ALUGA SOLDA
ALUGUEL DE SOLDAS

# Manual do Equipamento

MIG MAG · TIG · ARCO SUBMERSO · MULTIPROCESSO · RETIFICADORAS
CORTE PLASMA INVERSORAS · ELETRODO · GERADORES DE ENERGIA

a melhor locadora
temos tudo que sua
obra precisa


## ACESSE NOSSO SITE
www.alugaasolda.com.br

(11) 4617-9696
comercial@alugaasolda.com.br

OM-263 657E 2015–10

**Processes**

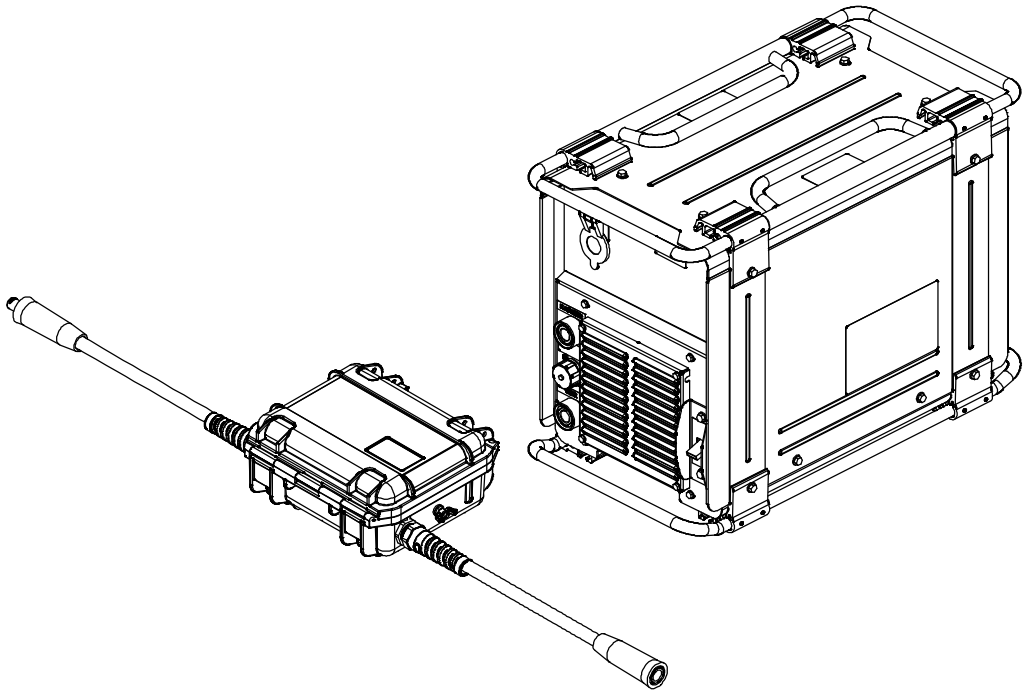
Multiprocess Welding

**Description**

Arc Welding Power Source

# PipeWorx 350 FieldPro™ And FieldPro™ Remote

## CE



# OWNER'S MANUAL

**File: Multiprocess**

Visit our website at

**www.MillerWelds.com**

# From Miller to You

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

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

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

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

ISO 9001 REGISTERED QUALITY SYSTEM

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

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.**

TRUE BLUE® WARRANTY

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

Miller®

# TABLE OF CONTENTS

# TABLE OF CONTENTS

# 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 |
|---|---|
| PIPEWORX 350 FIELDPRO (CE) | 907633 |
| | |
| | |

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 60974-10:2007 Arc Welding Equipment – Part 10: Electromagnetic compatibility (EMC) requirements

Signatory:

June 29, 2015

**David A. Werba**

MANAGER, PRODUCT DESIGN COMPLIANCE

Date of Declaration

264239B

# SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING



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

## 1-1. Symbol Usage

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

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

***NOTICE*** *– Indicates statements not related to personal injury.*

☞ *Indicates special instructions.*

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

## 1-2. Arc Welding Hazards

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

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

**During operation, keep everybody, especially children, away.**

### ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Additional safety precautions are required when any of the following electrically hazardous conditions are present: in damp locations or while wearing wet clothing; on metal structures such as floors, gratings, or scaffolds; when in cramped positions such as sitting, kneeling, or lying; or when there is a high risk of unavoidable or accidental contact with the workpiece or ground. For these conditions, use the following equipment in order presented: 1) a semiautomatic DC constant voltage (wire) welder, 2) a DC manual (stick) welder, or 3) an AC welder with reduced open-circuit voltage. In most situations, use of a DC, constant voltage wire welder is recommended. And, do not work alone!
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install, ground, and operate this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first – double-check connections.
- Keep cords dry, free of oil and grease, and protected from hot metal and sparks.
- Frequently inspect input power cord and ground conductor for damage or bare wiring – replace immediately if damaged – bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or repaired cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Do not touch electrode holders connected to two welding machines at the same time since double open-circuit voltage will be present.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal. Disconnect cable for process not in use.
- Use GFCI protection when operating auxiliary equipment in damp or wet locations.

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

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

### HOT PARTS can burn.

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

## FUMES AND GASES can be hazardous.

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

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

## ARC RAYS can burn eyes and skin.

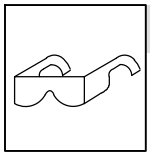
Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

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

## WELDING can cause fire or explosion.

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

- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Do not weld where flying sparks can strike flammable material.
- Protect yourself and others from flying sparks and hot metal.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on containers that have held combustibles, or on closed containers such as tanks, drums, or pipes unless they are properly prepared according to AWS F4.1 and AWS A6.0 (see Safety Standards).
- Do not weld where the atmosphere may contain flammable dust, gas, or liquid vapors (such as gasoline).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock, sparks, and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear body protection made from durable, flame–resistant material (leather, heavy cotton, wool). Body protection includes oil-free clothing such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.
- After completion of work, inspect area to ensure it is free of sparks, glowing embers, and flames.
- Use only correct fuses or circuit breakers. Do not oversize or by-pass them.
- Follow requirements in OSHA 1910.252 (a) (2) (iv) and NFPA 51B for hot work and have a fire watcher and extinguisher nearby.
- Read and understand the Safety Data Sheets (SDSs) and the manufacturer's instructions for adhesives, coatings, cleaners, consumables, coolants, degreasers, fluxes, and metals.



## FLYING METAL or DIRT can injure eyes.

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

## BUILDUP OF GAS can injure or kill.

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

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

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

## NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.

## CYLINDERS can explode if damaged.

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

- Protect compressed gas cylinders from excessive heat, mechanical shocks, physical damage, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder – explosion will result.
- Use only correct compressed gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve. Do not stand in front of or behind the regulator when opening the valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Use the right equipment, correct procedures, and sufficient number of persons to lift and move cylinders.
- Read and follow instructions on compressed gas cylinders, associated equipment, and Compressed Gas Association (CGA) publication P-1 listed in Safety Standards.

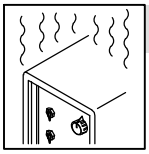
## 1-3. Additional Symbols For Installation, Operation, And Maintenance

### FIRE OR EXPLOSION hazard.

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

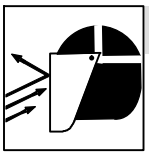
### FALLING EQUIPMENT can injure.

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



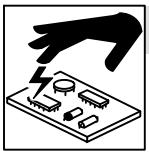
### OVERUSE can cause OVERHEATING

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



### FLYING SPARKS can injure.

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



### STATIC (ESD) can damage PC boards.

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

### MOVING PARTS can injure.

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

### WELDING WIRE can injure.

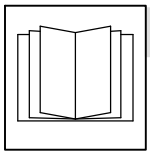
- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.


### BATTERY EXPLOSION can injure.

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

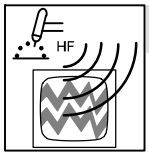
### MOVING PARTS can injure.

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



### READ INSTRUCTIONS.

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




### H.F. RADIATION can cause interference.

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

### ARC WELDING can cause interference.

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

## 1-4. California Proposition 65 Warnings

**Welding or cutting equipment produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)**

**This product contains chemicals, including lead, known to the state of California to cause cancer, birth defects, or other reproductive harm. *Wash hands after use.***

## 1-5. Principal Safety Standards

*Safety in Welding, Cutting, and Allied Processes,* ANSI Standard Z49.1, is available as a free download from the American Welding Society at http://www.aws.org or purchased from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

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

*Safe Practices for Welding and Cutting Containers that have Held Combustibles,* American Welding Society Standard AWS A6.0, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

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

*Safe Handling of Compressed Gases in Cylinders,* CGA Pamphlet P-1, from Compressed Gas Association, 14501 George Carter Way, Suite 103, Chantilly, VA 20151 (phone: 703-788-2700, website:www.cganet.com).

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

*Safe Practice For Occupational And Educational Eye And Face Protection,* ANSI Standard Z87.1, from American National Standards Institute, 25 West 43rd Street, New York, NY 10036 (phone: 212-642-4900, website: www.ansi.org).

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

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

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

## 1-6. EMF Information

Electric current flowing through any conductor causes localized electric and magnetic fields (EMF). The current from arc welding (and allied processes including spot welding, gouging, plasma arc cutting, and induction heating operations) creates an EMF field around the welding circuit. EMF fields may interfere with some medical implants, e.g. pacemakers. Protective measures for persons wearing medical implants have to be taken. For example, restrict access for passers–by or conduct individual risk assessment for welders. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

1. Keep cables close together by twisting or taping them, or using a cable cover.
2. Do not place your body between welding cables. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep head and trunk as far away from the equipment in the welding circuit as possible.
5. Connect work clamp to workpiece as close to the weld as possible.
6. Do not work next to, sit or lean on the welding power source.
7. Do not weld whilst carrying the welding power source or wire feeder.

**About Implanted Medical Devices:**

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

# SECTION 2 – CONSIGNES DE SÉCURITÉ – LIRE AVANT UTILISATION



**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.**

***NOTE*** *– 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 ELECTRIQUE, PIECES EN MOUVEMENT, et PIECES 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.**

**Seul un personnel qualifié est autorisé à installer, faire fonctionner, entretenir et réparer cet appareil.**

**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 se servir de source électrique à courant électrique dans les zones humides, dans les endroits confinés ou là où on risque de tomber.
- 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 doublée.
- 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.**

- Arrêter les convertisseurs, débrancher le courant électrique et décharger les condensateurs d'alimentation selon les instructions indiquées dans la partie Entretien 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 auxquels 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.

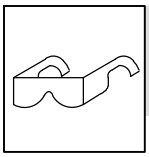
Le rayonnement de l'arc du procédé de soudag génère des rayons visibles et invisibles intense (ultraviolets et infrarouges) susceptibles de provoquer des brûlure dans les yeux et sur la peau. Des étincelles sont projetées pendant l soudage.

- 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 homologués.
- Ne pas souder dans un endroit là 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 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 soudez pas si l'air ambiant est chargé de particules, gaz, ou vapeurs inflammables (vapeur d'essence, par exemple).
- Brancher le câble de masse sur la pièce le 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 dégeler 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.
- 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 PIECES DE METAL ou DES SALETES peuvent provoquer des blessures dans les yeux.

- Le soudage, l'écaillement, 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.
- Utiliser les équipements corrects, les bonnes procédures et suffisamment de personnes pour soulever et déplacer 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.

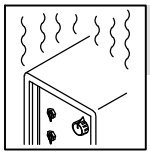
## 2-3. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance

### 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.

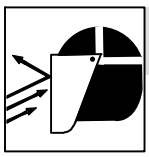
### LA CHUTE DE L'ÉQUIPEMENT peut provoquer des blessures.

- Utiliser l'anneau de levage uniquement pour soulever l'appareil, NON PAS les chariots, les bouteilles de gaz ou tout autre accessoire.
- Utiliser un équipement de levage de capacité suffisante pour lever 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 Nº94–110) lors du levage manuelle de pièces ou équipements lourds.



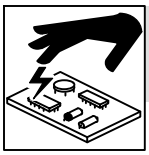
### L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

- 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 PROJETÉES 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 imprimes.

## 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.

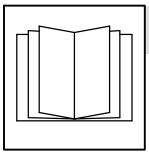
- Ne pas appuyer sur la gâchette avant d'en avoir reçu l'instruction.
- Ne pas diriger le pistolet vers soi, d'autres personnes ou toute pièce mécanique en engageant le fil de soudage.


## 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.

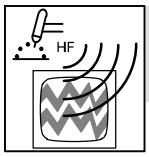
## Les PIÈCES MOBILES peuvent causer des blessures.

- 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'entretien en respectant les manuels d'utilisation, les normes industrielles et les codes nationaux, d'état et locaux.




## 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

**Les équipements de soudage et de coupage produisent des fumées et des gaz qui contiennent des produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des malformations congénitales et, dans certains cas, des cancers. (Code de santé et de sécurité de Californie, chapitre 25249.5 et suivants)**

**Ce produit contient des produits chimiques, notamment du plomb, dont l'État de Californie reconnaît qu'ils provoquent des cancers, des malformations congénitales ou d'autres problèmes de procréation. *Se laver les mains après utilisation.***

## 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 02269 (phone: 1-800-344-3555, website: www.nfpa.org and www. sparky.org).

*Safe Handling of Compressed Gases in Cylinders,* CGA Pamphlet P-1, from Compressed Gas Association, 14501 George Carter Way, Suite 103, Chantilly, VA 20151 (phone: 703-788-2700, website:www.cganet.com).

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

*Safe Practice For Occupational And Educational Eye And Face Protection,* ANSI Standard Z87.1, from American National Standards Institute, 25 West 43rd Street, New York, NY 10036 (phone: 212-642-4900, website: www.ansi.org).

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

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

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

## 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 CEM peuvent créer des interférences avec certains implants médicaux comme des 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.

# Notes

# SECTION 3 – DEFINITIONS

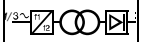
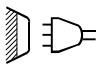
## 3-1. Additional Safety Symbols And Definitions

☞ *Some symbols are found only on CE products.*

| | |
|---|---|
|  | Warning! Watch Out! There are possible hazards as shown by the symbols.<br>Safe1 2012–05 |
|  | When power is applied failed parts can explode or cause other parts to explode.<br>Safe26 2012–05 |

## 3-2. Miscellaneous Symbols And Definitions

☞ *Some symbols are found only on CE products.*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A | Amperage | ⎓ | Direct Current (DC) | ∿ | Alternating Current (AC) | V | Voltage |
|  | Single / Three Phase Static Frequency Converter-Trans-former-Rectifier | 3∿ | Three Phase | 1∿ | Single Phase | I | On |
| O | Off |  | Shielded Metal Arc Welding (SMAW) | S | Suitable for Some Hazardous Locations | X | Duty Cycle |
|  | Protective Earth (Ground) |  | SD Logo Is A Trademark Of The SD–3C, LLC | $U_0$ | Rated No Load Voltage (OCV) | $I_2$ | Rated Welding Current |
| $U_2$ | Conventional Load Voltage |  | Line Connection |  | Gas Metal Arc Welding (GMAW) |  | Gas Tungsten Arc Welding (GTAW) / Tungsten Inert Gas (TIG) Welding |
| $U_1$ | Primary Voltage | $I_{1max}$ | Rated Maximum Supply Current | $I_{1eff}$ | Maximum Effective Supply Current | 1/3∿ | Single / Three Phase |
| Hz | Hertz | IP | Internal Protection Rating | % | Percent | | |

# SECTION 4 – SPECIFICATIONS

## 4-1. Serial Number And Rating Label Location

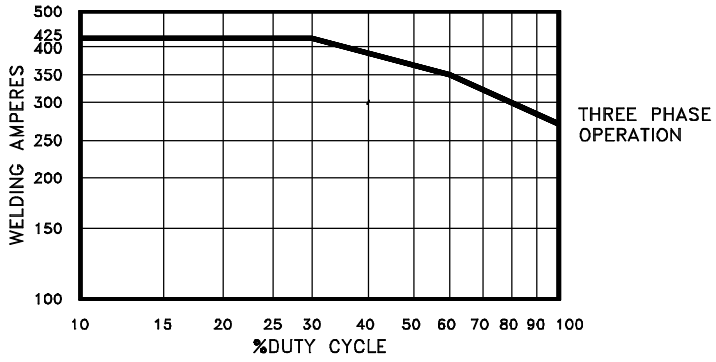
The serial number and rating information for this product is located on the rear. Use rating label to determine input power requirements and/or rated output. For future reference, write serial number in space provided on back cover of this manual.

## 4-2. Unit Specifications

☞ *Do not use information in unit specifications table to determine electrical service requireements. See Sections 5-4 and 5-5 for information on connecting input power.*

| Input Power | Rated Output | Voltage Range in CV Mode | Amperage Range in CC Mode | Max. Open-Circuit Voltage | RMS Amps Input at Rated Load Output, 50/60 Hz 3-Phase at NEMA Load Voltages and Class I Rating | | KVA | KW |
|---|---|---|---|---|---|---|---|---|
| | | | | | 380 V | 400 V | | |
| 3-Phase | 350 A at 34 VDC, 60% Duty Cycle* | 10–44 V | 10–350 A | 78 VDC | 27.1 | 25.9 | 17.8 | 15.9 |
| *See Section 4-3 for Duty Cycle Rating. | | | | | | | | |

## 4-3. Duty Cycle And Overheating

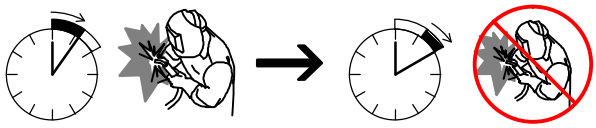



Duty Cycle is percentage of 10 minutes that unit can weld at rated load without overheating.

