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Processes



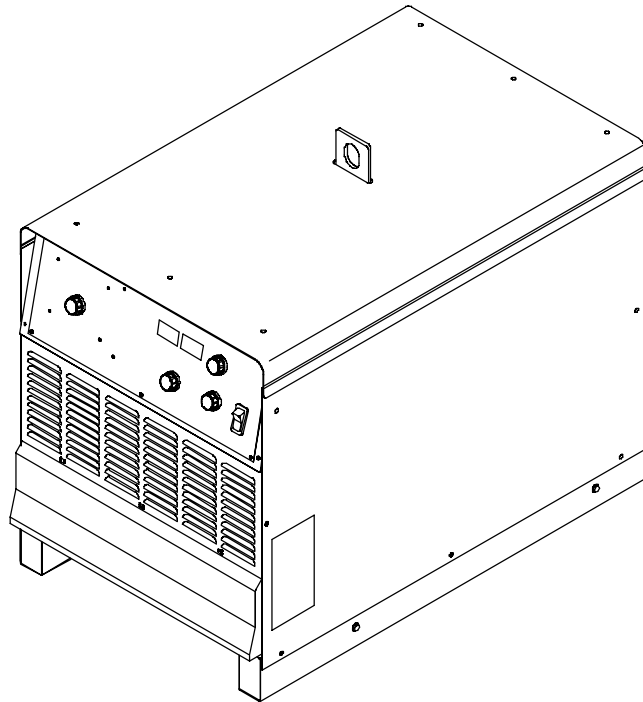
Multiprocess Welding

Description



Arc Welding Power Source

NT[®] 456 CC/CV



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.



Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001:2000 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.**



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



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SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

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

1-1. Symbol Usage

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

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


NOTICE – Indicates statements not related to personal injury.

 Indicates special instructions.



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

1-2. Arc Welding Hazards

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

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

 During operation, keep everybody, especially children, away.



ELECTRIC SHOCK can kill.

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

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

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

SIGNIFICANT DC VOLTAGE exists in inverter-type 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 cause severe burns.

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



FUMES AND GASES can be hazardous.

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

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



ARC RAYS can burn eyes and skin.

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

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



WELDING can cause fire or explosion.

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

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

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



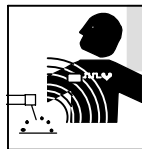
FLYING METAL or DIRT can injure eyes.

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



BUILDUP OF GAS can injure or kill.

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



MAGNETIC FIELDS 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.

Shielding 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 shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Use the right equipment, correct procedures, and sufficient number of persons to lift and move cylinders.
- Read and follow instructions on compressed gas cylinders, associated equipment, and Compressed Gas Association (CGA) publication P-1 listed in Safety Standards.

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



FIRE OR EXPLOSION hazard.

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



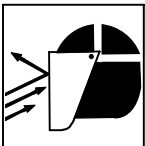
FALLING UNIT can cause injury.

- 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.



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 cause injury.

- 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 cause injury.

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



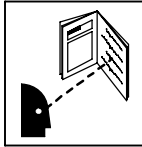
WELDING WIRE can cause injury.

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



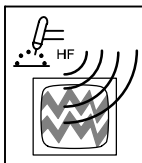
MOVING PARTS can cause injury.

- 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 as necessary.
- Reinstall doors, panels, covers, or guards when maintenance is finished and before reconnecting input power.



READ INSTRUCTIONS.

- Read Owner's Manual before using or servicing unit.
- Use only genuine replacement parts from the manufacturer.



H.F. RADIATION can cause interference.


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




ARC WELDING can cause interference.


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

1-4. California Proposition 65 Warnings


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

 **Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling.**

For Gasoline Engines:

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

For Diesel Engines:

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

1-5. Principal Safety Standards

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

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

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, P.O. Box 9101, Quincy, MA 02269-9101 (phone: 617-770-3000, website: www.nfpa.org and www.sparky.org).

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

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 5060 Mississauga,

Ontario, Canada L4W 5NS (phone: 800-463-6727 or in Toronto 416-747-4044, 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 10036-8002 (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, P.O. Box 9101, Quincy, MA 02269-9101 (phone: 617-770-3000, 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 Regional Offices—phone for Region 5, Chicago, is 312-353-2220, website: www.osha.gov).

1-6. EMF Information

Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields

Welding current, as it flows through welding cables, will cause electromagnetic fields. There has been and still is some concern about such fields. However, after examining more than 500 studies spanning 17 years of research, a special blue ribbon committee of the National Research Council concluded that: "The body of evidence, in the committee's judgment, has not demonstrated that exposure to power-frequency electric and magnetic fields is a human-health hazard." However, studies are still going forth and evidence continues to be examined. Until the final conclusions of the research are reached, you may wish to minimize your exposure to electromagnetic fields when welding or cutting.

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them, or using a cable cover.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep welding power source and cables as far away from operator as practical.
5. Connect work clamp to workpiece as close to the weld as possible.

About Implanted Medical Devices:

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

SECTION 2 – CONSIGNES DE SÉCURITÉ – LIRE AVANT UTILISATION

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! Se protéger et protéger les autres contre le risque de blessure — lire et respecter ces consignes.

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).
- Installer le poste correctement et le mettre à la terre convenablement selon les consignes du manuel de l'opérateur et les normes nationales, provinciales 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 afin de s'assurer qu'il n'est pas altéré ou à nu, le remplacer immédiatement s'il l'est. Un fil à nu 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.

Il reste une TENSION DC NON NÉGLIGEABLE dans les sources de soudage onduleur quand on a coupé l'alimentation.

- 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.



DES PIÈCES CHAUDES peuvent provoquer des brûlures graves.

