	14.4 (0.8*)	14.4 (0.8*)	13.8 (0.17*)	13.8 (0.17*)

*While idling; Input amperage fluctuates while idling and is always less than one Ampere. Use one Ampere for power efficiency calculations.

4-4. 500 Model Specifications

 Do not use information in unit specifications table to determine electrical service requirements. See Sections 5-10 and 5-11 for information on connecting input power.

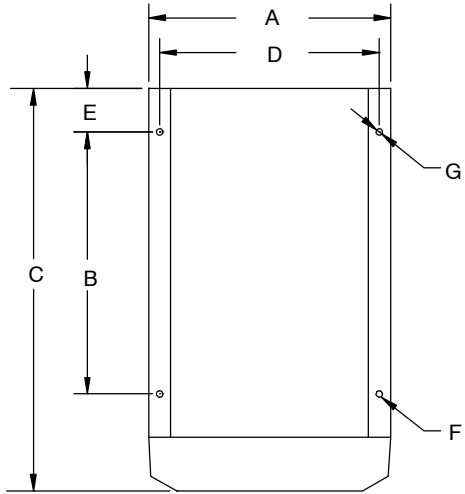
 This equipment will deliver rated output at an ambient air temperature up to 104 °F (40 °C).

Input Power	Rated Welding Output	Amperage Range CC Mode	Voltage Range CV Mode	Maximum Open-Circuit Voltage	Amperes Input At Rated Load Output 50/60 Hz, Three-Phase		KVA		KW	
					380 V	400 V	380 V	400 V	380 V	400 V
Three Phase	500 A @ 40 V DC, 100% Duty Cycle	20-600 A	10-44 V	75	34.9 (0-1A*)	33.2 (0-1A*)	23.1 (0.8*)	23.1 (0.8*)	21.9 (0.17*)	21.9 (0.17*)

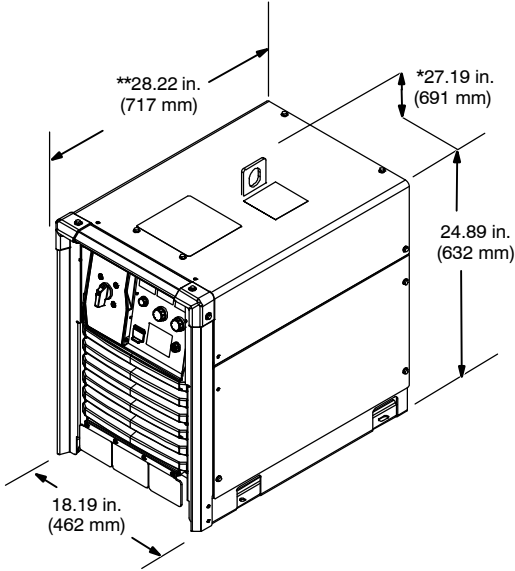
*While idling; Input amperage fluctuates while idling and is always less than one Ampere. Use one Ampere for power efficiency calculations.

4-5. Dimensions And Weight

Hole Layout Dimensions	
A	17.52 in. (445 mm)
B	17.33 in. (441 mm)
C	26.17 in. (665 mm)
D	16.09 in. (409 mm)
E	2.28 in. (58 mm)
F	.47 in. (12 mm)
G	.47 x 1 in. (12 x 25mm)
Weight	
350 Model: 127 lb (58 kg)	
500 Model: 148 lb (67 kg)	
Lifting Eye Weight Rating: 1000 lb (453 kg) Maximum	



Side view diagram of the welding power source. Dimensions are labeled as follows: A (width), B (height from base to top of mounting holes), C (total height), D (width of mounting holes), E (height from base to mounting holes), F (height of base), and G (height of mounting holes).



Isometric view diagram of the welding power source. Dimensions are labeled as follows: **28.22 in. (717 mm) (width), *27.19 in. (691 mm) (height), 24.89 in. (632 mm) (height), and 18.19 in. (462 mm) (width).

*Height includes lifting eye

**Length includes E-Stop cover

278352-C

4-6. Static Characteristics

The static (output) characteristics of the welding power source can be described as *flat* during the GMAW process and *drooping* during the CAC-A process. Static characteristics are also affected by control settings (including software), electrode, shielding gas, weldment material, and other factors. Contact the factory for specific information on the static characteristics of the welding power source.

4-7. Environmental Specifications

A. IP Rating

IP Rating
IP23S
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.
IP23S 2014-06

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 does not comply with IEC 61000-3-12. If it is connected to a public low voltage system, it is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment can be connected. IEC/TS 61000-3-4 can be used to guide parties concerned by the installation of arc welding equipment with an input current greater than 16 A in a low voltage network.	ce-emc 2 2014-07
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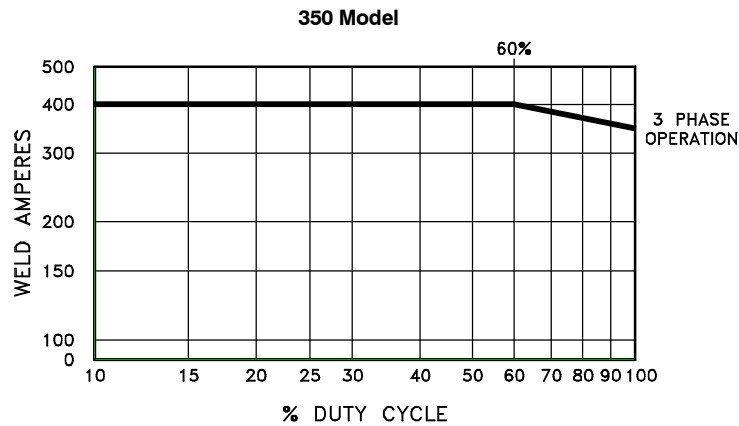
C. Temperature Specifications

Operating Temperature Range	Storage Temperature Range
14 to 104 °F (–10 to 40°C)	–4 to 131 °F (–20 to 55°C)
Temp_2016-07	

D. China EEP Hazardous Substance Information

中国电器电子产品中有害物质的名称及含量 China EEP Hazardous Substance Information						
部件名称 Component Name (如果适用) (if applicable)	有害物质 Hazardous Substance					
	铅 Pb	汞 Hg	镉 Cd	六价铬 Cr6	多溴联苯 PBB	多溴二苯醚 PBDE
黄铜和铜部件 Brass and Copper Parts	X	O	O	O	O	O
耦合装置 Coupling Devices	X	O	O	O	O	O
开关装置 Switching Devices	O	O	X	O	O	O
线缆和线缆配件 Cable and Cable Accessories	X	O	O	O	O	O
电池 Batteries	X	O	O	O	O	O
本表格依据中国SJ/T 11364的规定编制。 This table is prepared in accordance with China SJ/T 11364.						
O: 表示该有害物质在该部件所有均质材料中的含量均在中国GB/T26572规定的限量要求以下。 Indicates that the concentration of the Hazardous Substance in all homogeneous materials of the part is below the relevant threshold of China GB/T 26572.						
X: 表示该有害物质至少在该部件的某一均质材料中的含量超出中国GB/T26572规定的限量要求。 Indicates that the concentration of the Hazardous Substance in at least one homogeneous material of the part is above the relevant threshold of China GB/T 26572.						
电器电子产品的环保使用期限依据中国SJ/Z11388的规定确定。 The EFUP value of this EEP is defined in accordance with China SJ/Z 11388.					EEP_2016-06	

4-8. Duty Cycle And Overheating

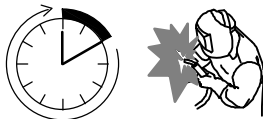


Duty Cycle is percentage of 10 minutes that unit can weld at rated load without overheating.

If unit overheats, thermostat(s) opens, output stops, and cooling fan runs. Wait fifteen minutes for unit to cool. Reduce amperage or duty cycle before welding.

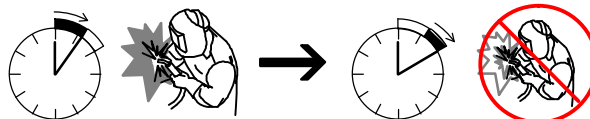
NOTICE – Exceeding duty cycle can damage unit and void warranty.

100% Duty Cycle At 350 Amperes



Continuous Welding

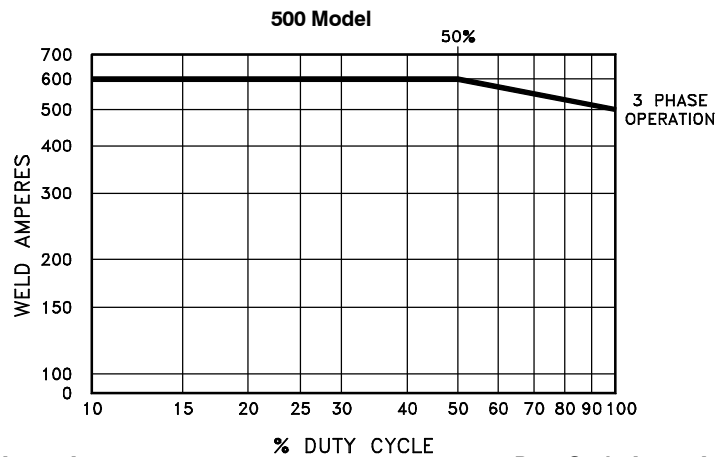
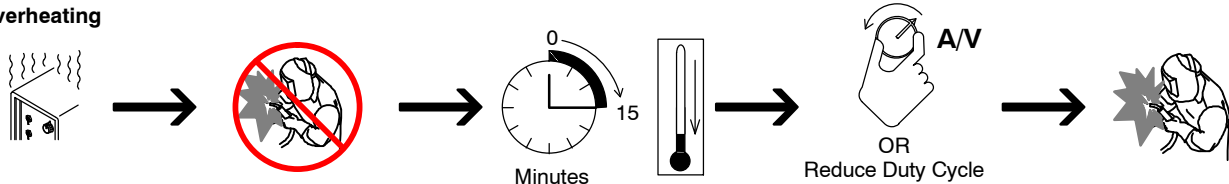
60% Duty Cycle At 400 Amperes



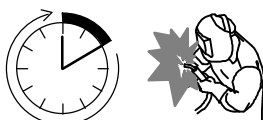
6 Minutes Welding

4 Minutes Resting

Overheating

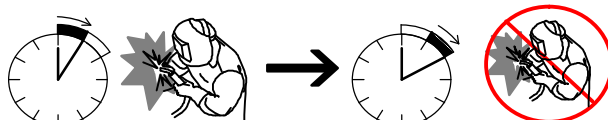


100% Duty Cycle At 500 Amperes



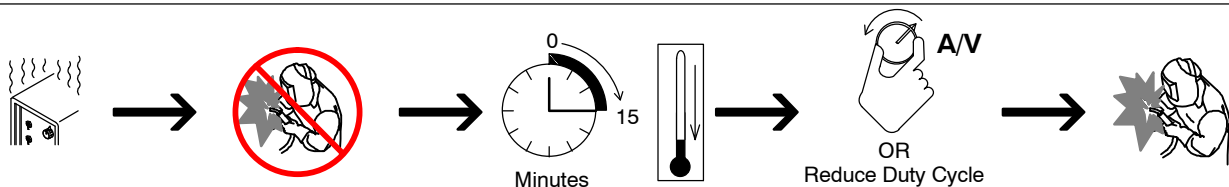
Continuous Welding

50% Duty Cycle At 600 Amperes



5 Minutes Welding

5 Minutes Resting

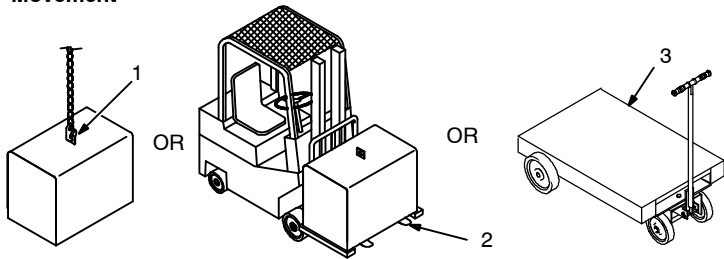


SECTION 5 – INSTALLATION

5-1. Selecting A Location



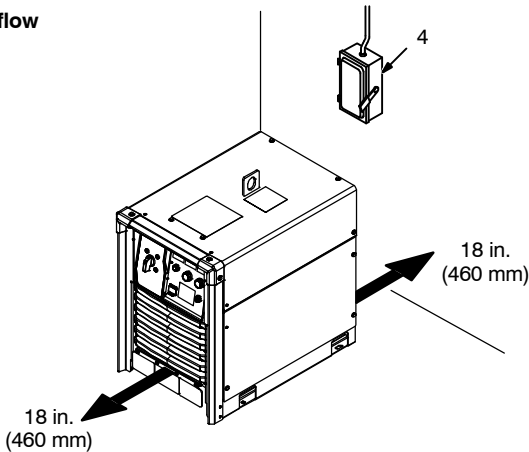
Movement



OR

OR

Location And Airflow



18 in.
(460 mm)

18 in.
(460 mm)

4

Do not move or operate unit where it could tip.



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

Do not stack units. Beware of tipping.

1 Lifting Eye
2 Lifting Forks
Use lifting eye or lifting forks to move unit.
If using lifting forks, extend forks beyond opposite side of unit.

3 Hand Cart
Use cart or similar device to move unit.

4 Line Disconnect Device
Locate unit near correct input power supply.

Loc_continuum 2018-08

Notes

Visit www.youtube.com/MillerWelders for informational videos.



5-2. Weld Output Terminals And Selecting Cable Sizes*

NOTICE – The Total Cable Length in Weld Circuit (see table below) is the combined length of both weld cables. For example, if the power source is 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.

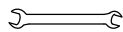
Welding Amperes	Weld Cable Size** and Total Cable (Copper) Length in Weld Circuit Not Exceeding***							
	100 ft (30 m) or Less		150 ft (45 m)	200 ft (60 m)	250 ft (70 m)	300 ft (90 m)	350 ft (105 m)	400 ft (120 m)
	10 – 60% Duty Cycle AWG (mm ²)	60 – 100% Duty Cycle AWG (mm ²)	10 – 100% Duty Cycle AWG (mm ²)					
100	4 (20)	4 (20)	4 (20)	3 (30)	2 (35)	1 (50)	1/0 (60)	1/0 (60)
150	3 (30)	3 (30)	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	3/0 (95)
200	3 (30)	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	4/0 (120)
250	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2x2/0 (2x70)	2x2/0 (2x70)
300	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2x2/0 (2x70)	2x3/0 (2x95)	2x3/0 (2x95)
350	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2x2/0 (2x70)	2x3/0 (2x95)	2x3/0 (2x95)	2x4/0 (2x120)
400	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2x2/0 (2x70)	2x3/0 (2x95)	2x4/0 (2x120)	2x4/0 (2x120)
500	2/0 (70)	3/0 (95)	4/0 (120)	2x2/0 (2x70)	2x3/0 (2x95)	2x4/0 (2x120)	3x3/0 (3x95)	3x3/0 (3x95)
600	3/0 (95)	4/0 (120)	2x2/0 (2x70)	2x3/0 (2x95)	2x4/0 (2x120)	3x3/0 (3x95)	3x4/0 (3x120)	3x4/0 (3x120)
* This chart is a general guideline and may not suit all applications. If cable overheats, use next size larger cable. **Weld cable size (AWG) is based on either a 4 volts or less drop or a current density of at least 300 circular mils per ampere. () = mm² for metric use ***For distances longer than those shown in this guide, see AWS Fact Sheet No 39, Welding Cables, available from the American Welding Society at http://www.aws.org.								

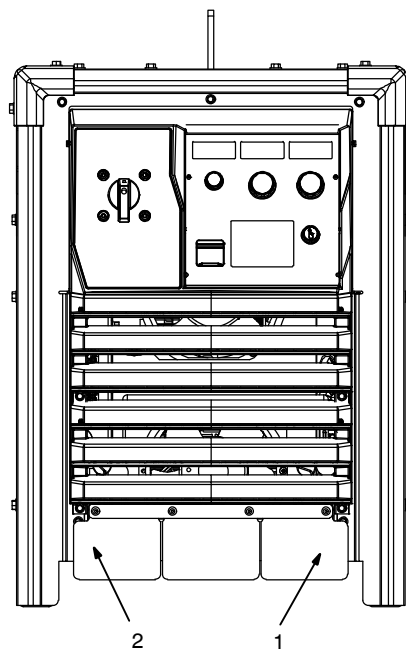
Ref. S-0007-L 2017-08

Notes

5-3. Connecting Weld Output Cables



Tools Needed:
 3/4 in. (19 mm) for output terminal type connection



Front View

⚠ Turn off power before connecting to weld output terminals or receptacles.

⚠ Do not use worn, damaged, undersized, or repaired cables.

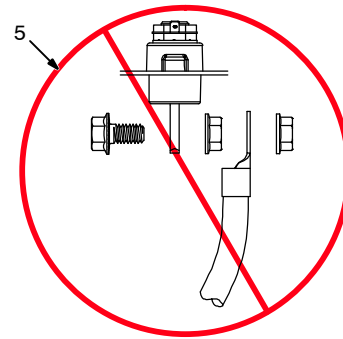
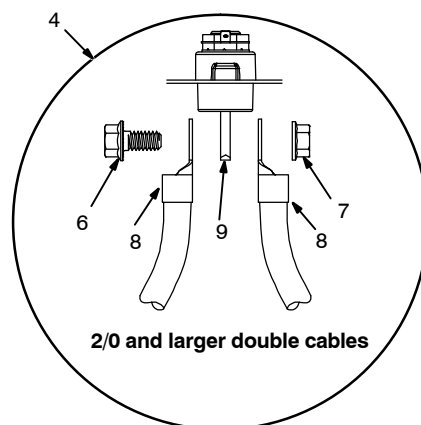
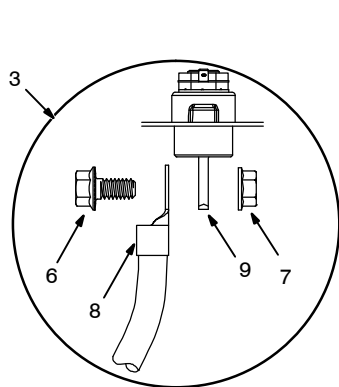
⚠ Failure to properly connect weld cables may cause excessive heat and start a fire, or damage your machine.

Ensure all connections are tight.

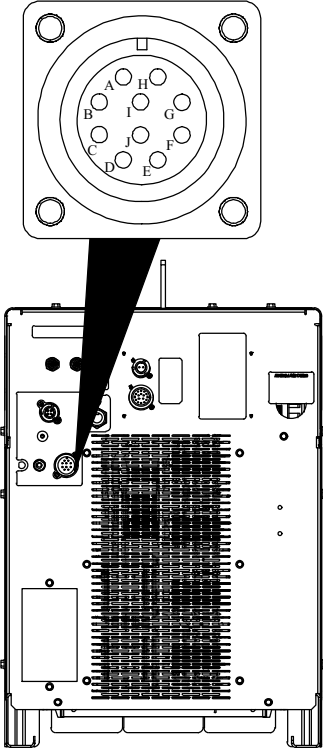
 Do not place anything between weld cable terminal and output terminal. Make sure that the surfaces of the weld cable terminal and output terminal are clean.

- 1 Negative (-) Output Terminal, located under stud cover.
- 2 Positive (+) Output Terminal, located under stud cover.
- 3 Correct Weld Cable Connection For Single Feeder
- 4 Correct Weld Cable Connection For 2/0 And Larger Double Cables
- 5 Incorrect Weld Cable Connection
- 6 Weld Output Terminal Bolt
- 7 Nut
- 8 Weld Cable Terminal
- 9 Output Terminal

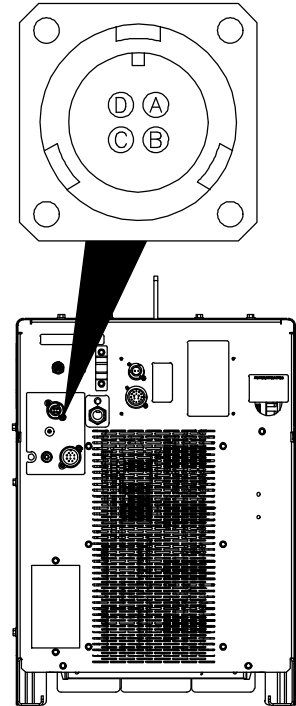
Remove supplied nut and bolt from weld output terminal. Insert bolt through hole in weld cable terminal and hole in weld output terminal. Screw nut onto bolt until weld cable terminal is tight against output terminal. Torque to 45-55 ft lb (61-75 N·m).



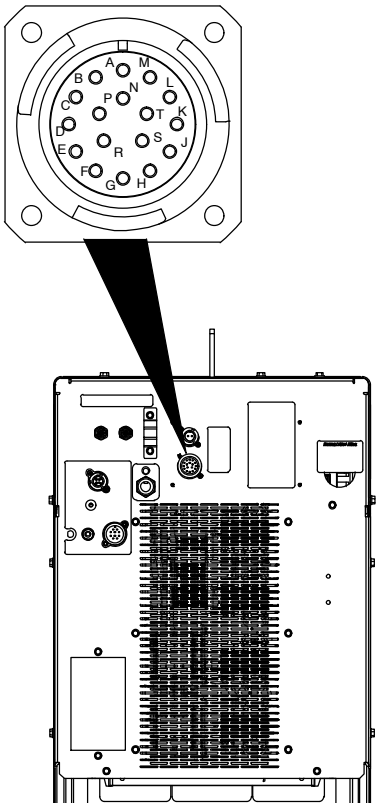
5-4. Remote 10 Wire Feeder Control Receptacle RC2 Information

 278352-C	Socket	Socket Information
	A	+50 Volts DC Common
	B	+50 Volts DC Common
	C	Voltage Sense
	D	+50 Volts DC Power
	E	+50 Volts DC Power
	F	ENET Rx -
	G	ENET Tx -
	H	Drain
	I	ENET Tx +
	J	ENET Rx +

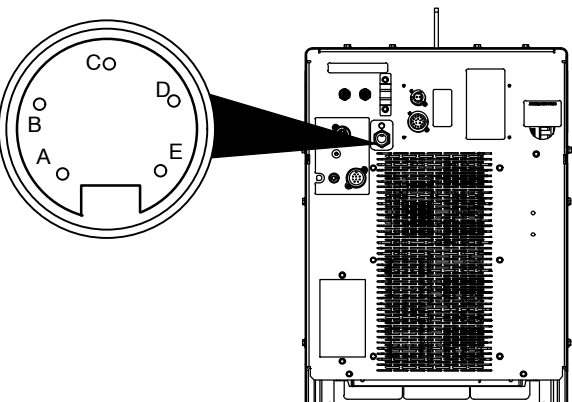
5-5. Volt Sense Receptacle RC3 Information

 278352-C	Socket	Socket Information
	A	Not Used
	B	Volt Sense Negative
	C	Not Used
	D	Not Used

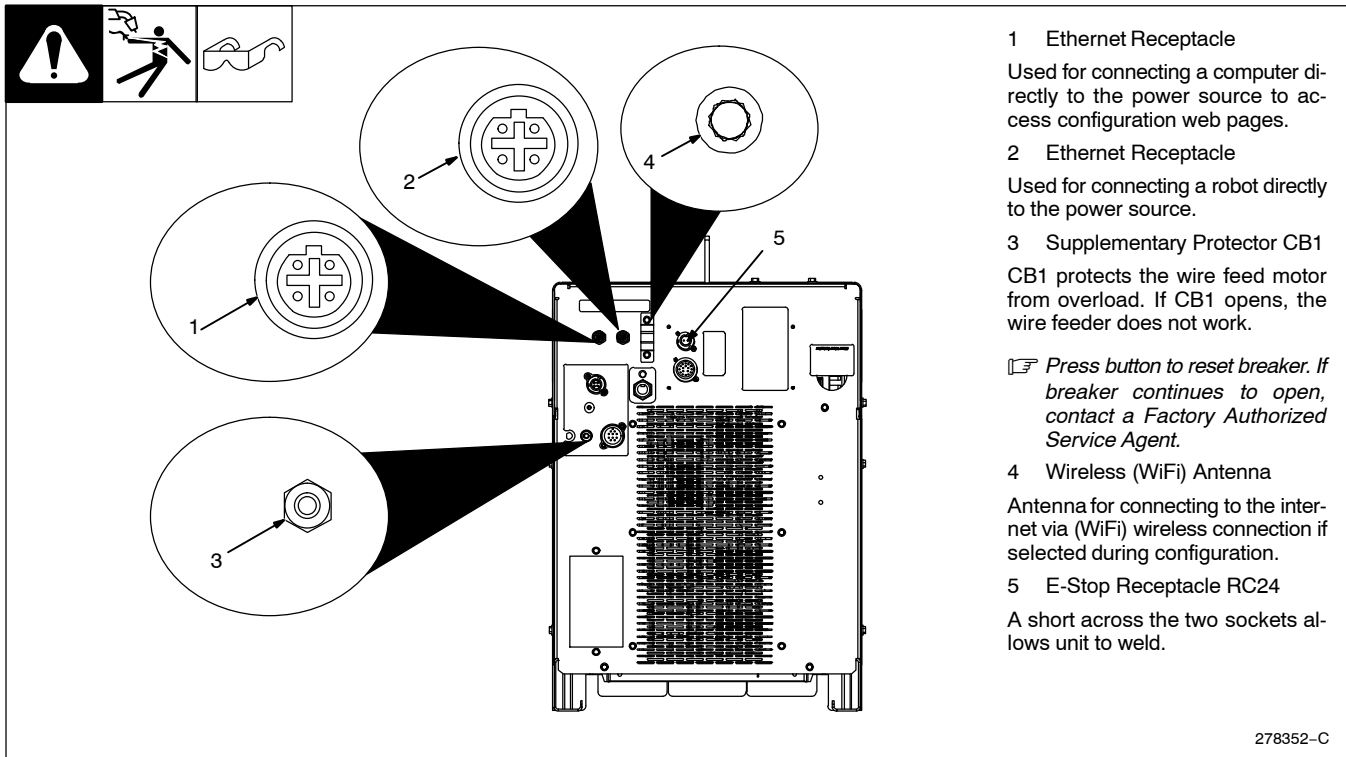
5-6. Peripheral Receptacle RC22 Functions

 278352-C	Socket	Ref. Com	Socket Information
	A		Output common
	B	Closure when weld contactor on	Digital output 1 (DO1)
	C	Not defined	Digital output 2 (DO2)
	D	Closure to signal when touched	Digital output 3 (DO3)
	E		Not Used
	F	Circuit common for AIM board	Chassis ground
	G		Input common
	H	*Turn on Touch Sense with +24 VDC	Request to turn on Touch Sense (DI1)
	J	Not defined	Digital input 2 (DI2)
	K	Not defined	Digital input 3 (DI3)
	L		Not Used
	M		Not Used
	N	+24 VDC output goes high when touched	Touched hardware signal 14 ohm impedance
	P		Not Used
	R		Not Used
	S		Not Used
	T		Not Used

5-7. Devicenet Receptacle

 Ref. 278352-C	Socket	Socket Information
	A	Chassis Ground
	B	+24 volts DC; Available Current Is 1 Ampere
	C	+24 volts DC Common
	D	CAN H
	E	CAN L

5-8. Supplementary Protector CB1, Communication Panel, And E-Stop



Notes

5-9. Electrical Service Guide

Elec Serv 2017-01



Failure to follow these electrical service guide recommendations could create an electric shock or fire hazard. These recommendations are for a dedicated circuit sized for the rated output and duty cycle of the welding power source.

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.

NOTICE – **INCORRECT INPUT POWER** can damage this welding power source. This welding power source requires a **CONTINUOUS** supply of input power at rated frequency ($\pm 10\%$) and voltage ($\pm 10\%$). Phase to ground voltage shall not exceed $+10\%$ of rated input voltage. Do not use a generator with automatic idle device (that idles engine when no load is sensed) to supply input power to this welding power source.

Actual input voltage should not exceed $\pm 10\%$ of indicated required input voltage. If actual input voltage is outside of this range, output may not be available.

350 Model	50/60 Hz Three Phase	
Input Voltage (V)	380	400
Input Amperes (A) At Rated Output	20.4	19.2
Max Recommended Standard Fuse Rating In Amperes ¹		
Time-Delay Fuses ²	30	30
Normal Operating Fuses ³	40	35
Min Input Conductor Size In AWG (mm ²) ⁴	10 (5.26)	10 (5.26)
Max Recommended Input Conductor Length In Feet (Meters)	214 (65)	238 (73)
Min Grounding Conductor Size In AWG (mm ²) ⁴	10 (5.26)	10 (5.26)

500 Model	50/60 Hz Three Phase	
Input Voltage (V)	380	400
Input Amperes (A) At Rated Output	34.9	33.2
Max Recommended Standard Fuse Rating In Amperes ¹		
Time-Delay Fuses ²	50	50
Normal Operating Fuses ³	70	70
Min Input Conductor Size In AWG (mm ²) ⁴	8 (8.37)	8 (8.37)
Max Recommended Input Conductor Length In Feet (Meters)	180 (55)	198 (60)
Min Grounding Conductor Size In AWG (mm ²) ⁴	8 (8.37)	8 (8.37)

Reference: 2017 National Electrical Code (NEC) (including article 630)

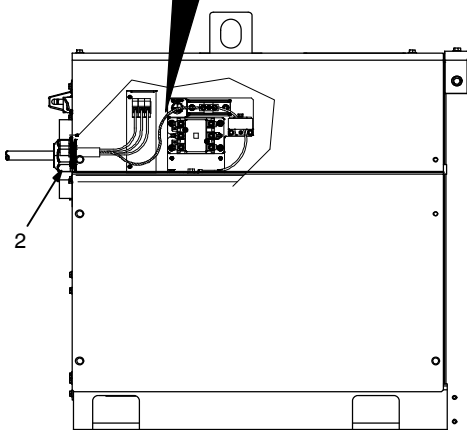
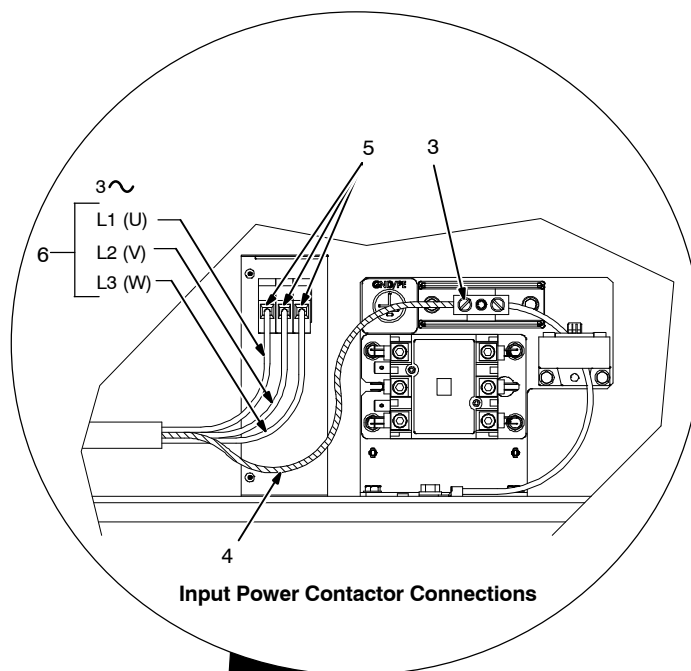
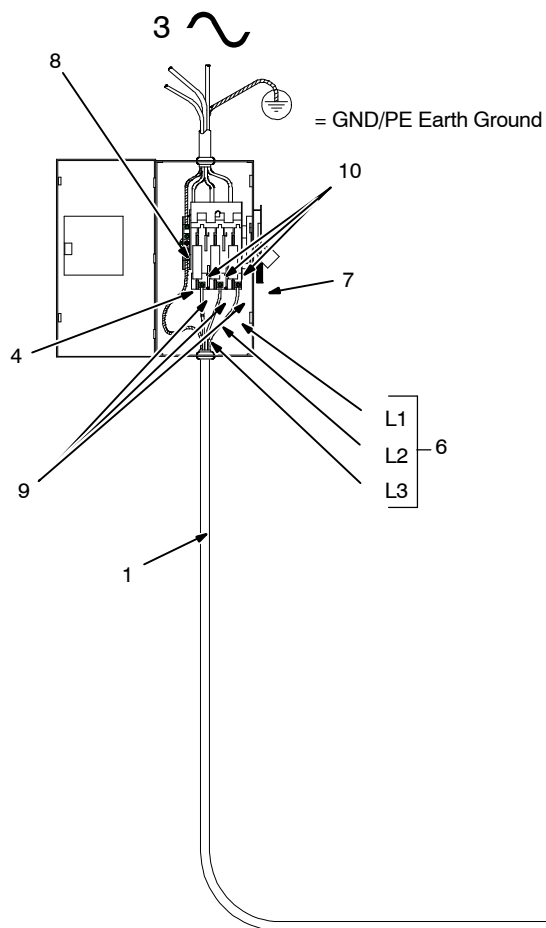
1 If a circuit breaker is used in place of a fuse, choose a circuit breaker with time-current curves comparable to the recommended fuse.