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

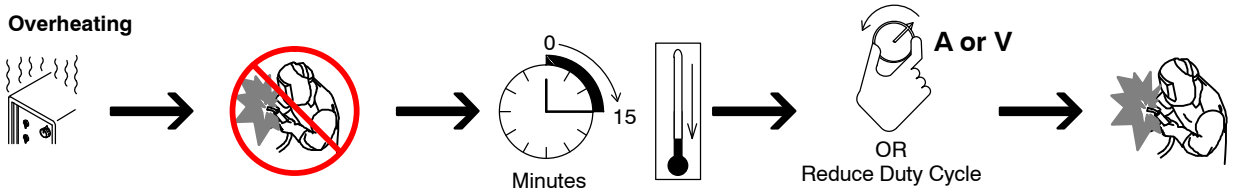
***NOTICE*** – *Exceeding duty cycle can damage unit and void warranty.*

**60% Duty Cycle**



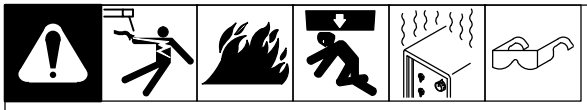
6 Minutes Welding — 4 Minutes Resting

**Overheating**



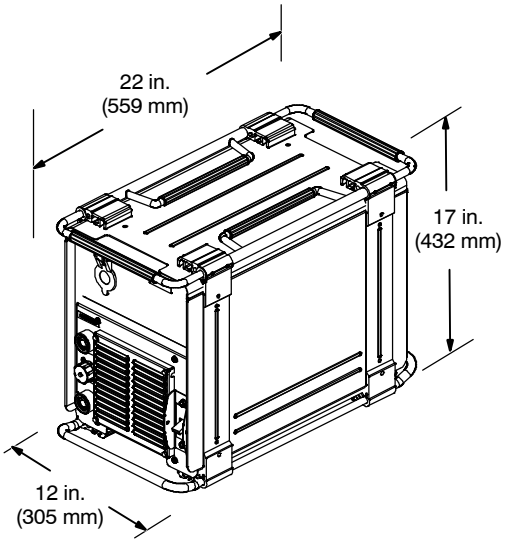

Ref. 216 568-A

## 4-4. Dimensions And Weight



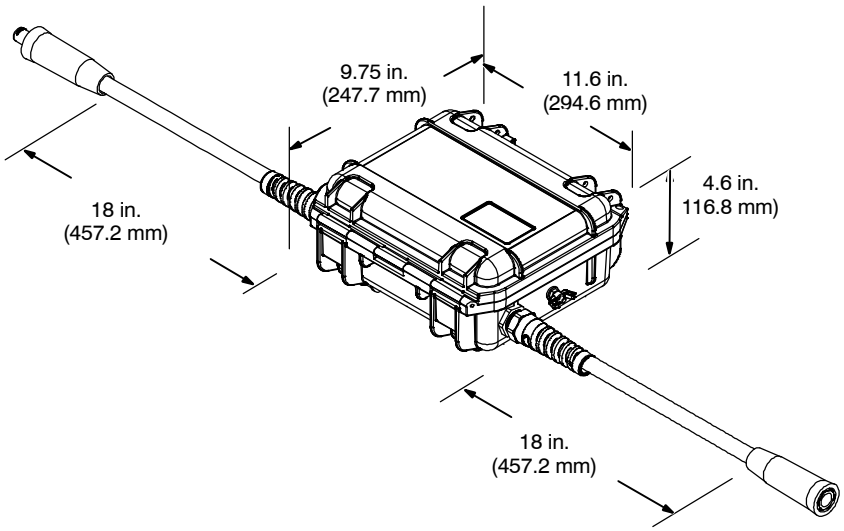
**Power Source**

100 lb (45.4 kg)




**Remote**

9.08 lb (4.12 kg)




Ref. 255 179-B / Ref. 255 429-B

## 4-5. Environmental Specifications

### A. IP Rating

| IP Rating |
| --- |
| IP23 |
| This equipment is designed for outdoor use. It may be stored, but is not intended to be used for welding outside during precipitation unless sheltered. |
| IP23S 2014–06 |

### B. Information On Electromagnetic Fields (EMF)

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

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

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

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

ce-emf 1 2010-10

### C. Information On Electromagnetic Compatibility (EMC)

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

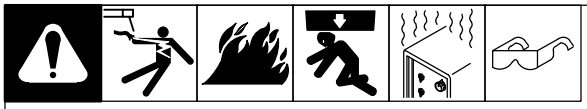
This equipment complies with IEC61000-3-11 and IEC 61000–3–12 and can be connected to public low-voltage systems provided that the public low-voltage system impedance $Z_{max}$ at the point of common coupling is less than 33.98 mΩ (or the short–circuit power $S_{sc}$ is greater than 4,708,376 VA). It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the system impedance complies with the impedance restrictions.

ce-emc 1 2014-07

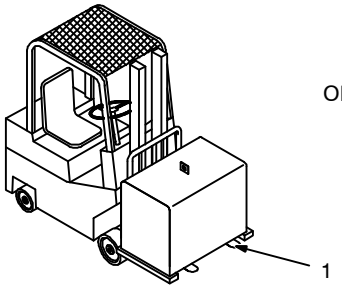
# Notes

# SECTION 5 – INSTALLATION

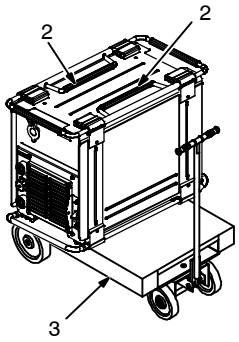
## 5-1. Selecting a Location



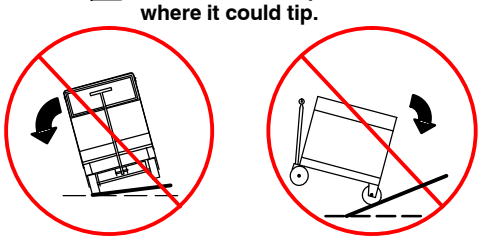
**Movement**




OR

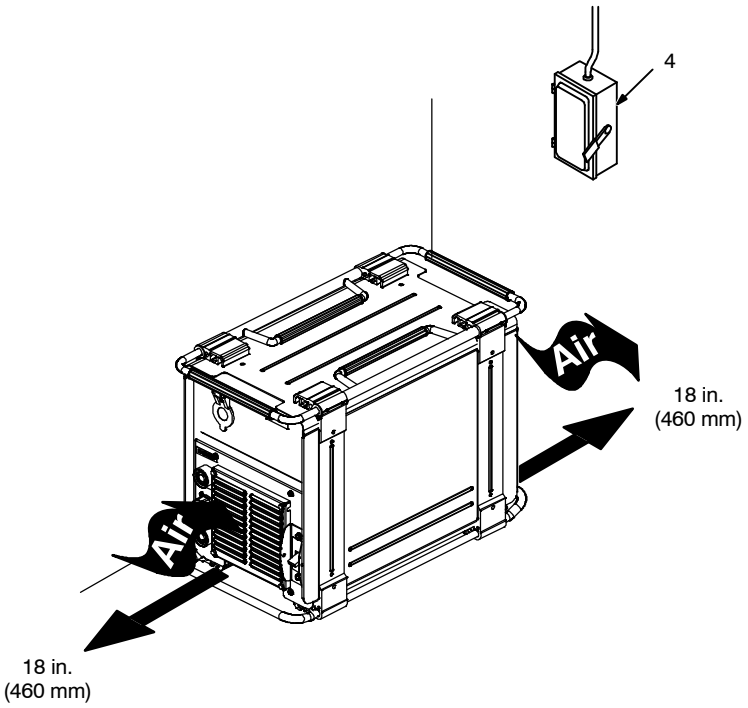



**Do not move or operate unit where it could tip.**



---

**Location And Airflow**




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

1 Lifting Forks

Extend forks beyond opposite side of unit.

2 Lifting Handles

Use handles to lift unit.

3 Hand Cart

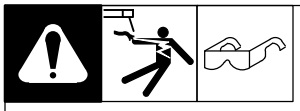
Use cart or similar device to move unit.

4 Line Disconnect Device

Locate unit near correct input power supply.

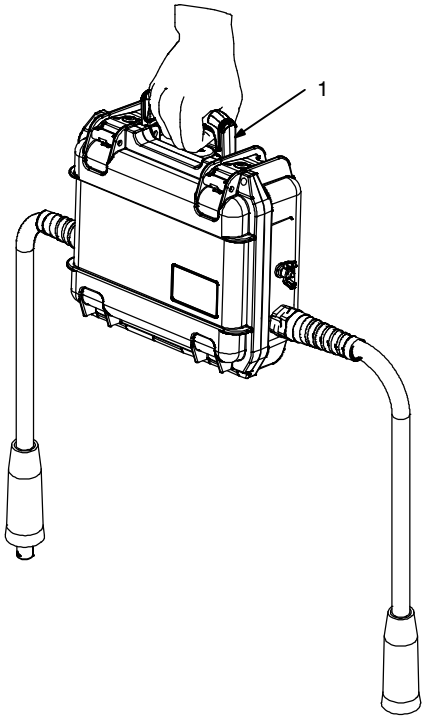
loc_med 2015-04 / Ref. 255 179-B

## 5-2. Proper Method To Carry Remote



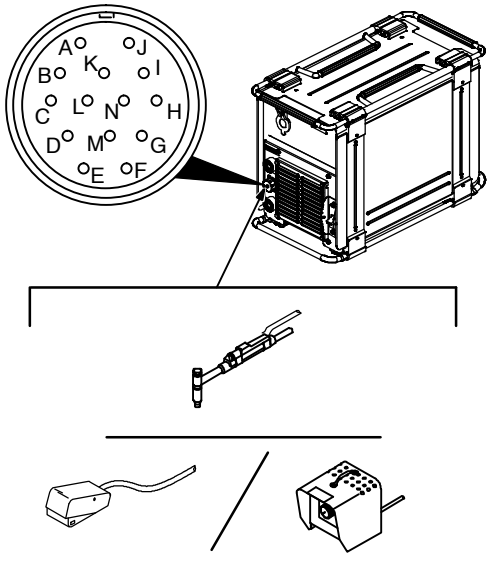
1 Handle

Carry Remote only by using the handle.




255 409-B

## 5-3. Remote 14 Receptacle Information




Ref. 255 179-B

| REMOTE 14 | Socket* | Socket Information |
|---|---|---|
| 14 VOLTS DC OUTPUT (CONTACTOR) | A | 14 volts DC. Circuit limited to 35 mA. |
| | B | Contact closure to A completes contactor control circuit. |
| REMOTE OUTPUT CONTROL | C | Output to remote control; +10 volts DC. |
| | D | Remote control circuit common. |
| | E | 0 to +10 volts DC input command signal from remote control. |

*The remaining sockets are not used.

## 5-4. Electrical Service Guide

Elec Serv 2014–01

***NOTICE*** *– INCORRECT INPUT POWER can damage this welding power source. Phase to ground voltage shall not exceed +10% of rated input voltage.*

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

**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.**

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

| | Three-Phase 350 A | |
|---|---|---|
| **Input Voltage (V)** | 380 | 400 |
| **Input Amperes (A) At Rated Output** | 27.1 | 25.9 |
| **Max Recommended Standard Fuse Rating In Amperes [1]** | | |
| **Time-Delay Fuses [2]** | 30 | 30 |
| **Normal Operating Fuses [3]** | 40 | 40 |
| **Min Input Conductor Size In AWG/Kcmil [4]** | 14 | 14 |
| **Max Recommended Input Conductor Length In Feet (Meters)** | 87 (26) | 97 (30) |
| **Min Grounding Conductor Size In AWG/Kcmil [4]** | 14 | 14 |

Reference: 2014 National Electrical Code (NEC) (including article 630)

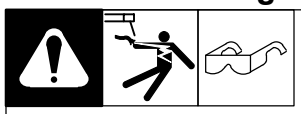
1 If a circuit breaker is used in place of a fuse, choose a circuit breaker with time-current curves comparable to the recommended fuse.

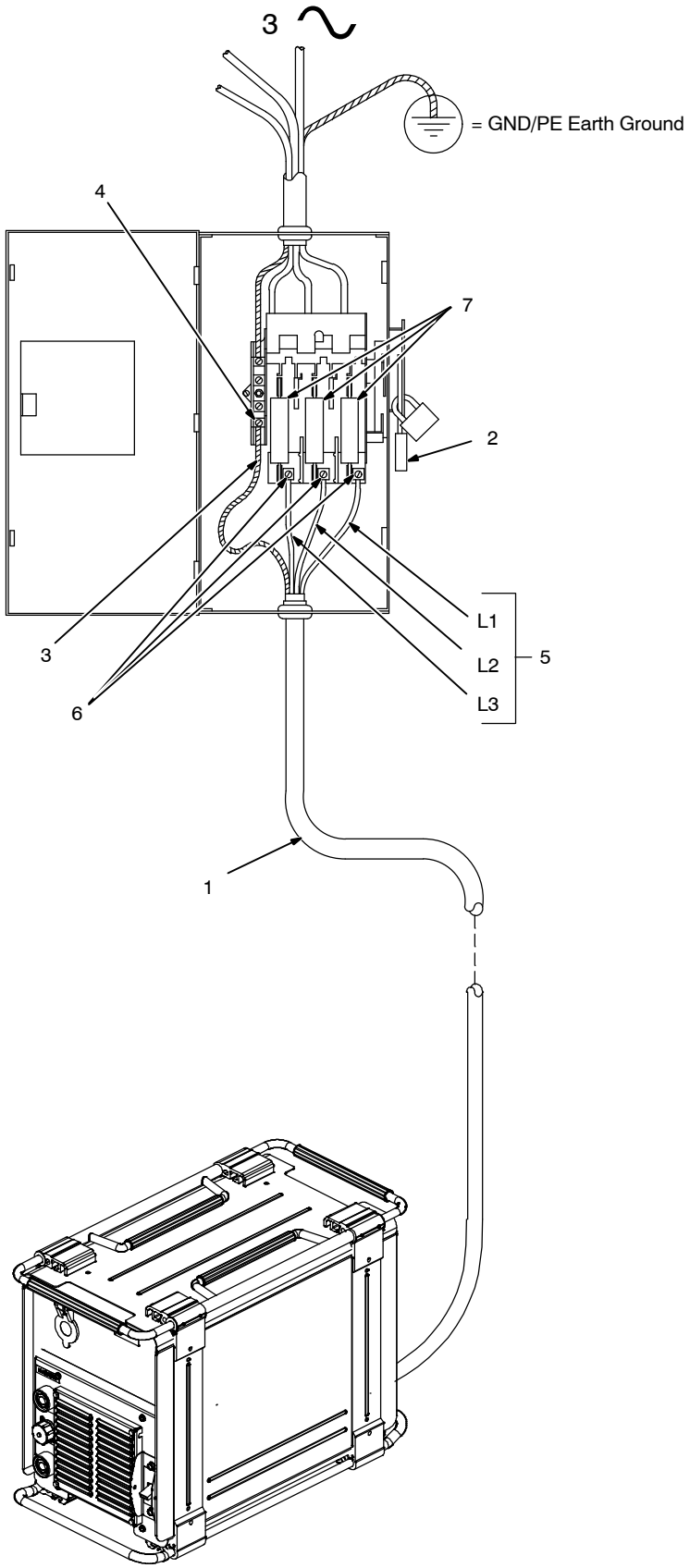
2 “Time-Delay” fuses are UL class “RK5” . See UL 248.

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).

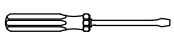
4 Conductor data in this section specifies conductor size (excluding flexible cord or cable) between the panelboard and the equipment per NEC Table 310.15(B)(16). If a flexible cord or cable is used, minimum conductor size may increase. See NEC Table 400.5(A) for flexible cord and cable requirements.

## 5-5. Connecting 3-Phase Input Power



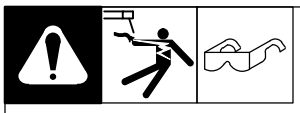



Tools Needed:



input2 2012−05 − 803 766-C / Ref. 255 179-B

## 5-5. 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.**

**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 input power between 208 and 575 VAC without removing cover to relink the power source.*

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

**For Three-Phase Operation**

1 Input Power Cord.

2 Disconnect Device (switch shown in the OFF position)

3 Green Or Green/Yellow Grounding Conductor

4 Disconnect Device Grounding Terminal

5 Input Conductors (L1, L2 And L3)

6 Disconnect Device Line Terminals

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

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

7 Over-Current Protection

Select type and size of over-current protection using Section 5-4 (fused disconnect switch shown).

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

input2 2012–05

# Notes

**Work like a Pro!**

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

## 5-6. Weld Output Receptacles And Selecting Cable Sizes*

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

| 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.
( ) = $mm^2$ for metric use

***For distances longer than those shown in this guide, call a factory applications rep. at 920-735-4505 (Miller) or 1-800-332-3281 (Hobart).

Ref. S-0007-L 2015–02

## 5-7. Weld Output Terminals

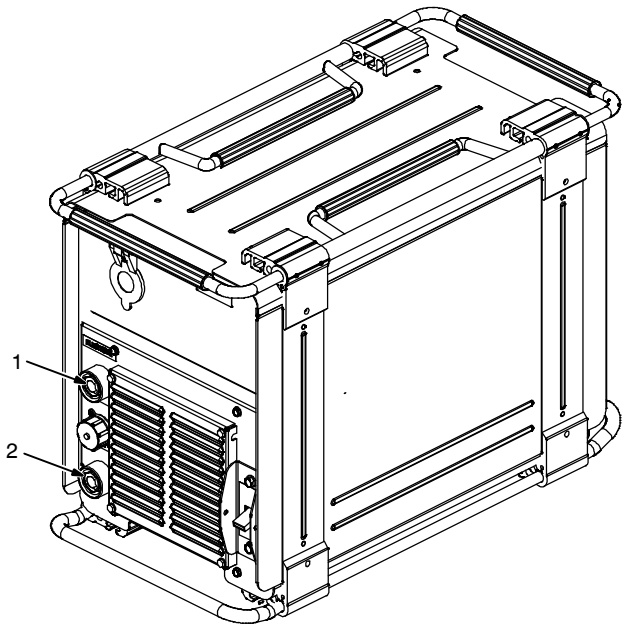
**Turn off power before connecting to weld output terminals.**

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

1 Electrode Output Terminal

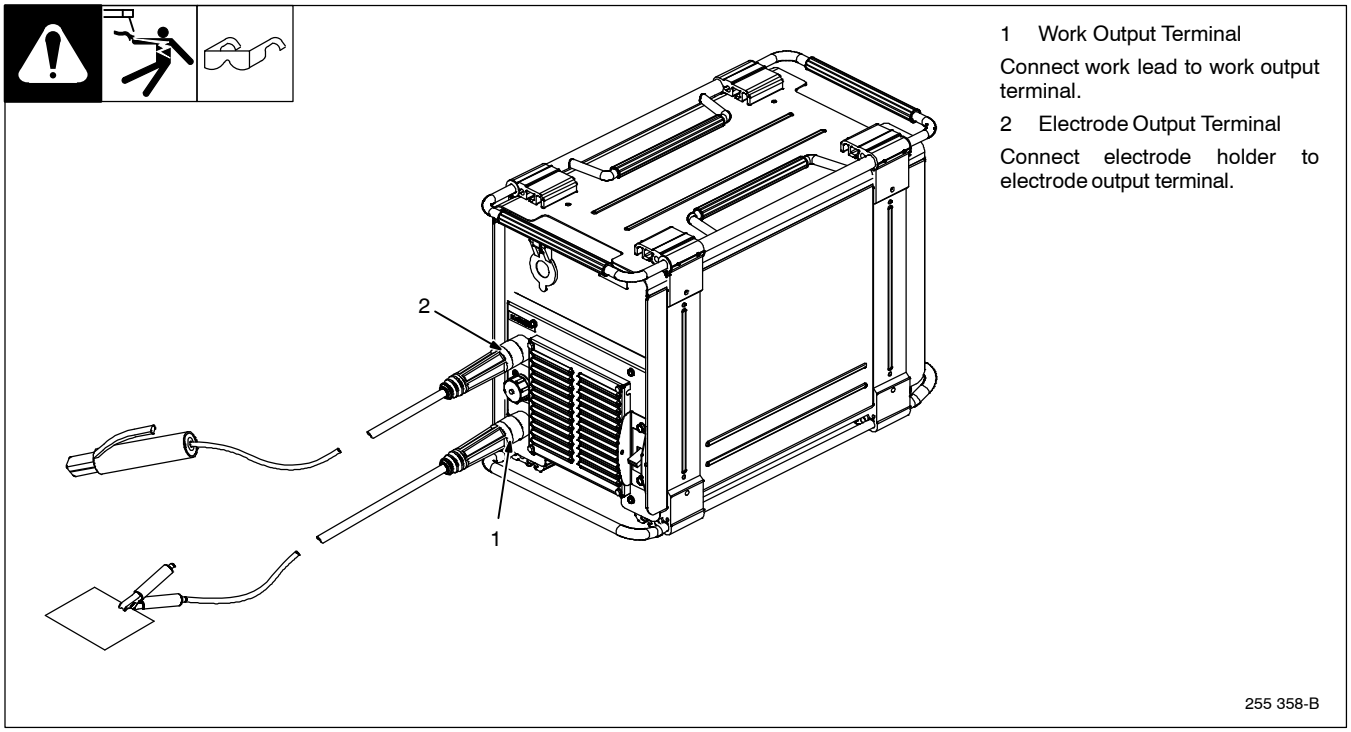
2 Work Output Terminal

☞ *For welding output terminal connections see Sections 5-8 thru 5-12 for typical connection processes.*




output term1 2015–02 / Ref. 255179-B

## 5-8. Stick Connections




1 Work Output Terminal

Connect work lead to work output terminal.

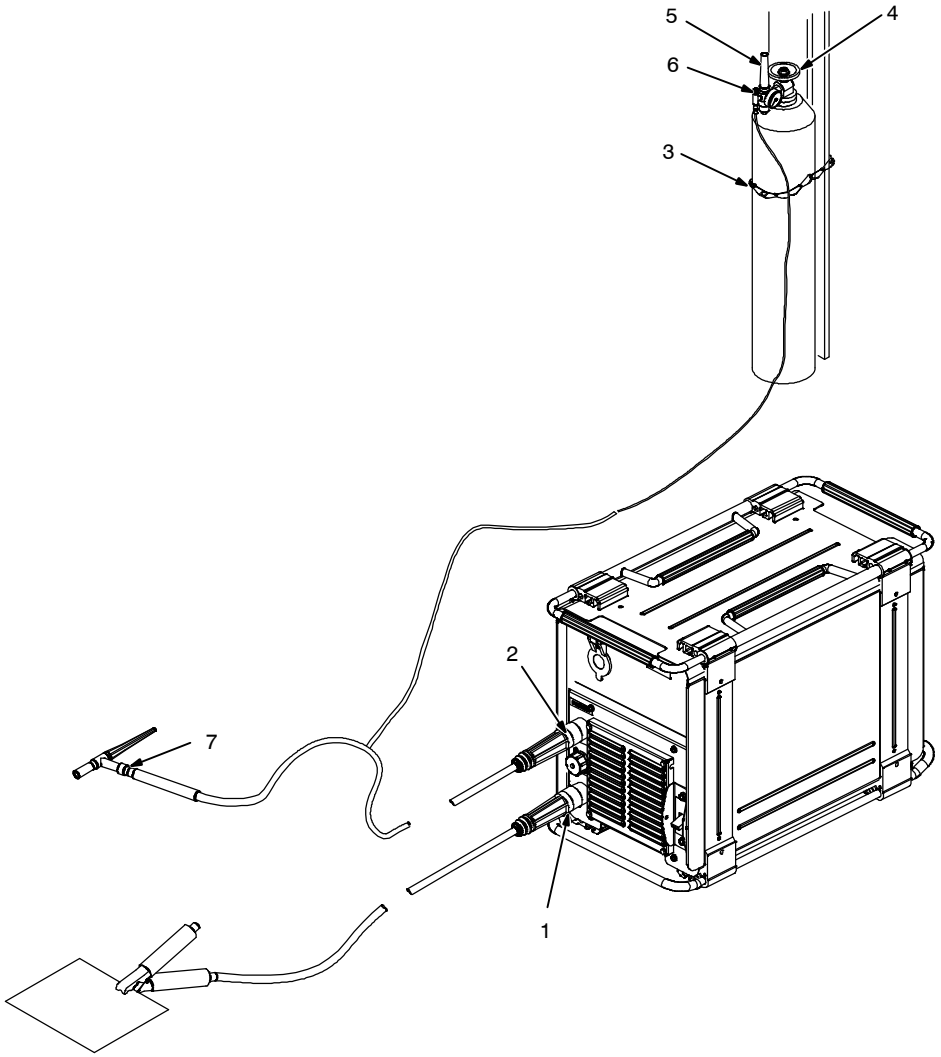
2 Electrode Output Terminal

Connect electrode holder to electrode output terminal.

255 358-B

# Notes

## 5-9. TIG Lift-Arc™ Connections




1 Work Output Terminal

Connect work lead to work output terminal.

2 Electrode Output Terminal

Connect TIG torch with gas valve to electrode output terminal.

3 Gas Cylinder

4 Cylinder Valve

Open valve slightly so gas flow blows dirt from valve. Close valve.

5 Regulator/Flowmeter

6 Flow Adjust

Typical flow rate is 15 cubic feet per hour (7.1 liters per minute).

Connect torch gas hose to regulator/flowmeter.

7 Gas Valve

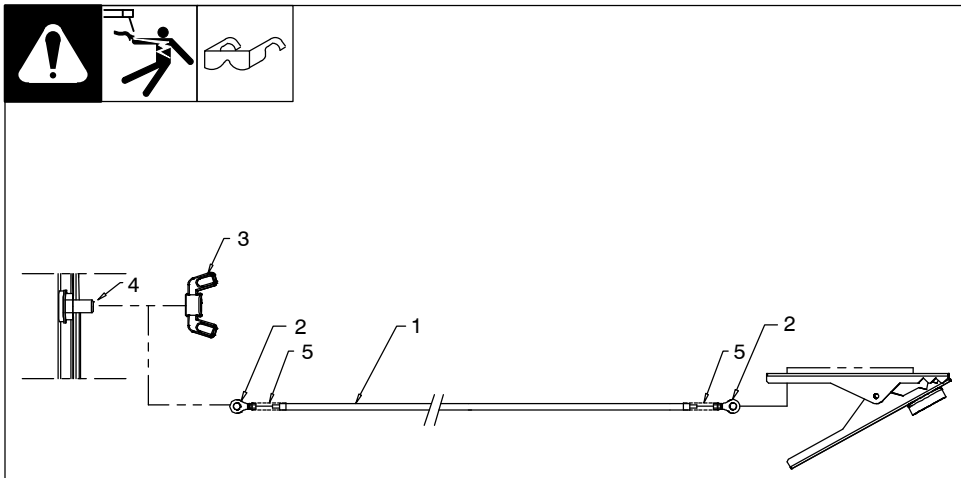
Valve controls gas preflow and postflow. Open valve on torch just before welding.

Tools Needed:

11/16 in., 1-1/8 in., (21 mm)

255 357-B

## 5-10. Connecting Work Sense Lead To Remote




☞ *The work sense lead is required for operation of the FieldPro Remote.*

1 Lead

2 Ring Terminal 1/2 in.

If using a ring terminal, slide terminal onto post on the remote.

3 Wing Nut

Once terminal or wire is on post, tighten wing nut.

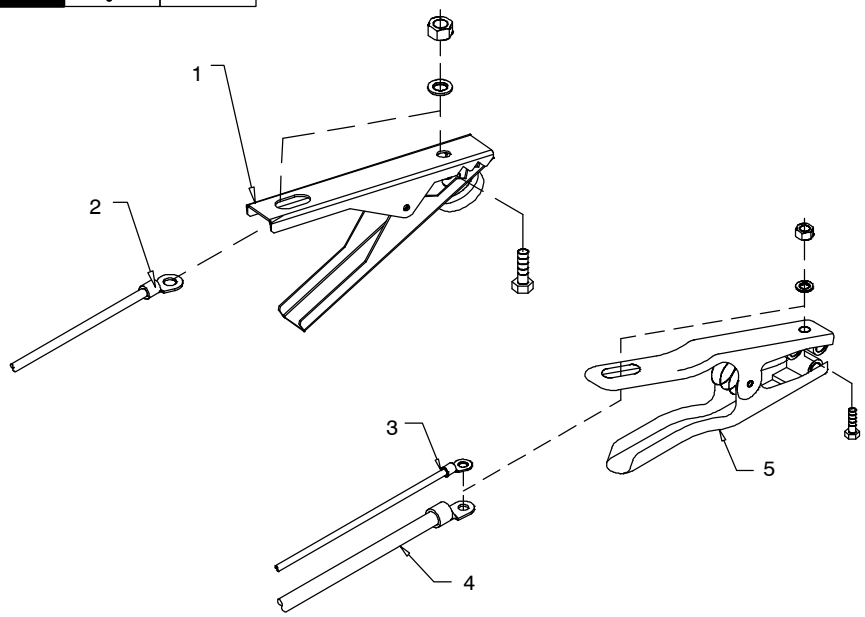
4 Binding Post

5 Electrical Tape Or Heat Shrink Tubing

If ring terminal is cut or broken, the bare wire can be looped around the post and tightened under the wing nut.

255 450-A

## 5-11. Optional Method Of Combining Wok Sense Lead With Work Clamp




1 Work Sense Clamp

2 Ring Terminal 1/2 in.

Disconnect ring terminal from clamp.

3 Work Sense Lead

4 Work Cable

5 Work Clamp

☞ *Be sure that work sense lead ring terminal is on top of work cable ring terminal when connecting to clamp.*

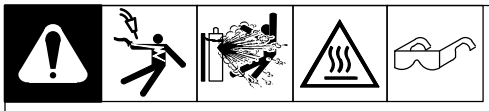
Connect work sense lead and work cable to work clamp.

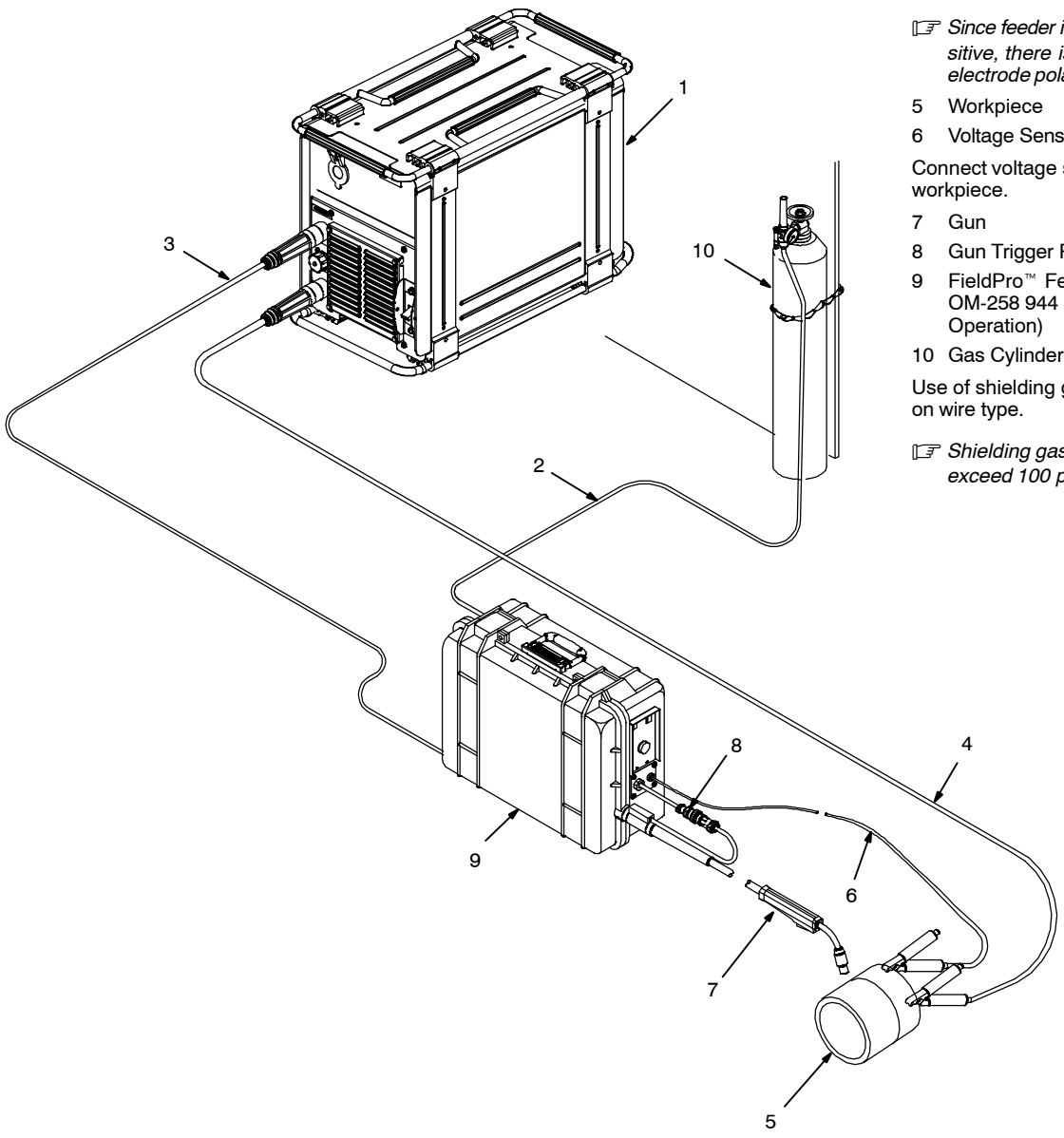
Tools Needed:

3/8 in.

255 449-A

## 5-12. Connecting Basic Feeder






**Turn Off wire feeder and welding power source. Stop engine on welding generator.**

1 Welding Power Source

2 Gas Hose

3 Weld Cable To Feeder

4 Work Cable To Workpiece

Weld cable and work cable connections to power source (DCEN/DCEP) are dependant on wire type.

☞ *Since feeder is not polarity sensitive, there is no need for an electrode polarity switch.*

5 Workpiece

6 Voltage Sensing Clamp

Connect voltage sensing clamp to workpiece.

7 Gun

8 Gun Trigger Receptacle

9 FieldPro™ Feeder (See OM-258 944 For Feeder Operation)

10 Gas Cylinder

Use of shielding gas is dependant on wire type.