2 "Time-Delay" fuses are UL class "RK5" . See UL 248.

3 "Normal Operating" (general purpose - no intentional delay) fuses are UL class "K5" (up to and including 60 amps), and UL class "H" (65 amps and above).

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) and is based on allowable ampacities of insulated copper conductors having a temperature rating of 167°F (75°C) with not more than three single current-carrying conductors in a raceway. 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.

5-10. Connecting 3-Phase Input Power



Side View Of Unit

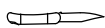
Tools Needed:



3/8 in.



3/16 in.



input5 2013-04 / 277114-B / 278352-C

5-11. Connecting 3-Phase Input Power (Continued)



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

⚠ Disconnect and lockout/tagout input power before connecting input conductors from unit. Follow established procedures regarding the installation and removal of lockout/tagout devices.

⚠ Make input power connections to the welding power source first.

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

NOTICE – The Auto-Line circuitry in this unit automatically adapts the power source to the primary voltage being applied. Check input voltage available at site. This unit can be connected to any 3-phase input power between 230 and 575 VAC without removing cover to relink the power source.

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

1 Input Power Conductors (Customer Supplied Cord)

Select size and length of conductors using Section 5-10. Conductors must comply with national, state, and local electrical codes. If applicable, use lugs of proper amperage capacity and correct hole size.

Welding Power Source Input Power Connections

2 Strain Relief Kit 274563 Supplied With Machine

Install strain relief of proper size for unit and input conductors. Route conductors (cord) through strain relief. Tighten strain relief.

3 Welding Power Source Grounding Terminal

4 Green Or Green/Yellow Grounding Conductor

Route green or green/yellow grounding conductor through current transducer and connect to welding power source grounding terminal first..

5 Welding Power Source Line Terminals

6 Input Conductors L1, L2, L3

Connect input conductors L1, L2, and L3 to welding power source line terminals.

Reinstall top cover on welding power source.

Disconnect Device Input Power Connections

7 Disconnect Device (switch shown in the OFF position)

8 Disconnect Device Grounding Terminal

9 Disconnect Device Line Terminals

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

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

10 Over-Current Protection

Select type and size of over-current protection using Section 5-10 (fused disconnect switch shown).

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

Input5 2013-04

Notes



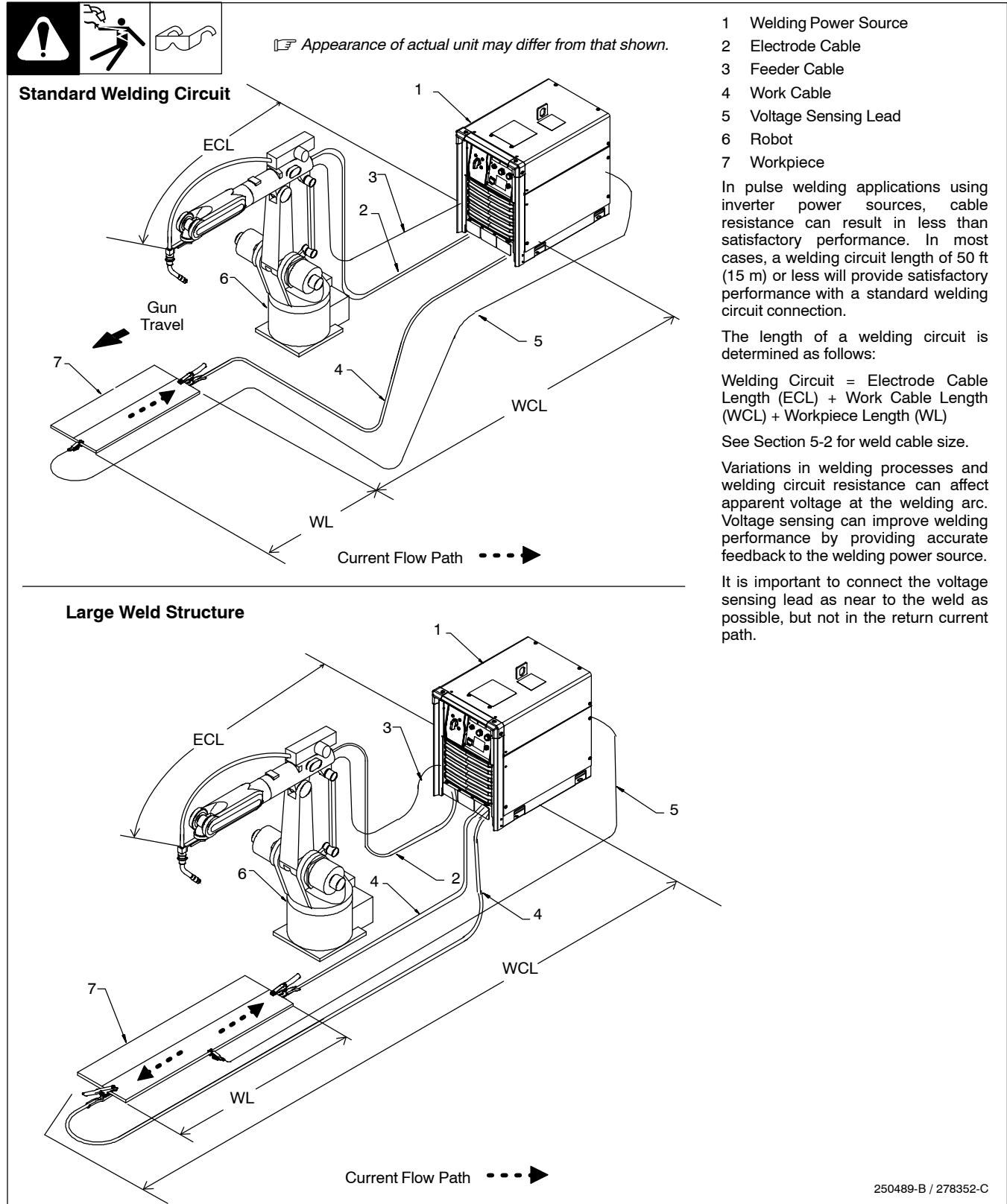
Work like a Pro!

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

SECTION 6 – RECOMMENDED SET-UP PROCEDURES

6-1. Welding Circuit

☞ Minimizing the welding circuit loop can prevent extreme voltage drops that produce poor welding characteristics.



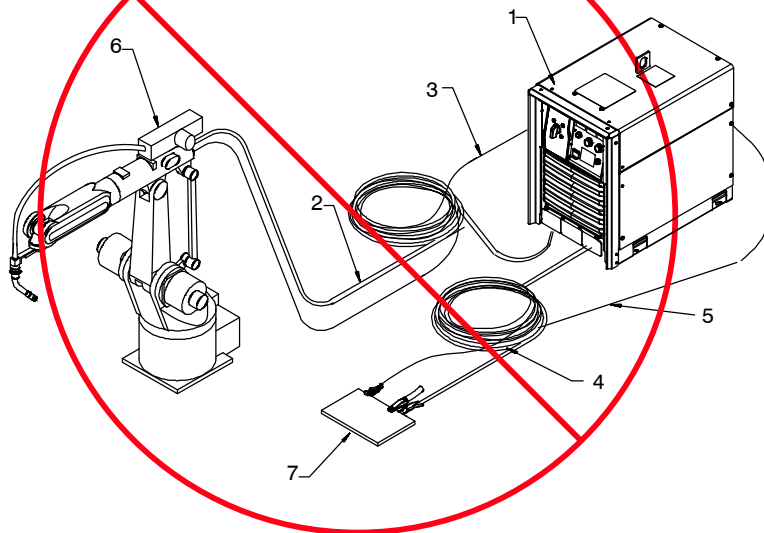
250489-B / 278352-C

6-2. Arranging Welding Cables To Reduce Welding Circuit Inductance



☞ Appearance of actual unit may differ from that shown.

Bad



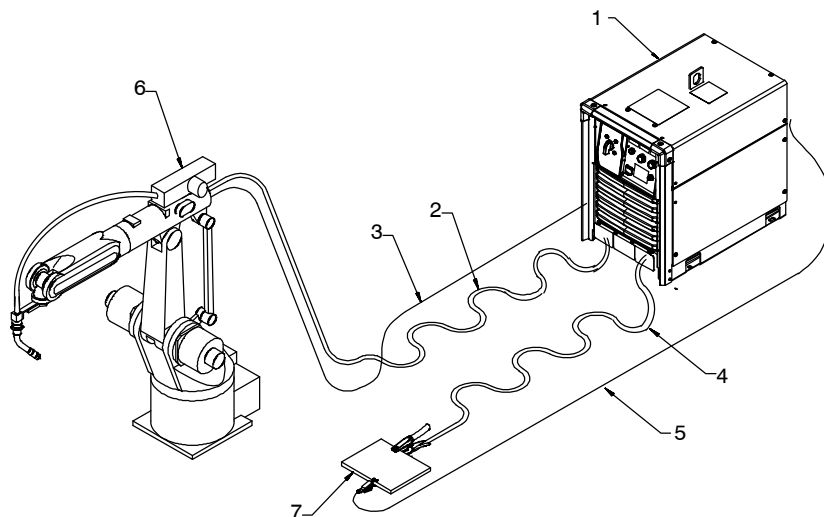
- 1 Welding Power Source
- 2 Electrode Cable
- 3 Feeder Cable
- 4 Work Cable
- 5 Voltage Sensing Lead
- 6 Robot
- 7 Workpiece

The arrangement of the cables has an effect that is significant to the welding properties. As an example, Accupulse and RMD welding processes can produce high welding circuit inductance depending on cable length and arrangement. This can result in limited current rise during droplet transfer into the welding puddle.

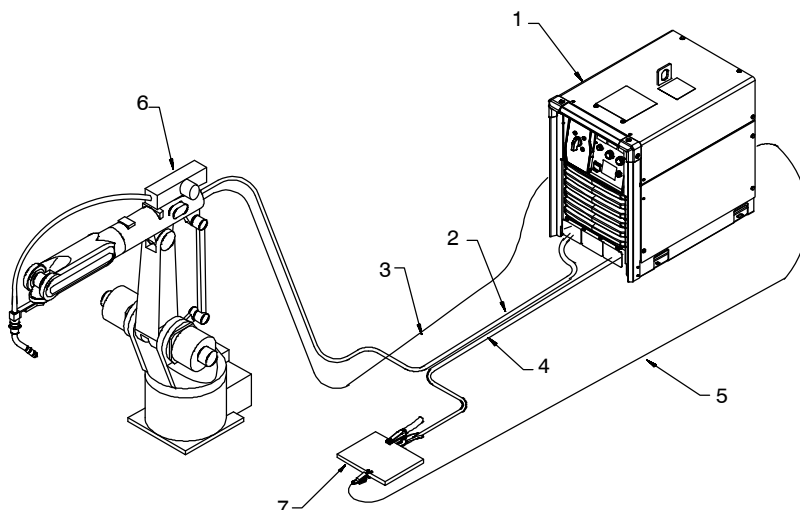
The Vsense option can be turned On or Off in the Setup menu or by using the web pages. The electrode sense lead is contained in the feeder control cable and compensates for voltage drop in all semi-automatic processes when the Vsense option is On. The work sense lead connects to the Axxess welding power source 4-pin connector located above the negative output terminal. This work sense lead compensates for work cable voltage drop when connected to the welding power source when the Vsense option is On.

Do not coil excess cables. Use cables that are the appropriate length for the application. Whenever using long weld cables [longer than 50 ft (15 m)] try to arrange positive and negative weld cables together to reduce the magnetic field surrounding the cables. Avoid coupling the feeder and work sense leads with the weld cables.

Better



Best

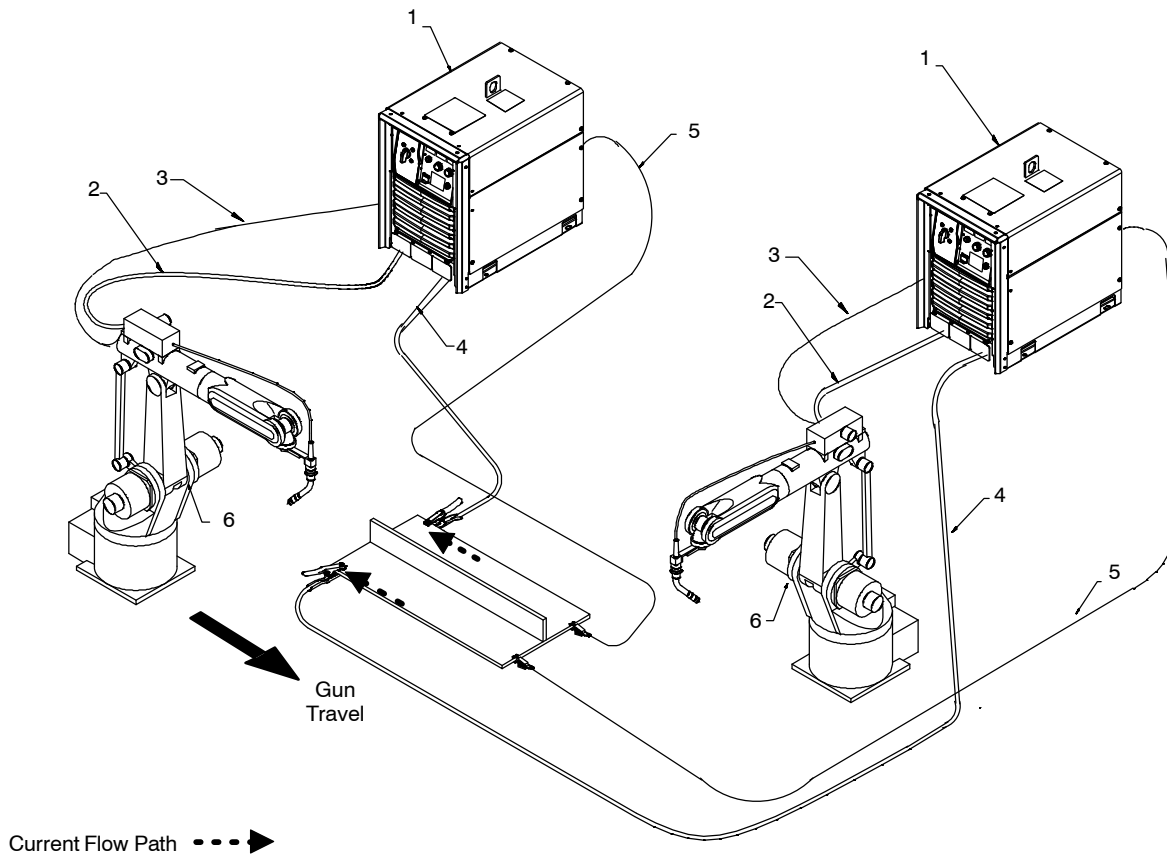


250503-B / 278352-C

6-3. Using Multiple Welding Power Sources



☞ Appearance of actual unit may differ from that shown.



Current Flow Path - - - ➔

250504-B / 278352-C

- 1 Welding Power Source
- 2 Electrode Cable
- 3 Feeder Cable
- 4 Work Cable
- 5 Voltage Sensing Lead
- 6 Robot
- 7 Workpiece

Each welding power source should have a separate work cable connection to the workpiece. Do not stack or join work cables together at the workpiece. This is very important for pulse welding applications.

It is important to connect the voltage sensing lead as near to the weld as

possible, but not in the return current path.

Connect voltage sensing lead at the end of the weld joint.

The direction of the welding path should be away from the work cable connections.

Connect work clamp at the beginning of the weld joint.

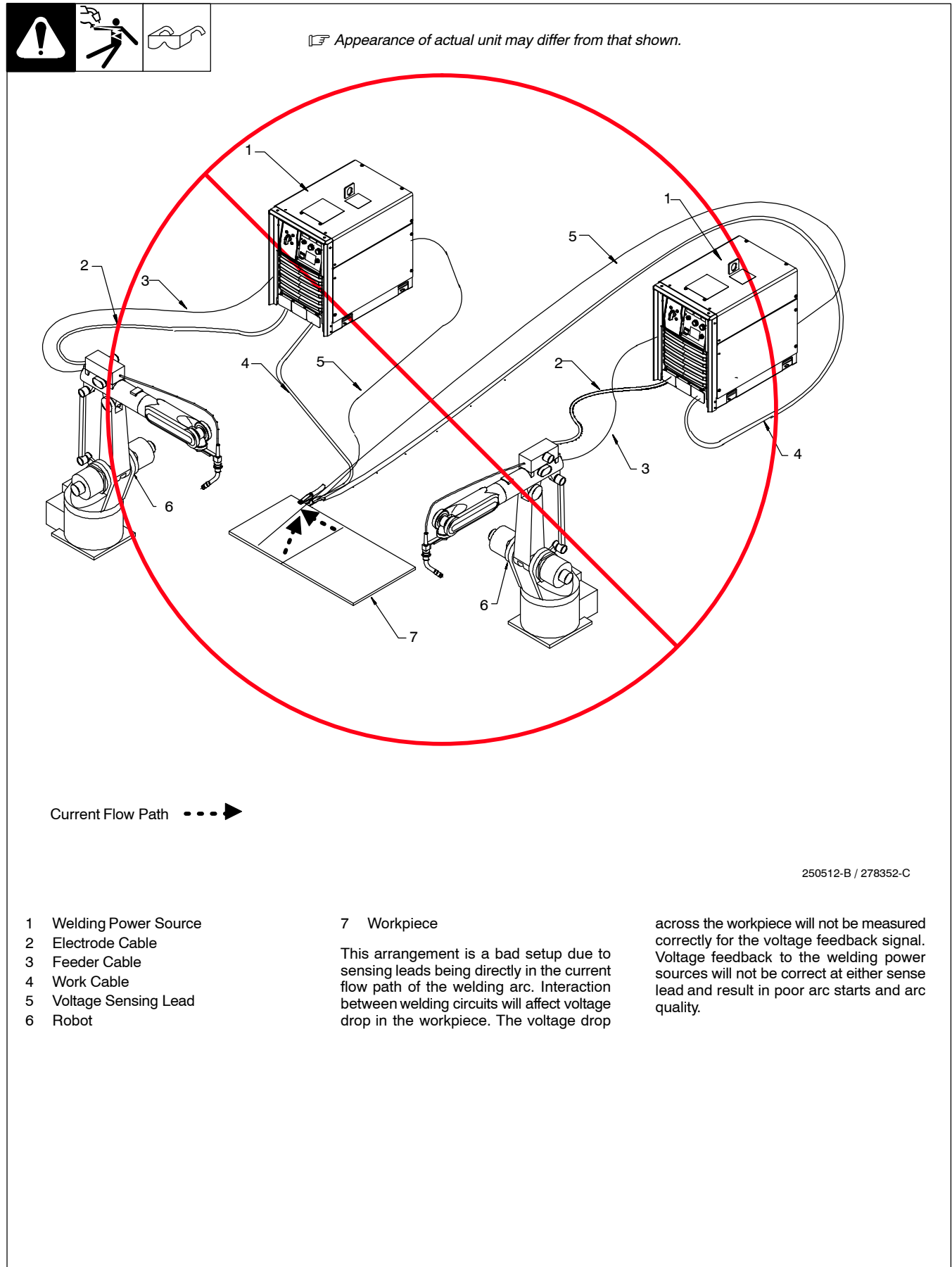
Each welding gun should have its own source of shielding gas. Use a separate shielding gas regulator and shielding gas connection for each welding gun.

Arc blow is the deflection of a welding arc from its normal path due to magnetic forces. It will adversely affect the appearance of a weld, cause excessive spatter, and impair the quality of a weld.

Arc blow occurs primarily during the welding of steel or ferromagnetic metals. Weld current will take the path of least resistance, but not always the most direct path through the workpiece to the work lead connection. The most intense magnet force will be around the arc due to a difference in resistance for the magnetic path in the base metal. The work clamp connection is important and should be placed at the starting point of a weld. It is recommended to have as short of an arc as possible so that there is less of an arc for the magnetic forces to control. Conditions affecting the magnetic force acting on the arc vary so widely that the reference here is only about cabling connections and arc preferences.

6-4. Voltage Sensing Lead And Work Cable Connections For Multiple Welding Arcs

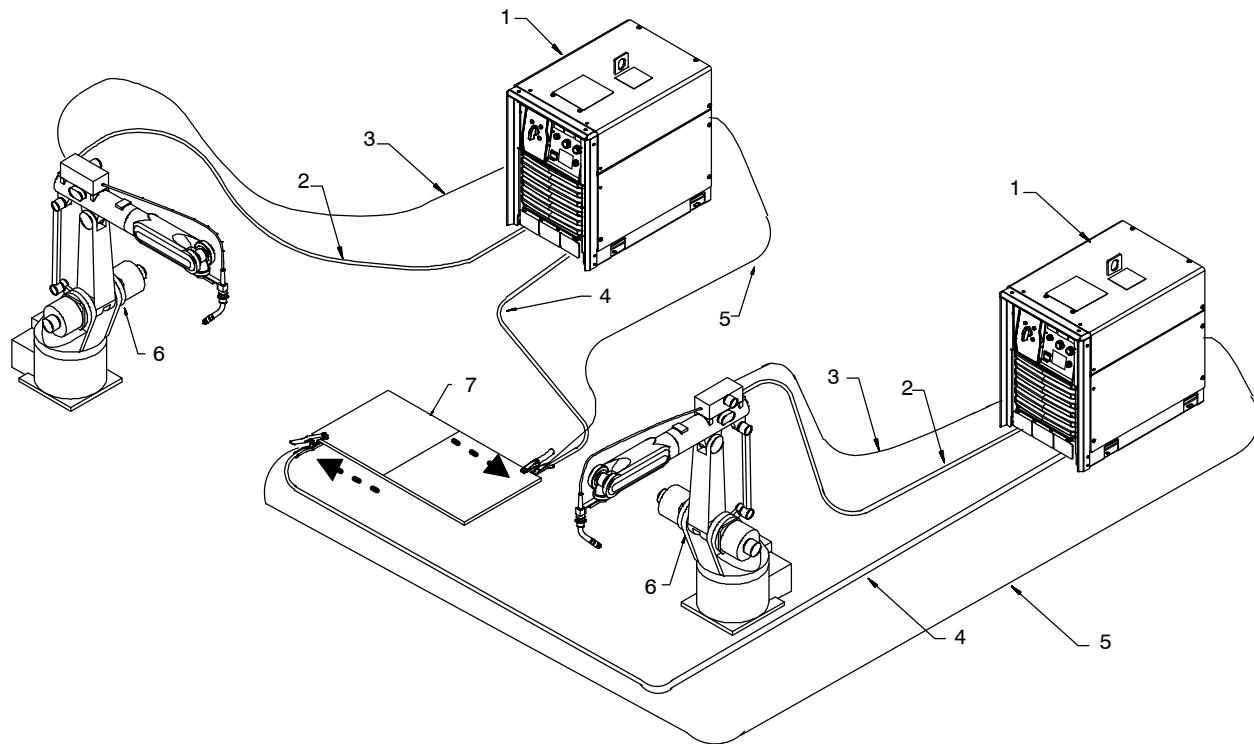
A. Bad Setup



B. Better Setup



 Appearance of actual unit may differ from that shown.



Current Flow Path - - - ➔

250513-B / 278352-C

- 1 Welding Power Source
- 2 Electrode Cable
- 3 Feeder Cable
- 4 Work Cable
- 5 Voltage Sensing Lead

- 6 Robot
- 7 Workpiece

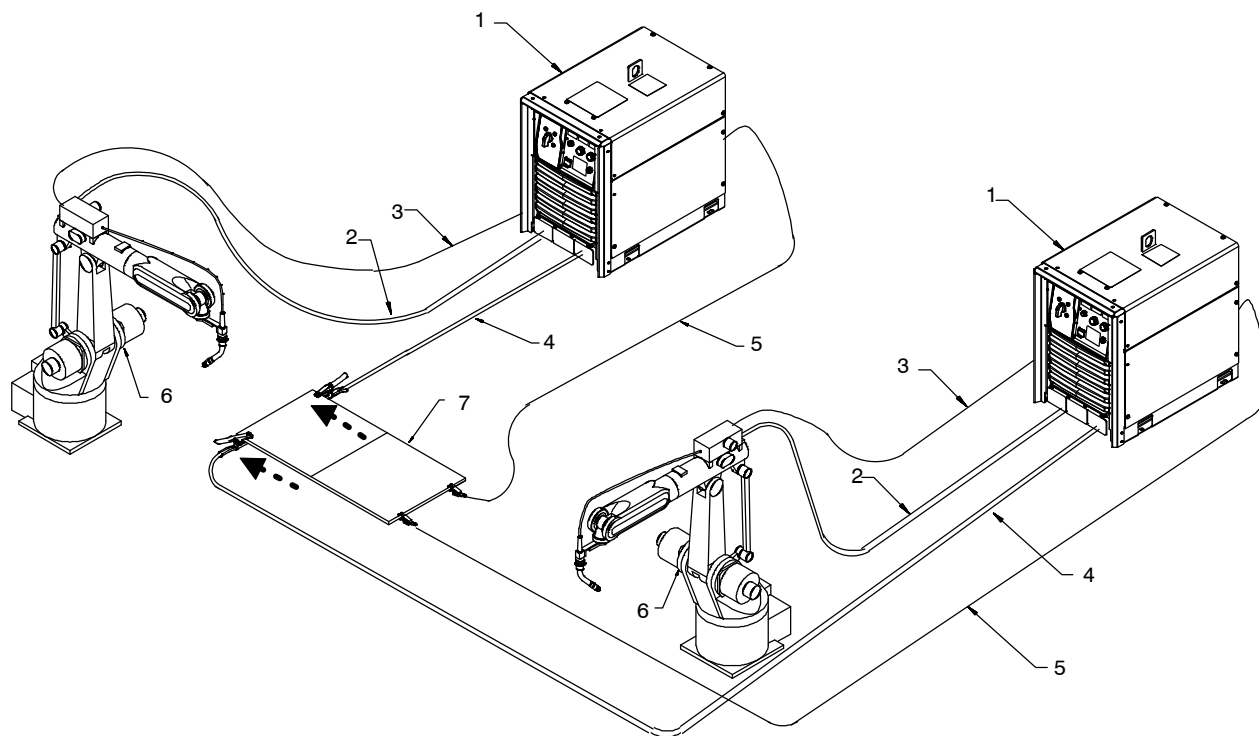
This arrangement is a better setup for supporting separate voltage feedback to

the welding power sources. The most accurate voltage sensing may not be achieved due to voltage drops in the workpiece. This may require compensation in the welding parameters.

C. Best Setup



 Appearance of actual unit may differ from that shown.



Current Flow Path - - - ➔

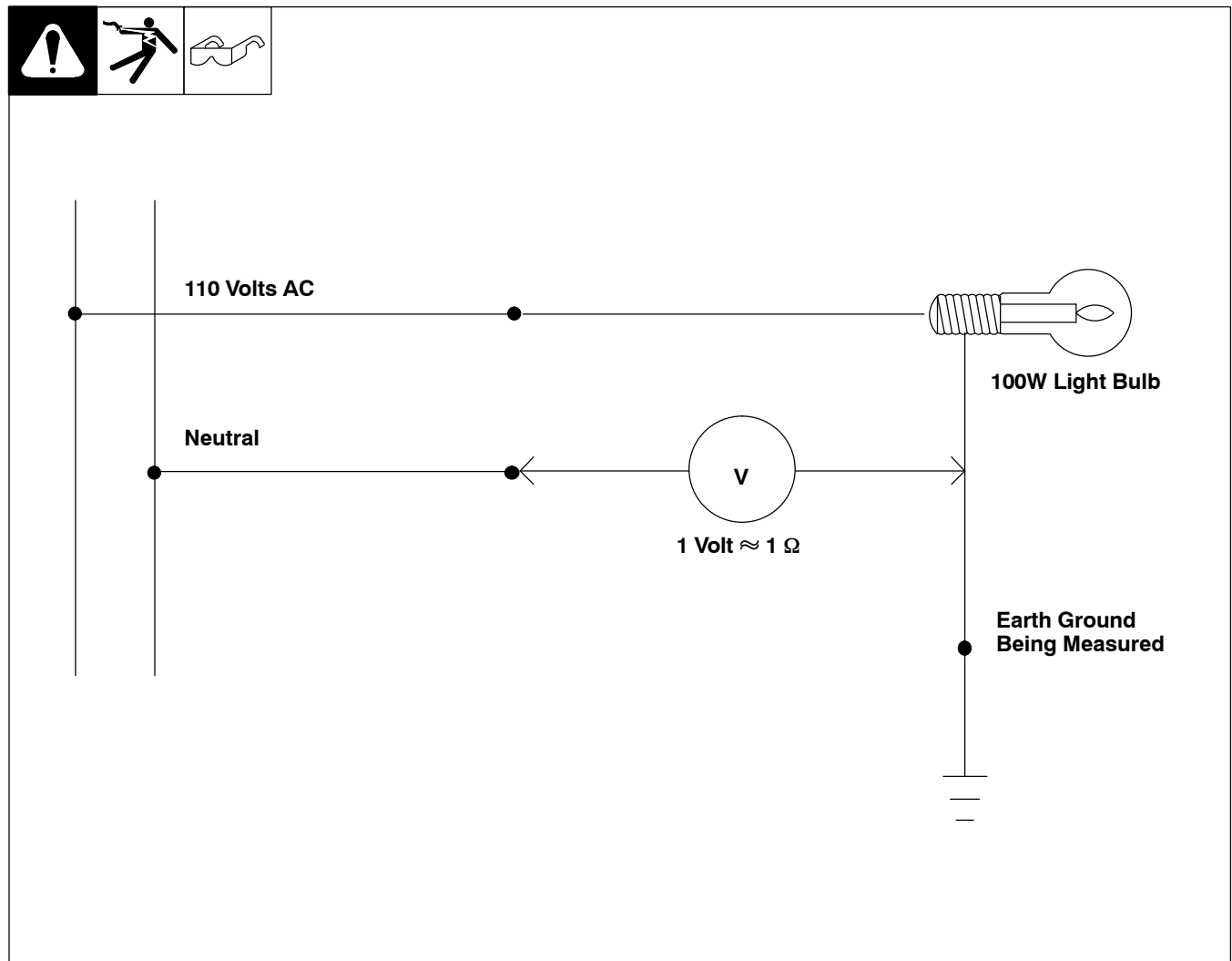
250515-B / 278352-C

- | | |
|------------------------|------------------------|
| 1 Welding Power Source | 5 Voltage Sensing Lead |
| 2 Electrode Cable | 6 Robot |
| 3 Feeder Cable | 7 Workpiece |
| 4 Work Cable | |

This arrangement is the best setup for proper voltage sensing at the workpiece. Voltage feedback to the welding power sources will more accurate and result in reliable arc starts and better arc quality.

6-5. Earth Grounding

When using a robot or any programmable controls, it is necessary to connect equipment to a good earth ground. Grounding helps eliminate electrically generated noise from corrupting processing data or the potential damage to sensitive electrical components. Electrical noise is an issue anytime high frequency TIG equipment or inverter type power supplies are used in the area. A method for checking for a good earth ground is shown below. Also, be sure to a good connection to the earth ground.



Measuring Facility (Earth) Ground Resistance

The resistance of an earth ground can be measured using a 100W light bulb, an ac voltmeter and a 110 volts AC electrical drop. As shown in the circuit, the 110 volts AC (hot) supply and the 100W light bulb approximate a 1 ampere current source when the light bulb circuit is completed by connecting to the earth ground. The AC voltmeter, referenced to the AC neutral line, can then be used to measure the voltage rise due to the 1 ampere current source through earth ground. Each volt of rise on the earth ground represents 1 ohm of resistance. A resistance of less than 10 ohms at the earth ground should be adequate.

IMPORTANT: DO NOT mount anything to robot control cabinet.

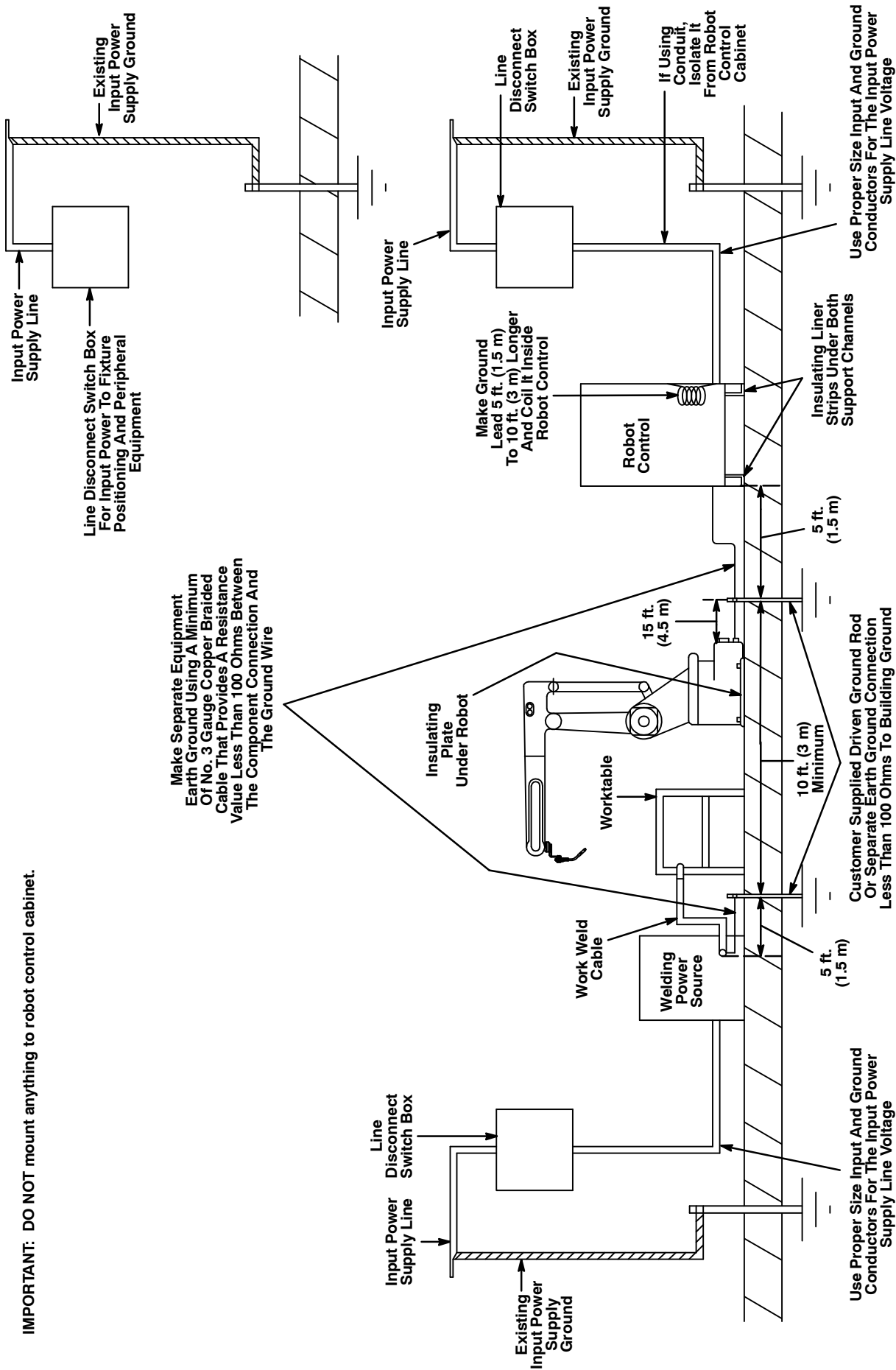


Figure 9-1. Earth Ground Connections To Stationary Robot System Components

6-6. 30 Points Of Mechanics In MIG Welding

30 Pts MIG – 2014-09

Primary Power

- Check primary power connection at line disconnect switch or receptacle and/or cord plug.
- Check primary power connection at welding power source.

Secondary Power

- Check secondary weld output connections at welding power source.
- Inspect condition and routing of positive weld cable to wire drive motor.
- Check connection of positive weld cable to wire drive motor.
- Inspect condition and routing of negative weld cable to fixture.
- Check connection of negative weld cable to fixture.
- Inspect condition of any rotary grounds, grounding shoes or other auxiliary grounds.
- Check installation, routing and condition of welding gun.

Shielding Gas

- Check gas hose connection to shielding gas supply regulator.
- Check shielding gas flow rate.
- Check gas hose routing.
- Check gas hose connection at wire drive housing.
- Check gun connection at wire drive and be sure O-rings seal at drive housing.
- Check condition of gas diffuser.
- Check condition of nozzle.
- Check O-ring for proper sealing at nozzle.

Welding Wire

- Inspect condition of de-reeler. Check for wear at quick-connect coupling and replace if necessary.
- Check placement of payoff pack or drum for smooth feed path.
- Inspect condition and routing of input conduit.
- Check installation of quick-connect coupling at rear of wire drive so that it does not contact drive rolls. Check for wear and replace if necessary.
- Check drive rolls and replace if worn.
- Check for drive roll tension setting.
- Check intermediate guide for proper size to match wire size and replace if worn.
- Check for proper length of liner at both ends and be sure it is cut without burrs.
- Check liner for proper size to match wire size.
- Check liner for wear and clean out to prevent plugging.
- Check contact tip for proper size to match wire size.
- Check contact tip for wear and change at regular intervals.
- Check contact tip for a tight fit and secure installation at gun.

6-8. Basic Welding Troubleshooting

Listed below are some problems, causes and remedies related to welding operations; however, this list does not contain every possible condition that could be encountered in welding.

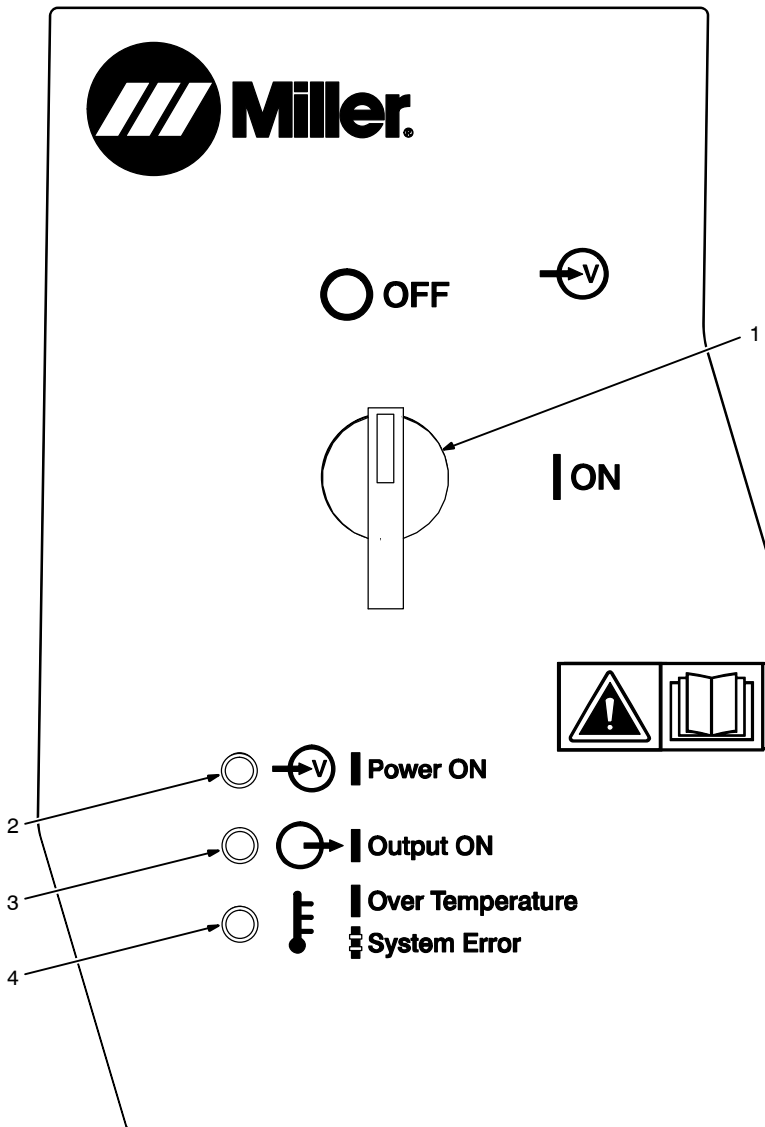
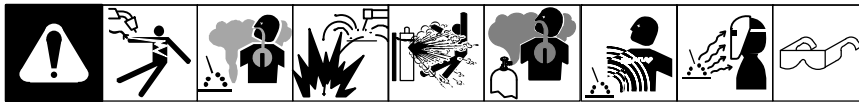
   		
Trouble	Probable Cause	Remedy
No weld output; unit completely inoperative.	Line disconnect switch in Off position.	Place switch in On position.
	Power source switch in Off position.	Place switch in On position.
	Primary power fuse blown or circuit breaker tripped.	Replace fuse or reset circuit breaker and check input voltage.
Weld output is present, but wire stops feeding while welding.	Wire feeder protective fuse blown or circuit breaker tripped.	Replace fuse or reset circuit breaker and find overload condition.
	Wire feeder drive rolls misaligned.	Align drive rolls.
	Wrong size drive rolls.	Replace with proper size drive rolls.
	Too much or too little drive roll pressure.	Adjust drive roll pressure.
	Too much tension set at wire spool.	Reduce wire spool tension.
	Restriction in unspooler or drum adapter.	Replace unspooler or repair restriction.
	Feeder motor burnt out.	Test motor and replace if necessary.
	Gun liner dirty or restricted.	Remove gun liner and clean or replace.
	Wrong type or size of liner.	Install proper size liner.
	Broken or damaged gun or torch.	Replace faulty parts.
	Contact tip opening restricted.	Replace contact tip.
	Wrong size or type of contact tip.	Replace with proper size and type contact tip.
	Sharp bends or kinks in gun cable or liner.	Straighten gun cable and/or replace liner.
	Gun overheating.	Use gun with proper amperage rating.
	Wrong size wire.	Match wire size to liner and contact tip.
	Guides rubbing on drive rolls.	Adjust or position guides properly.
	Drive rolls jammed.	Remove foreign object from gears.
	Motor cable disconnected or damaged.	Connect, repair or replace motor cable.

Trouble	Probable Cause	Remedy
Porosity in weld.	Dirty base metal, heavy oxides, mill scale, oil, etc.	Clean base metal by brushing, grinding or use chemical cleansing before welding.
	Regulator/flowmeter faulty.	Adjust or replace regulator/flowmeter.
	Gas cylinder valve closed.	Open gas cylinder valve.
	Gas regulator diaphragm defective.	Replace regulator.
	Flowmeter cracked or broken.	Repair or replace flowmeter.
	Gas hose disconnected or leaking.	Connect or replace gas hose.
	Too much or too little gas flow.	Adjust for proper gas flow.
	Moisture in shielding gas.	Replace gas cylinder or supply.
	Wrong gas for wire type or transfer mode.	Use correct shielding gas.
	Feeder gas solenoid faulty.	Replace solenoid.
	Gun or outlet cable leaking.	Repair or replace faulty parts.
	Wire feed speed setting too high.	Reduce wire feed speed.
	Contact tip extends too far out of nozzle.	Adjust or replace parts (max distance should not exceed 1/8 in (3.2 mm)).
	Nozzle to work distance too large.	Reduce nozzle to work distance.
	Incorrect gun or torch angle.	Set proper gun angle (porosity or dirty welds mean gun angle is too large).
	Nozzle restriction.	Clean off spatter or remove restriction.
	Breeze or drafts in weld zone.	Shield weld zone from drafts.
	Low shielding gas cylinder pressure.	Replace gas cylinder.
	Gas leak at gun to feeder connection.	Properly install gun or replace O-rings at gun connector.
Excessive spatter.	Voltage set too high.	Reduce voltage setting (reduce trim or arc adjust for pulse welding).
	Incorrect gun or torch angle.	Set proper gun angle.
	Too much or too little gas flow.	Adjust for proper gas flow.
	Wrong gas for wire type or transfer mode.	Use correct shielding gas.
	Wrong electrode wire type or size.	Use proper electrode wire.
	Wrong inductance setting.	Adjust inductance.
	Electrode wire dirty or old.	Replace with new electrode wire.
	Oily or dirty base metal.	Clean base metal by brushing, grinding or use chemical cleansing before welding.
	Excessive wire stick-out or nozzle to work distance too great.	Adjust wire stick-out or reduce nozzle to work distance.
	Wrong transfer mode.	Set proper transfer mode.
	Travel speed too slow.	Increase travel speed so that arc is on leading edge of weld puddle.

Trouble	Probable Cause	Remedy
Wandering, hunting or erratic arc.	Restriction in unspooler or drum adapter.	Replace unspooler or repair restriction.
	Dirty or worn gun liner or inlet cable.	Remove gun liner or inlet cable and clean or replace.
	Sharp bends or kinks in gun cable or liner.	Straighten gun cable and/or replace liner.
	Loose or worn contact tip.	Tighten or replace contact tip.
	Wrong size or type of contact tip.	Replace with proper size and type contact tip.
	Gun overheating.	Use gun with proper amperage rating.
	Loose power cables or other electrical connections.	Tighten, repair or replace connections or cables, also check all rotary or brush type connections.
	Incorrect gun or torch angle.	Set proper gun angle.
	Too much or too little gas flow.	Adjust for proper gas flow.
	Moisture in shielding gas.	Replace gas cylinder or supply.
	Wrong gas for wire type or transfer mode.	Use correct shielding gas.
	Wrong program selection for pulse welding.	Make proper program selection.
	Improper or unsteady analog command from robot controller.	Check signal from robot controller (as a troubleshooting aid go to power source control of voltage and wire speed).
	Gun or outlet cable leaking.	Repair or replace faulty parts.
	Incorrect nozzle to work distance.	Set proper distance [3/8 in to 5/8 in (9.5 to 15.9 mm) for short arc, 5/8 in to 1 in (15.9 to 25.4 mm) for pulse welding, and 3/4 in to 1-1/4 in (19.1 to 31.8 mm) for spray welding].
	Voltage sensing leads open or shorted.	Repair or replace voltage sense leads.
	High frequency noise in the area.	Be sure proper grounding methods are followed when TIG or plasma equipment is used in the area.
	Arc blow.	See Section 6-7.
	Drive motor tachometer or motor cable open or shorted.	Check drive motor tachometer and cables, and repair or replace.
	Wrong size drive rolls.	Replace with proper size drive rolls.
	Too much or too little drive roll pressure.	Adjust drive roll pressure.
Welding wire burns back to contact tip at the start of a weld.	Restriction in wire feed system.	Check inlet cable, gun liner and wire guides.
	Worn drive rolls.	Replace drive rolls.
	Wrong size drive rolls.	Replace with proper size drive rolls.
	Improper start parameters.	Adjust start parameters.
	Worn contact tip.	Replace contact tip.
	Wrong size or type of contact tip.	Replace with proper size and type contact tip.
	Not enough cast in welding wire.	Add a wire straightener to put cast in wire.
Welding wire burns back to contact tip during welding.	Restriction in wire feed system.	Check inlet cable, gun liner and wire guides.
	Worn drive rolls.	Replace drive rolls.
	Wrong size drive rolls.	Replace with proper size drive rolls.
	Too much or too little drive roll pressure.	Adjust drive roll pressure.
	Worn contact tip.	Replace contact tip.
	Wrong size or type of contact tip.	Replace with proper size and type contact tip.
	Not enough cast in welding wire.	Add a wire straightener to put cast in wire.
Welding wire burns back to contact tip at the end of a weld.	Welding power source output not shutting off.	Make sure all switches are in correct position, repair power source if necessary.
	Burnback setting too high or too long.	Adjust burnback setting or turn off completely.

SECTION 7 – OPERATION

7-1. Operator Controls



1 Power Switch

Turns unit On or Off.

2 Power On LED

Power LED illuminates when unit is energized.

3 Output On LED

Output LED illuminates when weld output is energized.

4 Error LED

On Solid–

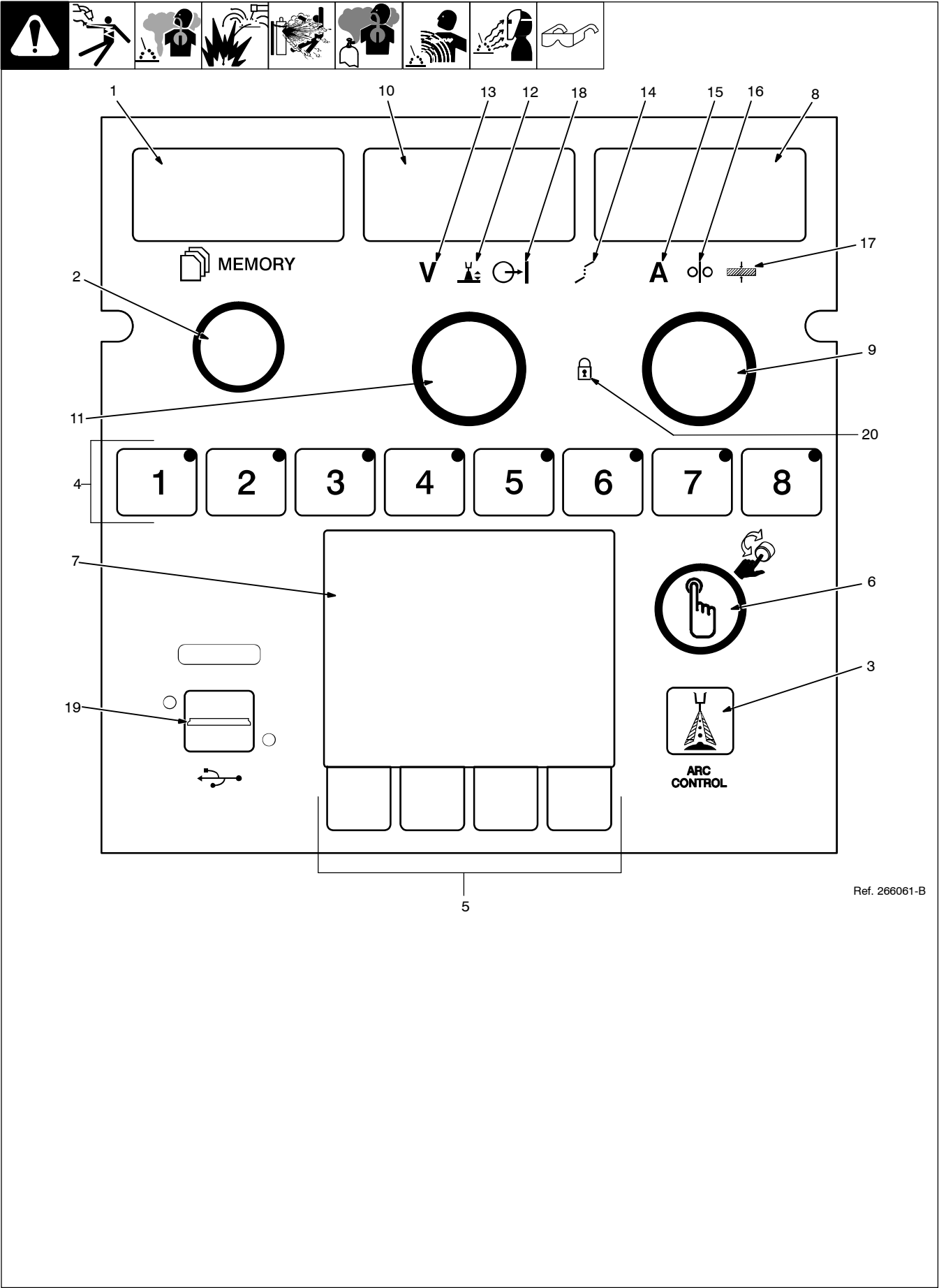
Unit has overheated and weld output has been disabled. Allow unit to cool to operating temperature. Error LED will turn off and welding may resume.

Blinking–

A system error has occurred. Use the User Interface to determine the source of the error as well as possible solutions. Follow on-screen instructions to clear the error. When the error has been cleared the Error LED will stop blinking and welding may resume.

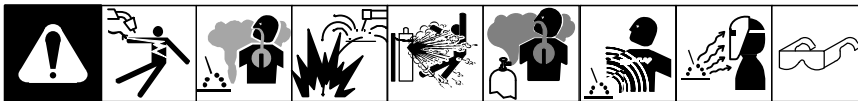
After turning unit off, wait until Power ON LED is off before turning unit back on. Cycling power too quickly can cause software issues on power up.

7-2. User Interface



Ref. 266061-B

7-3. Description Of Front Panel Controls (See Section 7-2)



1 Memory Display

The Memory display shows the active weld program. The range is from 0001 to 9999.

2 Memory/Variable Adjustment Knob

Use this knob to select a program number or increase/decrease the variable shown in the Memory display.

3 Arc Control Button

The Arc Control button is process dependent. It allows user to change the variable that appears on the Values/Parameters display, such as inductance, DIG, RMD (ball size) or trim. The range can be +/- depending on the process.

4 Memory 1-8 Buttons And LEDs

Use these buttons to select a stored program from the weld program library data. The LED will indicate which program is selected and active.

The Variables/Parameters display will show weld program library summary data for the selected program.

5 Soft Key Buttons

Use these buttons to navigate the menus appearing in the LCD display

6 Scroll Knob And Select/Save Button

Rotate this knob to scroll available options or increase/decrease the variable shown in the LCD display.

Pressing this knob acts as a Select/Save

button. Press the button to select options available in the LCD display

7 Values/Parameters LCD Display

This display shows all values and parameters that have been selected using the Soft Key buttons and the Scroll knob and Save/Select button.

8 Amperage/Wire Feed Speed Display

This display shows amperage, or wire feed speed depending on the process selected.

9 Amperage/Wire Feed Speed/Material Thickness Adjustment Knob

Use this knob to increase/decrease amperage, wire feed speed, or material thickness depending on the process selection. These values appear on the Amperage/Wire Feed Speed/Material Thickness display.

10 Voltage/Arc Length/Inductance/Arc Adjust/RMD Display

This display shows voltage, arc length, inductance, arc adjust or RMD depending on the process selected.

11 Voltage/Arc Control Adjustment Knob

Use this knob to increase/decrease voltage or arc length depending on the process selection. These values appear on the Voltage/Arc Length/Inductance/Arc Adjust/RMD display.

12 Arc Length Indicator

LED illuminates to show that arc length function is active.

13 Voltage Indicator

LED illuminates to show that the voltage function is active.

14 Synergic Mode Active Indicator

LED illuminates to show that a synergic weld process is active.

15 Amperage Indicator

LED illuminates to show that a SMAW, GMAW or CAG process is selected. Values appear on the Voltage/Arc Length/Inductance/Arc Adjust/RMD display.

16 Wire Feed Speed Indicator

LED illuminates to show that a GMAW or GMAW-P weld process is selected. Values appear on the Amperage/Wire Feed Speed/Material Thickness display.

17 Material Thickness Indicator

This feature will be functional in a later software release.

18 Output ON Indicator

LED illuminates to show that open circuit voltage is present at the weld output terminals.

19 USB Port

Use this port for all USB related functions

20 Parameter Lock Indicator

LED illuminates to show weld parameters are locked and active.

* Disabled or not available.

SECTION 8 – CONFIGURATION

8-1. Accessing Configuration Web Pages

To access the power source configuration webpages you will need the optional communication panel (See Section 5-8). Connect a PC directly to the jack on the communication panel with a CAT5 or CAT6 Ethernet cable.

Enter the default IP address, 169.254.0.2, into a web browser and the welder configuration web pages will open to the Home screen.

8-2. Home Screen



1 Navigation Bar

Select Home, Setup, Arc Management, Data Management, or Help screens.

2 Information Bar

Displays general information on power source, location, asset number, serial number, and display language.

3 Power Source Information

Displays power source information. Edit button allows these parameters to be changed.

4 Active Program

Displays the program number, process, wire size and alloy, and gas. Edit button allows these parameters to be changed.

5 Weld Outputs (Live)

Displays the weld output conditions of the power source and feeder in real time.

6 Commands

Displays current user changeable commands. Depending on the weld process being used these commands will vary. Edit button allows parameters to be changed.

7 Last Weld

Displays the voltage and amperage used during the last weld made.

8 Productivity

Displays arc time, the amount of wire used, and the amount of wire remaining.

9 Active Error

Displays any active error messages. View Error Log button will display a list of previous errors and the time at which they occurred.

8-3. Setup Screen

The Setup Screen is a grid of 14 panels, each with an 'Edit' button and a help icon. The panels are arranged in a 4x3 grid with the last cell empty.

Panel Number	Panel Name	Key Settings/Options
1	Auto Continuum™	Location: None, Asset: None, Unit Date/Time: 8/21/2015 2:44
2	Purge Time	Time(Seconds): 5
3	Enabled Errors	Arc Start, Arc Run Time, Wire Stuck
4	Jog Speed	Jog Min.: 60 IPM, Jog Max.: 700 IPM
6	Data Connections	Insight CenterPoint™: Disabled, Insight Core™: Disabled
7	Region	United States (English)
8	Status	English/Metric Values: English, Slope Adjustment: Disabled, Synergic Mig: Disabled, CE/English Library: English, Scaling: 0 to 99, WFS/Amps Command: WFS
9	WiFi Settings	
10	Auto Thread	Load Rate: 700 IPM, Torch Length: 72 Inches
11	Wire Spool	Wire: .035 STL E70, Spool Size: 60 Pounds, Remaining: 60 Pounds
12	Weld Cable Setup	VFB Method: Sense Lead, Resistance Compensation: Disabled, Inductance Compensation: Disabled
13	Robot Options	Robot Mfg: Kuka, Control Level: Robot, IP Address: 169.254.0.2, Robot Communication Method: Ethernet IP, Remote Program Select: Enabled
14	Dry Run	Dry Run Mode: Disabled

1 Information Bar
Displays information on power source, location, asset number, serial number, and language.

2 Purge Time
Displays the length of time gas will flow when the purge button is pressed. Edit button allows time length to be changed.

3 Enabled Errors
Displays which system errors are enabled. Click Edit to enable or disable system errors.

4 Jog Speed
Displays the min and max jog speeds in inches per minute (IPM). Edit button allows min and max jog speed settings to be changed.

5 Ethernet Settings
Edit button allows changes to connectivity settings.

6 Data Connections
Displays which data connections are enabled.

7 Region
Displays current region. Edit button allows region to be changed.

8 Status
Displays the status of various system selections: English vs Metric display values, Slope Adjustment enable/disable, Synergic MIG Enable/Disable, CE vs English weld library availability, Arc length command scaling.

9 WiFi Settings
Edit button allows changes to WiFi settings.

10 Auto Thread
Displays the Load Rate in inches per minute (IPM) and Torch Length (Inches) to determine the length of time for Auto Threading. Edit button allows these parameters to be changed.

11 Wire Spool
Displays wire type, spool size, and amount of wire remaining on the spool. Edit button allows wire information to be changed or reset.

12 Weld Cable Setup
Displays length and diameter of positive and negative weld leads, torch, and voltage feed-back (VFB) method that are selected. Edit button allows these parameters to be changed.

13 Robot Options
Displays current robot connectivity options. Edit button allows robot options to be changed.

14 Dry Run
Allows an automated weld cell to cycle without striking an arc by simulating the arc detected signal back to the weld cell.

8-4. Setup Screen

The screenshot displays a grid of 15 settings panels on a dark background. Each panel has a title, a list of settings with their current values, and 'Edit' and '?' buttons. The panels are arranged in a 3x5 grid. Callout numbers 1 through 15 are placed around the screen, pointing to specific panels or sections.

Callout Number	Panel Name	Settings and Values
1	Auto Continuum™	Location: None Asset: None Unit Date/Time: 8/21/2015 2:44
2	Purge Time	Time(Seconds): 5
3	Enabled Errors	Arc Start Arc Run Time Wire Stuck
4	Jog Speed	Jog Min.: 60 IPM Jog Max.: 700 IPM
5	Ethernet Settings	
6	Data Connections	Insight CenterPoint™: Disabled Insight Core™: Disabled
7	Region	United States (English)
8	Status	English/Metric Values: English Slope Adjustment: Disabled Synergic Mig.: Disabled CE/English Library: English Scaling: 0 to 99 WFS/Amps Command: WFS
9	WiFi Settings	
10	Auto Thread	Load Rate: 700 IPM Torch Length: 72 Inches
11	Wire Spool	Wire: .035 STLE70 Spool Size: 60 Pounds Remaining: 60 Pounds
12	Weld Cable Setup	VFB Method: Sense Lead Resistance Compensation: Disabled Inductance Compensation: Disabled
13	Robot Options	Robot Mfg: Kuka Control Level: Robot Robot Communication Method: Analog & Digital Remote Program Select: Enabled
14	Dry Run	Dry Run Mode: Disabled
15	Auto Calibration	Auto Calibration Date/Time: Auto Calibration Not Completed.

1 Information Bar
Displays general information on welding power source, location, asset number, serial number, and display language.

2 Purge Time
Displays the length of time gas will flow when the purge button is pressed. Edit button allows time length to be changed.

3 Enabled Errors
Displays which system errors are enabled. Click Edit to enable or disable system errors.

4 Jog Speed
Displays the minimum and maximum Jog speeds in inches per minute (IPM). Edit button allows minimum and maximum jog speed setting to be changed for forward and reverse jog.

5 Ethernet Settings
Edit button allows user to change connectivity settings.

6 Data Connections

Displays which data connections are enabled or disabled.

7 Region
Displays current region. Edit button allows region to be changed.

8 Status
Displays the status of various system selections: English vs. Metric display values, Slope Adjustment enable/disable, Synergic MIG enable/disable, CE/English weld library availability, Arc length command scaling

9 WiFi Settings
Edit button allows user to change WiFi Settings.

10 Auto Thread
Displays the Load Rate in inches per minute (IPM) and Torch Length (Inches) to determine the length of time for Auto Threading. Edit button allows these parameters to be changed.