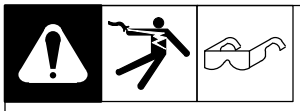
☞ *Shielding gas pressure not to exceed 100 psi (689 kPa).*

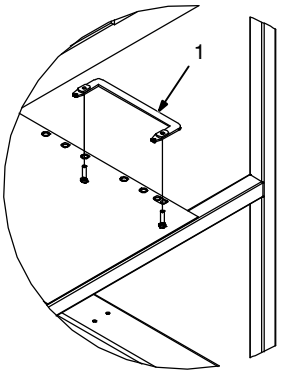
258 966-A

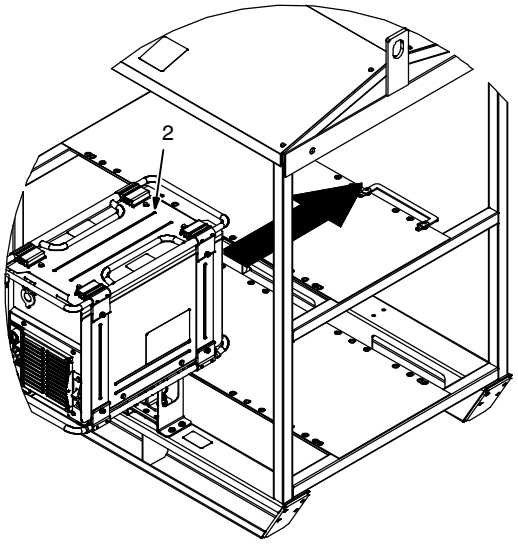
## 5-13. Setting Inductance

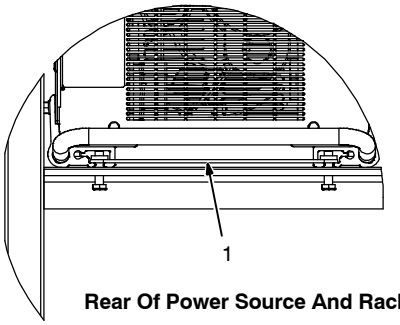
The power source will display ACC when a FieldPro Feeder is connected to the power source. Press either the Up or Down arrow key to set the inductance within the range of 0 to 99.

## 5-14. Installing Welding Power Source Onto Rack

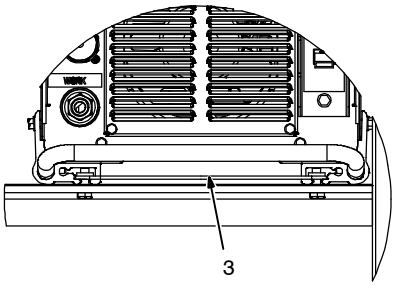





**Rear Of Power Source And Rack**




**Front Of Power Source And Rack**

Rack – 195466 Universal Inverter Rack

Mounting Kit – 301100
One Kit Per Machine
(See OM-259 463 For rack setup and operation)

Have only qualified persons make this installation.

**Turn Off welding power sources before inspecting or installing rack.**

1 Rear Rack Mounting Bracket

Loosely attach one rack mounting bracket (with the weld nuts facing up) on the back of the rack with 2 screws.

2 Welding Power Source

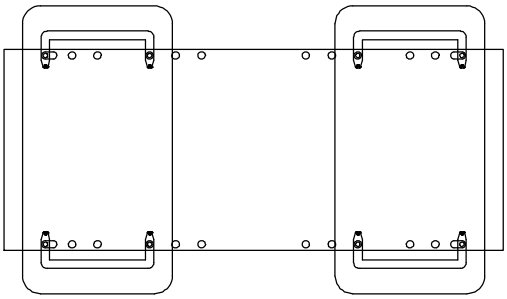
Slide power source onto rack in front of the bracket.

Align the channels of the rear base brackets with the rack mounting bracket. Push the power source back so the mounting bracket slides into the channels.

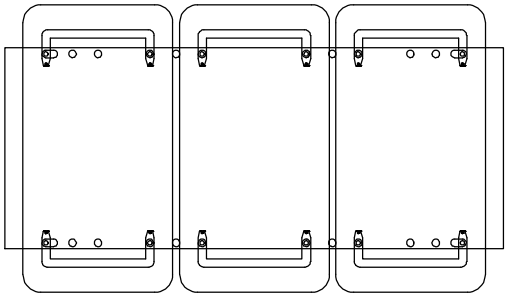
3 Front Rack Mounting Bracket

Slide the second rack mounting bracket (with the weld nuts facing up) into the channels on the front base brackets. Attach bracket to rack using 2 screws. Tighten all 4 bracket screws to 10 ft lb (13.6 N·m).

**Hole Layout For 4-Pack Rack**



**Hole Layout For 6-Pack Rack**



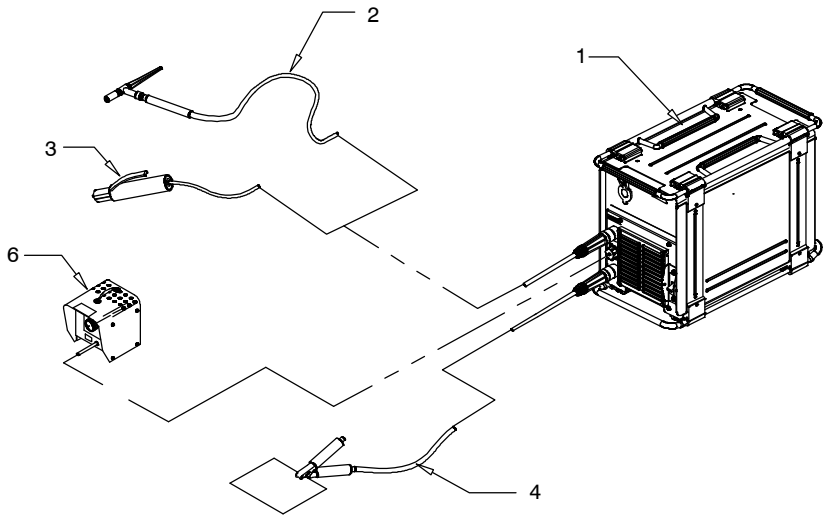
Tools Needed:

1/2 in.

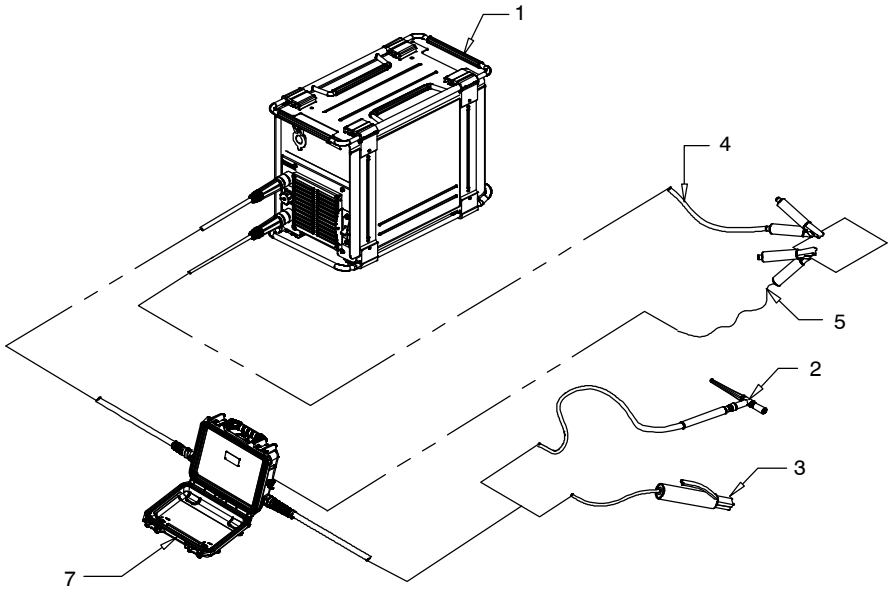
259 422-A / 254 712-A

## 5-15. Connecting To Remote

**RHC-14 Or Wireless Remote Connection**




**FieldPro Remote Connection**




This power source can be used with either the FieldPro Remote, RHC−14 remote, or wireless remote (see RHC−14 remote or wireless remote Owner's Manual for operating instructions).

1 Power Source

2 TIG Torch (Shielding Gas Not Shown)

3 Electrode Holder

When using an RHC-14 or wireless remote, connect TIG torch or electrode holder directly to the ELECTRODE (top) output receptacle.

4 Work Cable

Connect work cable to WORK (bottom) output receptacle on the front of the welding power source. Attach work cable clamp as close to the arc as possible.

5 Work Sense Lead

When using a FieldPro Remote, attach work sense lead clamp next to the work cable clamp. Connect the other end of the work sense lead to the binding post on the side of the FieldPro Remote.

6 RHC−14 Remote Or Wireless Remote

Connect RHC-14 or wireless remote to 14-pin receptacle on the front of the power source.

7 FieldPro Remote

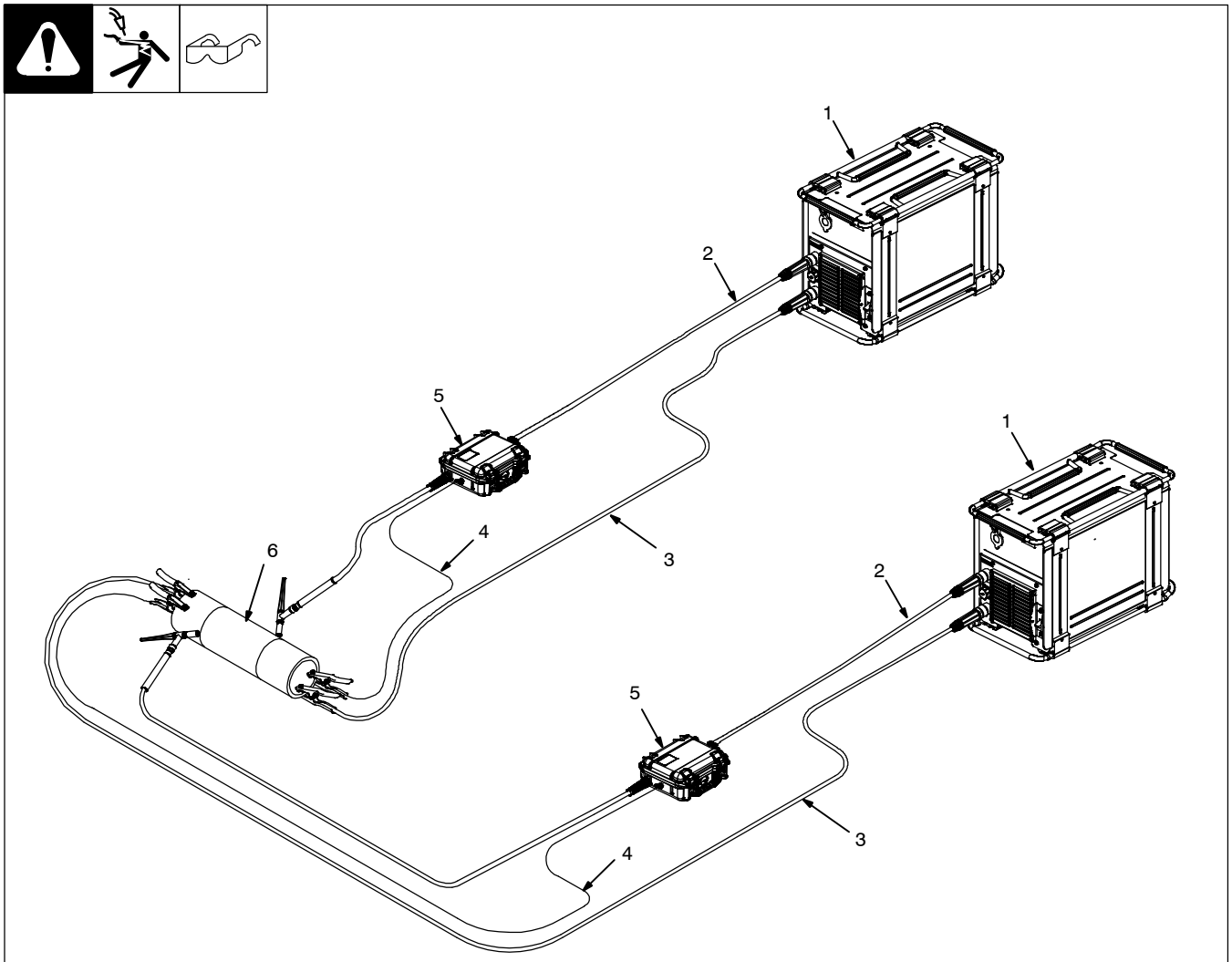
Connect one end of the weld cable to ELECTRODE (top) output receptacle on the front of the power source and the other end to the FieldPro Remote. Connect the TIG torch or electrode holder to the other side of the FieldPro Remote.

☞ *The RHC-14 or wireless remote can be used with the FieldPro Remote to allow amperage adjustment during welding.*

255 420-B

## 5-16. Volt Sense Lead And Work Cable Connections For Multiple Welding Arcs

### A. Ideal Setup




255 378-B

1 Welding Power Source

2 Weld Cable

3 Work Cable

4 Work Sense Lead

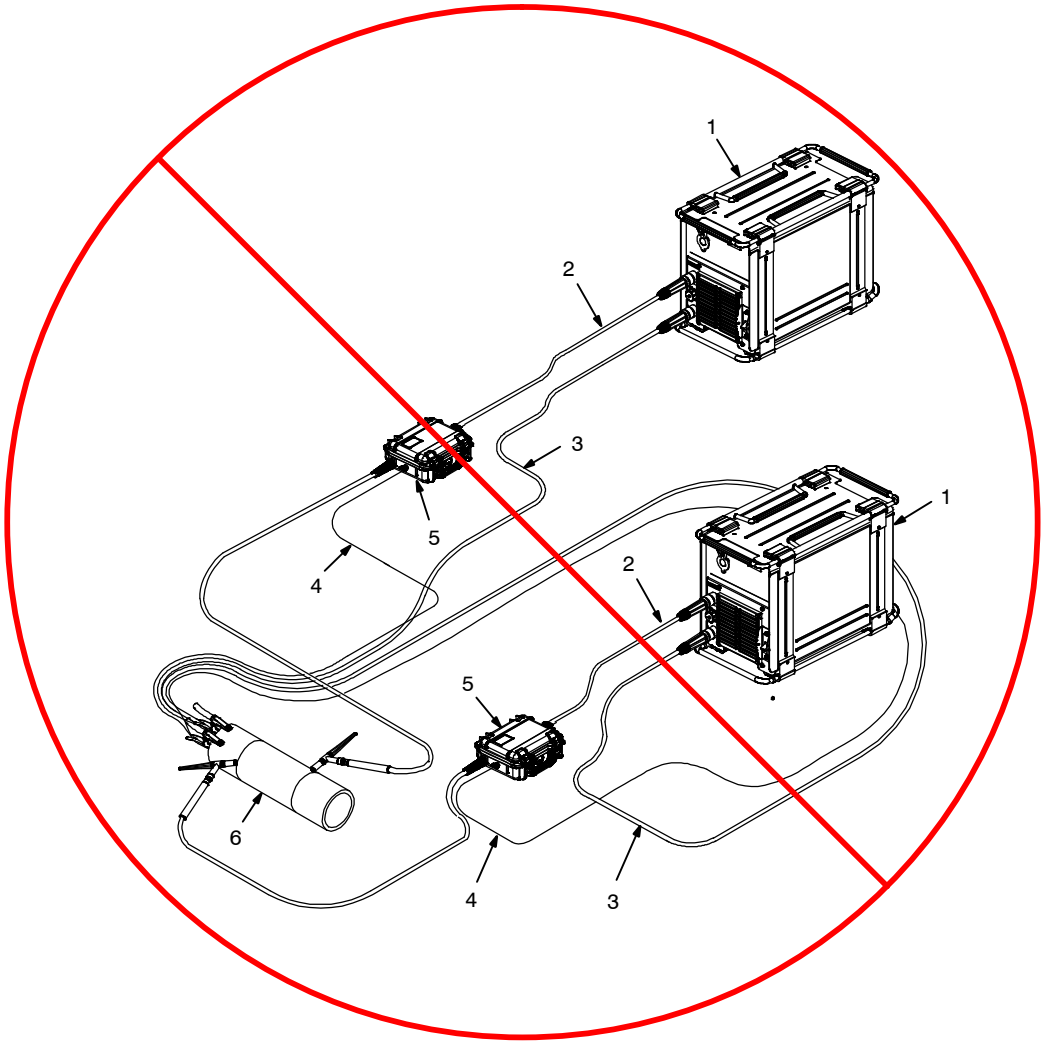
The work sense lead is required for operation of the FieldPro Remote.

5 Remote

6 Workpiece

This arrangement is an ideal setup for multiple welding arcs.