11 Wire Spool

Displays wire type, spool size, and amount of wire remaining on the spool. Edit button allows wire information to be changed or reset.

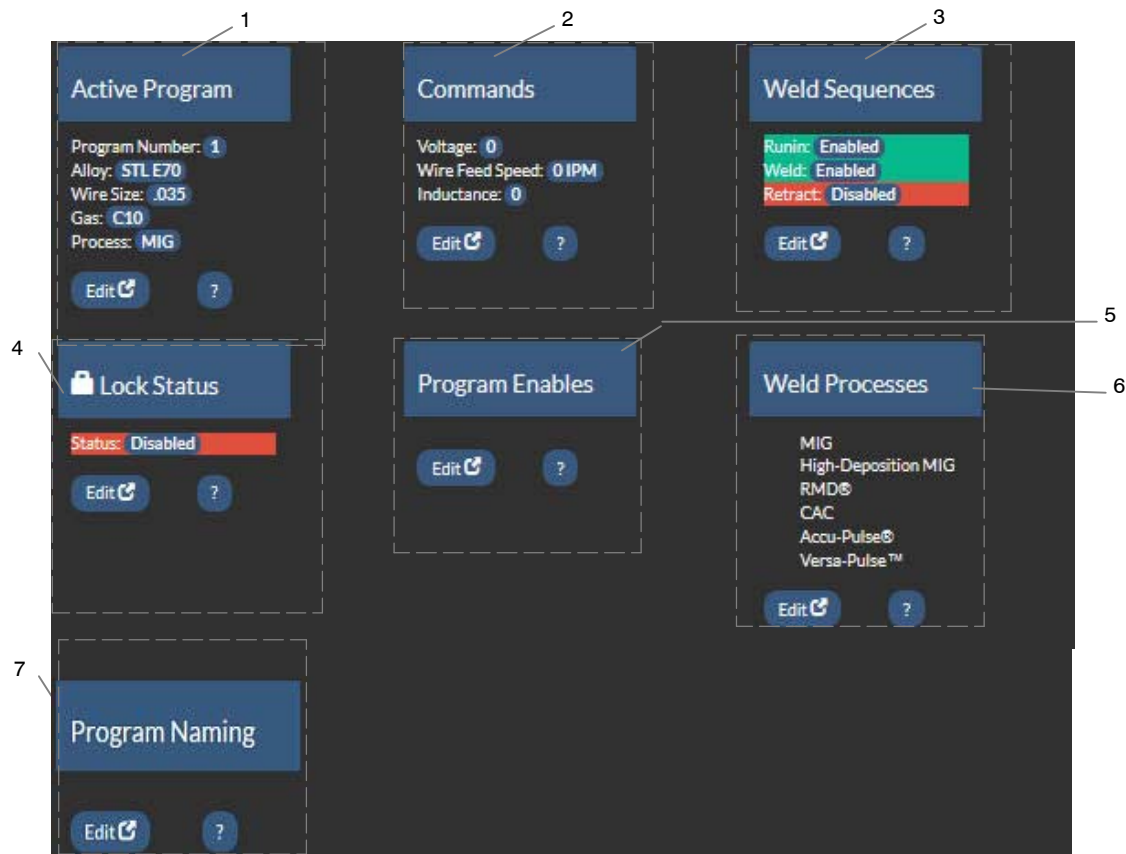
12 Weld Cable Setup
Displays length and diameter of positive and negative weld leads, torch, and voltage feedback (VFB) method that are selected. Edit button allows these parameters to be changed.

13 Robot Options
Displays current robot connectivity options. Edit button allows robot options to be changed.

14 Dry Run
Allows an automated weld cell to cycle without striking an arc by simulating the arc detected signal back to the weld cell

15 Auto Calibration
Edit button will display last auto calibration, give live feedback of auto calibration values.

8-5. Arc Management Screen



1 Active Program

Displays the program number, process, wire size and alloy, and gas. Edit button allows these parameters to be changed.

2 Commands

Displays current user changeable commands. Depending on the weld process being used these commands will vary. Edit button allows parameters to be changed.

3 Weld Sequence

Displays active weld sequence parameters.

Edit button allows changes to these parameters. Parameter limits are also set through this menu.

4 Lock Status

Displays the current status of system locks. Edit button allows the lock configuration to be changed.

5 Program Enable

Edit button allows user to select which programs are available for use.

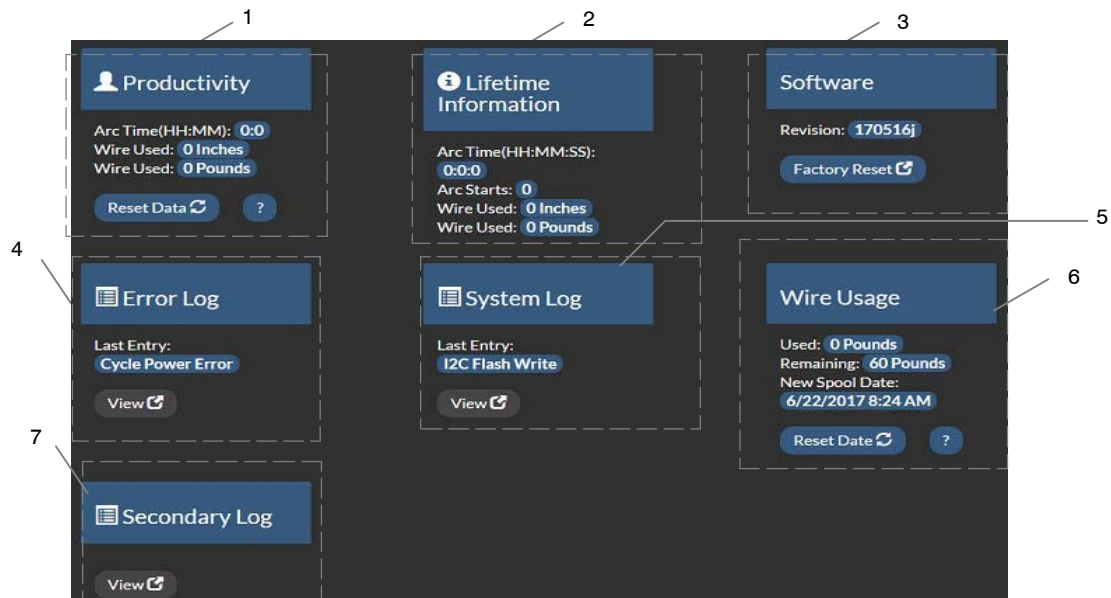
6 Weld Processes

Displays available weld processes. Edit button allows processes to be enabled or disabled.

7 Program Naming

Edit button allows user to enter a short personalized name for a weld program and a longer description of what the program is for. Both fields must have data entered. The short name will then be viewable on the LCD screen on the User Interface of the Continuum.

8-6. Data Management Screen



1 Productivity

Displays arc time and wire used in inches and pounds. Click Reset Data to reset productivity data.

2 Lifetime Information

Displays total arc time, arc starts, and wire used over lifetime of unit.

3 Software Information

Displays the software revision.

Factory Reset button will take user to a Factory Reset screen. Read and follow all instructions on Factory Reset screen to perform a Factory Reset.

4 Error Log

Displays the last error experienced by the system.

View button displays a list of previous errors and the time at which they occurred.

5 System Log

Displays the last entry into the system log.

View button displays a list of the entries made to the system log and the time at which they occurred.

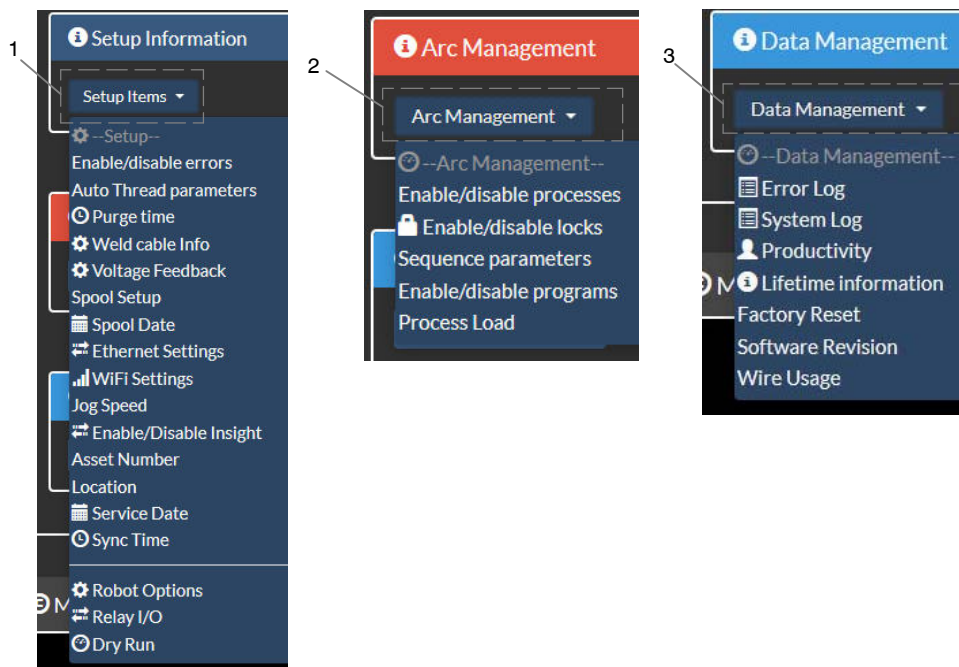
6 Wire Usage

Displays the amount of wire used, the amount remaining, and the date the spool was started. Click Reset Data when starting a new spool.

7 Secondary Log

View button displays a list of secondary compensation tests that were run, listing Pass/Fail status, date/time test was run, torch resistance, torch voltage, weld cable resistance, weld cable voltage, and weld cable current.

8-7. Help Screen



The Help Screen contains three drop down menus which contain the features on the Setup, Arc Management and Data Management screens.

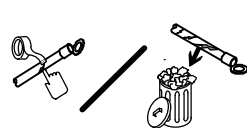
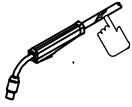
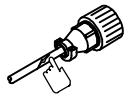
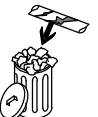
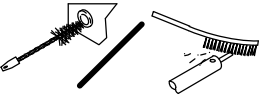
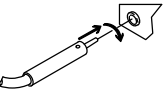
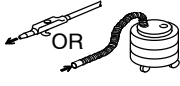
1 Setup Information Drop-Down Menu

2 Arc Management Drop-Down Menu

3 Data Management Drop-Down Menu

SECTION 9 – MAINTENANCE & TROUBLESHOOTING

9-1. Routine Maintenance

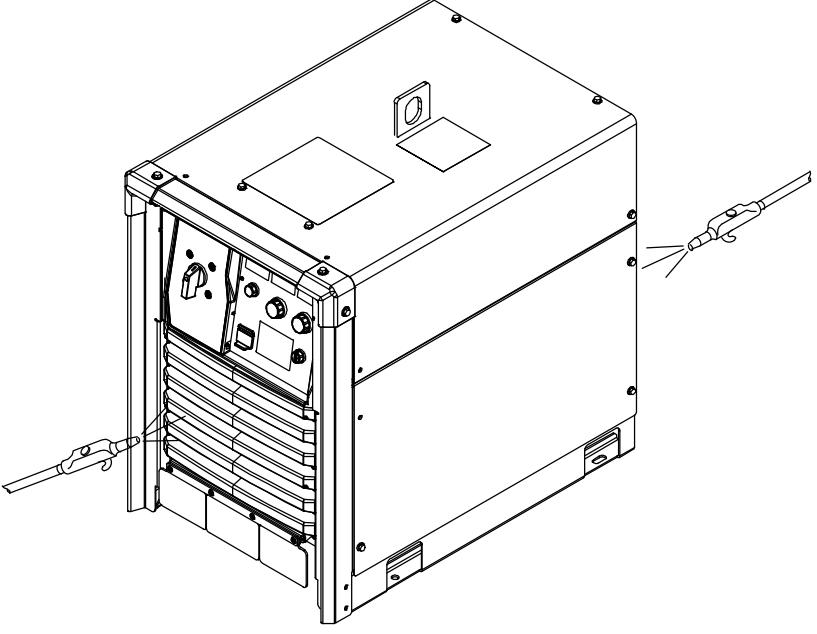
    Disconnect power before maintaining.  <i>Maintain more often during severe conditions.</i>				
 ✓ = Check ◇ = Change ● = Clean ☆ = Replace * To be done by Factory Authorized Service Agent				
Every 3 Months	 ☆ Unreadable Labels	 ● Weld Terminals	 ✓ ☆ Weld Cables	 ✓ ☆ Gun Cables
	 ✓ ☆ Cords	 ✓ ☆ Cracked Parts	 ● Weld Connections	 ✓ Tighten Weld Cable Connections
Every 6 Months	 ● Inside Unit			

9-2. Blowing Out Inside Of Unit



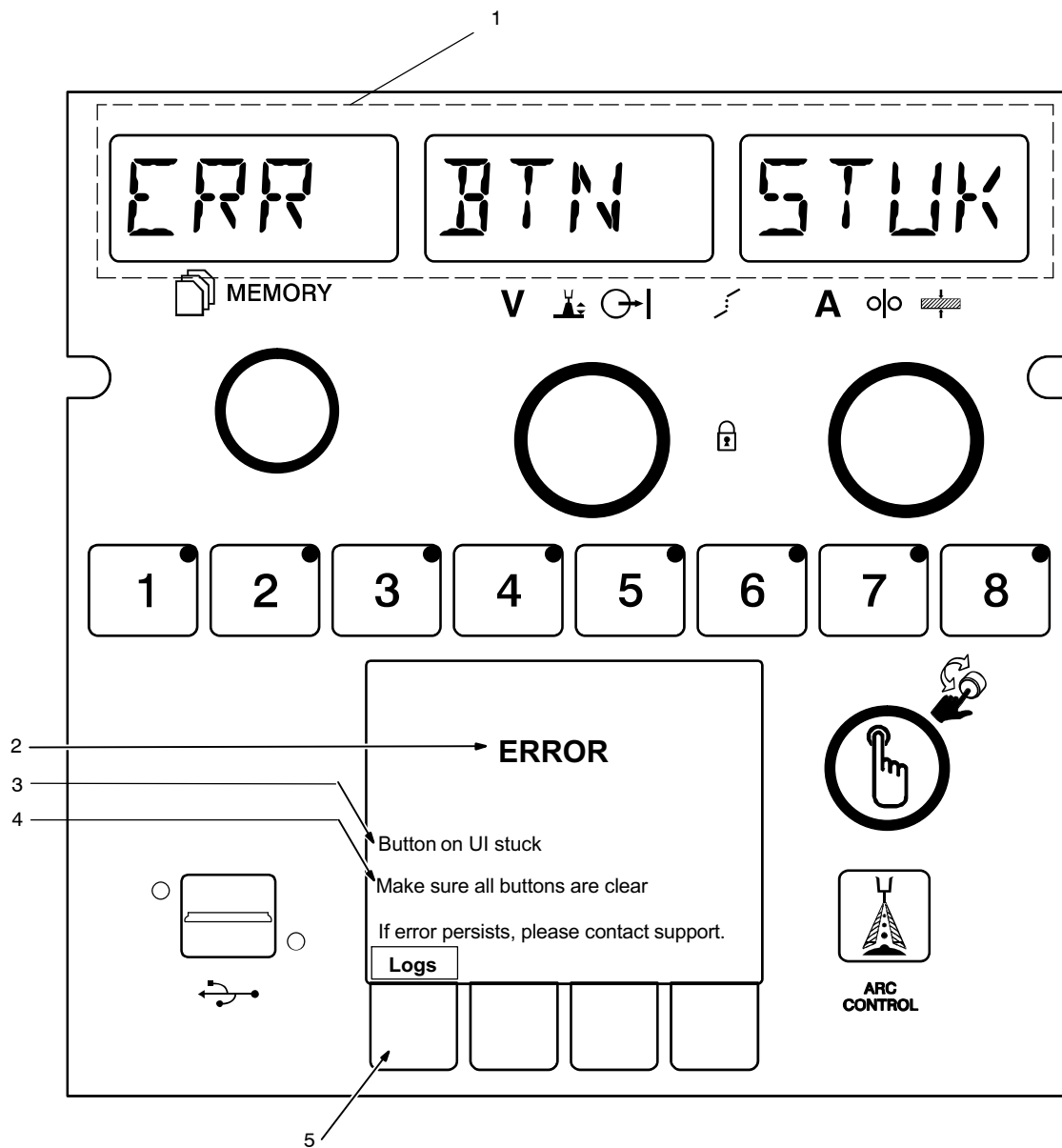


Do not remove case when blowing out inside of unit.
 To blow out unit, direct airflow through front and back louvers.



278352-C

9-3. Error Code Troubleshooting Description And Tables



Ref. 266061-B

1 LED Display Message

Displays a short message describing the error or where the error is occurring. Some messages may represent multiple different errors. For more specific error information see the LCD Display Message.

2 Message Type

There are three types of messages that will be displayed.

ERROR- The system has experienced a fault that must be addressed before continuing use.

MESSAGE- No fault has occurred, but some action must be taken before resuming use of the welding system. For instance, input power may need to be cycled after loading new software.

WARNING- There is something that should be addressed before continuing. For instance, the volt sense lead connection has been lost.

3 LCD Display Message

Provides more information about the message being displayed.

4 LCD Solution Message

Describes the action needed to clear the message or fault being experienced.

5 Logs Soft Key

Pressing the Logs soft key will take the user to the Logs Menu. From the Logs Menu it is possible to access the Error Log. The LCD Error Log Messages are stored in the Error Log.

9-4. Error Code Troubleshooting Description And Tables

RED LED Display	LCD Display Message	Description	Possible Causes	Potential Solutions
BOOT ERROR or BOOT FAIL	System Booting Status bar stopped at 1%, 2%, 3%, or 4%	One of the components in the system is not connected to the network or the rest of the system.	Wires in the interconnecting cable are disconnected. There is a pin or socket in one of the communication receptacles that is broken. Internal circuit board failure.	Replace the interconnecting cable from the power source to the wire feeder, or between the ROI and wire drive, if it is a Swingarc system. Replace the power source, ROI, wire drive, or wire feeder to have serviced.
No Display	LCD is blank	Feeder is not powering up, white power light is illuminated and power source contactor is energized.	Bad communication cable. Internal circuit board failure.	Replace communication cable between power source and wire feeder. Replace the power source, ROI, wire drive, or wire feeder to have serviced.
ERR THERM or ERR OVERTEMP	ERROR Thermal System Problem Welding Power Source has overheated Allow unit to cool. Cycle power on the power source.	The power source is over heating. The overtemp light is on constant.	The fan louvers/wind tunnel openings are blocked. The fan motors are not turning on or cannot rotate. The heat sinks are dirty.	Ensure that there is a minimum of 18 inches distance between power source and other objects. The power source must be serviced/repared before proper operation. Blow out inside of wind tunnel per the preventative maintenance section.
CYCLE POWER	The unit requires a power cycle. Cycle power on power source.	This message may display if the settings changed in the configuration of the system.		Cycle power on the power source.
ERR COMMS	ERROR System communication loss Cycle power on the power source.	User Interface is not connected to the rest of the system.	Bad communication cable between the feeder and power source.	Replace interconnecting cable.
ERR COMMS	ERROR Internal comms loss:	There are many communication errors in the system indicating where the problem may be. The communication could be lost from the power source, wire feeder, ROI, or wire drive. The detailed message in the LCD screen will give the proper details for the servicing technician.	Poor connection in the communication cable between the wire feeder and the power source. Open connection in the interconnecting cable on the back of the power source, wire feeder, ROI, or wire drive. Database in the system may be corrupted.	Replace the communication cable. The power source, ROI, wire drive, or wire feeder must be serviced/repared before proper operation. Reinstall the system software.
ERR WIRSTUK	ERROR Wire Stuck Error Wire stuck to workpiece at the end of the weld.	Wire stuck to work piece at the end of the weld.		Break/Cut away from the work piece.
ERR ARC	ERROR Arc error occurred. Check wire feeder and power source.	The arc produced was not a valid arc, weld voltage was too high or too low for the parameters set on the User Interface.	Broken or disconnected weld cable. Wire delivery is too slow, arc length too long.	Repair or replace weld cable. Repair or replace work clamp or cable connection. Check/Replace gun liner. Check drive roll pressure is properly set for the application
ERR TRGSTUK	ERROR Trigger held during power up. Release trigger and press button to clear error.	Trigger Stuck error occurs if the trigger is held when the feeder is powered up. The error may be cleared by releasing the trigger.	Trigger or trigger wires in the MIG gun may be shorted together.	Repair or replace the MIG gun.

RED LED Display	LCD Display Message	Description	Possible Causes	Potential Solutions
WRN SOFTWARE	WARNING Incompatible software detected. Sys SW Rev Mismatch Error	The software in another component in the system is creating a software mismatch. The software in the wire feeder and power source are at different revisions.	A component in the system is newer than the rest of the components. A different wire feeder and power source were placed together for the first time.	Update system software.
ERR INPUT PWR	ERROR Must use three phase primary power.	The system is experiencing a single phase condition, missing a primary leg.	There is a poor connection in the three phase plug or disconnect. There is an open fuse or circuit breaker.	Contact a qualified electrician to verify the primary power and possible solutions.
ERR INPUT PWR	ERROR The primary input voltage is too high. Check the primary connections.	Customer supplied primary voltage is too high.		Contact a qualified electrician to verify the primary power and possible solutions.
ERR INPUT PWR	ERROR The primary input voltage is too low. Check the primary connections.	Customer supplied primary voltage is too low.	Poor connection in the three phase plug or disconnect.	Contact a qualified electrician to verify the primary power and possible solutions.
ERR BTN STUK	ERROR Button on UI stuck Make sure all buttons are clear.		Button on UI was held too long. Membrane button on the overlay is damaged.	The wire feeder or ROI must be serviced/repared before proper operation.
ERR ARC STRT	ERROR Trigger held too long without arc.	The weld output was active too long before striking an arc.	The drive rolls were open and the wire did not move. There is no weld cable between the feeder and power source.	Ensure proper drive roll pressure is applied. Ensure the lower drive roll carrier support plate is installed. Install weld cable.
ERR REL TRIG	ERROR Trigger was held too long. Release trigger and press button to clear error.	Release Trigger error occurs if the user has the trigger held for more than two minutes without striking an arc or if the user holds the trigger past the postflow phase in a timed weld. This may also happen if the Jog button is depressed too long.	The trigger in the MIG gun is shorted or stuck in a closed position.	Repair or replace the MIG gun.

RED LED Display	LCD Display Message	Description	Possible Causes	Potential Solutions
WRN OVER-AVER	WARNING Duty cycle exceeded System will be ready to weld shortly.	The duty cycle of the power source has been exceeded. The power source shut down to allow itself to cool down. The error will be active for a period of time.	The welding output was too high for too long of a period of time.	Allow the welder to be powered on and sitting idle until the error clears, typically for a period of 15 minutes.
ERR AUX PWR	ERROR Aux power problem. Cycle power on the power source.	The 115 VAC aux power circuit board is experiencing a problem.	A device plugged into the 115 VAC receptacle is too much load. Auxiliary Power failure	Remove the device from the 115 VAC receptacle. The power source must be serviced/repaired before proper operation.
ERR THERM	ERROR Thermal System Problem Cycle power on the power source.	The system is experiencing overheating on the primary or secondary heat sinks. Also see ERR THERM 1,2, or 3 messages.	The fans are not turning on. The fan enable signal from the Arc Control board (PC4) is not present.	Check the fan output from the Control Power Supply board (PC13). Ensure the Fan Enable wires are terminated properly. Replace (PC4).
ERR PWR SRC	ERROR Boost CS1, CS2, CS3, or CS4 current error Cycle power on power source.	Primary current transducer sensor feedback is reporting too high or too low amperage draw of the input primary power.	Primary AC input may be too high or too low on one or more legs.	Contact a qualified electrician to verify the primary power and possible solutions.
WRN VSNS LOS	WARNING V-sense Feedback Warning Lost volt sense lead feedback.	The power source is not receiving the voltage feedback input from the internal connections or the external volt sense lead.	The feedback configuration setting is configured for V-Sense and the cable is broken or disconnected. Inspect the volt sense lead for breaks. The interconnecting cable has an open wire carrying the voltage feedback input.	Replace the Volt Sense lead. Replace the Volt-Sense lead. Replace the Interconnecting cable.
ERR COOL TEMP	ERROR Cooler Over Temperature	The temperature sensor in the cooler is reporting the coolant temperature is too high and shuts down the system until the temperature is low enough.	There is blockage in the torch or in the torch coolant line. The welding application is exceeding the cooler capabilities.	Replace the torch or clear the blockage in the cooler lines. Reduce the welding output.
ERR COOL FLOW	ERROR Cooler Low Flow	The coolant lines do not have coolant flowing.	The air in the coolant lines have not yet been purged. The filter is clogged with debris. There is blockage in the torch or the torch coolant line.	Turn on the weld output by Load Bank mode several times and clear the error each time until the coolant gets into the flow indicator and activates the flow switch. Follow the coolant maintenance instructions in the Cooler OM. Replace the torch or clear the blockage in the coolant lines.

9-5. Troubleshooting

					
Trouble			Remedy		
No weld output; completely inoperative			Place line disconnect in On position (see Section 5-11).		
			Check and replace line fuse(s), if necessary, or reset circuit breaker (see Section 5-11).		
			Check for proper input power connections (see Section 5-11).		
No weld output; meter display on with no error displayed.			Check to see if the contactor indicator light is lit when contactor line is asserted on.		
Erratic or improper weld output with no errors displayed.			Use proper size and type of weld cable (see Section 5-2).		
			Clean and tighten all weld connections.		
Wire does not feed.			Check supplementary protector CB1 and reset if necessary.		
			Check motor control cable connections.		
Wire feeds erratically.			Readjust hub tension.		
			Readjust drive roll pressure.		
			Clean or replace dirty or worn drive rolls.		
			Remove weld spatter around the nozzle opening.		
			Replace contact tip or liner. See gun Owner's Manual.		
			Check motor control cable connections.		
Wire feeds as soon as power is supplied.			Check gun trigger. See gun Owner's Manual.		
Wire stubbing on low end using a constant current power source.			Increase output setting of the power source.		
			Check voltage sense lead connection, clean and tighten if necessary.		
Gas does not flow or does not stop flowing; wire feeds.			Check gas valve and flow meter.		
Wire burns back to gun contact tip when using electrode negative (straight polarity) process.			Check to be sure that volt sense lead is connected to the work.		

[illegible]

SECTION 10 – INSIGHT CORE™ INSTALLATION

10-1. License Agreement

You have acquired a device (Insight Core) which includes software licensed by Miller Electric Mfg. Co. Such software products, as well as associated media, printed materials, and “online” or electronic documentation for such software are protected by international intellectual property laws and treaties. The software is licensed, not sold. All rights reserved.

10-2. Downloading Connectivity Survey

In order to ensure proper connectivity, visit the Insight Core Download page at <https://insight.millerwelds.com/download> .

Download and print the Network Connectivity Survey Form.

Ask your corporate IT department to complete the survey.

10-3. Obtaining System IP Address

 The factory default IP address of all Continuum systems is 169.254.0.2.

 Ethernet and WiFi connections each have their own unique IP addresses.

 The power source must be on the same Subnet as the computer used to access the Continuum's web pages.

1. Connect your Continuum Welding System per the instructions in the power source Owner's Manual.
2. Connect an Ethernet cable between your computer and the power source.
3. Turn the welding power source on.
4. From the Feeder (or pendant) main menu screen, go to the Ethernet Settings screen. Using the scroll knob, select **System**, then **Network Settings**, then **Ethernet Settings**. Note the IP address.

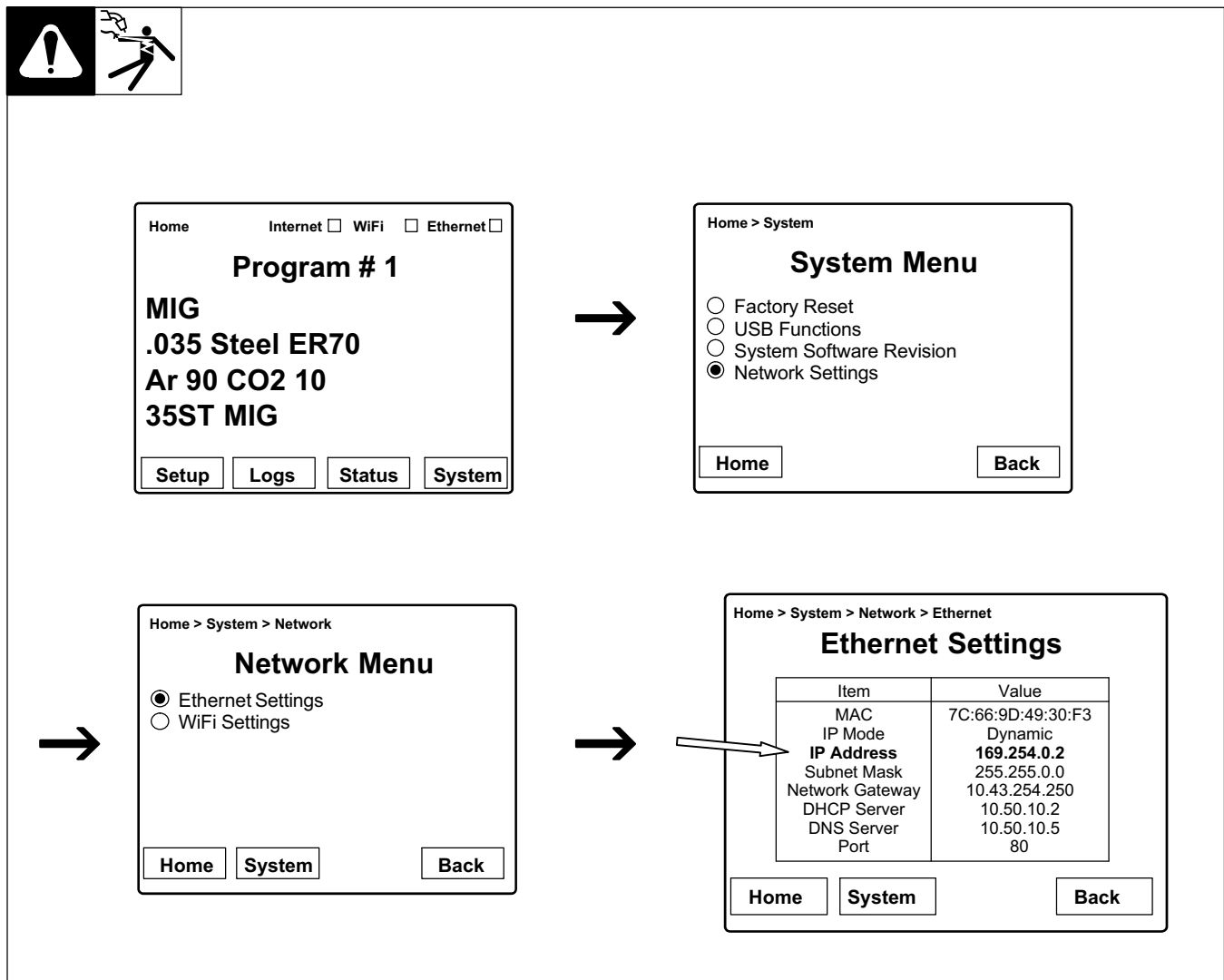


Figure 10-1. Obtaining IP Address

10-4. Enabling Insight Core Through The Continuum's Web Pages

1. Connect a computer to the welding power source with an Ethernet cable and open a browser.
2. Enter the system IP address (see Section 10-3) into the address bar. The default IP address is 169.254.0.2.
3. Press **Enter**.