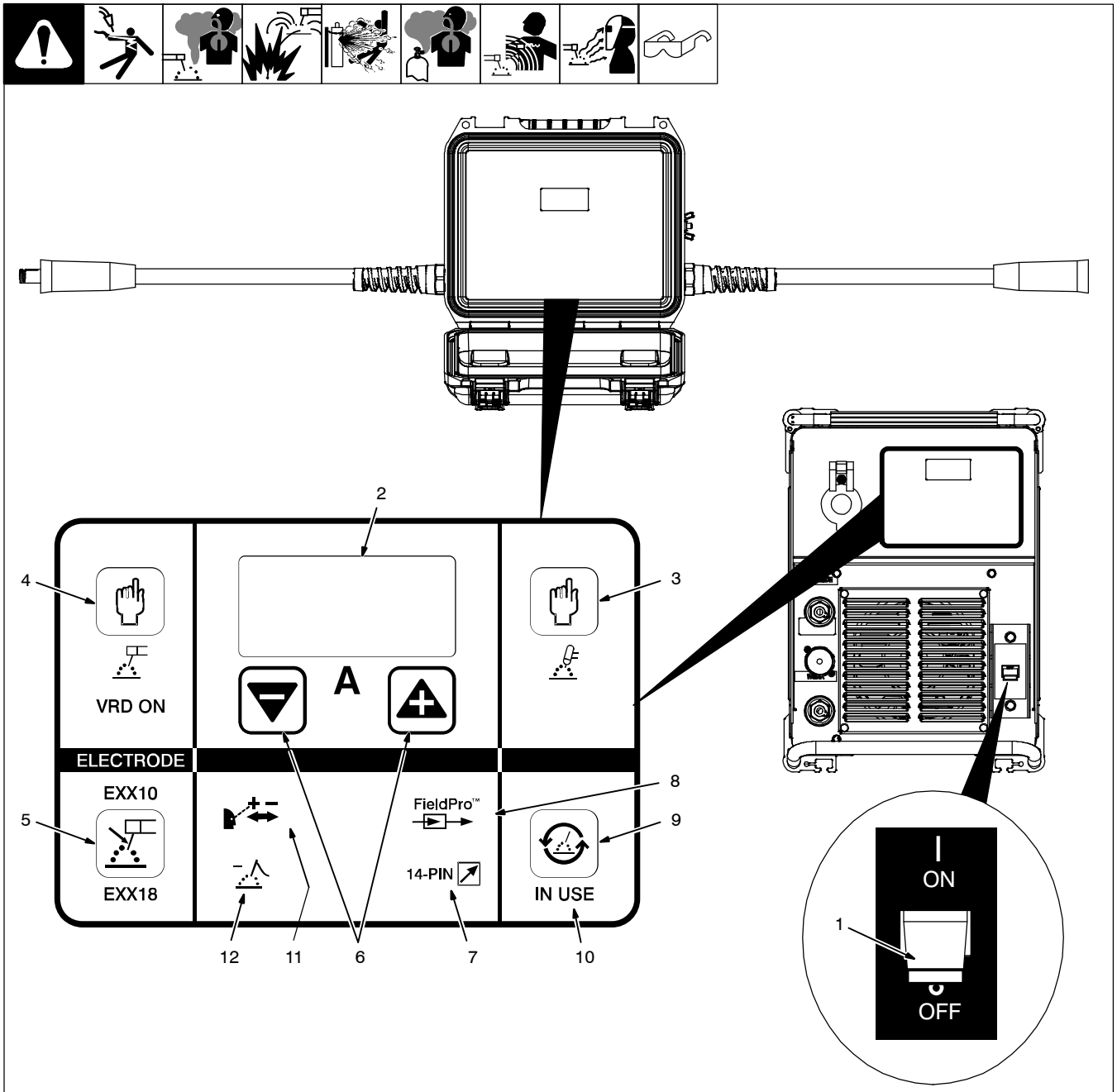
## B. Bad Setup




255 379-B

| | | | | |
|---|---|---|---|---|
| 1 | Welding Power Source | 4 | Work Sense Lead | This arrangement is a bad setup. Clamps for separate units should not be shared. Weld cables should not be crossed. |
| 2 | Weld Cable | 5 | Remote | |
| 3 | Work Cable | 6 | Workpiece | |

## 6-1. Welding Power Source And Remote Interface Controls




255 429-B / 264 180-B / Ref. 255 179-B / 253 664-A

1 Power Switch
2 AMPS Display
3 TIG Process Select Button
4 Stick Process Select Button
5 Stick Electrode Type Select Button
6 Amperage Adjustment Buttons
7 14-Pin Remote Connected Indicator
8 FieldPro Accessory Connected Indicator
9 IN USE Button
10 IN USE Indicator
11 Check Polarity Indicator
12 Stick Negative Indicator

## 6-2. Welding Power Source And Remote Interface Operation Description

**Power Switch** — Use this switch to power up or power down the welding power source.

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

**AMPS Display** — This display illuminates and shows amperage for either TIG or stick welding process. Measured amperage just prior to the end of a welding operation will appear on the display for ten seconds after welding operation.

**TIG Process Select Button** — Press and release this button to activate the TIG welding process controls. The TIG text below the button illuminates. Adjust the amperage to the appropriate setting within a range from 10 to 350 amps. If the TIG process has been selected and a remote current/contactor control is connected, holding the TIG process select button for more than two seconds will display the effective amperage command (based on the amperage setting and the remote current/contactor control setting).

**Stick Process Select Button** — Press and release this button to activate the stick welding process controls. The STICK text below the button illuminates as well as the active stick electrode type text. Select the desired stick electrode type and adjust the amperage to the appropriate setting within a range from 40 to 350 amps.

**Stick Electrode Type Select Button** — Press and release button to select the desired stick electrode type (EXX10 or EXX18). The text above or below the button will illuminate for the active electrode type. This button is only active with the stick welding process and only then will text for the electrode type illuminate.

☞ *There may be a "clunk" sound from the power source when switching between Stick and TIG processes. This is part of normal power source operation.*

**Adjustable DIG and Hotstart** — Press and hold the STICK button for a few seconds to enter adjustable DIG. The right decimal point will illuminate on the display to indicate DIG. Once in adjustable DIG, press and release the STICK button again to enter adjustable Hotstart. The middle decimal point will illuminate on the display to indicate Hotstart. Pressing and releasing the STICK button a third time will exit the menu. The menu will automatically exit after 10 seconds of inactivity. Pressing and releasing any button other than the STICK button while in the menu will also exit the menu.

**Amperage Adjustment Buttons** — Use these buttons to set the desired amperage setting for either TIG or stick welding process.

**14-Pin Remote Connected Indicator** — The 14-PIN REMOTE text will illuminate when there is a 14-pin accessory connected to the Remote 14 receptacle on the power source.

**FieldPro ACCESSORY Connected Indicator** — The FieldPro ACCESSORY text will illuminate when there is a FieldPro accessory connected to and properly communicating with the power source.

**IN USE Button** — Press and release this button on the power source or FieldPro Remote to illuminate the IN USE text. Press and release again to turn IN USE text off. This lets others know that the machine is being used.

**IN USE Indicator** — Light automatically turns on when arc is struck. Toggle light using the IN USE button during use. Light will automatically turn off after four hours of inactivity.

**CHECK POLARITY Indicator** — The CHECK POLARITY text will illuminate along with an error message (Err) if the work and electrode leads are reversed. This will light only if a FieldPro accessory is connected. Power down and correct the connections (see Section 5 for proper connections).

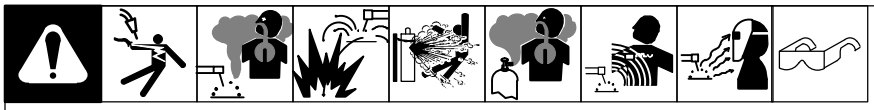
**STICK NEGATIVE Indicator** — The DCEN (–) STICK NEG text will illuminate if the polarity is negative while in STICK mode. To activate DCEN mode, press the STICK button and down arrow at the same time. Press the STICK button to exit this mode. The DCEN mode can be used for EXX10 and/or EXX18 process setting. The mode has to be set for each electrode process individually.

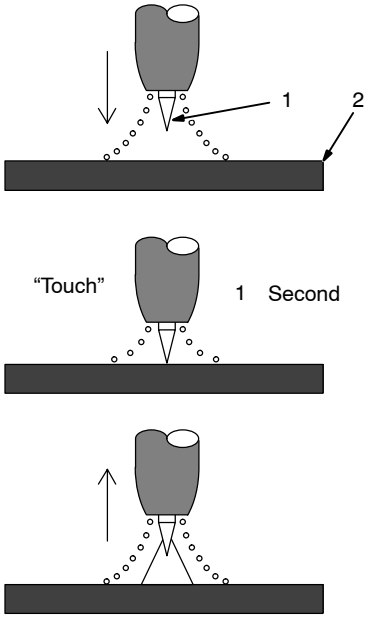
***NOTICE*** *– Controls on the FieldPro Remote are NOT adjustable during welding. To make adjustments during welding, use the power source controls. Adjustments can be made if using the RHC-14 remote or wireless remote.*

### Table 6-1. Recommended Process Selections vs Electrode Type

| Electrode Type | Suggested Process Setting |
|---|---|
| EXXX1 | EXX10 |
| EXXX2 | EXX10 |
| EXXX3 | EXX18 |
| EXXX4 | EXX18 |
| EXXX5 | EXX18 |
| EXXX6 | EXX18 |
| EXXX7 | EXX18 |
| EXXX8 | EXX18 |
| Stainless | EXX18 |

## 6-3. Lift-Arc TIG Procedure






With Process Switch in the TIG position, start an arc as follows:

1 TIG Electrode

2 Workpiece

Touch tungsten electrode to workpiece at weld start point. Arc will not start while electrode is touching the workpiece. Slowly lift electrode to form an arc.

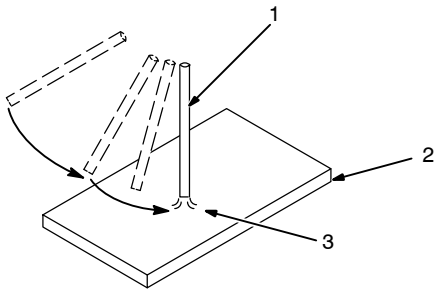
☞ *Do not re-touch the electrode to the workpiece. The arc will go out and the electrode will stick.*

Normal open-circuit voltage is not present before tungsten electrode touches workpiece; only a low sensing voltage is present between electrode and workpiece. The solid-state output contactor does not energize until after electrode is touching workpiece. This allows electrode to touch workpiece without overheating, sticking, or getting contaminated.

☞ *If FieldPro Remote is connected, its display may temporarily turn off when the tungsten touches the workpiece.*

Ref. S-156 279

## 6-4. Stick Start Procedure – Scratch Start Technique




With Stick selected, start arc as follows:

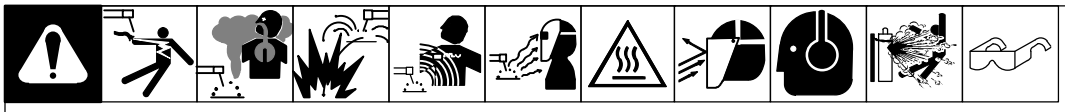
1 Electrode

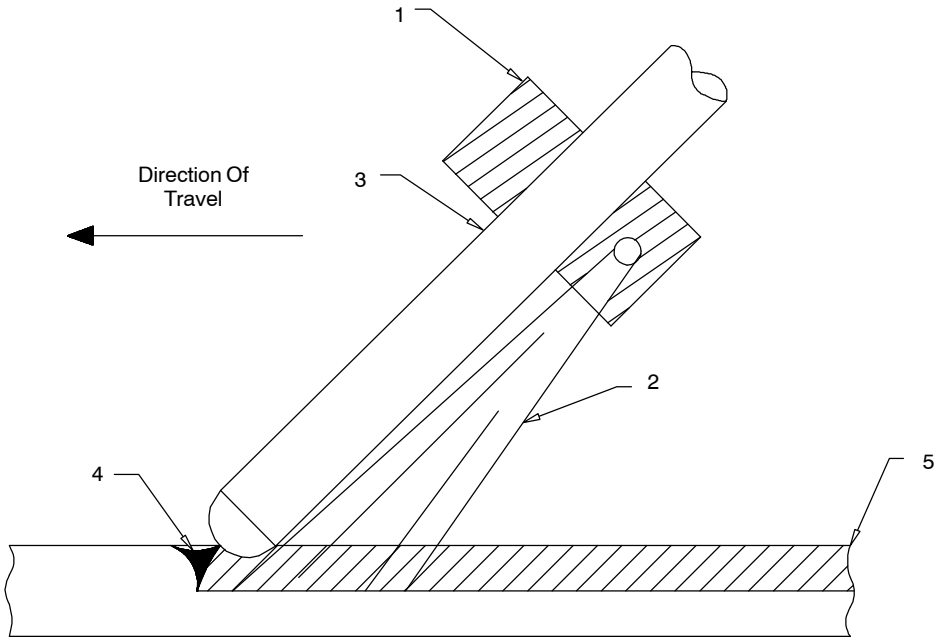
2 Workpiece

3 Arc

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

## 6-5. Carbon Arc Gouging






258 443-A

1 Electrode Holder

Choose correct electrode holder for the process.

2 Air Stream

The air stream should be in line with the electrode and positioned between the electrode and the workpiece.

3 Carbon Electrode

Choose the correct electrode size for the desired gouge.

4 Gouging Arc

Keep the arc short.

5 Workpiece

Start air compressor and adjust regulator to correct setting. Use the lowest air pressure that will blow away the molten metal. Ensure that the electrode point is shaped correctly and insert it in the electrode holder. The electrode should extend no more than 7 in. (178 mm) and no less than 2 in. (51 mm) from the electrode holder. Strike the arc, then open the air valve. Use proper arc and travel speed to create the desired shape and condition of the gouge.

Always cut away from the operator as molten metal sprays some distance from the workpiece.

Ensure that everyone in the work area is not in the path of the spray.

Remove all combustible material from the work area. Place metal deflection plates in front of the operation.

## 6-6. Restoring Factory Defaults

A factory reset of the power source can be accomplished by pressing the Stick and TIG buttons simultaneously for more than four seconds.

The display will show fSt and then go to dashes when the reset is complete.

## 6-7. Viewing Software Revision

Press and hold the Electrode and In Use buttons simultaneously to view the system software revision level.

While still holding down the Electrode push button, press the In Use push button again to display the User Interface software revision level.

# SECTION 7 – MAINTENANCE & TROUBLESHOOTING

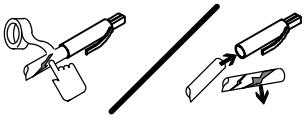
## 7-1. Routine Maintenance

**Disconnect power before maintaining.**

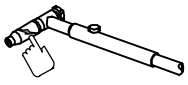
☞ *Maintain more often during severe conditions.*

**3 Months**

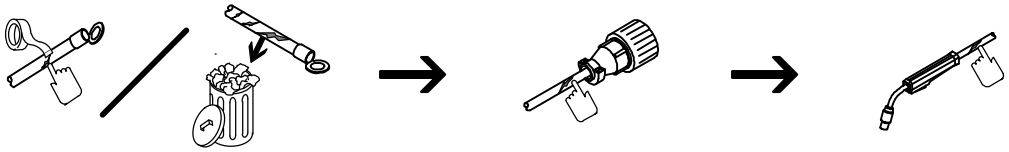

Replace Damaged Or Unreadable Labels



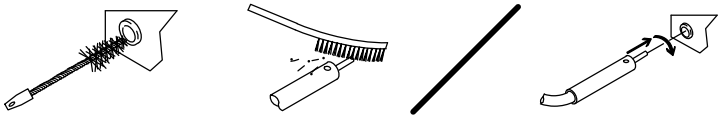
Repair Or Replace Cracked Cables



Replace Cracked Torch Body

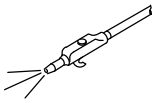


Repair Or Replace Cracked Cables And Cords



Clean And Tighten Weld Connections

**6 Months**

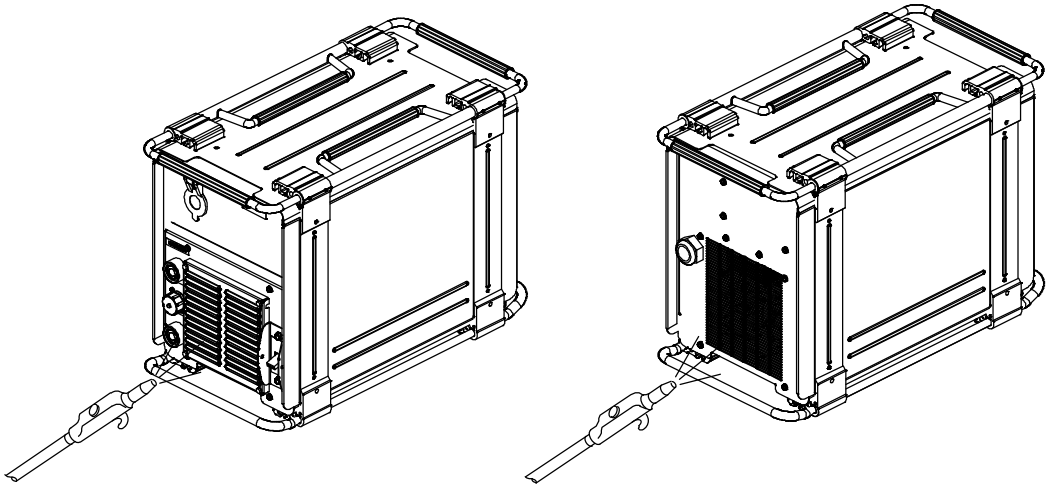


Blow Out Inside

## 7-2. Blowing Out Inside Of Unit

**Do not remove case when blowing out inside of unit.**

To blow out unit, direct airflow through front and back louvers as shown.