Figure 10-2. Connecting To Continuum Web Page

4. The Continuum system's web page appears. On the top of the page, click **Setup**.

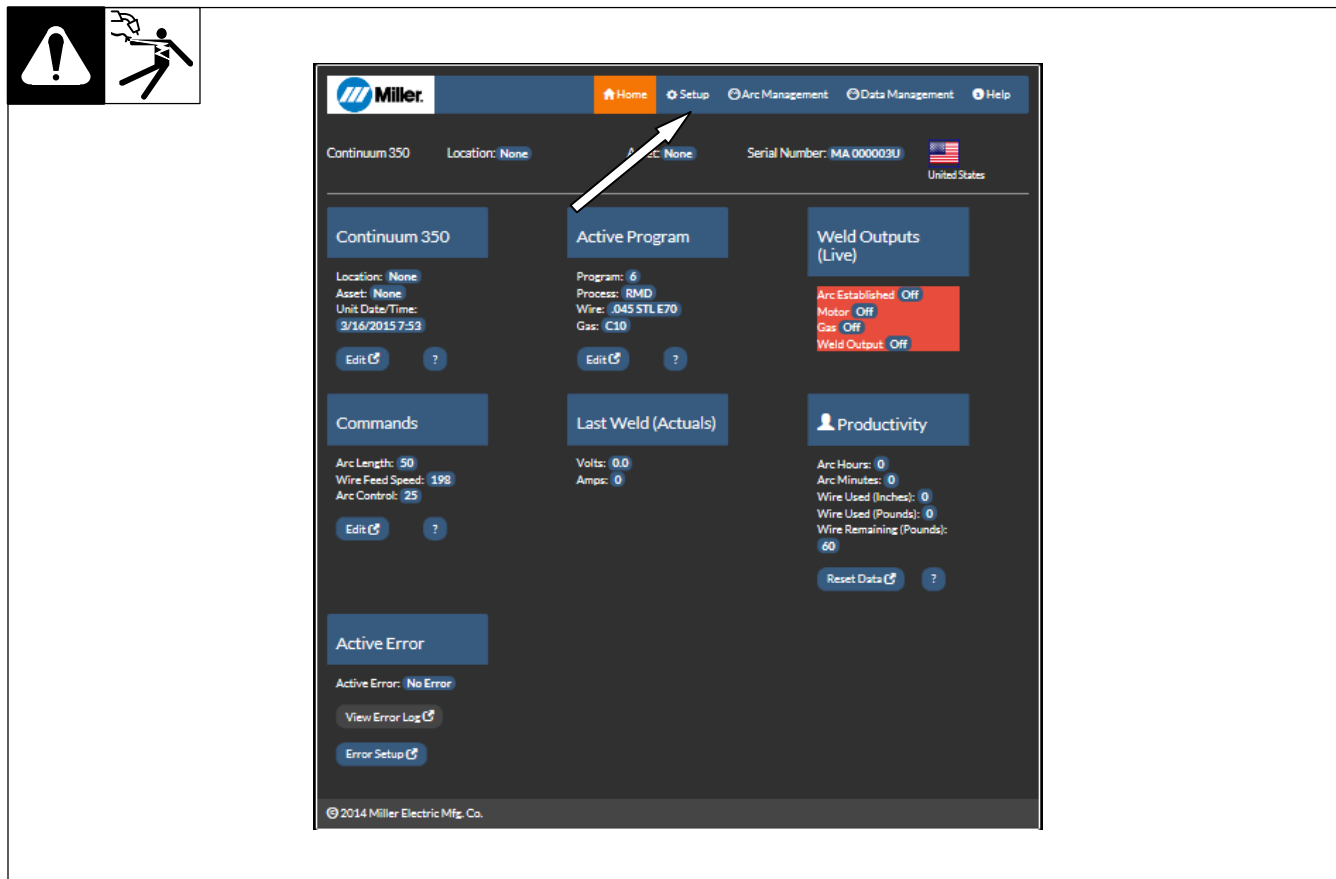


Figure 10-3. Continuum Web Page

5. Under **Data Connections**, click **Edit**.

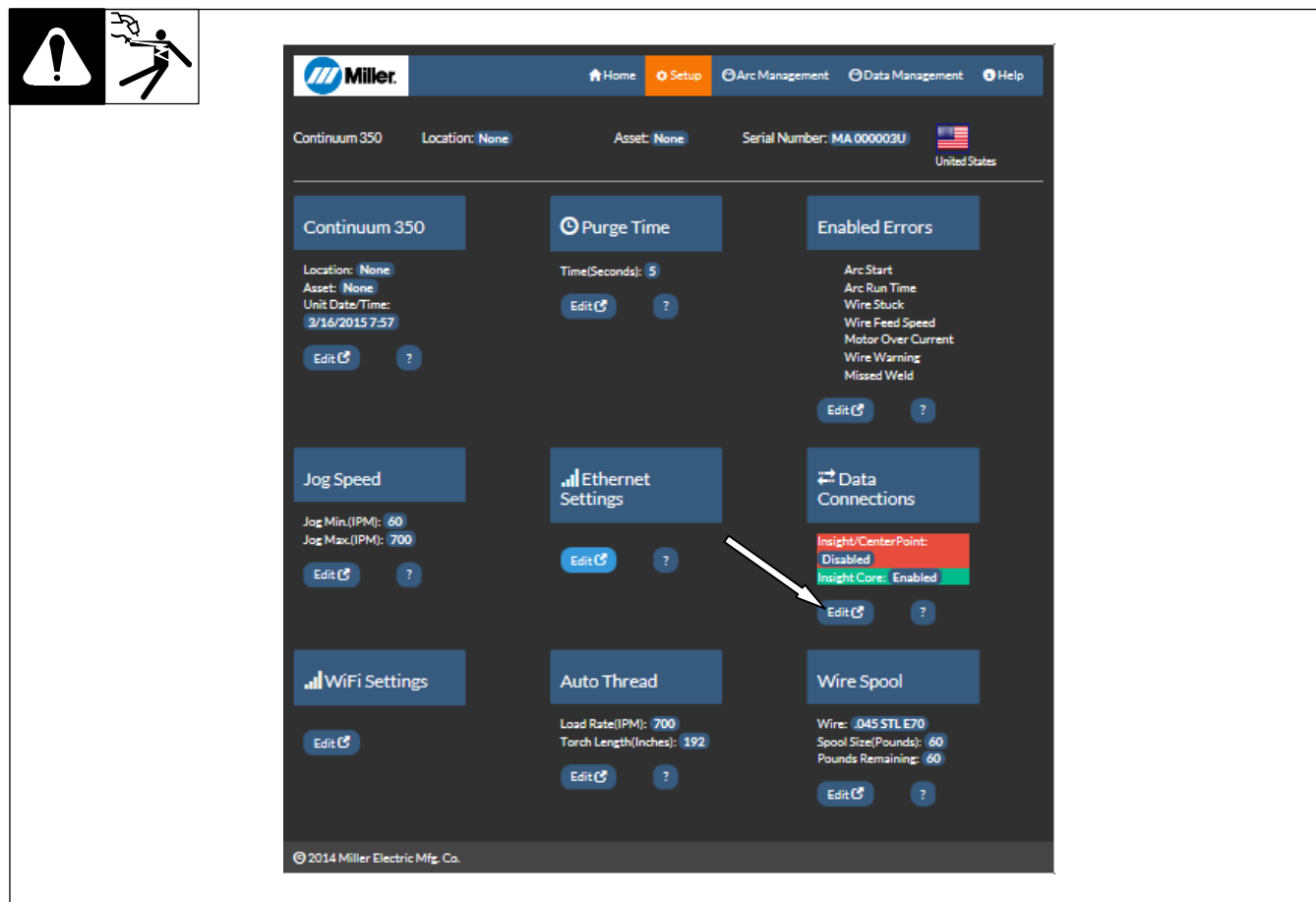


Figure 10-4. Setup Page

6. Enable or disable Insight Core by clicking your selection. After your selection is made, click **Save All**.
7. Cycle the machine power by turning the machine off, waiting until the Power On light goes off, and turning power on again.

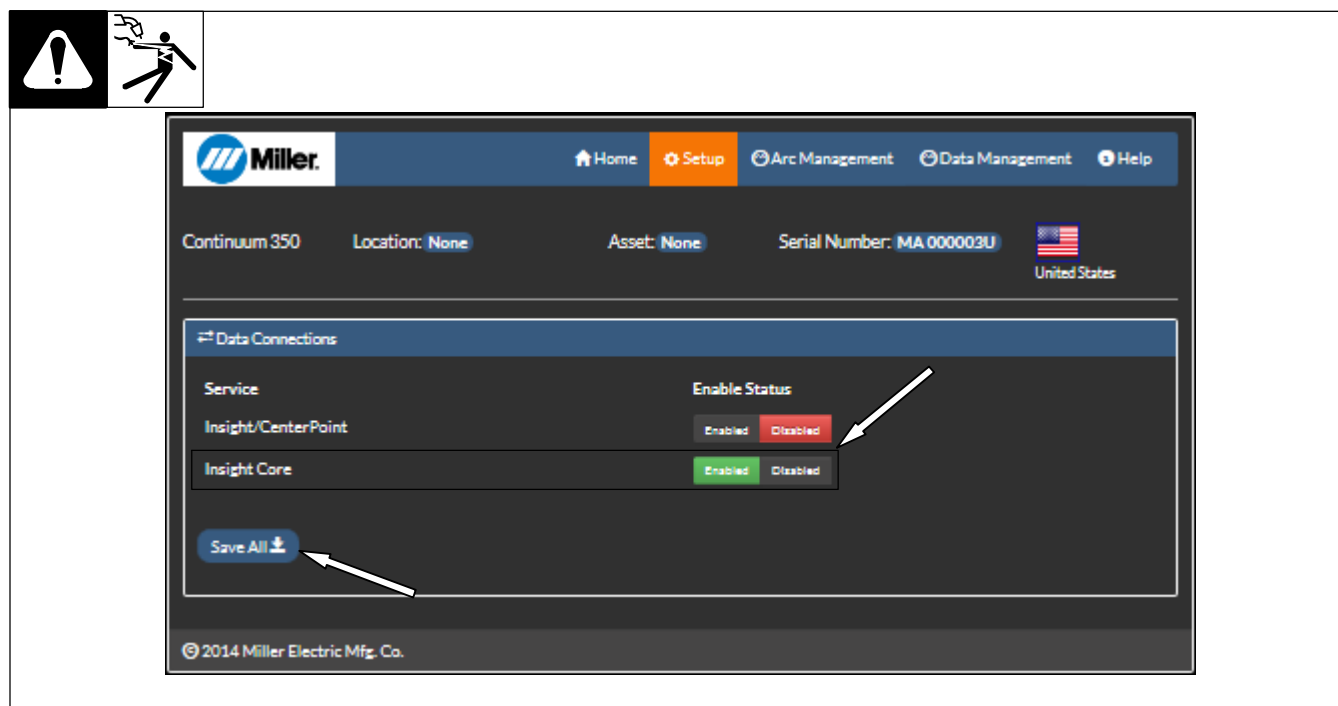


Figure 10-5. Data Connections Page

10-5. Configuring The Network Connection

 If this is the initial installation of a unit, determine what type of installation will be required. Connection information is required for each new installation of the Insight Core product.

 To set up more than one Continuum system, or if a computer near the Continuum is not available, it is more efficient to use the Insight Core Configuration Utility available at the Insight Core Downloads web page: <https://insight.millerwelds.com/download> .

1. Connect a computer to the power source with an Ethernet cable and open a browser.
2. Enter the IP address (see Section 10-3) into the address bar. The default IP address is 169.254.0.2. See Figure 10-2.
3. Press **Enter**.
4. The Continuum system's web page appears. On the top of the page, click **Setup**.
 - To configure a WiFi connection using DHCP (dynamic IP addresses), go to Section A.
 - To configure a WiFi connection using static WiFi addressing, go to Section B.
 - To configure a wired Ethernet connection using DHCP (dynamic IP addresses), go to Section C.
 - To configure a wired Ethernet connection using static IP addressing, go to Section D.

A. WiFi Connection Using DHCP (Dynamic Addressing)

1. On the Setup page, under **WiFi Settings**, click **Edit**.

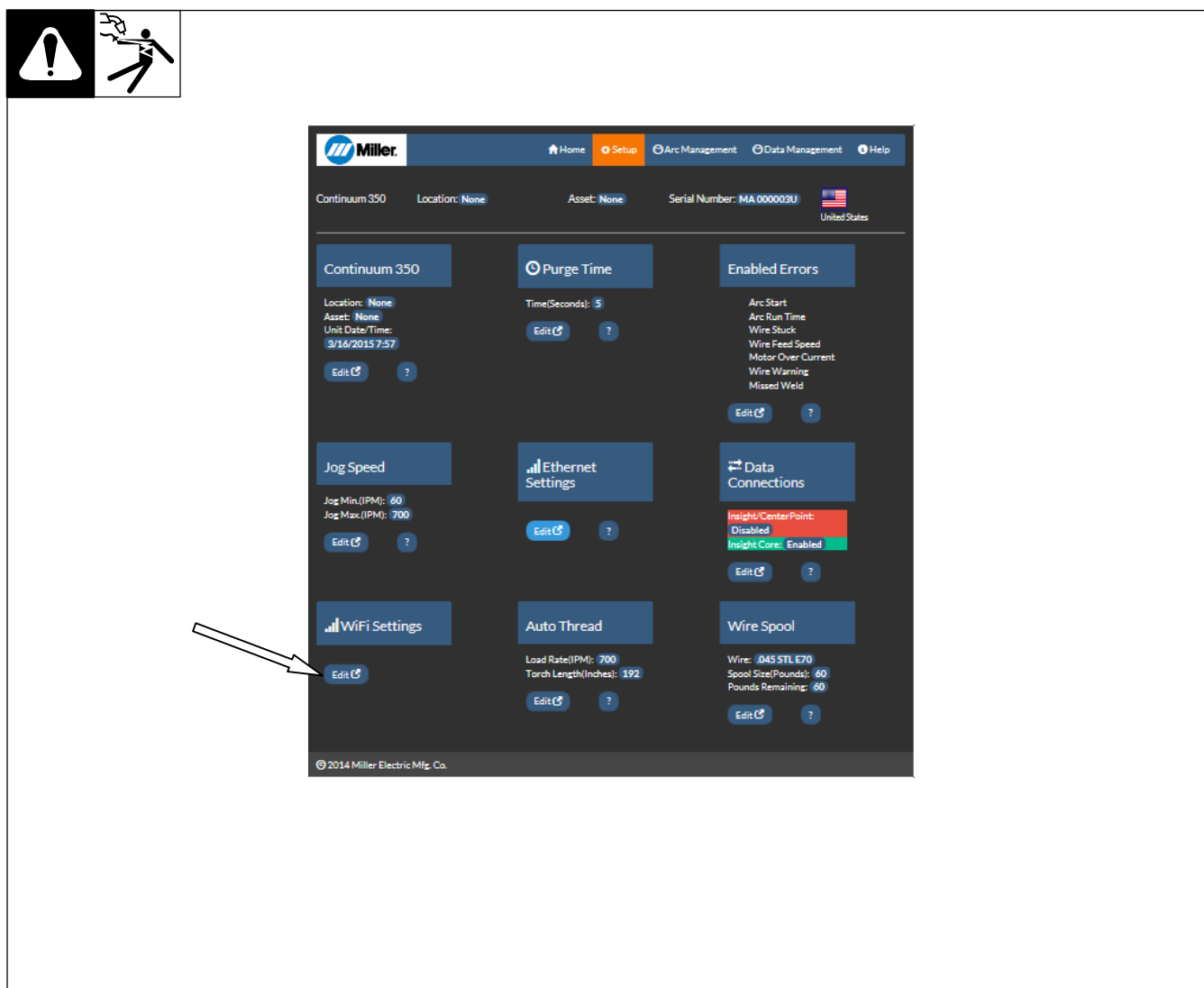


Figure 10-6. Editing WiFi Settings

2. On the screen that appears, under **Security Setup**, enter your network name (SSID), security type, and security key. This information is found on the Network Connectivity Survey completed by your IT Department (see Section 10-2).
3. Click **Save Security Settings** to save your wireless network settings.
4. Under **WiFi Address**, select **Dynamic**.
5. Under **DNS Address**, select **DHCP Automatic**.
6. When finished, click **Save All**.
7. Cycle the machine power by turning the machine off, waiting until the Power On light goes off, and turning power on again.

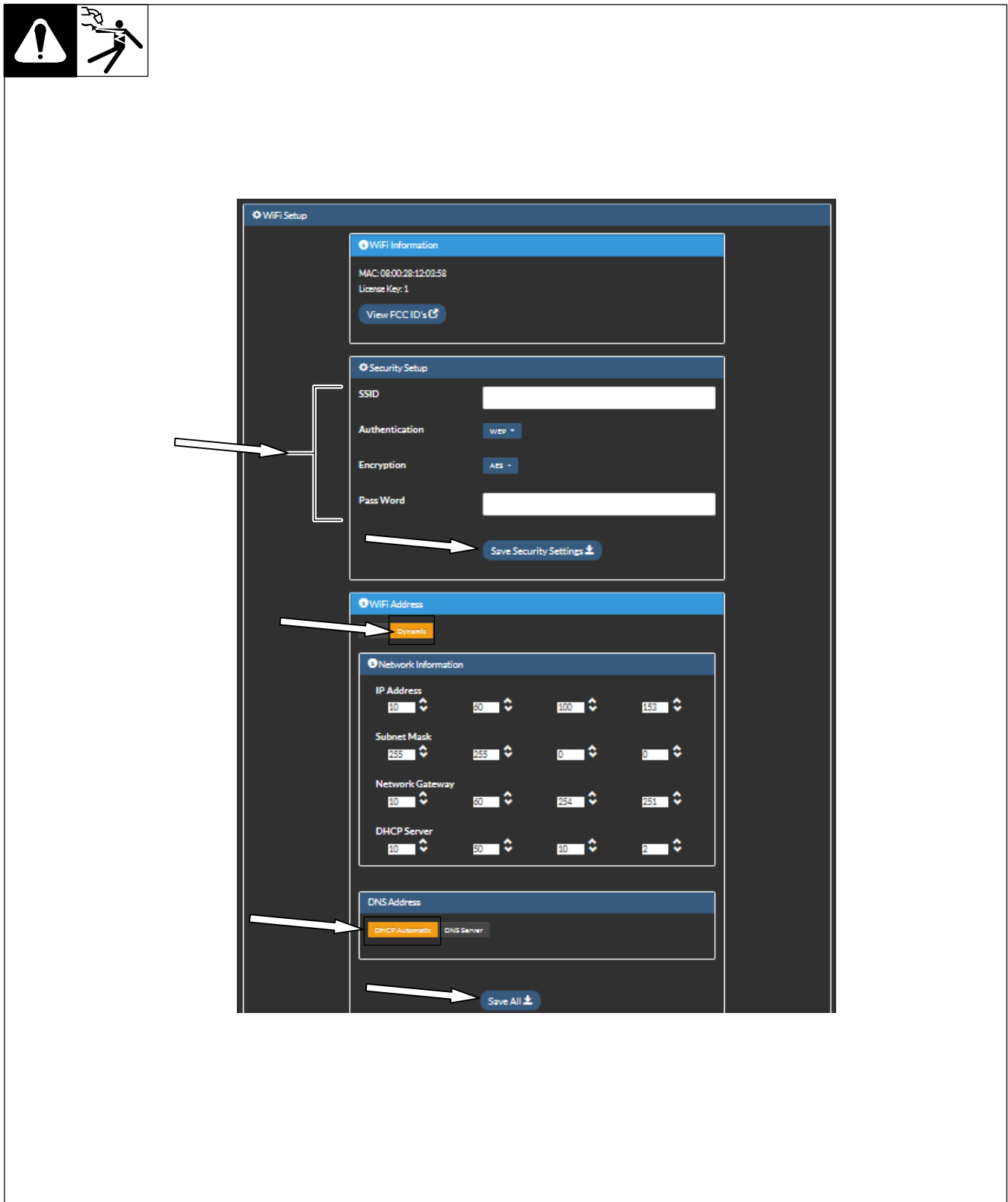


Figure 10-7. Configuring WiFi Connection Using DHCP

B. WiFi Connection Using Static Addressing

1. On the Setup page, under **WiFi Settings**, click **Edit** (see Figure 10-6).
2. On the screen that appears, under **Security Setup**, enter your network name (SSID), security type, and security key. This information is found on the Network Connectivity Survey completed by your IT Department (see Section 10-2).
3. Click **Save Security Settings** to save your wireless network settings.
4. Under **WiFi Address**, select **Static**.
5. Under **Network Information**, enter your IP address, subnet mask, and network gateway. This information is found on the Network Connectivity Survey completed by your IT Department (see Section 10-2).
6. Under **DNS Address**, select **DNS Server**. Enter DNS address from the Network Connectivity Survey completed by your IT Department (see Section 10-2).
7. When finished, click **Save All**.
8. Cycle the machine power by turning the machine off, waiting until the Power On light goes off, and turning power on again.

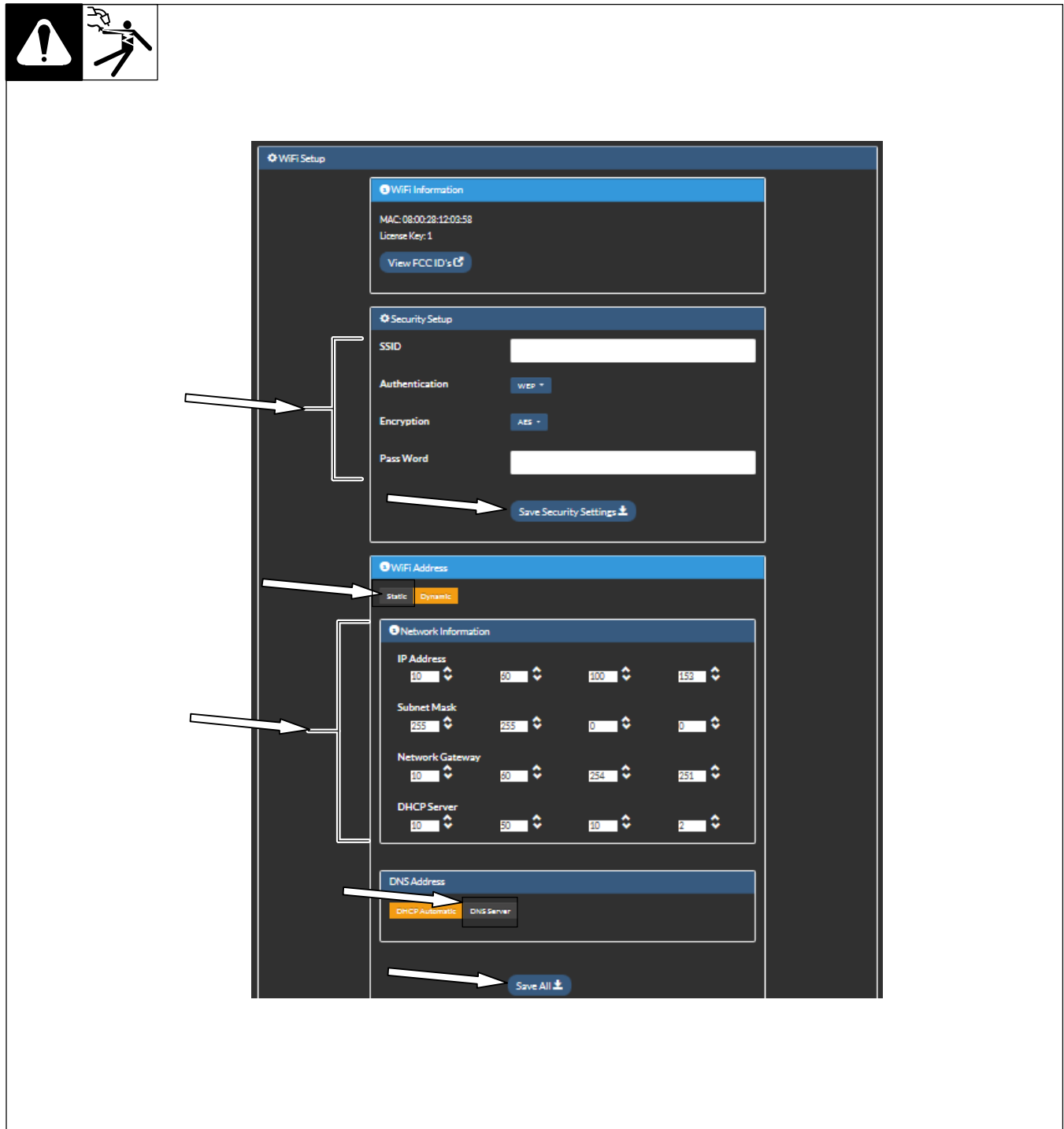
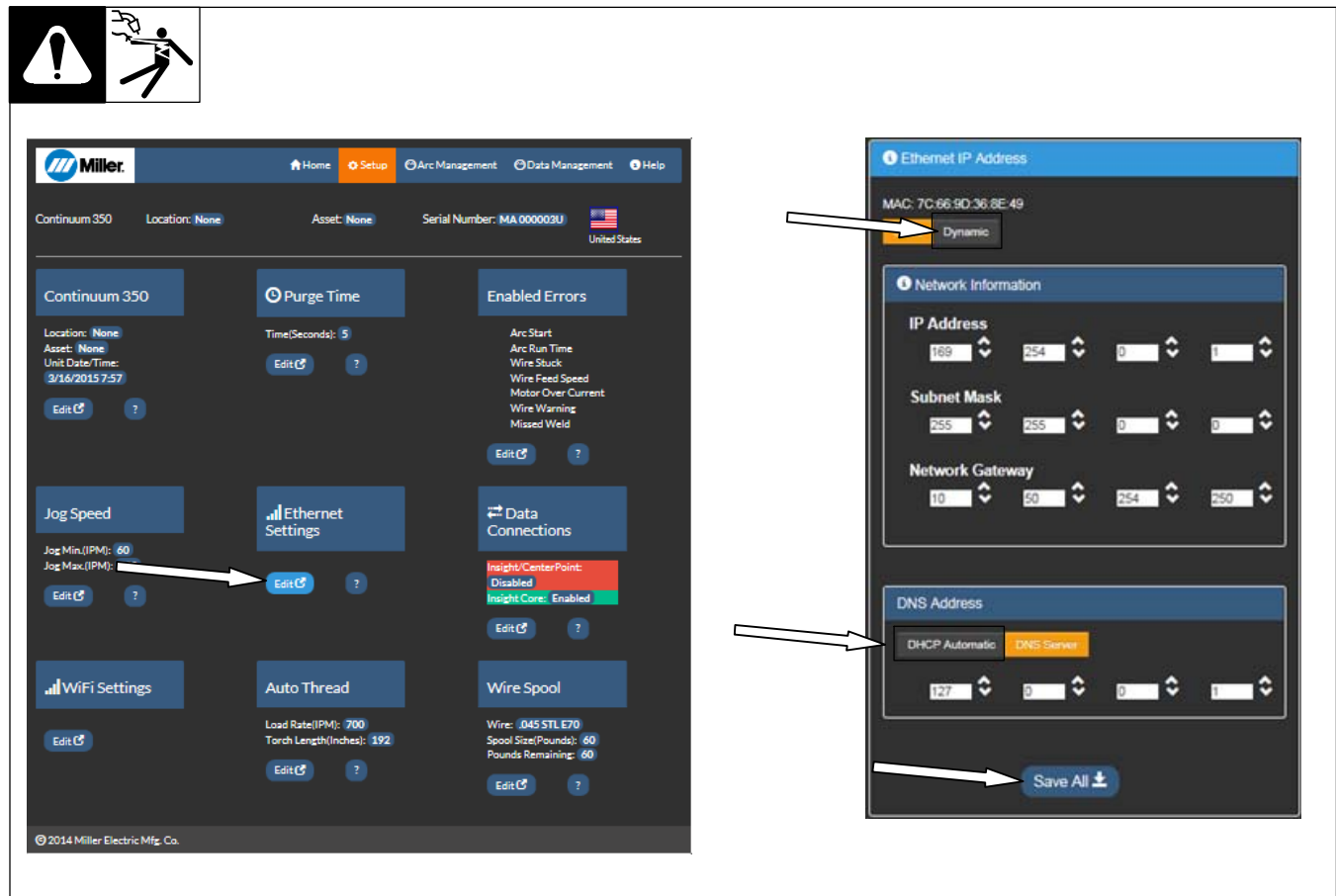


Figure 10-8. Configuring WiFi Connection Using Static Addressing

C. Wired (Ethernet) Connection Using DHCP (Dynamic Addressing)

1. On the Setup page, under **Ethernet Settings**, click **Edit**.
2. At the top of the screen that appears, select **Dynamic** underneath the IP address. The Network Information below will automatically fill in.
3. Under **DNS Address**, select **DHCP Automatic**.
4. When finished, click **Save All**.
5. Cycle the machine power by turning the machine off, waiting until the Power On light goes off, and turning power on again.



Notes

D. Wired (Ethernet) Connection Using Static Addressing

1. On the Setup page, under **Ethernet Settings**, click **Edit**.
2. At the top of the screen that appears, select **Static** under the IP address.
3. Under **Network Information**, enter your IP address, subnet mask, and network gateway. This information is found on the Network Connectivity Survey completed by your IT Department (see Section 10-2).
4. Under **DNS Address**, select **DNS Server**. Enter DNS address from the Network Connectivity Survey completed by your IT Department (see Section 10-2).

 Double-check the numbers before saving. A wrong number may be difficult to correct.

5. When finished, click **Save All**.
6. Cycle the machine power by turning the machine off, waiting until the Power On light goes off, and turning power on again.

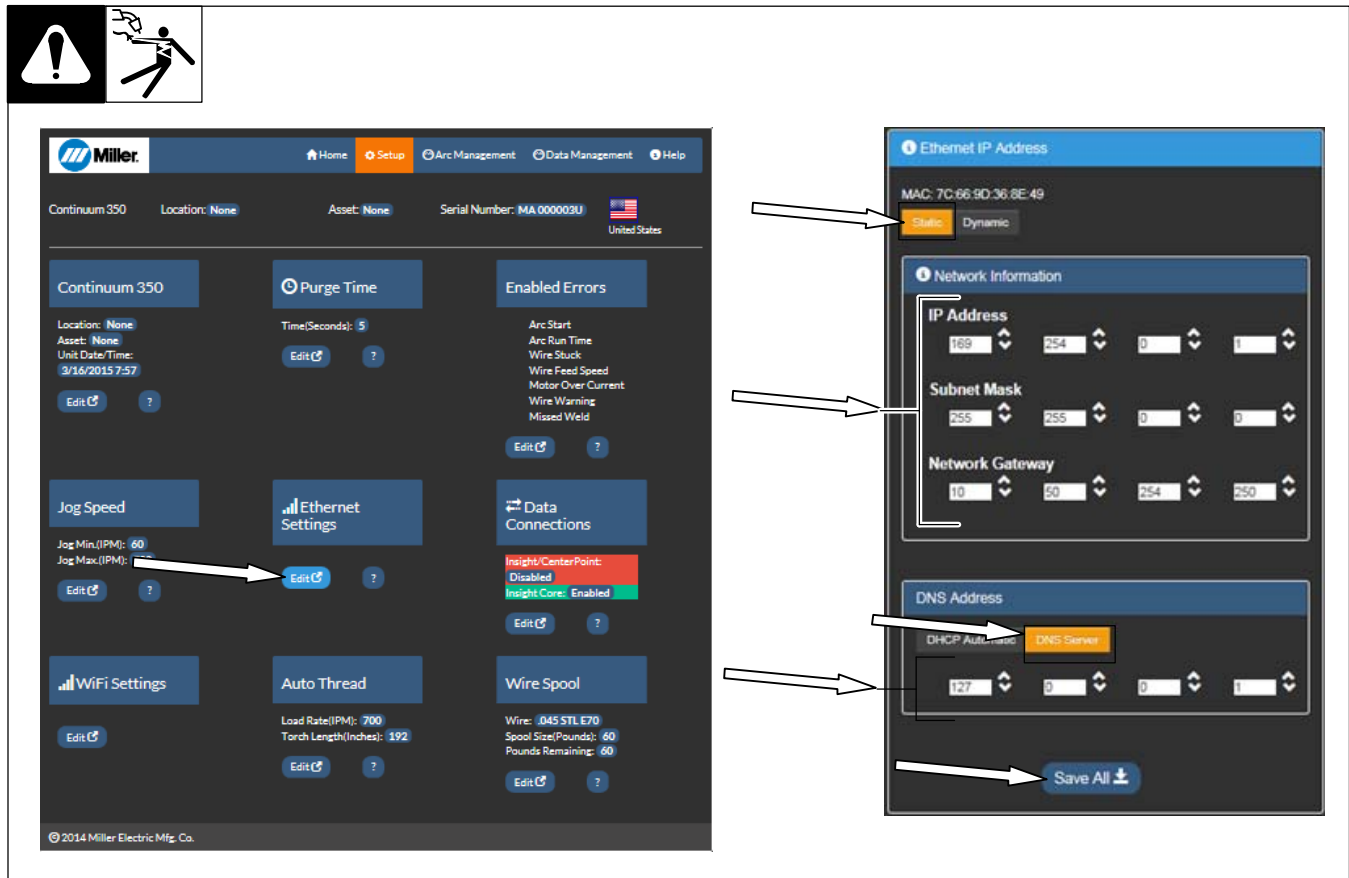


Figure 10-10. Configuring Ethernet Connection Using Static Addressing

Notes

10-6. Verifying Network Connection

 It can take up to five minutes for a WiFi network to connect the first time.

To verify the network connection, reference the feeder (or pendant) display. If a WiFi connection is being used, the box next to **WiFi** should be yellow. If an Ethernet connection is being used, the box next to **Ethernet** should be yellow. Only one (Ethernet or WiFi) is required to establish a network connection. Once the network is identified, the box next to **Internet** should be green.

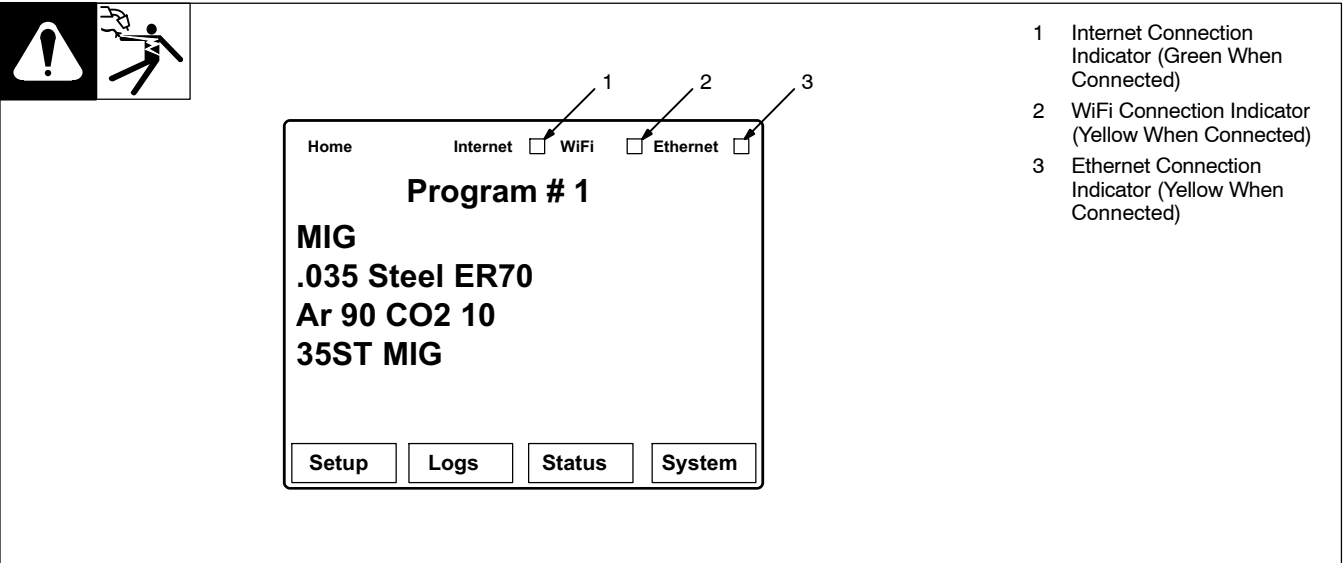


Figure 10-11. Verifying Network Connection

To review settings from the feeder, go to the Ethernet Settings screen. Using the scroll knob, select **System**, then **Network Settings**, then either **Ethernet Settings** or **WiFi Settings**.

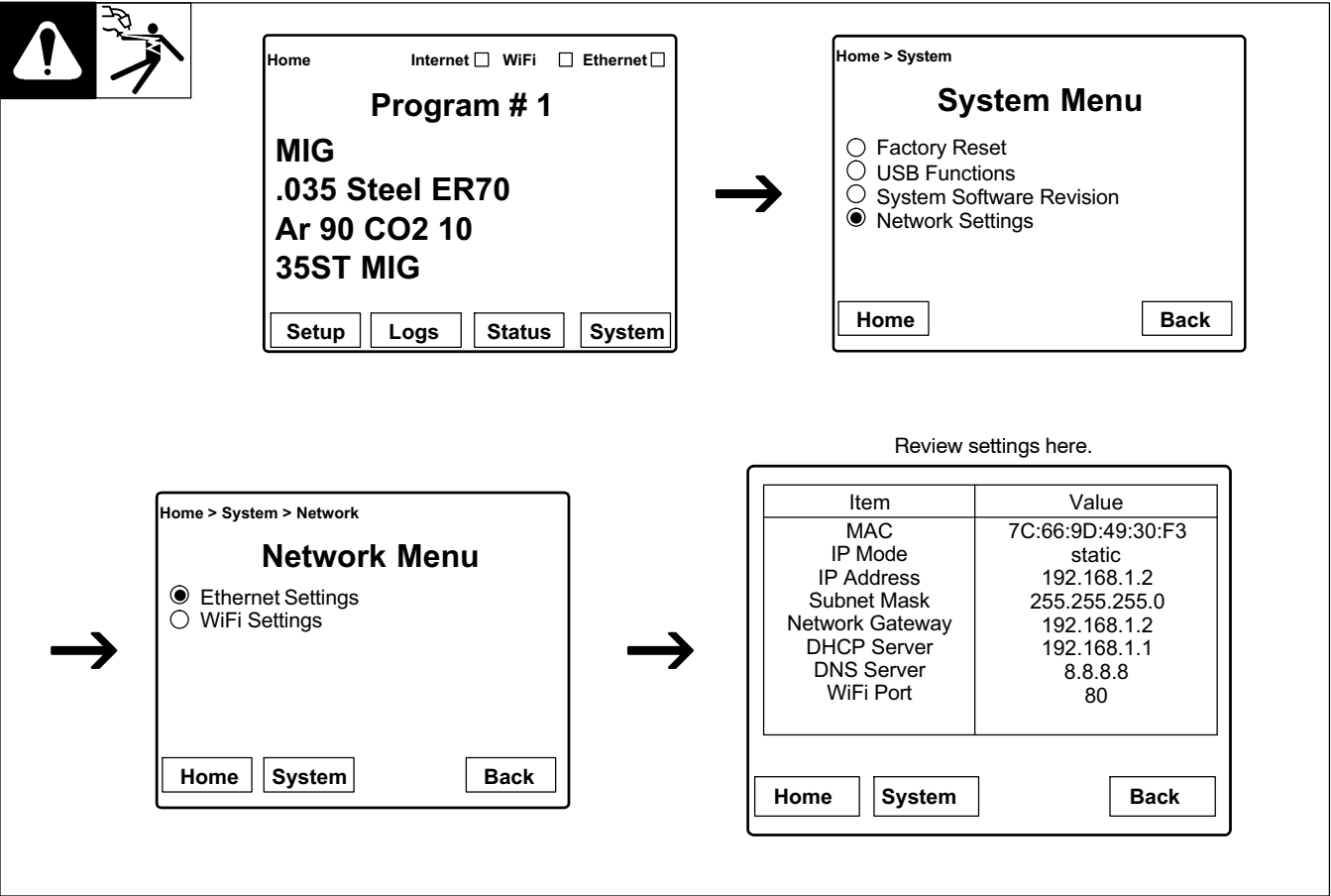


Figure 10-12. Verifying Network Connection

10-7. Determining Device Serial Number And License Key

Obtaining the device serial number and license key is necessary for product registration. Registration will activate your Insight Core account and give access to all Insight Core data.

1. Insert a USB drive into the front port on the Continuum Feeder.

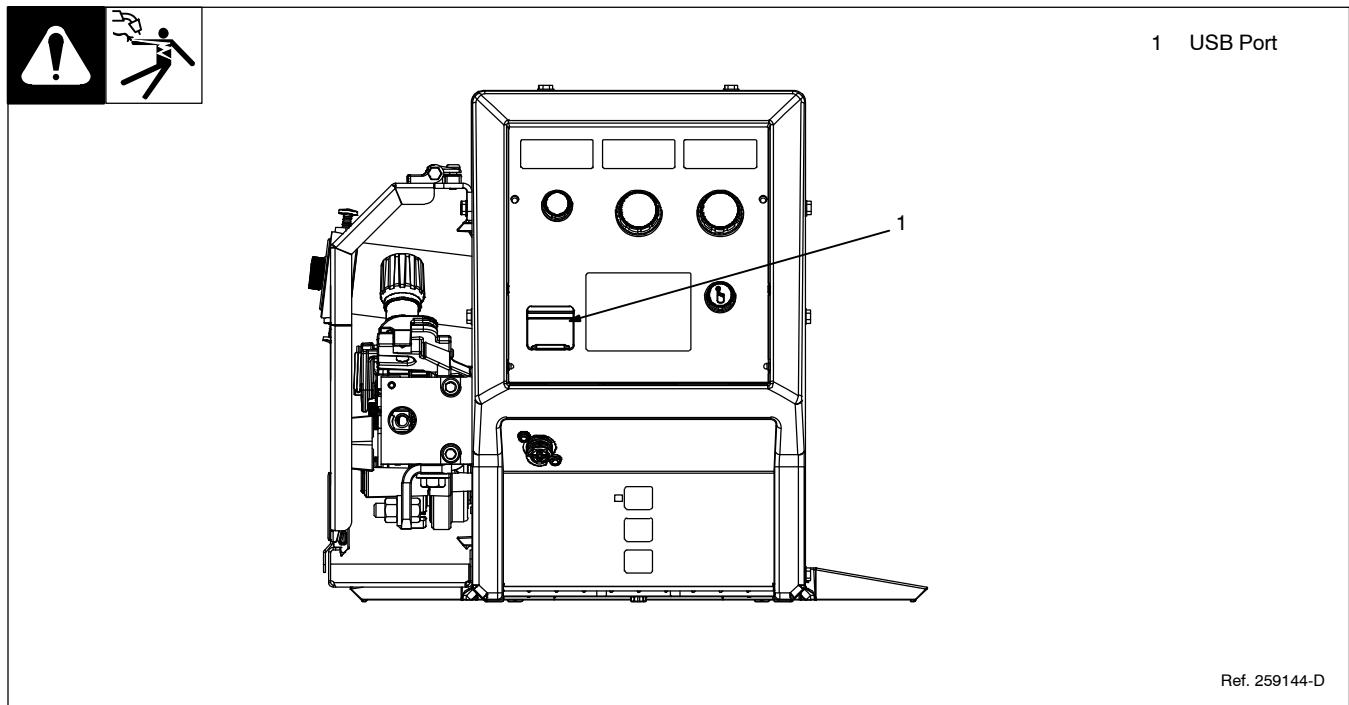


Figure 10-13. Continuum Feeder USB Location

2. From the feeder (or pendant) main menu, select **System** to bring up the System menu. Using the scroll knob, select **USB Functions**, then **Write to USB**, then **License Key**, then **Yes** to save the license key and serial number data. This process will load an IP_MAC file onto the USB drive, which contains the unique license key for your system.

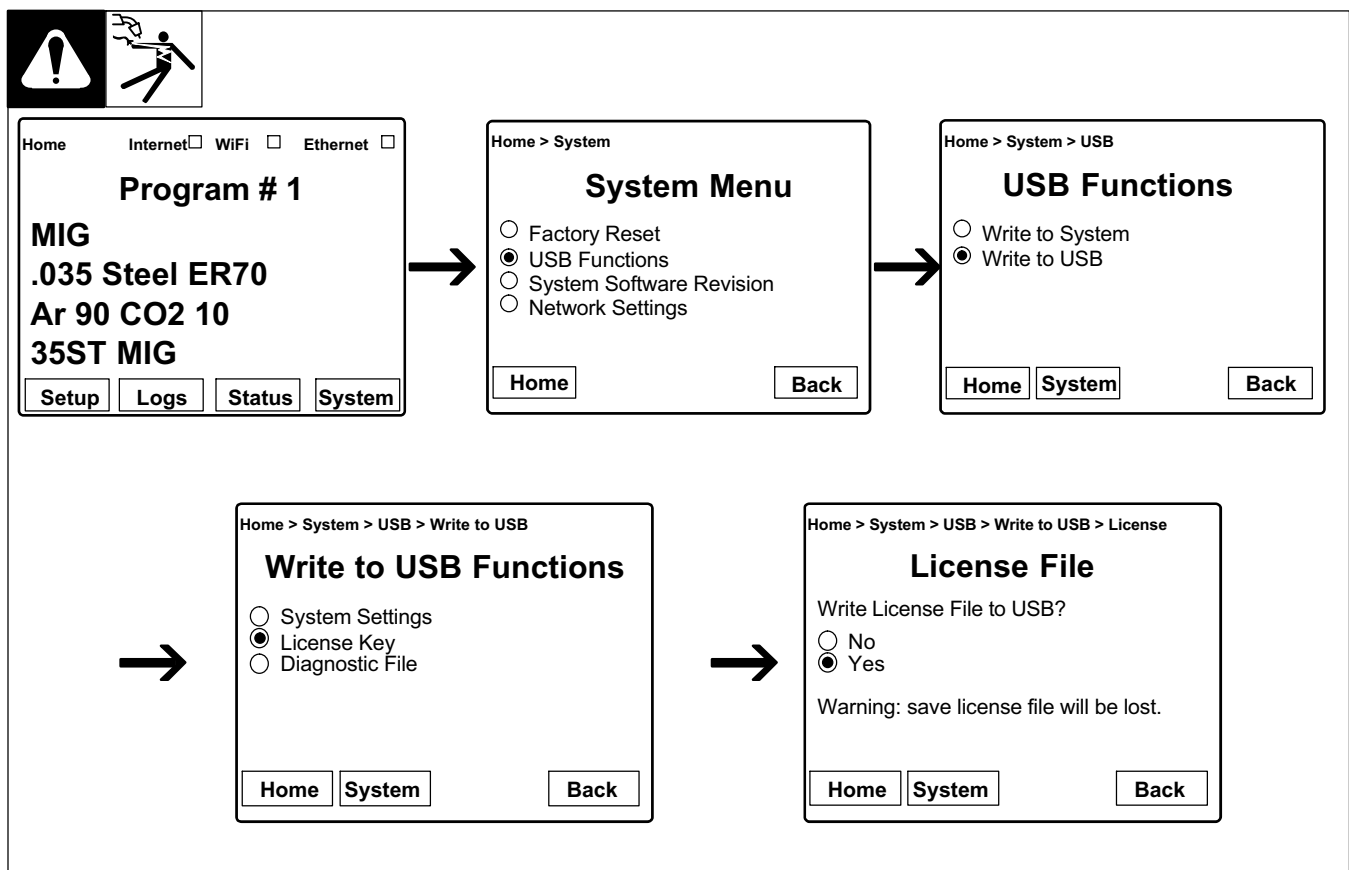


Figure 10-14. Obtaining Serial Number And License Key

3. Remove the USB drive from the feeder and insert it into your computer. Allow time for the computer to recognize the USB drive.
4. Find and open the folder named Device License Keys on the USB drive.

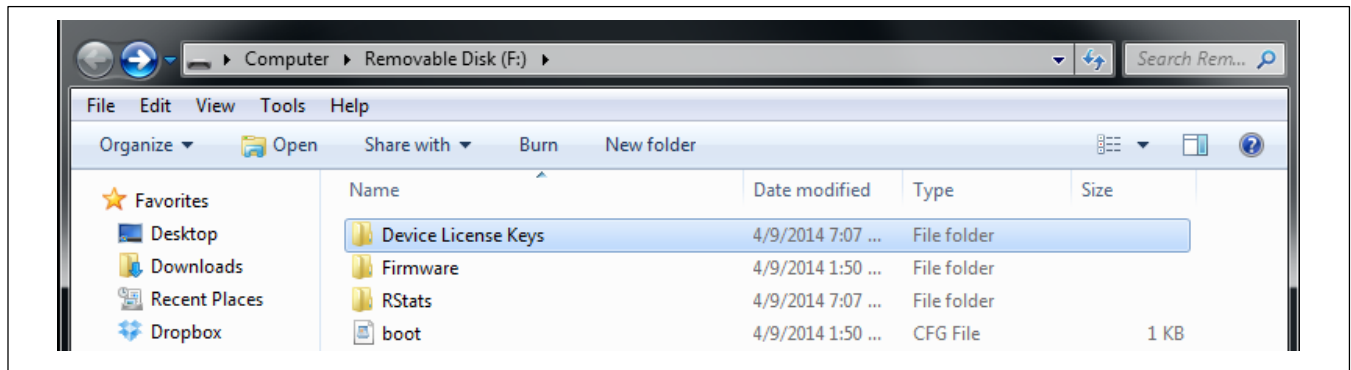


Figure 10-15. Device License Keys Folder

5. Open the .txt file called "IP_MAC_ADDR_LIC..." with a text editor (Notepad) to find the module/device serial number and license key needed to register the device.

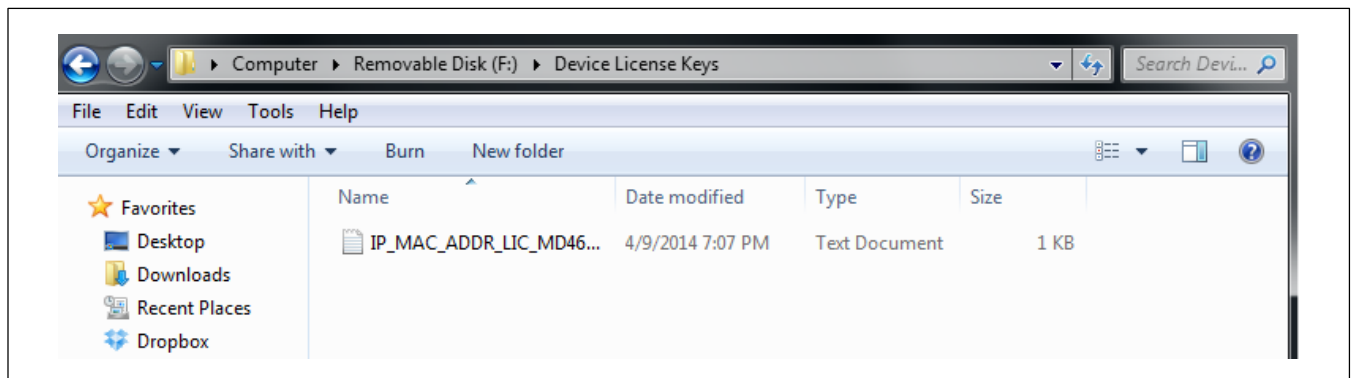


Figure 10-16. Device License Key File

6. Write down or copy and paste the serial number and license key for registration.

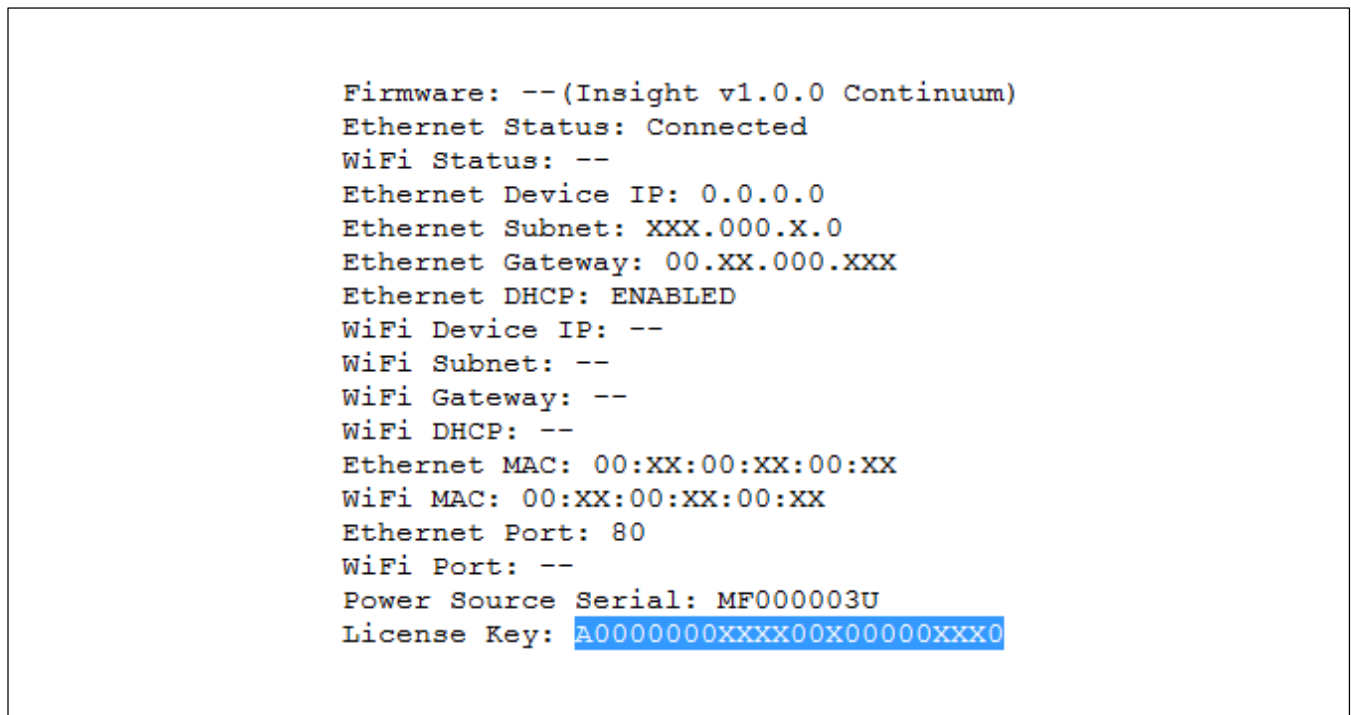


Figure 10-17. Device License Key Information

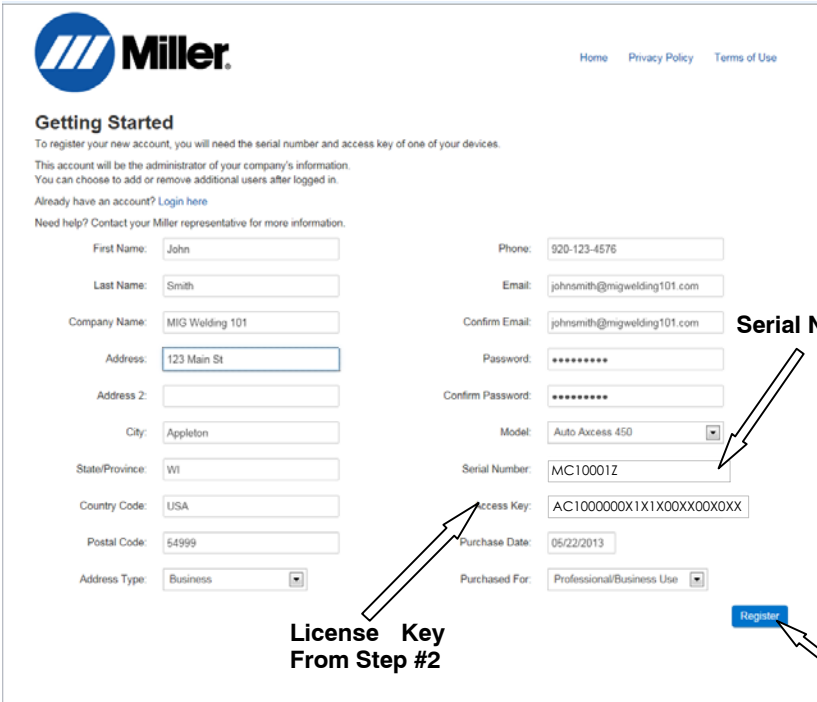
This file also verifies the connections information. Exact information in the file will vary based on connection type and device.

To continue device registration, proceed to Section 10-8.

10-8. Registering Initial Device And Creating An Account

1. Open a web browser and navigate to <https://insight.millerwelds.com/registration>.
2. Fill in all information shown in Figure 10-18. Use serial number and license key from Section 10-7.

 If this device is an additional module to be added to your existing fleet already registered, click Log In button and proceed to Section 10-9.



Miller

Home Privacy Policy Terms of Use

Getting Started

To register your new account, you will need the serial number and access key of one of your devices.
This account will be the administrator of your company's information.
You can choose to add or remove additional users after logged in.
Already have an account? [Login here](#)
Need help? Contact your Miller representative for more information.

First Name: John Phone: 920-123-4576
Last Name: Smith Email: johnsmith@mgwelding101.com
Company Name: MIG Welding 101 Confirm Email: johnsmith@mgwelding101.com
Address: 123 Main St Password: *****
Address 2: Confirm Password: *****
City: Appleton Model: Auto Access 450
State/Province: WI Serial Number: MC10001Z
Country Code: USA Access Key: AC100000X1X1X00XX00X0XX
Postal Code: 54999 Purchase Date: 05/22/2013
Address Type: Business Purchased For: Professional/Business Use

Serial Number

License Key From Step #2

Register

Figure 10-18. Registering A New Account

3. After clicking on the Register button, the homepage for the company that was just created will appear (see Figure 10-19).

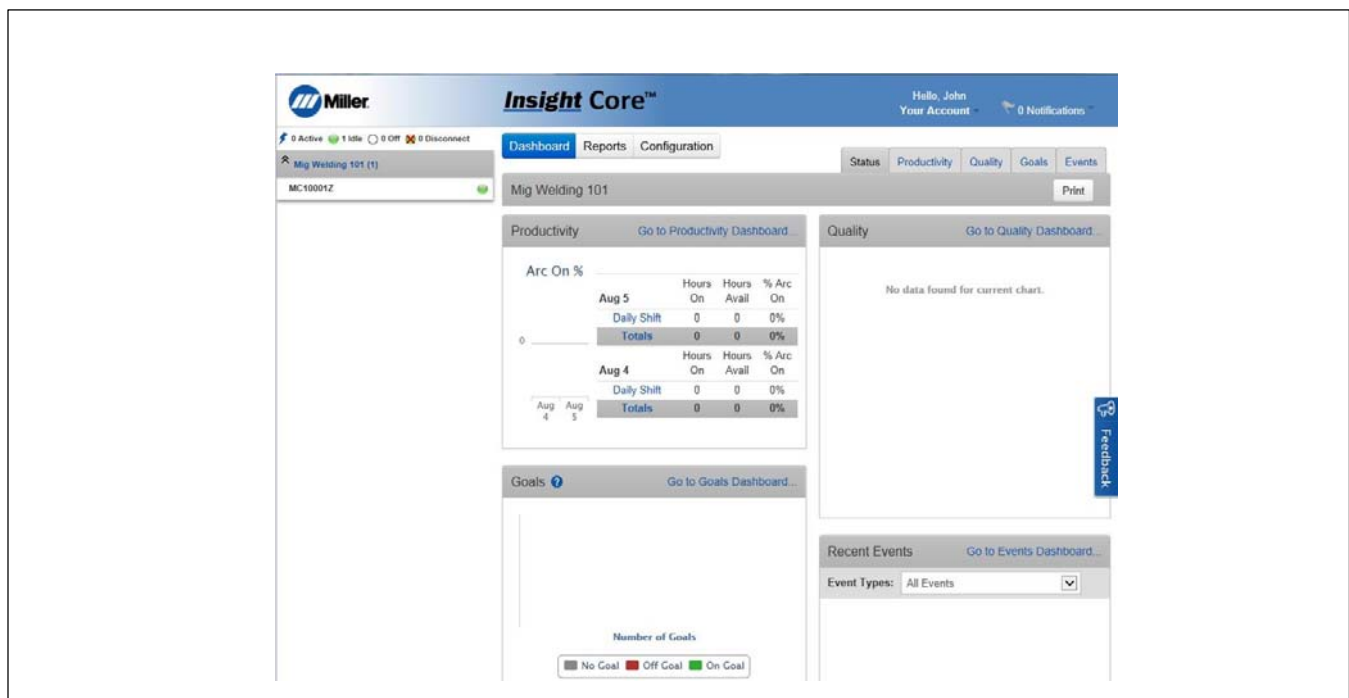


Figure 10-19. Insight Core Company Dashboard

 To register additional devices proceed to Section 10-9.

10-9. Registering Additional Devices

1. Log in to Insight Core website at <https://insight.millerwelds.com/>.
2. Click on the Configuration tab (See Figure 10-20).
3. On the Configuration tab, click on the Register New Device button.