Ref. 255 179-B

## 7-3. Welding Power Source And Remote Diagnostics Help Codes


**Display Example**

| Display Code | Fault | Description |
|---|---|---|
| H01 | Primary Transformer Over Current | Indicates a malfunction in the primary power circuit. |
| H02 | Secondary Thermistor Malfunction | Indicates the left side thermal protection circuitry is malfunctioning. |
| H03 | Secondary Circuit Over Temperature | Indicates left side of unit has overheated. Unit has shutdown to allow fans to lower left side temperature. Operation will continue after unit is within normal temperature range. |
| H04 | Primary Temperature Sensor Malfunction | Indicates the right side thermal protection circuitry is malfunctioning. |
| H05 | Primary Circuit Over Temperature | Indicates right side of unit has overheated. Unit has shutdown to allow fans to lower right side temperature. Operation will continue after unit is within normal temperature range. |
| H06 | Current Foldback | Indicates operation at maximum input current.. |
| H08 | Output Over Voltage Malfunction | Output voltage exceeded 100 VDC for more than 1/2 second. |
| H12 | Precharge Incomplete | Precharge did not complete in allotted time. |
| H13 | Internal Voltage Malfunction | System cannot measure output voltage. |
| H16 | PC2 Temperature Sensor Malfunction | Indicates thermal protection circuitry on the Process Control board is malfunctioning. |
| H17 | PC2 Over Temperature | Indicates PC2 has overheated. Unit has shutdown to allow fans to lower temperature. |
| H18 | PC3 Temperature Sensor Malfunction | Indicates thermal protection circuitry on the System Power board is malfunctioning. |
| H19 | PC3 Over Temperature | Indicates PC3 has overheated. Unit has shutdown to allow fans to lower temperature. |
| H20 | PC2 Power Supply Low | Indicates the control supply on PC2 is malfunctioning. |
| H21 | Primary Input Line Voltage Malfunction | Indicates input primary line voltage is too low.<br>Primary line voltage must be at least 90% of specified nominal voltage. |
| H22 | Boost Fault | Indicates the boost circuitry on the right side of unit is malfunctioning. |
| H26 | Button Stuck On Power Source | Indicates button is stuck on the power source upon start up. Fault will clear when button is released. |
| H27 | Polarity Switch Fault | Indicates the relay circuitry (W1, W2) is malfunctioning. |
| H30 | Stuck Contactor TIG/Stick | Indicates a stuck remote contactor in either Stick or TIG process. |
| H32 | Accessory Temperature Sensor Malfunction | Indicates the thermistor in the attached FieldPro accessory is malfunctioning. |
| H33 | Accessory Over Temperature | Indicates the attached FieldPro accessory has overheated. |
| H96 | PC7 Communication Malfunction | Indicates internal communication malfunction to PC7. |
| H97 | PC1 Communication Malfunction | Indicates internal communication from primary power circuitry to secondary power circuitry on PC1. |
| H98 | Serial Communication Loss | Indicates serial communication was initially made and is now malfunctioning. May appear normally during firmware updates. Communication between PC1 and PC5 malfunction. |
| H99 | Serial Communication Malfunction | Indicates serial communication is malfunctioning. May appear normally during firmware updates. Communication between PC1 and PC5 malfunction. |

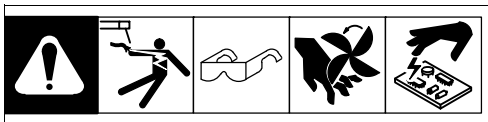
## 7-4. Feeder Diagnostics Help Codes

The FieldPro Feeder does not display the same help codes as the power source. Error conditions are indicated by a “HLP” message on the display, or by the blinking of the Red LED on motor board PC1. To view the Red LED, turn off the power source, remove the wrapper, and turn power source back on. The Red LED blinks in a 2.5 second cycle. The number of blinks in this period indicates the type of error. If an error condition does not exist on the motor board, the Red LED is on steady.


**Display Example**

| Display Code | Red LED On PC1 | Fault | Description |
|---|---|---|---|
| H11 | 1 Blink | Communication Error | This error occurs 2.5 seconds after a loss of communication between the motor board and meter board. The operator may continue to weld with this error present. The error may be cleared by turning the power off, waiting a minimum of 2 seconds, and turning power back on. |
| H12 | 2 Blinks | Trigger Error | This error occurs if the operator has fed approximately 35 ft (10.7 m) of wire without striking an arc, or if the welding wire is shorted during a welding operation and switch DIP4 on the front panel board is de-pressed toward the OPEN position. The error may be cleared by releasing the gun trigger. |
| H14 | 4 Blinks (Constant Blinking) | Motor Overload | Indicates that the motor has been drawing too much current for too long. To remedy, reduce the wire feed speed or the wire feeder torque load/duty cycle. The error may be cleared by turning the power off, waiting a minimum of 2 seconds, and turn-ing the power back on. |
| H15 | 3 Blinks | Bus Bar Overheating | Indicates the arc is drawing too much cur-rent for too long. To remedy, reduce the weld amperage or duty cycle. |

## 7-5. Troubleshooting Welding Power Source



| Trouble | Remedy |
|---|---|
| No weld output; unit completely in–operative | Place line disconnect switch in On position (see Section 5-5). |
| | Check and replace line fuse(s), if necessary*. |
| | Check for proper input power connections (see Section 5-5). |
| No weld output; meter display On. | Check, repair, or replace RHC-14 remote control. |
| | Unit overheated. Allow unit to cool with fan ON (see Section 4-3). |
| | Check ammeter help displays. |
| Erratic of improper weld output. | Use proper size and type of weld cable. |
| | Clean and tighten all weld connections. |
| | Check volt sense lead. Straighten any coiled cables. |
| When remote control is connected to unit output is always on. | Check RHC-14 remote control switch and potentiometer resistances. |
| *Have a trained and qualified service technician check and replace line fuse(s). | |

## 7-6. Troubleshooting Welding Power Source Issues

If the welding power source is NOT responding after everything is connected, follow the items listed below before contacting the nearest factory-authorized service agent:

**Welding power source is plugged in and there is no power after turning on unit.**

- If unit is directly connected to a line disconnect box or plugged into a receptacle from a line disconnect box, be sure that the line disconnect switch or main breaker is in the ON position.

**Weld is not consistent from one welding application to another.**

- Be sure that work clamp is connected to a clean, paint-free area of pipe; otherwise, grind an area if necessary to make a good work connection.
- Keep work clamp as close as possible to joint being welded.
- Follow recommended settings in Operation section of manual to select a starting point for welding.
- Recommended joint preparation and fit-up is 1/32-1/16 in (0.8-1.6 mm) land and a 1/8 in (3.2 mm) root opening.

**Porosity in weld bead (TIG welding).**

- Check shielding gas supply that there is enough gas and supply is turned on.
- Check shielding gas flow rate at regulator.
- Check that gas pressure does not exceed 90 psi (621 kPa).
- Check all shielding gas fitting and tighten if necessary.
- Shield joint from wind.

**FieldPro Remote does not turn on.**

- Check work sense lead connection. Be sure that the clamp is connected to a clean, paint-free area of the workpiece.

## 7-7. Power Source Calibration Procedure

☞ *At any point during voltage or amperage calibration, the IN USE button may be used to advance without saving the calibration. This may be useful when only wishing to verify calibration and not change the settings. Press the ELECTRODE button at any point to exit calibration mode. Routine calibration is not necessary for most applications, calibration is verified at the factory.*

**Required Equipment:**

Calibrated voltage meter and ammeter

Load bank or shorting cable

**Setup And Enter Calibration Mode:**

1. Disconnect output cables including all accessories.
2. Turn power on.
3. To enter calibration mode, press and hold the STICK and IN USE buttons at the same time for 2 seconds. Display will show — — —
4. Release buttons. Display will show CAL. Output will be de-energized. Voltage and current meters should measure zero.

- For Voltage Calibration, connect voltage meter across the output studs. + to ELECTRODE and – to WORK (open circuit load).
- For Amperage Calibration, connect shorting cable or load bank at heavy load setting to output studs. Connect ammeter to measure output current.

☞ *If at any point the display reading is out of the allowed range, unit may need to have the calibration values defaulted. See below for default procedure. If defaulting the calibration does not resolve the issue, the unit may require servicing.*

☞ *If at any point the measured voltage or amperage readings are out of the allowed range or are not the correct polarity (+ or –), the unit may require servicing.*

**Voltage Calibration Procedure:**

1. When in calibration mode, open/disconnect load from output studs, then press the TIG button.
2. Verify the display shows 27.0 (±2.0).
3. Verify the voltmeter displays -27.0 (±2.0). Verify value is negative.
4. Using the – and + buttons, adjust the display to match the measured value.
5. Wait a few seconds, then verify display and voltmeter reading are the same.
6. Press the TIG button to save the calibration setting.
7. Verify the display shows 72.0 (±5.0), indicating open circuit voltage.
8. Verify the voltmeter displays -72.0 (±5.0). Verify value is negative.
9. Using the – and + buttons, adjust the display to match the measured value.
10. Wait a few seconds, then verify display and voltmeter reading are the same.
11. Press the TIG button to save the calibration setting.
12. Verify the display shows 27.0 (±2.0).
13. Verify the voltmeter displays 27.0 (±2.0). Verify value is positive.
14. Using the – and + buttons, adjust the display to match the measured value.
15. Wait a few seconds, then verify display and voltmeter reading are the same.
16. Press the TIG button to save the calibration setting.
17. Verify the display shows 72.0 (±5.0), indicating open circuit voltage.
18. Verify the voltmeter displays 72.0 (±5.0). Verify value is positive.

19. Using the – and + buttons, adjust the display to match the measured value.
20. Wait a few seconds, then verify display and voltmeter reading are the same.
21. Press the TIG button to save the calibration setting.
22. Press ELECTRODE button to exit calibration mode or continue on to Amperage Calibration procedure.

**Amperage Calibration Procedure:**

1. When in calibration mode, connecting shorting cable/load bank across output studs, then press the STICK button.
2. Verify the display shows 50 (±5.0).
3. Verify the ammeter displays 50 (±5.0).
4. Using the – and + buttons, adjust the display to match the measured value.
5. Wait a few seconds, then verify display and ammeter reading are the same.
6. Press the STICK button to save the calibration setting.
7. Verify the display shows 350 (±5.0).
8. Verify the ammeter displays 350 (±5.0).
9. Using the – and + buttons, adjust the display to match the measured value.
10. Wait a few seconds, then verify display and ammeter reading are the same.
11. Press the STICK button to save the calibration setting.
12. Press ELECTRODE button to exit calibration mode.

**Default Calibration Procedure:**

- Three levels of calibration default are provided as follows:

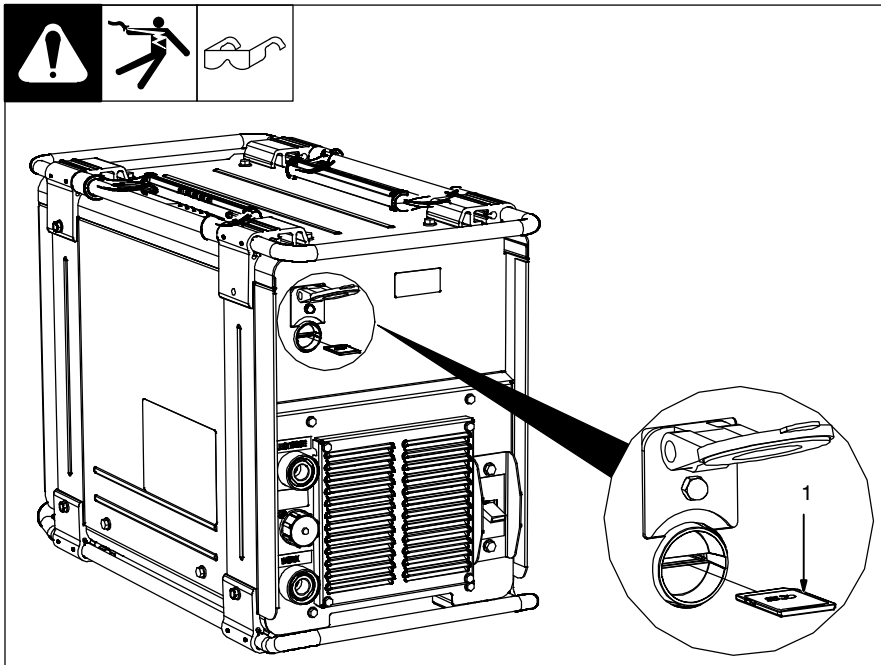
  Default all  Default voltage calibration  Default amperage calibration
- Enter calibration mode using the method described above.
- Default all

  When in calibration mode, press and hold the STICK and TIG buttons at the same time until the display shows — — —
- Default voltage calibration

  When in calibration mode, enter the voltage calibration mode by pressing the TIG button. Then press and hold the STICK and TIG buttons at the same time until the display shows — — —
- Default amperage calibration

  When in calibration mode, enter amperage calibration mode by pressing the STICK button. Then press and hold the STICK and TIG buttons at the same time until the display shows — — —

## 7-8. Updating Software In Welding Power Source




1 SD Card

Insert SD card into the SD card slot on the front of the unit. Turn power on or cycle power to the welding power source. Unit automatically updates.

The update may take 20 to 30 seconds. The front panel display may show dashes and/or H99.

Upon completion of the update, the display shows Crd. Remove SD card to resume normal operation.

Press and hold the Electrode and In Use push buttons simultaneously to verify unit has updated successfully with the correct system software revision level.

266 872

# SECTION 8 – ELECTRICAL DIAGRAM

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

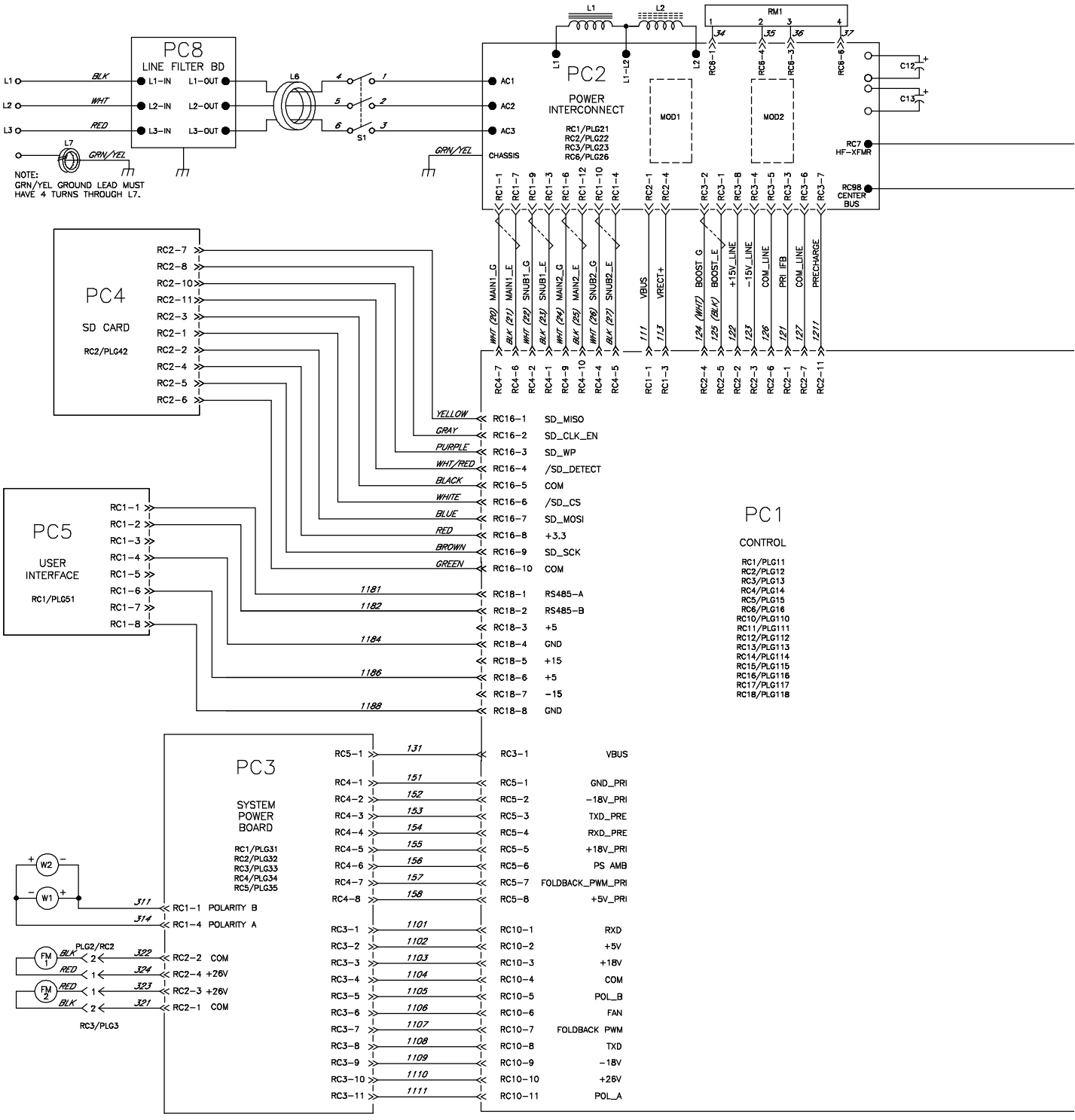
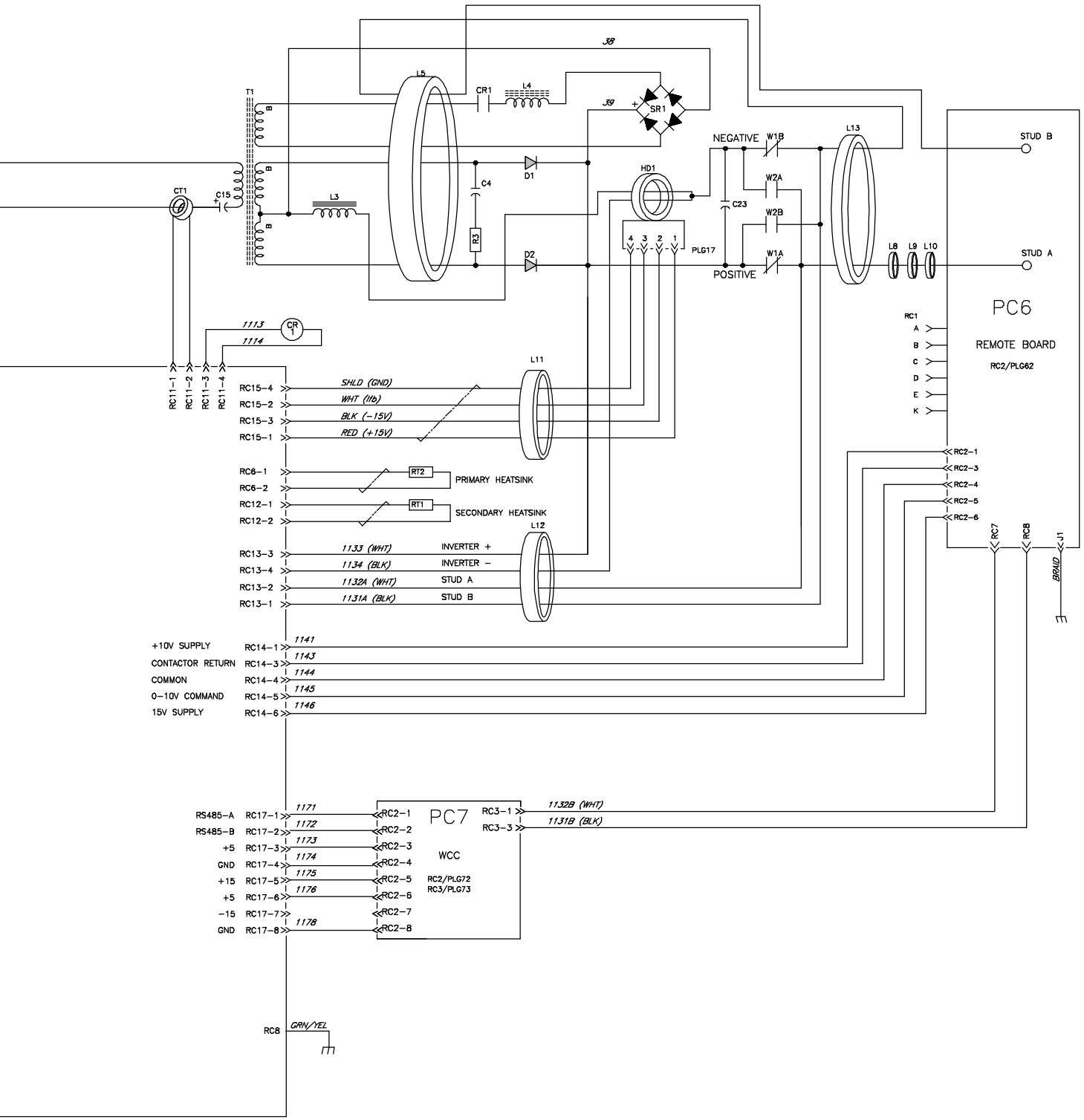
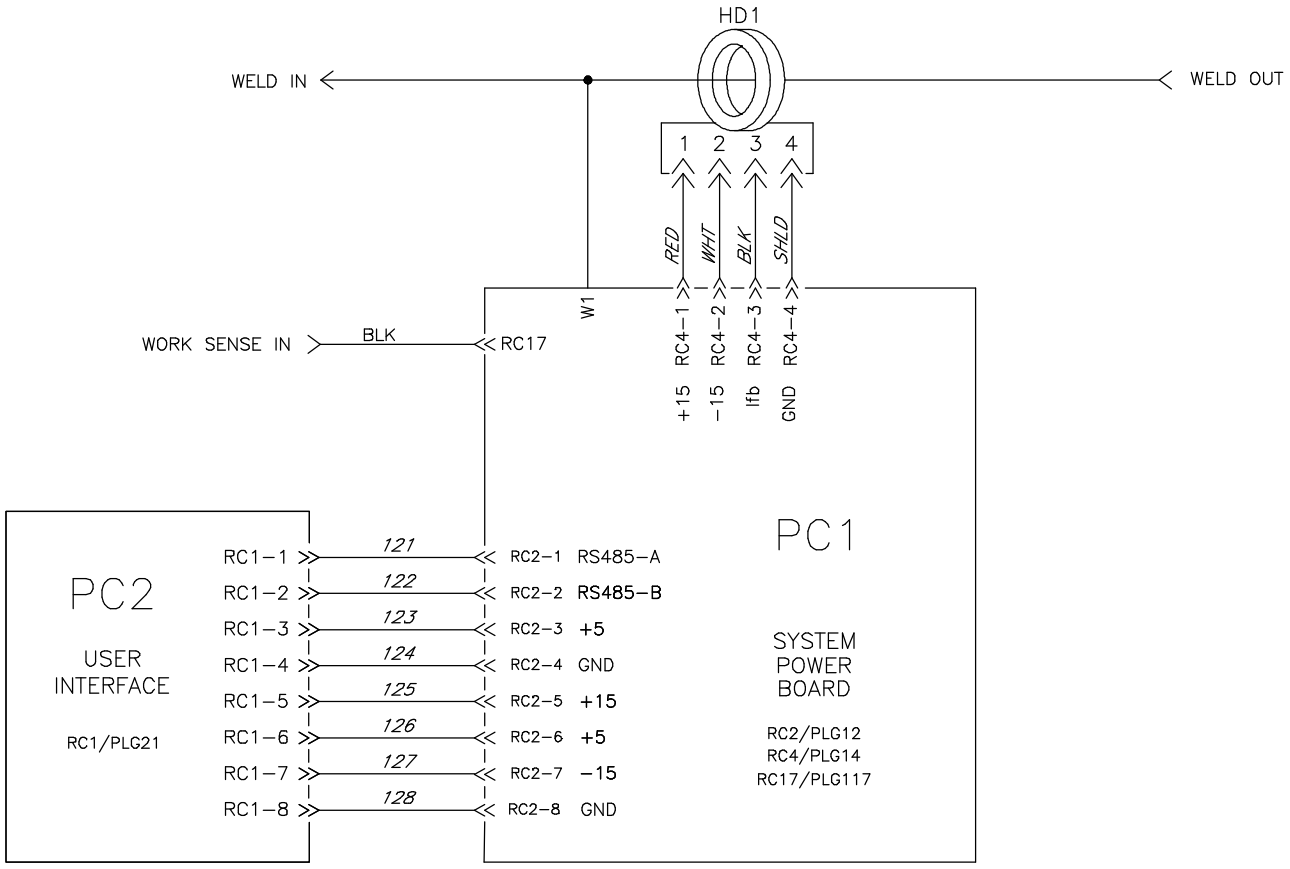



**Figure 8-1. Welding Power Source Circuit Diagram**


T1
CT1
C15
L3
L5
CR1
L4
SR1
D1
C4
R3
D2
HD1
C23
NEGATIVE
POSITIVE
W1B
W2A
W2B
W1A
L13
L8
L9
L10
STUD B
STUD A
PLG17
PC6
REMOTE BOARD
RC2/PLG62
RC1
A
B
C
D
E
K
CR
1113
1114
RC11-1
RC11-2
RC11-3
RC11-4
L11
RC15-4
RC15-2
RC15-3
RC15-1
SHLD (GND)
WHT (11b)
BLK (-15V)
RED (+15V)
RC6-1
RC6-2
RC12-1
RC12-2
RT2
RT1
PRIMARY HEATSINK
SECONDARY HEATSINK
L12
RC13-3
RC13-4
RC13-2
RC13-1
1133 (WHT)
1134 (BLK)
1132A (WHT)
1131A (BLK)
INVERTER +
INVERTER -
STUD A
STUD B
+10V SUPPLY
CONTACTOR RETURN
COMMON
0-10V COMMAND
15V SUPPLY
RC14-1
RC14-3
RC14-4
RC14-5
RC14-6
1141
1143
1144
1145
1146
RC2-1
RC2-3
RC2-4
RC2-5
RC2-6
RC7
RC8
J1
BRAID
RS485-A
RS485-B
+5
GND
+15
+5
-15
GND
RC17-1
RC17-2
RC17-3
RC17-4
RC17-5
RC17-6
RC17-7
RC17-8
1171
1172
1173
1174
1175
1176
1178
PC7
WCC
RC2/PLG72
RC3/PLG73
RC2-1
RC2-2
RC2-3
RC2-4
RC2-5
RC2-6
RC2-7
RC2-8
RC3-1
RC3-3
1132B (WHT)
1131B (BLK)
RC8
GRN/YEL

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




255 132-B

**Figure 8-2. Remote Circuit Diagram**

# Notes

☞ *Hardware is common and not available unless listed.*

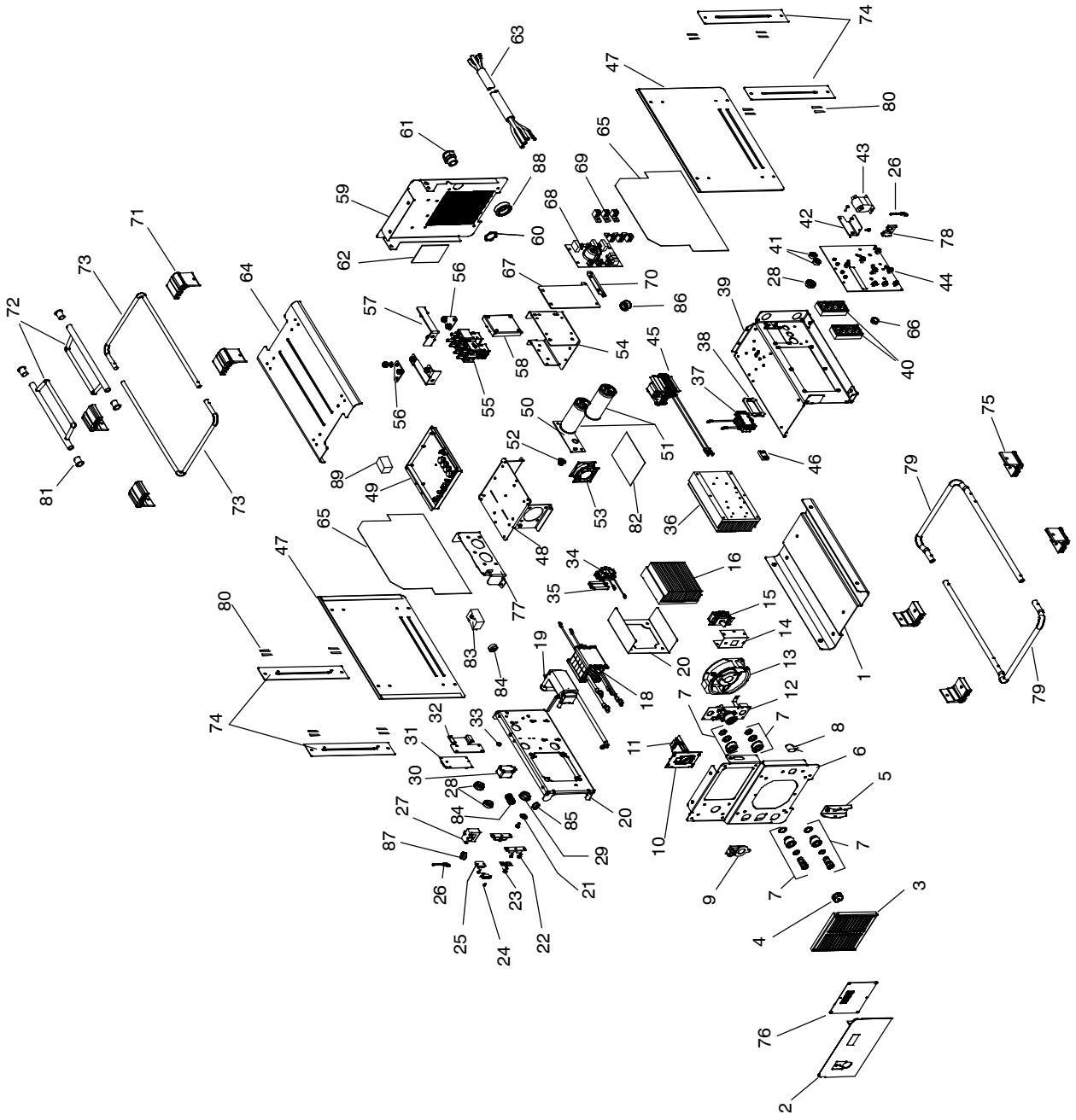



**Figure 9-1. Welding Power Source Parts Assembly**

| Item No. | Dia. Mkgs. | Part No. | Description | Quantity Model 907633 |
|---|---|---|---|---|

**Figure 9-1. Welding Power Source Parts Assembly**

| | | | | |
|---|---|---|---|---|
| ... 1 | | 257114 | .. Base | 1 |
| ... 2 | | 265434 | .. Nameplate/Switch Membrane, Front Pnl | 1 |
| ... 3 | | 175138 | .. Box, Louver | 1 |
| ... 4 | | 170391 | .. Conn, Circ MS Protective Cap | 1 |
| ... 5 | | 254891 | .. Plate, Switch | 1 |
| ... 6 | | 252839 | .. Panel, Front | 1 |
| ... 7 | | 268639 | .. Rcpt Assy, Tw Lk Insul Fem(Dinse Type) (Including)2 | |
| | | 257995 | .... Rcpt, Tw Lk Insul Fem Dinse Style w/O-ring | 1 |
| | | 250037 | .... Insulator, Bulkhead Front | 1 |
| | | 250039 | .... Insulator, Bulkhead Rear | 1 |
| | | 185714 | .... Washer, Tooth 22MMID x 31.5MMOD | 1 |
| | | 185717 | .... Nut, M20−1.5 1.00 Hex .19H Brs Locking | 1 |
| | | 185718 | .... O−Ring, 0.989 ID x 0.070 H | 1 |
| | | 186228 | .... O−Ring, 0.739 ID x 0.070 H | 1 |
| ... 8 | C6 | 264077 | .. Capacitor Assy | 1 |
| ... 9 | | 254892 | .. Door, SD Reader | 1 |
| ... 10 | | 234344 | .. Bracket, SD Card Reader | 1 |
| ... 11 | PC4 | 244477 | .. Circuit Card Assy, SD Card | 1 |
| ... 12 | PC6 | 268280 | .. Circuit Card Assy, FC Source Remote Interface (CE) | 1 |
| ... 13 | FM1 | 224694 | .. Fan | 1 |
| ... 14 | | 176226 | .. Insulator, Switch Power | 1 |
| ... 15 | S1 | 244920 | .. Switch | 1 |
| | | 253664 | .. Label, On−Off | 1 |
| ... 16 | | 225097 | .. Heat Sink, Rect LH | 1 |
| ... 17 | | 211503 | .. Insulator, Heat Sink | 1 |
| ... 18 | T1 | 212132 | .. Xfmr, HF Litz/Litz w/Boost | 1 |
| ... 19 | L3 | 272893 | .. Inductor, Output | 1 |
| ... 20 | | 212207 | .. Windtunnel, LH | 1 |
| ... 21 | | 196355 | .. Insulator, Screw | 4 |
| ... 22 | D1,D2 | 201531 | .. Kit, Diode Power Module | 2 |
| ... 23 | | 199840 | .. Bus Bar, Diode | 2 |
| ... 24 | R3/C4 | 233052 | .. Resistor/Capacitor | 1 |
| ... 25 | SR1 | 201530 | .. Kit, Diode Fast Recovery Bridge | 1 |
| ... 26 | RT1,RT2 | 199798 | .. Thermistor, NTC 30k ohm @ 25 Deg C 18.00 in. 2500V | 2 |
| ... 27 | HD1 | 182918 | .. Transducer, Current 400A Module Supply V +/− 15V | 1 |
| ... 28 | | 179276 | .. Bushing, Snap−In Nyl 1.000 ID X 1.375 Mtg Hole Cent | 3 |
| ... 29 | | 170647 | .. Bushing, Snap−In Nyl 1.312 ID X 1.500 Mtg Hole | 1 |
| ... 30 | CR1 | 198549 | .. Relay, Encl 24VDC SPST 35A/300VAC 4pin Flange Mtg | 1 |
| ... 31 | PC7 | 255714 | .. Circuit Card Assy, WCC Interface | 1 |
| ... 32 | | 252923 | .. Bracket, Mtg WCC Board | 1 |
| ... 33 | | 010546 | .. Bushing, Snap−In Nyl .375 ID X .500 Mtg Hole | 1 |
| ... 34 | L4 | 218020 | .. Inductor, Boost | 1 |
| ... 35 | | 227746 | .. Gasket, Inductor Mounting E55 Ferrite Core | 1 |
| ... 36 | | 196330 | .. Heat Sink, Power Module | 1 |
| ... 37 | L2 | 218018 | .. Inductor, Pre−Regulator | 1 |
| ... 38 | | 218566 | .. Gasket, Inductor Mounting E70 Ferrite Core | 1 |
| ... 39 | | 212206 | .. Windtunnel, RH | 1 |
| ... 40 | MOD1, | | | |
| | MOD2 | 261556 | .. Kit, Input/Pre−regulator And Invertor Module | 1 |
| ... 41 | | 153403 | .. Bushing, Snap−In Nyl .750 ID X 1.000 Mtg Hole Cent | 2 |
| ... 42 | | 219472 | .. Bracket, Mtg Capacitor Series | 1 |
| ... 43 | C15 | 196143 | .. Capacitor, Polyp Met Film 16. uf 400 VDC 10% | 1 |

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

| Item No. | Dia. Mkgs. | Part No. | Description | Quantity Model 907633 |
|---|---|---|---|---|