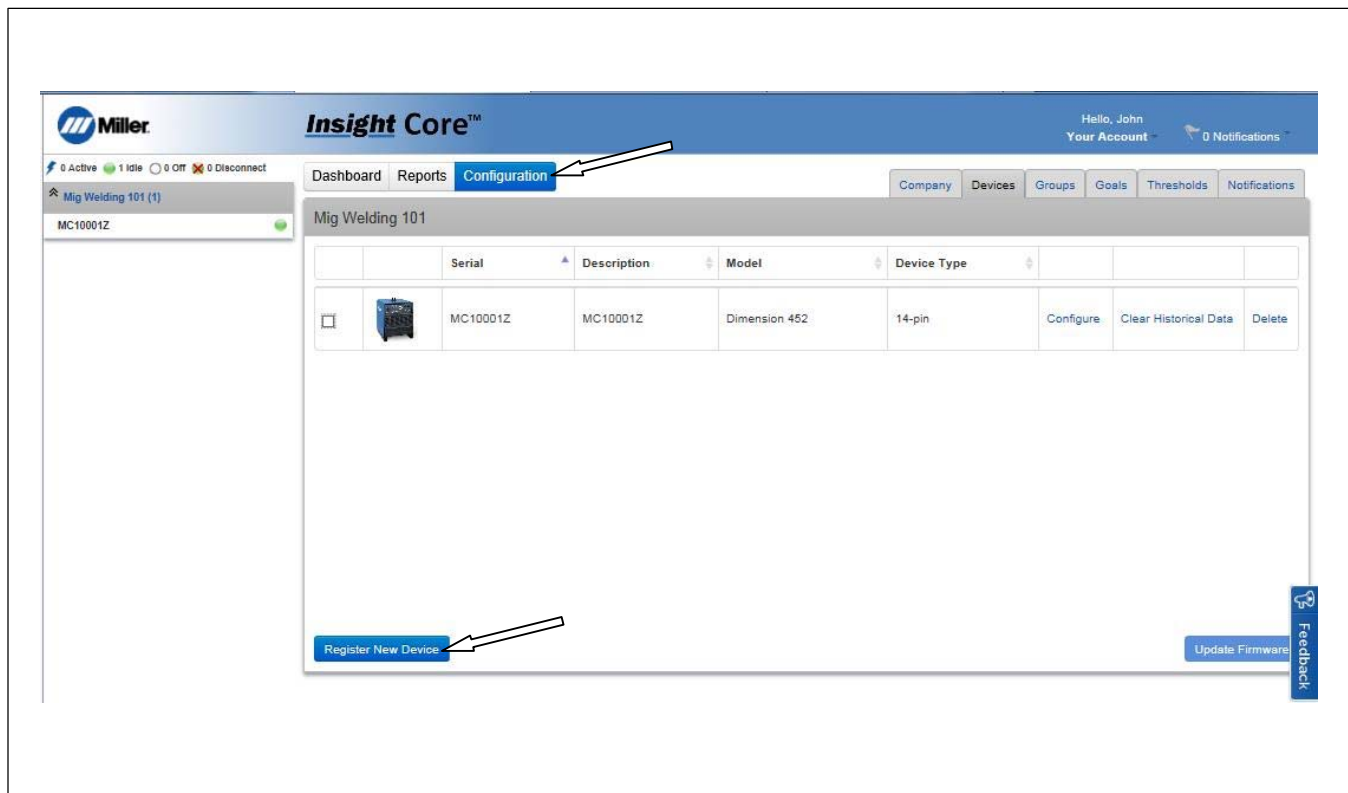


Figure 10-20. Configuration Screen

4. Enter the information for the new device you intend to register.
5. A confirmation screen will appear. If the information is correct, click on the Save button (see Figure 10-21).

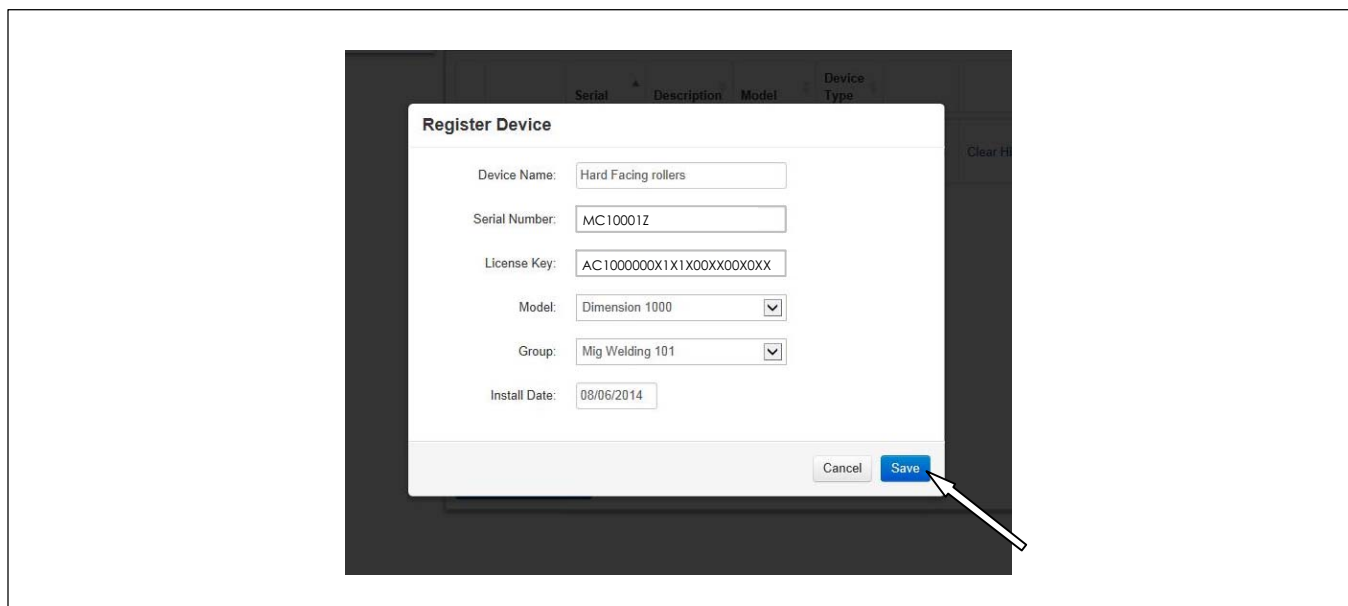


Figure 10-21. Register Device Confirmation Screen

6. After registration, the device will appear inside the corporate asset tree and begin displaying activity as operators begin welding with this power source.

6



⚠ WARNING
ELECTRIC SHOCK HAZARD

- Do not touch live electrical parts.
- Disconnect input power or stop engine before servicing.
- Do not operate with covers removed.
- Have only qualified persons install, use, or service this unit.

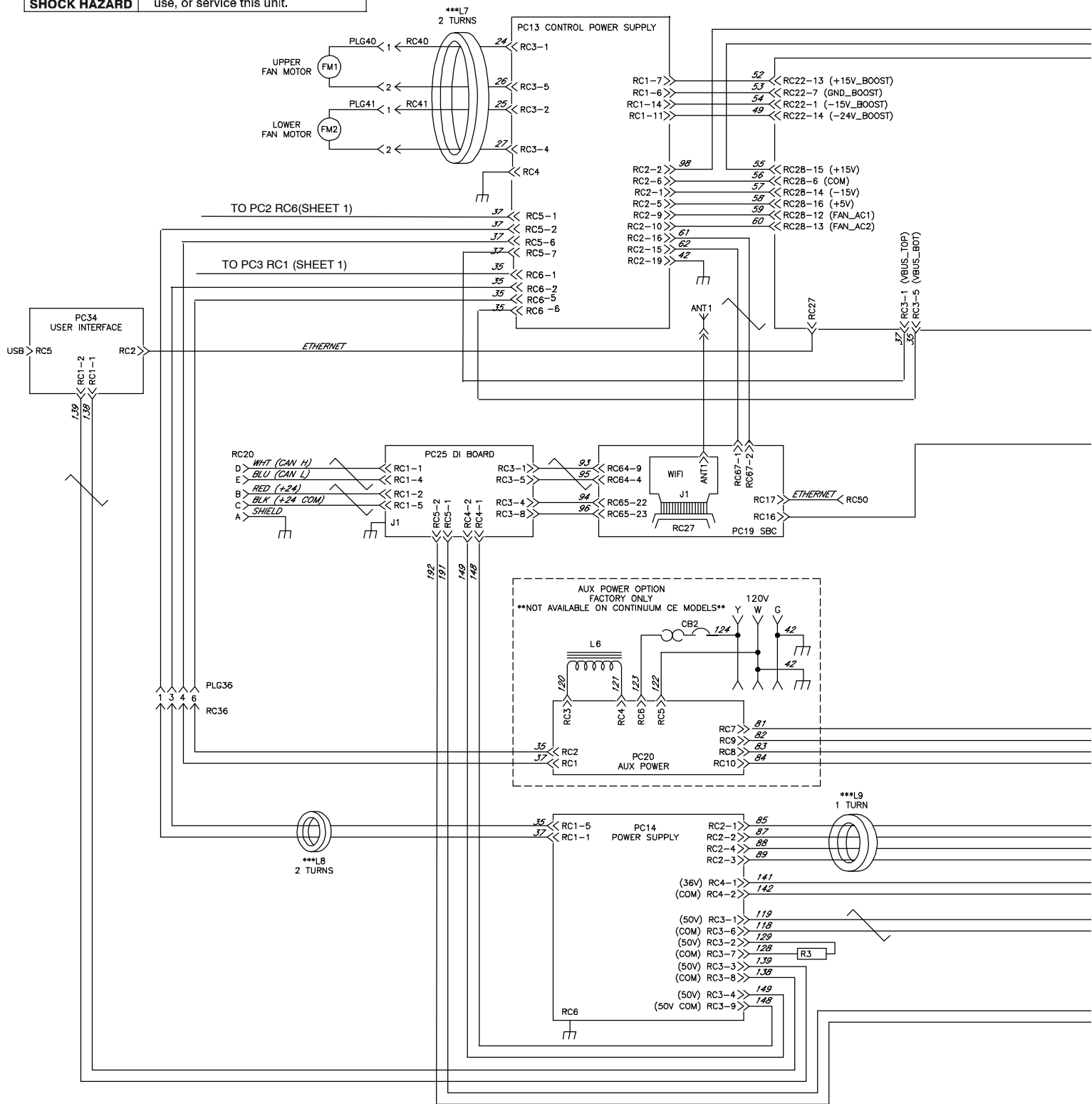
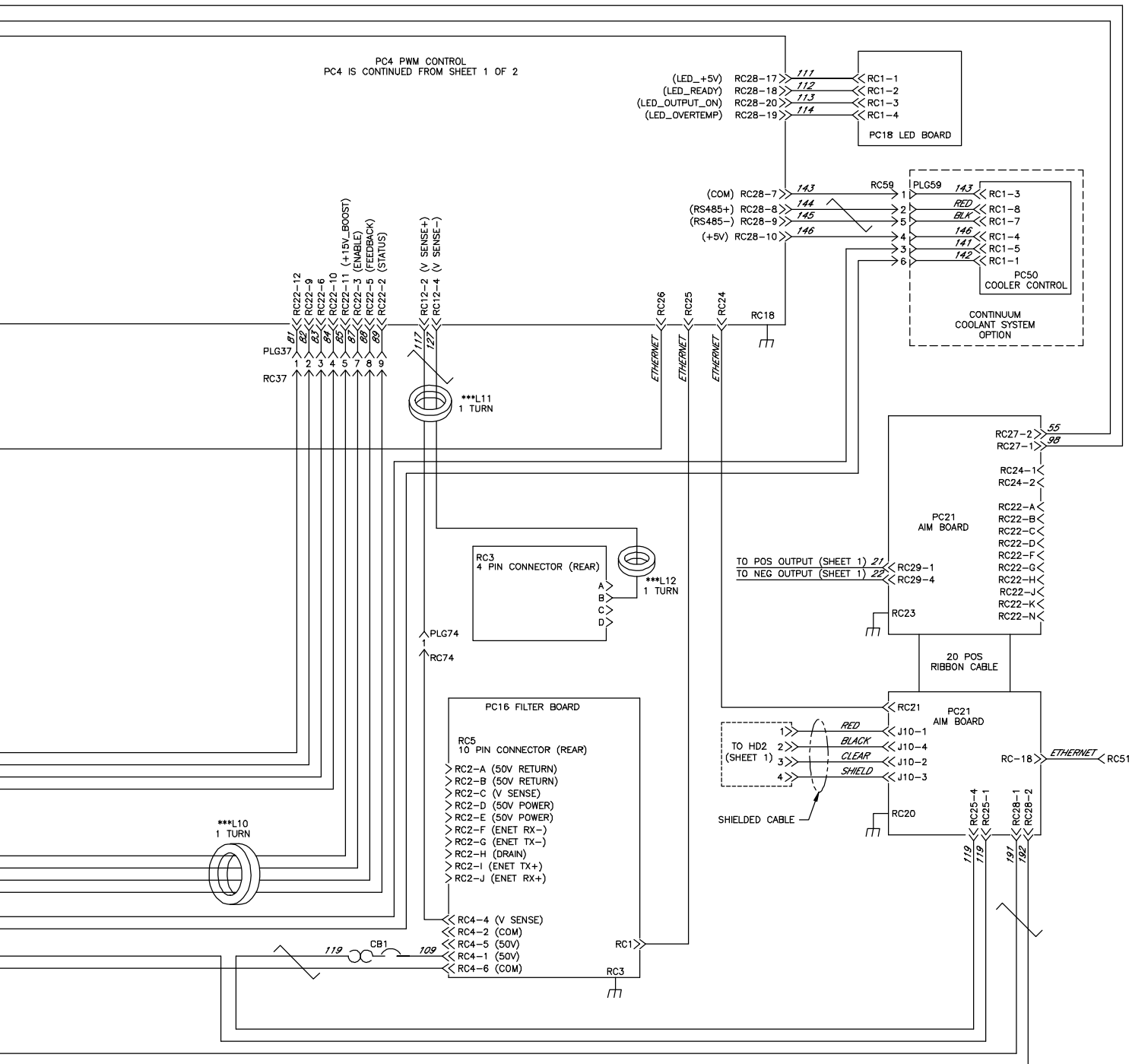


Figure 11-2. Circuit Diagram For Auto-Continuum 350 Model (Page 2 of 2)



⚠ WARNING



ELECTRIC SHOCK HAZARD

- Do not touch live electrical parts.
- Disconnect input power or stop engine before servicing.
- Do not operate with covers removed.
- Have only qualified persons install, use, or service this unit.

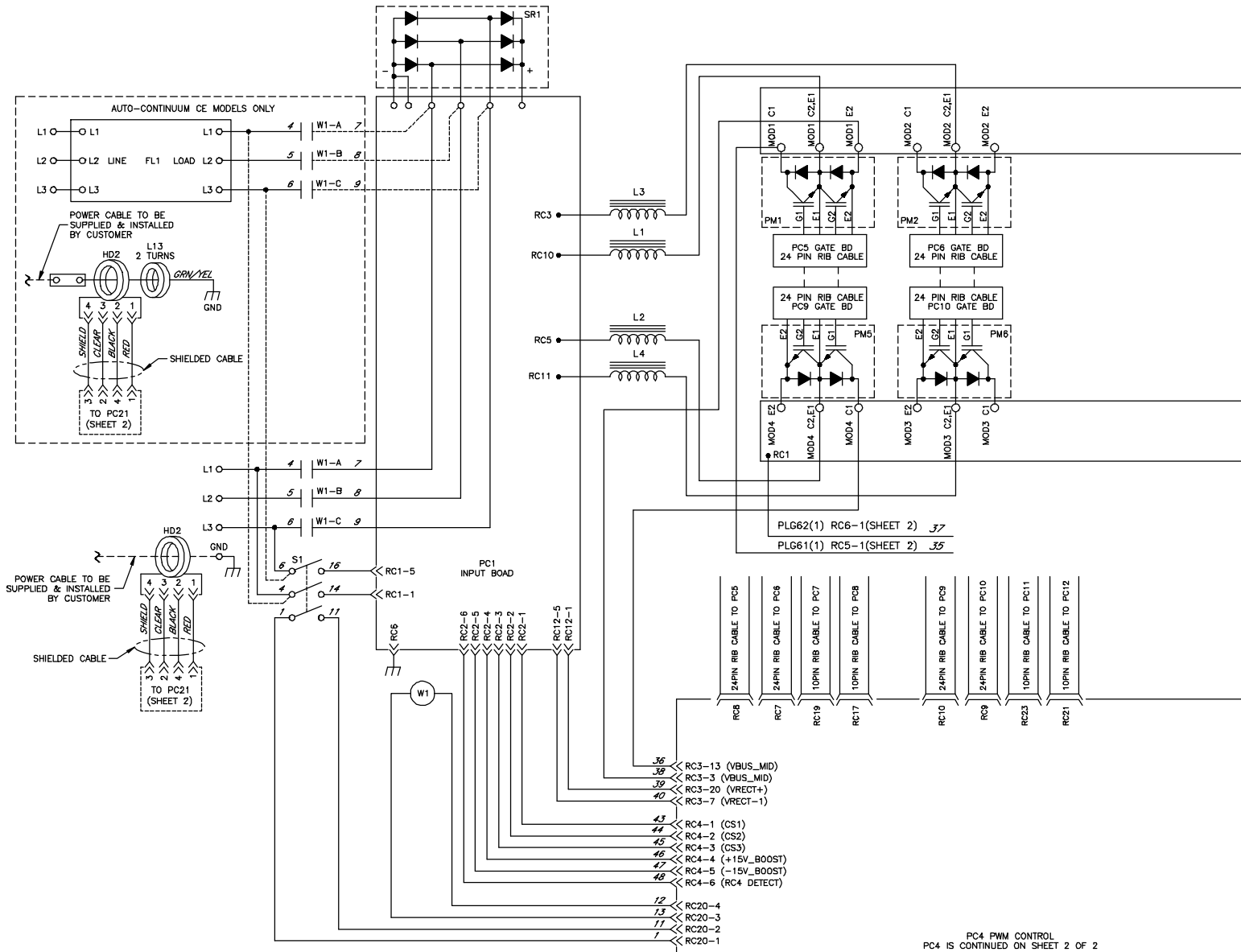
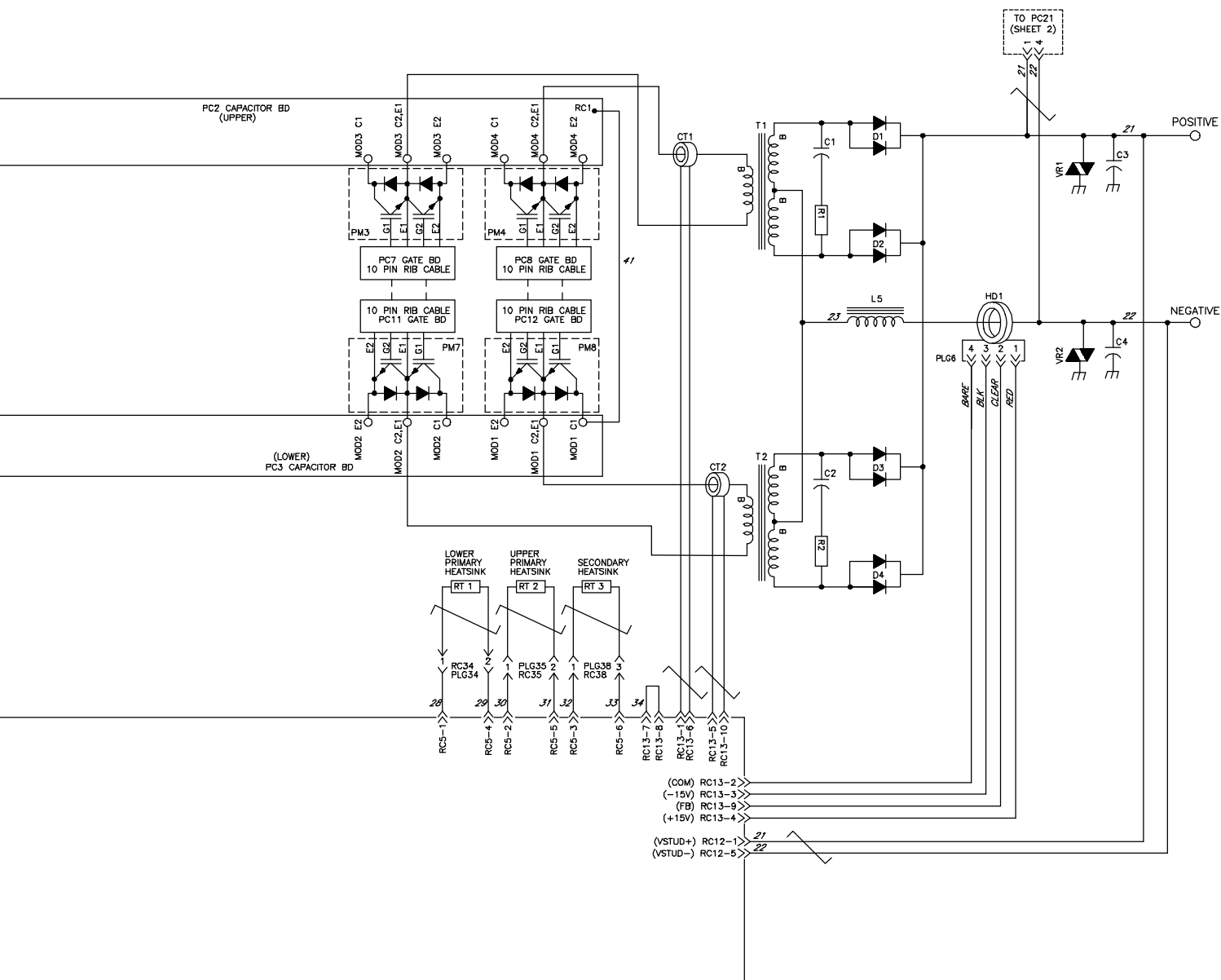


Figure 11-3. Circuit Diagram For Auto-Continuum 500 Model (Page 1 of 2)



	⚠ WARNING
	- Do not touch live electrical parts. - Disconnect input power or stop engine before servicing. - Do not operate with covers removed. - Have only qualified persons install, use, or service this unit.
ELECTRIC SHOCK HAZARD	

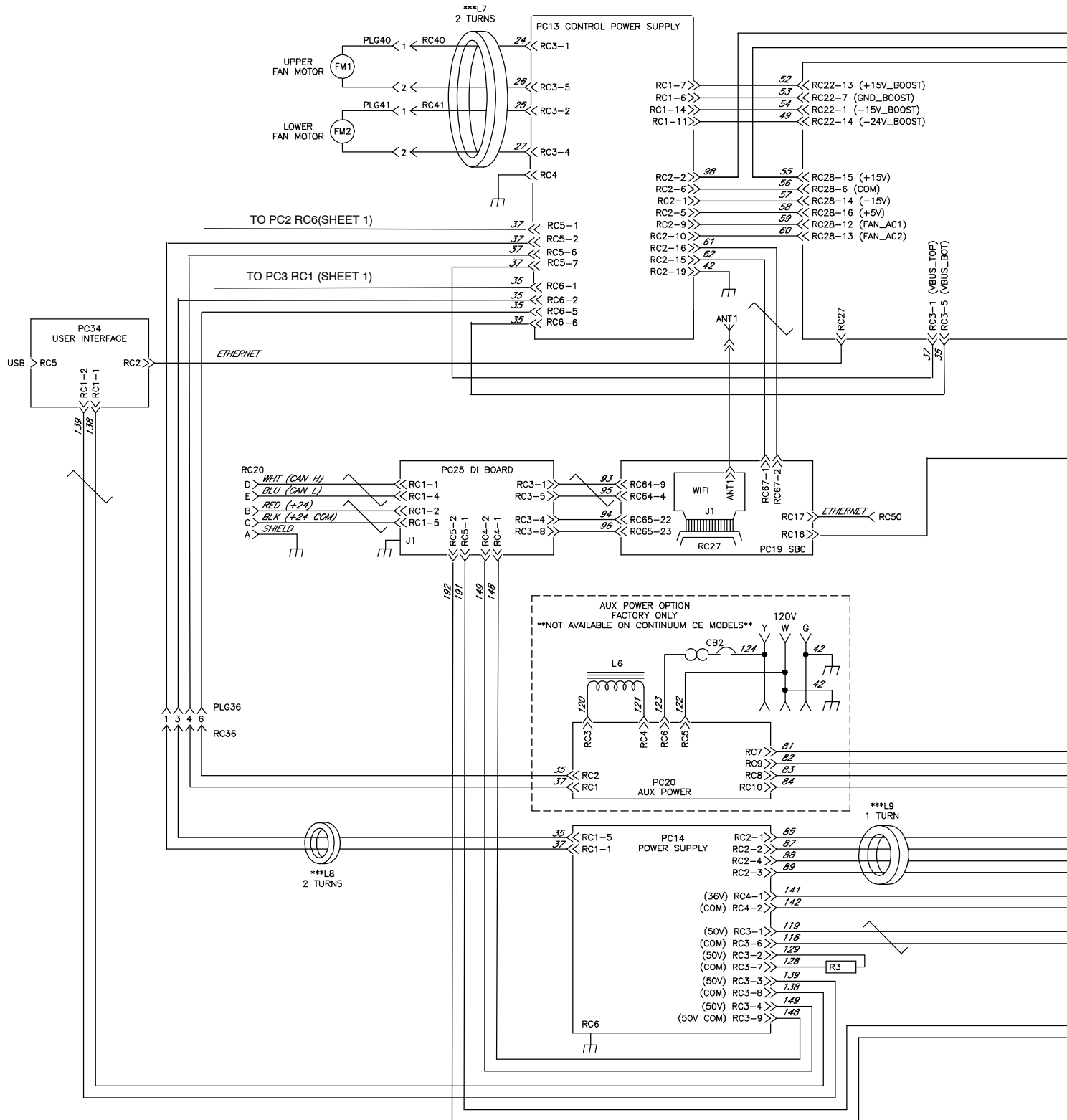


Figure 11-4. Circuit Diagram For Auto-Continuum 500 Model (Page 2 of 2)

SECTION 12 – PARTS LIST FOR 350 AND 500 MODELS

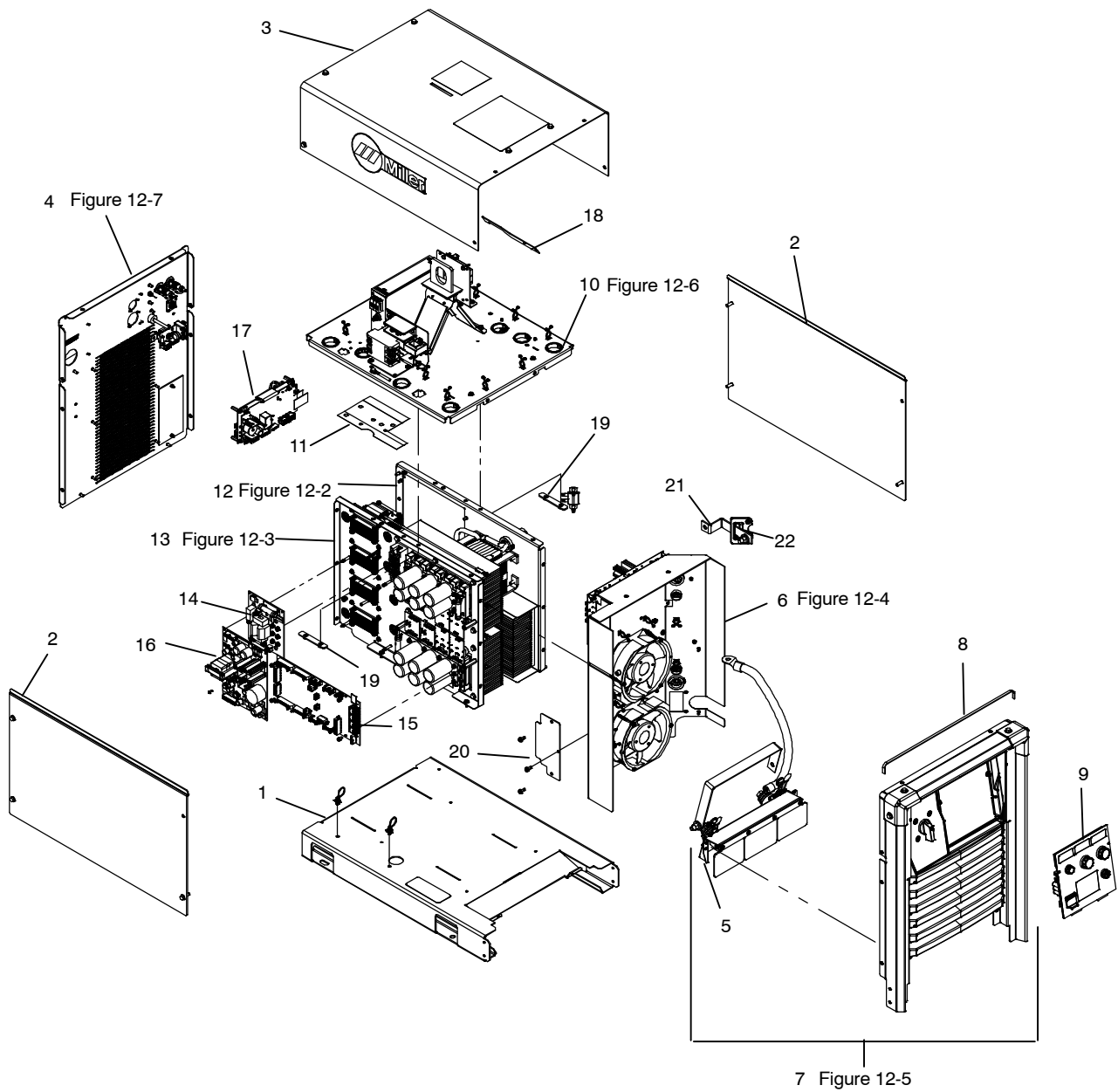
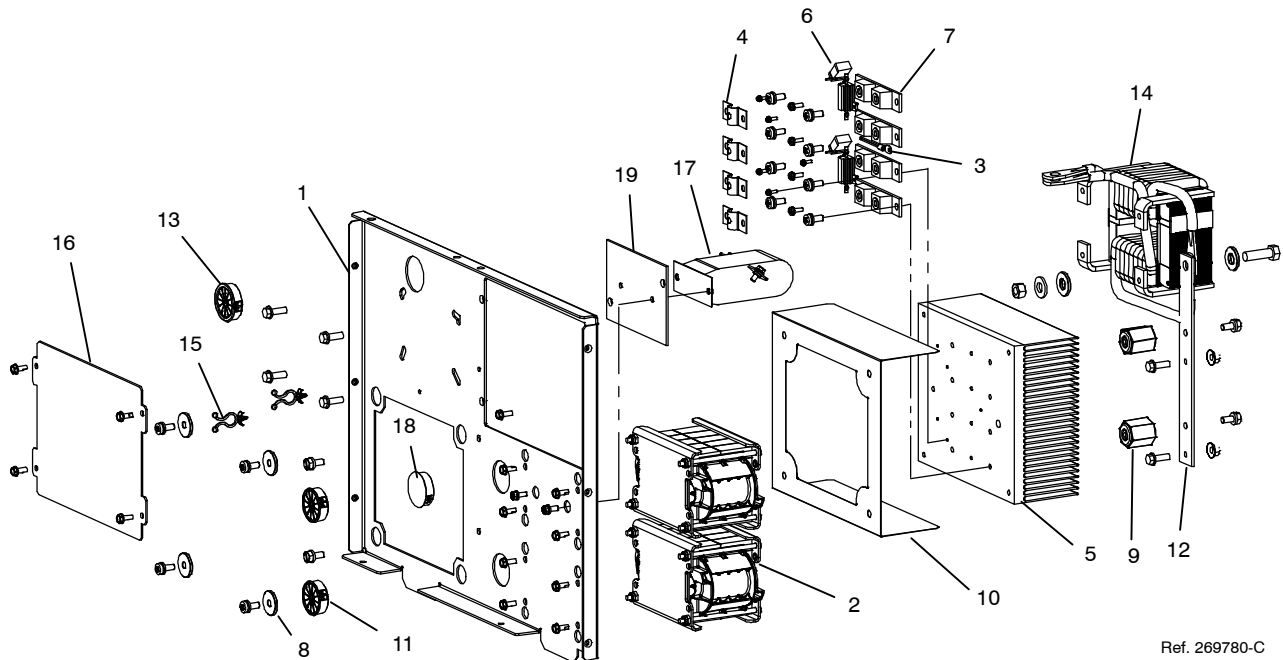


Figure 12-1. Main Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity	
Figure 12-1. Main Assembly				350 Model	500 Model
.. 1		+283001	.. Base ,Continuum	1	1
		219844	.. Label, Warning Electric Shock/Exploding Parts – Wdles	1	1
.. 2		+282994	.. Panel, Side	2	2
.. 3		+282688	.. Cover, Top	1	1
		274964	.. Label, Warning General Precautionary (En/Fr/Sp)	1	1
		274966	.. Label, Warning Falling Equipment (En/Fr/Sp)	1	1
.. 4		Figure 12-7	.. Rear Panel Assy, Continuum	1	1
.. 5		283172	.. Output Terminal Assy, (See Figure 12-5)	1	1
.. 6		Figure 12-4	.. Fan Panel Assy,	1	1
.. 7		Figure 12-5	.. Front Panel Assy, Continuum	1	1
.. 8		269472	.. Gasket, Sealing 17.000L x .250w x .063t	1	1
.. 9		273390	.. Assy, UI Auto	1	1
.. 10		Figure 12-6	.. Penthouse Assy	1	1
.. 11		270511	.. Insulator,.010 Thick X 4.500 X 8.000	1	1
.. 12		Figure 12-2	.. Windtunnel, Rh W/Cmpnts	1	1
.. 13		Figure 12-3	.. Windtunnel, Lh W/Cmpnts	1	1
.. 14	PC1	248915	.. Circuit Card Assy, Input	1	1
.. 15	PC4	279801	.. Circuit Card Assy, Inverter - Arc Control Auto W/Prog	1	1
.. 16	PC13	281972	.. Circuit Card Assy, Power Supply	1	1
.. 17		271671	.. Circuit Card Assy, AIM Continuum w/Prog	1	1
.. 18		273656	.. Bracket, Support EMC Filter	1	1
.. 19		266420	.. Plate, Lift Eye Mtg	2	2
.. 20		267407	.. Plate, Shielding	1	1
.. 21		273487	.. Bus Bar, Output	1	1
.. 22		269271	.. Insulator, Windtunnel/Bus Bar	1	1
		262913	.. Kit, Strain Relief 1.250 (Including)	1	1
		255675	.. Bushing, Strain Relief .865/1.26 Id x 1.250 Mtg Hole	1	1
		263092	.. Nut, Conduit 1.250 Npsm Knurled	1	1
		602177	.. Screw, Set 250–20 x .25 Knrlpt Sch stl Pln	1	1
		223930	.. Cable, E-Stop 30 Ft	1	1

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

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.