**Figure 9-1. Welding Power Source Parts Assembly (Continued)**

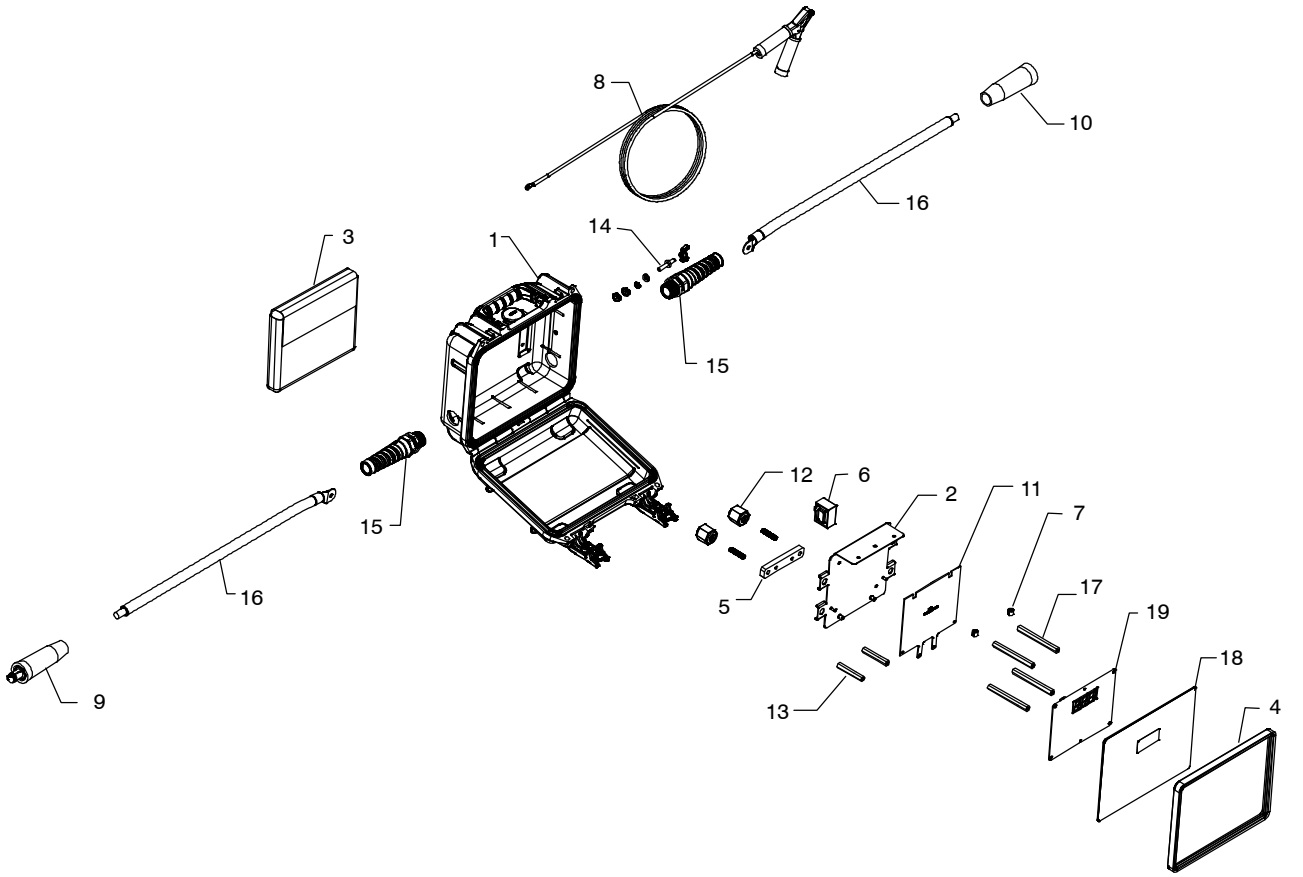
| | | | | |
|---|---|---|---|---|
| . . . 44 | . . . . . PC2 . . . . . | 260280 | . . Circuit Card Assy, Interconnect W/Label And Clips | 1 |
| . . . 45 | . . . . . L1 . . . . . | 212091 | . . Inductor, Input | 1 |
| . . . 46 | . . . . RM1, PLG26 . . . . | 205751 | . . Module, Power Resistor W/Plug | 1 |
| . . . 47 | | +252842 | . . Panel, Side | 2 |
| . . . 47 | | +268254 | . . Panel, Side Red−D−Arc | 2 |
| . . . 48 | | 257258 | . . Bracket Upper, Mtg Capacitor/PC Board | 1 |
| . . . 49 | . . . . . PC1 . . . . . | 256983 | . . Circuit Card Assy, FC Power Source Ctrl Potted | 1 |
| . . . 50 | | 257260 | . . Bracket, Capacitor Support | 1 |
| . . . 51 | . . . C12,C13 . . . | 193738 | . . Capacitor, Elctlt 1800 uf 500 VDC Can 2.52 Dia | 2 |
| . . . 52 | | 217040 | . . Nut, Nylon M12 Thread Capacitor Mounting | 2 |
| . . . 53 | . . . . . FM2 . . . . . | 183918 | . . Fan | 1 |
| . . . 54 | | 252855 | . . Bracket, Mtg Contactors | 1 |
| . . . 55 | . . . W1,W2 . . . | 247571 | . . Contactor, Latching (W1 front, W2 rear) | 2 |
| . . . 56 | | 254967 | . . Bus Bar, Input | 2 |
| . . . 57 | | 254968 | . . Bus Bar, Output | 2 |
| . . . 58 | . . . . . PC3 . . . . . | 252949 | . . Circuit Card Assy, Autoline Cntrl Power 70W Potted | 1 |
| . . . 59 | | 257115 | . . Panel,Rear | 1 |
| . . . 60 | | 182455 | . . Nut, Conduit 1.000 Npt Knurled | 1 |
| . . . 61 | | 215980 | . . Bushing, Strain Relief .709/.984 ID x 1.375 Mtg Hole | 1 |
| . . . 62 | | 252930 | . . Insulator, Rear Panel | 1 |
| . . . 63 | | 257239 | . . Cable, Power 12 ft 8 ga 4c (Non−Stripped End) | 1 |
| . . . 64 | | +252841 | . . Cover, Top | 1 |
| . . . 64 | | +268255 | . . Cover, Top Red−D−Arc | 1 |
| . . . 65 | | 256025 | . . Insulator, Side | 2 |
| . . . 66 | . . . . . CT1 . . . . . | 253320 | . . Xfmr, Current Sensing 200/1 W/15 in. Leads | 1 |
| . . . 67 | | 219471 | . . Bracket, Mtg Filter Board | 1 |
| . . . 68 | | 265141 | . . Circuit Card Assy, Input Filter FieldPro | 1 |
| . . . 69 | | 148025 | . . Lug,univ W/scr 600V 2/0-6 wire .266 stud | 4 |
| . . . 70 | | 219473 | . . Bracket,Mtg CE Filter Ground Plane | 4 |
| . . . 71 | | 257044 | . . Bracket, Top Extruded | 4 |
| . . . 72 | | 257047 | . . Handle, Carrying Pwxfld | 2 |
| . . . 73 | | 257049 | . . Handle, Formed Top | 2 |
| . . . 74 | | 257045 | . . Bracket, Side Support | 4 |
| . . . 75 | | 257043 | . . Bracket, Base Extruded | 4 |
| . . . 76 | . . . . . PC5 . . . . . | 265964 | . . Circuit Card Assy, Frnt Pnl Pwxfld Ps/Rmt w/Pgm VRD | 1 |
| . . . 77 | | 257259 | . . Bracket Lower, Mtg Capacitor/PC Board | 1 |
| . . . 78 | | 257382 | . . Bracket, Capacitor Guard | 1 |
| . . . 79 | | 257048 | . . Handle, Formed Bottom | 2 |
| . . . 80 | | 147139 | . . Tape, Adh Acrylic Double Sided .010 x .500 x 3.000 | 16 |
| . . . 81 | | 257050 | . . Bearing, Handle Pwxfld Ps | 4 |
| . . . 82 | | 233397 | . . Insulator, Board Bracket Capacitor | 1 |
| . . . 83 | | 191944 | . . Capacitor,Polyp Met Film 10. Uf 250 Vac 10% | 1 |
| . . . 84 | | 194254 | . . Core,Toroidal 22.25mm Id X 36.96mm Od X 15.88mm Th | 2 |
| . . . 85 | | 259715 | . . Core, Toroidal 28.7mm ID x 43.1mm OD x 18.5mm Th | 1 |
| . . . 86 | | 241027 | . . Core, Toroidal .748 ID x 1.142 OD x .600 Thk | 1 |
| . . . 87 | | 224262 | . . Core, Toroidal Nanocrystalline (43.1mm Diameter) | 1 |
| . . . 88 | | 131447 | . . Core, Toroidal 1.332 ID x 1.932 OD x .625 Thk | 1 |
| . . . 89 | | 255736 | . . Core, Ferrite Emi Snap-on .393 ID x .877 OD x 1.250 thk | 3 |

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

| Item No. | Dia. Mkgs. | Part No. | Description | Quantity Model 907633 |
|---|---|---|---|---|
| | | | **Figure 9-1. Welding Power Source Parts Assembly (Continued)** | |
| ..... | PLG51,PLG118, PLG72, PLG117 ... | 255063 | .. Housing Plug+Skts, (Service Kit) ..... | 4 |
| ..... | PLG73 .... | 256953 | .. Housing Plug+Skts, (Service Kit) ..... | 1 |
| ..... | PLG21 ..... | 115091 | .. Housing Plug+Skts, (Service Kit) ..... | 1 |
| ..... | PLG14,PLG34, PLG23 ..... | 115092 | .. Housing Plug+Skts, (Service Kit) ..... | 3 |
| ..... | PLG32, PLG115 .... | 115094 | .. Housing Plug+Skts, (Service Kit) ..... | 2 |
| ..... | PLG33, PLG14 .... | 130203 | .. Housing Plug+Skts, (Service Kit) ..... | 3 |
| ..... | PLG13,PLG35, PLG2/RC2 .. | 131054 | .. Housing Plug+Skts, (Service Kit) ..... | 3 |
| ..... | PLG12 .... | 131056 | .. Housing Plug+Skts, (Service Kit) ..... | 1 |
| ..... | PLG11 .... | 131204 | .. Housing Plug+Skts, (Service Kit) ..... | 1 |
| ..... | RC3/PLG3 .. | 135635 | .. Housing Plug+Skts, (Service Kit) ..... | 1 |
| ..... | PLG111,PLG22, PLG31, PLG113 ... | 201665 | .. Housing Plug+Skts, (Service Kit) ..... | 4 |
| ..... | | 227927 | .. Label, Warning Electric Shock/Exploding Parts-wdles ..... | 1 |
| ..... | | 212073 | .. Label, Warning Exploding Parts Can CE Wordless ..... | 2 |
| ..... | | 179310 | .. Label, General Precautionary Wordless Intl Small ..... | 2 |
| ..... | | 179309 | .. Label, Warning Falling Equipment Can Injure-wordles ..... | 2 |
| ..... | | 212945 | .. Label,Warning Incorrect Connections Ce Wordless ..... | 1 |
| ..... | | 219335 | .. Label, Warning Electric Shock Can Kill Wordless(CE) ..... | 1 |
| ..... | | 121389 | .. Label, Miller 12.437 x 5.250 Horizontal ..... | 2 |
| ..... | | 194017 | .. Label, Work (CE) ..... | 1 |
| ..... | | 194016 | .. Label, Electrode (CE) ..... | 1 |
| ..... | | 155436 | .. Label, Ground/Protective Earth ..... | 1 |
| ..... | | 252846 | .. Ckt, Pipeworx 350 FieldPro ..... | 1 |

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

☞ *Hardware is common and not available unless listed.*




255 407-B

**Figure 9-2. Remote Parts Assembly**

| Item No. | Dia. Mkgs. | Part No. | Description | Quantity Model 301176 |
|---|---|---|---|---|

**Figure 9-2. Remote Parts Assembly**

| | | | | |
|---|---|---|---|---|
| 1 | | +253680 | Case, Molded (Including) | 1 |
| 2 | | 253723 | Base, Remote | 1 |
| 3 | | 253372 | Pouch, Nylon 1000 Denier W/Velcro | 1 |
| 4 | | 253671 | Gasket, Remote | 1 |
| 5 | | 253666 | Bus Bar, LEM | 1 |
| 6 | HD1 | 191941 | Transducer, Current 200A Module Supply V+/− 15V | 1 |
| 7 | | 255046 | Insert, Nyl | 2 |
| 8 | | 255045 | Cable, Volt Sense 15 ft w/Clamp & Term | 1 |
| 9 | | 242239 | Conn, Tw Lk Insul Male(Dinse Type)1/0-2/0 Blk1 | |
| 10 | | 242240 | Conn, Tw Lk Insul Fem (Dinse Type) 1/0-2/0 Blk1 | |
| 11 | PC1 | 255721 | Circuit Card Assy | 1 |
| 12 | | 026947 | Stand−Off, Insul .250−20 x 1.000 Lg x .312 Thd | 2 |
| 13 | | 254969 | Stand−Off, No 6−32 x 1.375 Lg .250 Hex Al Fem | 2 |
| 14 | | 254883 | Stud, Brass | 1 |
| | | 255326 | Label, PipeWorx 350 Field Remote | 1 |
| | | 214521 | Label, Warning Turn Off Power Before Opening | 1 |
| | | 255253 | Label, Warning Disconnect Input Power Before Servicing | 1 |
| | PLG12, PLG21, PLG14 | 255063 | Housing Plug + Skts, (Service Kit) | 3 |
| 15 | | 121276 | Bushing, Strain Relief .450/.709 ID x 1.115 Mtg Hol | 2 |
| 16 | | 254257 | Lead List, Large | 2 |
| 17 | | 258463 | Spacer, Nylon 010-32 x 2.500 x .500 Hex | 4 |
| 18 | | 265458 | Nameplate/Switch Membrane, Front Pnl Pwxfld Rmt (CE) | 1 |
| 19 | | 265964 | Circuit Card Assy, Frnt Pnl Pwxfld Ps/Rmt w/Pgm VRD | 1 |
| | | 255133 | Plugs, w/Leads (User Interface) | 1 |
| | | 255145 | Cable, LEM Pipeworx 350 Field Remote | 1 |
| | | 255326 | Label, Nameplate Pipeworx 350 Field Remote | 1 |
| | | 255259 | Label, Notice Only FieldPro Compatible | 1 |
| | | 258410 | Card, Quick Reference Guide | 1 |

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

# Notes

*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.

Miller

# TRUE BLUE® WARRANTY

## Effective January 1, 2015
## (Equipment with a serial number preface of MF or newer)

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

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

Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Miller will provide instructions on the warranty claim procedures to be followed. If notification is submitted as an online warranty claim, the claim must include a detailed description of the fault and the troubleshooting steps taken to identify failed components and the cause of their failure.

Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the delivery date of the equipment to the original end-user purchaser, and not to exceed twelve months after the equipment is shipped to a North American distributor or eighteen months after the equipment is shipped to an International distributor.

1. 5 Years Parts — 3 Years Labor
   * Original Main Power Rectifiers Only to Include SCRs, Diodes, and Discrete Rectifier Modules
2. 3 Years — Parts and Labor
   * Auto-Darkening Helmet Lenses (Except Classic Series) (No Labor)
   * Engine Driven Welder/Generators **(NOTE: Engines are Warranted Separately by the Engine Manufacturer.)**
   * Inverter Power Sources (Unless Otherwise Stated)
   * 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)
   * Fume Extractors – Capture 5, Filtair 400 and Industrial Collector Series
4. 1 Year — Parts and Labor Unless Specified
   * Automatic Motion Devices
   * CoolBelt and CoolBand Blower Unit (No Labor)
   * Desiccant Air Dryer System
   * External Monitoring Equipment and Sensors
   * 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.)**
   * LiveArc Welding Performance Management System
   * Load Banks
   * Motor-Driven Guns (except Spoolmate Spoolguns)
   * PAPR Blower Unit (No Labor)
   * Positioners and Controllers
   * Racks
   * Running Gear/Trailers
   * Spot Welders
   * Subarc Wire Drive Assemblies
   * Water Coolant Systems
   * TIG Torches (No Labor)
   * Wireless Remote Foot/Hand Controls and Receivers
   * Work Stations/Weld Tables (No Labor)
5. 6 Months — Parts
   * Batteries
   * Bernard Guns (No Labor)
   * Tregaskiss Guns (No Labor)
6. 90 Days — Parts
   * Accessory (Kits)
   * Canvas Covers
   * Induction Heating Coils and Blankets, Cables, and Non-Electronic Controls
   * M-Guns
   * MIG Guns and Subarc (SAW) Torches
   * Remote Controls and RFCS-RJ45
   * Replacement Parts (No labor)
   * Roughneck Guns
   * 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.

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

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

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

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

Some states in the U.S.A. do not allow limitations of how long an implied warranty lasts, or the exclusion of incidental, indirect, special or consequential damages, so the above limitation or exclusion may not apply to you. This warranty provides specific legal rights, and other rights may be available, but may vary from state to state.

In Canada, legislation in some provinces provides for certain additional warranties or remedies other than as stated herein, and to the extent that they may not be waived, the limitations and exclusions set out above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary from province to 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<br>Options and Accessories<br>Personal Safety Equipment<br>Service and Repair<br>Replacement Parts<br>Training (Schools, Videos, Books)<br>Technical Manuals (Servicing Information and Parts)<br>Circuit Diagrams<br>Welding Process Handbooks<br>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.<br>For assistance in filing or settling claims, contact your distributor and/or equipment manufacturer's Transportation Department. |

**Miller Electric Mfg. Co.**
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

ORIGINAL INSTRUCTIONS – PRINTED IN USA

 2015–01