Ref. 269780-C

Figure 12-2. Right-Hand Windtunnel w/Components

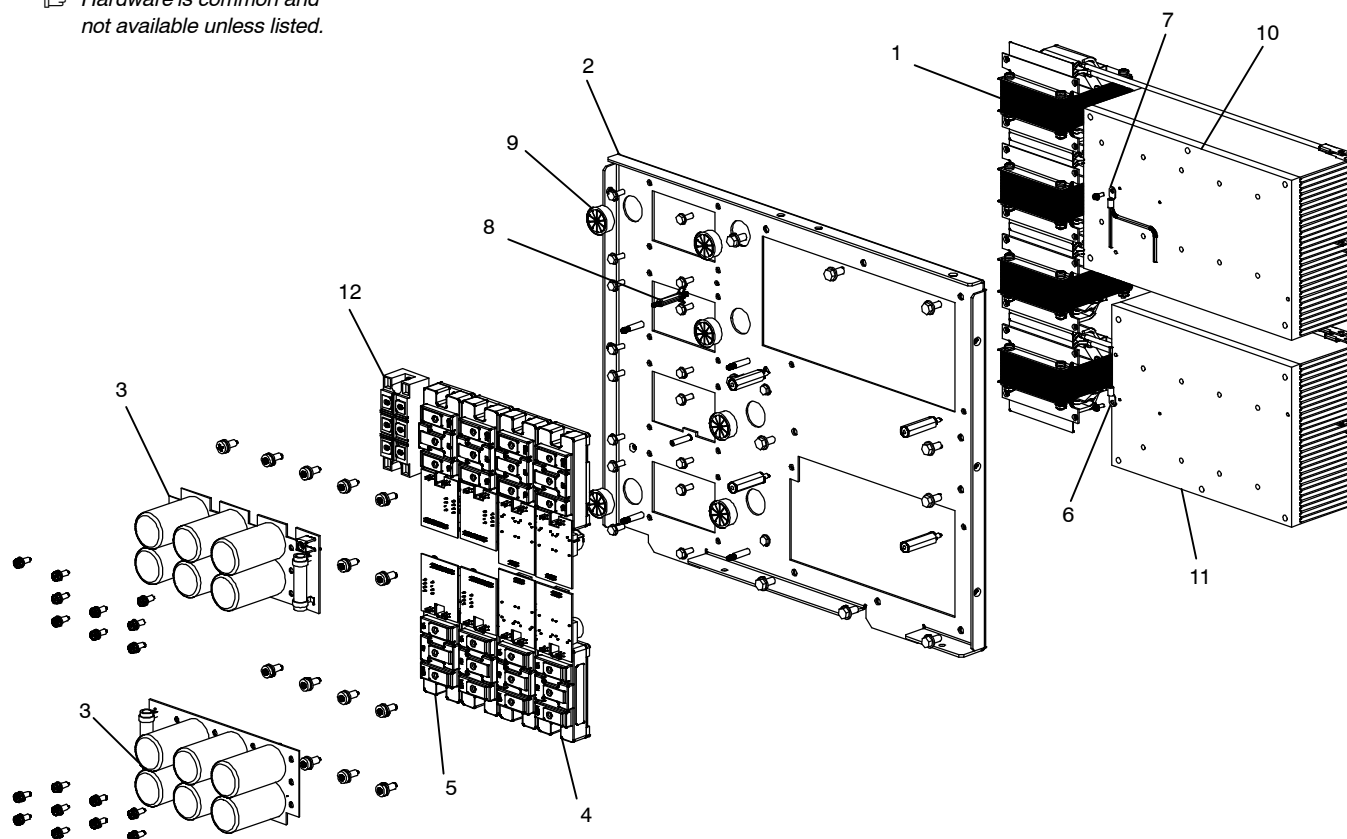
Item No.	Dia. Mkgs.	Part No.	Description	Quantity	
Figure 12-2. Right-Hand Windtunnel w/Components (Figure 12-1, Item 12)				350 Model	500 Model
1		265243	Windtunnel, Rh	1	1
2	T1-T2	252442	Xfmr, Hf Litz (500)	0	2
2	T1	267776	Xfmr, Hf Litz (350)	1	0
		263299	Heat Sink Assy, Output Diode (500)(Includes Items 3-7)	0	1
		267924	Heat Sink Assy, Output Diode (350)(Includes Items 3-7)	1	0
3		213029	Thermistor, Ntc 30k Ohm @ 25 Deg C 26.00in Lead	1	1
4		199840	Bus Bar, Diode	2	4
5		272416	Heat Sink, Diode	1	1
6		233052	Resistor/Capacitor,	1	2
7	D1-D4	201531	Kit, Diode Power Module	2	4
8		196355	Insulator, Screw	4	4
9		025248	Stand-off, Insul .250-20 X 1.250 Lg X .437 Thd	2	2
10		236727	Insulator, Heat Sink	1	1
11		179276	Bushing, Snap-in Nyl 1.000 Id X 1.375 Mtg Hole Cent	2	2
12		253547	Bus Bar, Xfmr Current	1	1
13		245520	Bushing, Snap-in Nyl 1.062 Id X 1.500 Mtg Hole Cent	1	1
14	L5	273683	Inductor, Output	1	1
15		223343	Clip, Wire Std .40-.50 Bndl .156hole .031-.078thk	2	2
16		267438	Plate, Blank Aux	1	1
17	C5	265285	Capacitor, Polyp Met Film 30. Uf 550 Vdc	1	0
18		057360	Blank, Snap-In Nyl 1.375 Mtg Hole Black	1	0
19		267870	Plate, Mtg Capacitor	1	0

◆ OPTIONAL

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

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Hardware is common and not available unless listed.



269781-A

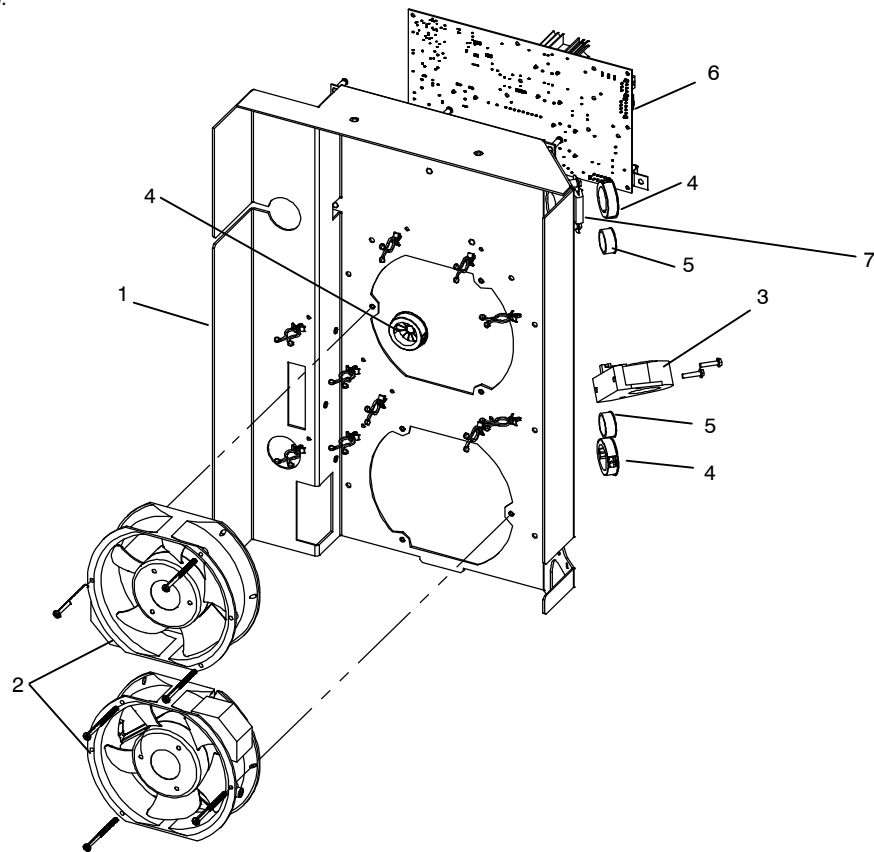
Figure 12-3. Left-Hand Windtunnel w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity	
Figure 12-3. Left-Hand Windtunnel w/Components (Figure 12-1, Item 13)				350 Model	500 Model
1	L1-L4	252375	Inductor, Input	2	4
2		265242	Windtunnel, Lh	1	1
3	PC2-PC3	248920	Circuit Card Assy, Capacitor (500)	0	2
3	PC2-PC3	265947	Circuit Card Assy, Capacitor (350)	2	0
4		284838	Kit, Transistor IGBT Module 500 (Inverter)	0	1
4		284839	Kit, Transistor IGBT Module 350 (Inverter)	1	0
5		284836	Kit, Transistor IGBT Module 500 (Boost)	0	1
5		284837	Kit, Transistor IGBT Module 350 (Boost)	1	0
6		252449	Thermistor, Ntc 30k Ohm @ 25 Deg C 8.00in Lead	1	1
7		173632	Thermistor, Ntc 30k Ohm @ 25 Deg C 12.00in Lead	1	1
8		262497	Stand-off Support, PC Card .156 Dia W/P&L 1.125	1	1
9		153403	Bushing, Snap-in Nyl .750 Id X 1.000 Mtg Hole Cent	4	6
10		266939	Heat Sink, IGBT Upper	1	1
11		266940	Heat Sink, IGBT Lower	1	1
12		184260	Kit, Diode Power Module	1	1
		047838	Blank, Snap-In Nyl 1.000 Mtg Hole Black	2	0
		267386	Plate, Input Inductor Blank	1	0

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

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

☞ Hardware is common and not available unless listed.



269782-C

Figure 12-4. Fan Panel Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
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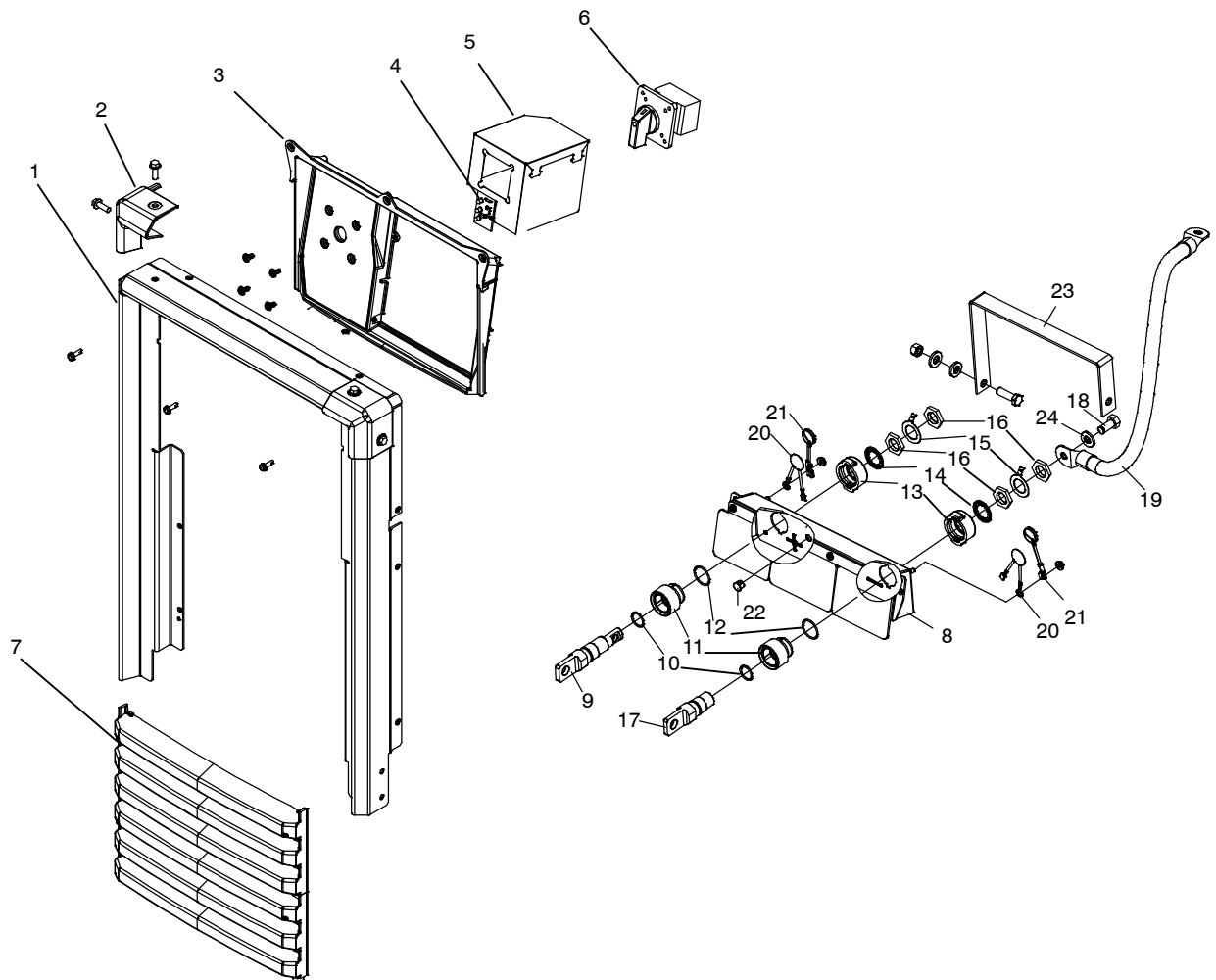
Figure 12-4. Fan Panel Assembly (Figure 12-1, Item 6)

.. 1	284550 ..	Panel, Fan Motor	1
.. 2 .. FM1-FM2 ..	213072 ..	Fan, Muffin 115v 60hz 3400 Rpm 6.378 Mtg Holes	2
.. 3 HD1	168829 ..	Transducer, Current 1000a Module Max Open Loop	1
.. 4	245520 ..	Bushing, Snap-in Nyl 1.062 Id X 1.500 Mtg Hole Cent	3
.. 5	153403 ..	Bushing, Snap-in Nyl .750 Id X 1.000 Mtg Hole Cent	2
.. 6 PC14	281663 ..	Circuit Card Assy, Control Feeder Power Pri	1
.. 7 R1	136076 ..	Resistor, WW Fxd 30W 200 Ohm Faston TE	1

+ When ordering a component originally displaying a precautionary label, the label should also be ordered.
To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

[illegible]

 Hardware is common and not available unless listed.



274588-C

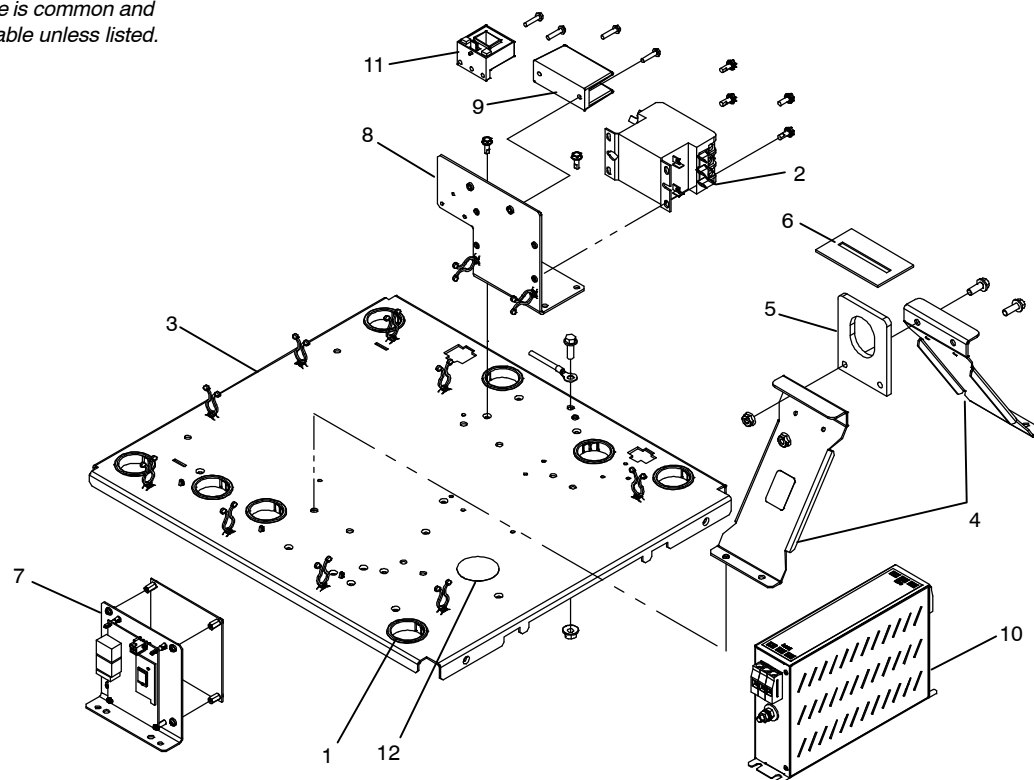
Figure 12-5. Front Panel Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
Figure 12-5. Front Panel Assembly (Figure 12-1, Items 5, 7)				
1		283066	Panel, Front	1
2		278284	Bracket, Corner Front and Back	2
3		253548	Panel, Top Front	1
4	PC18	256859	Circuit Card Assy, LED	1
5		261870	Cover, Switch	1
6	S1	252445	Switch, Rotary On/Off 3PH 20Amp 600V 2 Layer	1
7		262325	Panel, Front Grill	2
8		282956	Panel, Output Terminal	1
		269799	Terminal Pwr Assy, Output Tabbed (Includes)	1
9		260223	Terminal, Pwr Output Tabbed	1
10		186228	O-ring, 0.739 Id X 0.070 H	1
11		250037	Insulator, Bulkhead Front .890 Od	1
12		185718	O-ring, 0.989 Id X 0.070 H	1
13		250039	Insulator, Bulkhead Rear .890 Od	1
14		185714	Washer, Tooth 22mmid X 31.5mmmod 1.310-1mmt Intern	1
15		178548	Terminal, Connector Friction	1
16		185717	Nut, M20-1.5 1.00hex .19h Brs Locking	2
		269800	Terminal Pwr Assy, Output Front Bolted Rear (Includes)	1
17		252830	Terminal, Pwr Output Front Bolted Rear Int Thread	1
10		186228	O-ring, 0.739 Id X 0.070 H	1
11		250037	Insulator, Bulkhead Front .890 Od	1
12		185718	O-ring, 0.989 Id X 0.070 H	1
13		250039	Insulator, Bulkhead Rear .890 Od	1
14		185714	Washer, Tooth 22mmid X 31.5mmmod 1.310-1mmt Intern	1
15		178548	Terminal, Connector Friction	1
16		185717	Nut, M20-1.5 1.00hex .19h Brs Locking	2
18		198447	Screw, M10-1.5x 20 Hex Hd-pln 8.8 Pld Sems	1
19		256961	Lead List, Large	1
20	C3, C4	138695	Capacitor, Cer Disc .01 Uf 1000 Vdc W/Terms	2
21	VR1, VR2	269178	Varistor, W/Terminals	2
22		057359	Blank, Snap-in Nyl .375 Mtg Hole Black	1
23		273488	Bus Bar, Output	1
24		183337	Washer, Cone .380ld x .860Od x .109Thk	1
		605603	Tubing, Gl Acryl 1.000-1.036	1.33
			Label, Nameplate Continuum (Order By Model & Serial No.)	1

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

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Hardware is common and not available unless listed.



278347-E

Figure 12-6. Penthouse Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
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Figure 12-6. Penthouse Assembly (Figure 12-1, Item 10)

.. 1	170647	.. Bushing, Snap-in Nyl 1.312 Id X 1.500 Mtg Hole	8
.. 2	W1	180270 .. Contactor, Def Prp 40a 3p 24vac Coil W/Boxlug	1
.. 3	+265238	.. Panel, Upper Windtunnel	1
..	155436	.. Label, Ground/Protective Earth	1
.. 4	+265261	.. Lift Eye, Formed	2
..	273338	.. Label, Warning Hot Surfaces (Wordless)	1
..	272843	.. Label, Warning Input Connections/Electric Shock (Wordless)	1
.. 5	266232	.. Lift Eye	1
.. 6	256975	.. Seal, Lift Eye	1
.. 7	PC19	273411 .. Assy, Communication Package Auto	1
.. 8	276629	.. Bracket, Mtg Contactor	1
.. 9	271847	.. Block, Term 115 Amp 1 Pole Screw Term 2-14 Wire	1
.. 10	272886	.. Filter,Input 3 Phase 34 Amp	1
.. 11	HD2	182918 .. Transducer, Current 400A	1
.. 12	006086	.. Blank, Snap-In Nylon 1.500 Mtg Hole Black	1
..	278026	.. Core, Ferrite 25.90mm Od X 12.80mm Id	1
..	269968	.. Core, Ferrite 31.60mm Od X 19.55mm Id	3
..	276360	.. Core, Ferrite 9.50mm Od X 4.75mm Id	1
..	276453	.. Circuit Card Assy, Devicenet Interface Continuum	1

◆ OPTIONAL

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

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

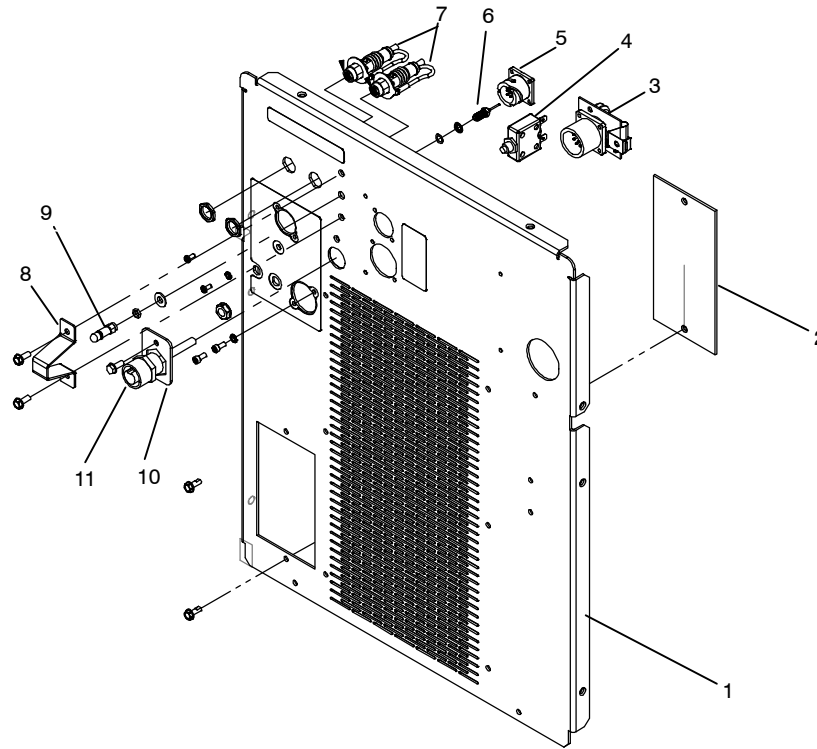


Figure 12-7. Rear Panel Assembly

277694-E

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
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Figure 12-7. Rear Panel Assembly (Figure 12-1, Item 4)

.. 1	..	+283079	.. Panel, Rear Auto	1
..	..	274436	.. Label, E-Stop-Peripherals Auto-Continuum	1
..	..	269416	.. Label, Ethernet/Wireless	1
..	..		.. Label, Nameplate Rear (Order By Model And Serial Number)	1
.. 2	..	257290	.. Panel, Rear Blank	1
.. 3	.. PC16	261838	.. Circuit Card Assy, Power Source 10 Pin Filter	1
.. 4	.. CB1	083432	.. Supplementary Pro, Man Reset 1p 10a 250vac Frict	1
.. 5	..	276430	.. Plugs, W/Leads	1
.. 6	..	271543	.. Cable Assy, Rf Antenna	1
.. 7	..	280153	.. Cable Assy, Rj45 Male/M12 Female .4m Lg	2
.. 8	..	286254	.. Bracket, Guard Antenna	1
.. 9	..	260822	.. Antenna, Rf Monopole 2.4ghz Screw Mount	1
.. 10	..	224012	.. Plate, Rotation Lock	1
.. 11	..	198956	.. Receptacle, Devicenet	1

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

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Notes

TRUE BLUE[®]

WARRANTY

Effective January 1, 2019

(Equipment with a serial number preface of MK or newer)

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

Warranty Questions?

Call
1-800-4-A-MILLER
for your local
Miller distributor.

Your distributor also gives
you ...

Service

You always get the fast,
reliable response you
need. Most replacement
parts can be in your
hands in 24 hours.

Support

Need fast answers to the
tough welding questions?
Contact your distributor.
The expertise of the
distributor and Miller is
there to help you, every
step of the way.

LIMITED WARRANTY – Subject to the terms and conditions below, Miller Electric Mfg. LLC, Appleton, Wisconsin, warrants to authorized distributors 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. Notifications submitted as online warranty claims must provide detailed descriptions of the fault and troubleshooting steps taken to diagnose failed parts. Warranty claims that lack the required information as defined in the Miller Service Operation Guide (SOG) may be denied by Miller.

Miller shall honor warranty claims on warranted equipment listed below in the event of a defect within the warranty coverage time periods listed below. Warranty time periods start on the delivery date of the equipment to the end-user purchaser, or 12 months after the equipment is shipped to a North American distributor, or 18 months after the equipment is shipped to an international distributor, whichever occurs first.

1. 5 Years Parts — 3 Years Labor
 - * Original Main Power Rectifiers Only to Include SCRs, Diodes, and Discrete Rectifier Modules
2. 3 Years — Parts and Labor Unless Specified
 - * Auto-Darkening Helmet Lenses (No Labor) (See Classic Series Exception Below)
 - * Engine Driven Welder/Generators
(NOTE: Engines are Warranted Separately by the Engine Manufacturer.)
 - * Insight Welding Intelligence Products
 - * Inverter Power Sources
 - * Plasma Arc Cutting Power Sources
 - * Process Controllers
 - * Semi-Automatic and Automatic Wire Feeders
 - * Transformer/Rectifier Power Sources
3. 2 Years — Parts and Labor
 - * Auto-Darkening Helmet Lenses – Classic Series Only (No Labor)
 - * Auto-Darkening Weld Masks (No Labor)
 - * Fume Extractors – Capture 5, Filtair 400 and Industrial Collector Series
4. 1 Year — Parts and Labor Unless Specified
 - * AugmentedArc and LiveArc Welding Systems
 - * Automatic Motion Devices
 - * Bernard BTB Air-Cooled MIG Guns (No Labor)
 - * CoolBelt and CoolBand Blower Unit (No Labor)
 - * Desiccant Air Dryer System
 - * Field Options
(NOTE: Field options are covered for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
 - * RFCS Foot Controls (Except RFCS-RJ45)
 - * Fume Extractors – Filtair 130, MWX and SWX Series
 - * HF Units
 - * ICE/XT Plasma Cutting Torches (No Labor)
 - * Induction Heating Power Sources, Coolers
(NOTE: Digital Recorders are Warranted Separately by the Manufacturer.)
 - * Load Banks
 - * Motor-Driven Guns (except Spoolmate Spoolguns)
 - * PAPR Blower Unit (No Labor)
 - * Positioners and Controllers
 - * Racks (For Housing Multiple Power Sources)
 - * Running Gear/Trailers
 - * Spot Welders

- * Subarc Wire Drive Assemblies
 - * TIG Torches (No Labor)
 - * Tregaskiss Guns (No Labor)
 - * Water Cooling Systems
 - * Wireless Remote Foot/Hand Controls and Receivers
 - * Work Stations/Weld Tables (No Labor)
5. 6 Months — Parts
 - * Batteries
 6. 90 Days — Parts
 - * Accessories (Kits)
 - * Canvas Covers
 - * Induction Heating Coils and Blankets, Cables, and Non-Electronic Controls
 - * M-Guns
 - * MIG Guns, Subarc (SAW) Torches, and External Cladding Heads
 - * Remote Controls and RFCS-RJ45
 - * Replacement Parts (No labor)
 - * Spoolmate Spoolguns

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

1. **Consumable components; such as contact tips, cutting nozzles, contactors, brushes, relays, work station table tops and welding curtains, or parts that fail due to normal wear. (Exception: brushes and relays are covered on all engine-driven products.)**
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.
4. Defects caused by accident, unauthorized repair, or improper testing.

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

The exclusive remedies for warranty claims are, at Miller's option, either: (1) repair; or (2) replacement; or, if approved in writing by Miller, (3) the pre-approved 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 use). Products may not be returned without Miller's written approval. Return shipment shall be at customer's risk and expense.

The above remedies are F.O.B. Appleton, WI, or Miller's authorized service facility. Transportation and freight are the customer's responsibility. TO THE EXTENT PERMITTED BY LAW, THE REMEDIES HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES REGARDLESS OF THE LEGAL THEORY. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT) REGARDLESS OF THE LEGAL THEORY. ANY WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY, OR REPRESENTATION, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, ARE EXCLUDED AND DISCLAIMED BY MILLER.

Some US states do not allow limiting the duration of an implied warranty or the exclusion of certain damages, so the above limitations may not apply to you. This warranty provides specific legal rights, and other rights may be available depending on your state. In Canada, some provinces provide additional warranties or remedies, and to the extent the law prohibits their waiver, the limitations set out above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary by province.





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

City

State

Zip



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

Personal Safety Equipment

Service and Repair

Replacement Parts

Training (Schools, Videos, Books)

Technical Manuals (Servicing Information and Parts)

Circuit Diagrams

Welding Process Handbooks

To locate a Distributor or Service Agency visit
www.millerwelds.com or call 1-800-4-A-Miller

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.

Miller Electric Mfg. LLC

An Illinois Tool Works Company
1635 West Spencer Street
Appleton, WI 54914 USA

International Headquarters-USA

USA Phone: 920-735-4505 Auto-Attended
USA & Canada FAX: 920-735-4134
International FAX: 920-735-4125

For International Locations Visit
www.MillerWelds.com