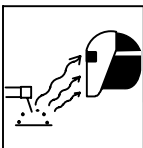
- Ne pas toucher à mains nues les parties chaudes.
- Prévoir une période de refroidissement avant de travailler à l'équipement.
- Ne pas toucher aux pièces chaudes, utiliser les outils recommandés et porter des gants de soudage et des vêtements épais pour éviter les brûlures.



LES FUMÉES ET LES GAZ peuvent être dangereux.

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

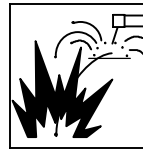
- Eloigner votre tête des fumées. Ne pas respirer les fumées.
- À l'intérieur, ventiler la zone et/ou utiliser une ventilation forcée au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage.
- Si la ventilation est médiocre, porter un respirateur anti-vapeurs approuvé.
- Lire et comprendre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



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

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

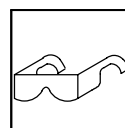
- Porter un casque de soudage approuvé muni de verres filtrants approprié pour protéger visage et yeux pendant le soudage (voir ANSI Z49.1 et Z87.1 énuméré dans les normes de sécurité).
- Porter des lunettes de sécurité avec écrans latéraux même sous votre casque.
- Avoir recours à des écrans protecteurs 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 des vêtements confectionnés avec des matières résistantes et ignifuges (cuir, coton lourd ou laine) et des bottes de protection.



LE SOUDAGE peut provoquer un incendie ou une explosion.

Le soudage effectué sur des conteneurs fermés tel 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 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 (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 la plus près possible de la zone de soudage pour éviter le transport du courant sur une longue distance par des chemins inconnus éventuels en provoquant des risques d'électrocution, d'étincelles et d'incendie.
- Ne pas utiliser le poste de soudage pour 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 des vêtements de protection dépourvus d'huile tels que des gants en cuir, une chemise en matériau lourd, des pantalons sans revers, des chaussures hautes et un couvre chef.
- 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.



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

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



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

- Fermer l'alimentation du gaz protecteur 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 MAGNETIQUES peuvent affecter des implants médicaux.

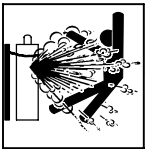
- Porteur de simulateur cardiaque ou autre implants médicaux, rester à distance.
- Les porteurs d'implants doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de soudage par points, de gougeage, du coupage plasma ou de chauffage par induction.



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.

Des bouteilles de gaz protecteur 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.

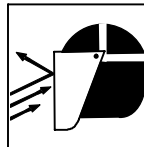
- Protéger les bouteilles de gaz comprimé d'une chaleur excessive, des chocs mécaniques, des dommages physiques, du laitier, des flammes ouvertes, des étincelles et des arcs.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber 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 protecteur, régulateurs, tuyaux et raccords convenables pour cette application spécifique ; les maintenir ainsi que les éléments associés en bon état.
- Détourner votre visage du détendeur-régulateur lorsque vous ouvrez la soupape de la bouteille.
- 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.



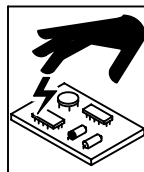
LES ÉTINCELLES VOLANTES risquent de provoquer des blessures.

- 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.



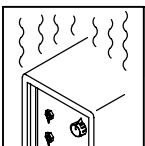
LA CHUTE DE L'APPAREIL peut blesser.

- 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.



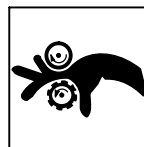
LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

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



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.



DES ORGANES MOBILES peuvent provoquer 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.



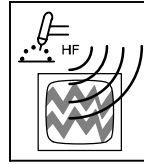
DES ORGANES MOBILES peuvent provoquer des blessures.

- S'abstenir de toucher des organes mobiles tels que des ventilateurs.
- Maintenir fermés et verrouillés les portes, panneaux, recouvrements et dispositifs de protection.
- Seules des personnes qualifiées sont autorisées à enlever les portes, panneaux, recouvrements ou dispositifs de protection pour l'entretien.
- Remettre les portes, panneaux, recouvrements ou dispositifs de protection quand l'entretien est terminé et avant de rebrancher l'alimentation électrique.



LIRE LES INSTRUCTIONS.

- Lisez le manuel d'instructions avant l'utilisation ou la maintenance de l'appareil.
- N'utiliser que les pièces de rechange recommandées par le constructeur.
- 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 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.



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)

⚠ Les batteries, les bornes et autres accessoires contiennent du plomb et des composés à base de plomb, produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des cancers et des malformations congénitales ou autres problèmes de procréation. Se laver les mains après manipulation.

Pour les moteurs à essence :

⚠ Les gaz d'échappement des moteurs contiennent des produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des cancers et des malformations congénitales ou autres problèmes de procréation.

Pour les moteurs diesel :

⚠ Les gaz d'échappement des moteurs diesel et certains de leurs composants sont reconnus par l'État de Californie comme provoquant des cancers et des malformations congénitales ou autres problèmes de procréation.

2-5. Principales normes de sécurité

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, de Global Engineering Documents (téléphone : 1-877-413-5184, site Internet : www.global.ihc.com).

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping, American Welding Society Standard AWS F4.1 de Global Engineering Documents (téléphone : 1-877-413-5184, site Internet : www.global.ihc.com).

National Electrical Code, NFPA Standard 70, de National Fire Protection Association, P.O. Box 9101, Quincy, MA 02269-9101 (téléphone : 617-770-3000, site Internet : www.nfpa.org).

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

Code for Safety in Welding and Cutting, CSA Standard W117.2, de Canadian Standards Association, 5060 Mississauga, Ontario, Canada

L4W 5NS (téléphone : 800-463-6727 ou à Toronto 416-747-4044, site Internet : www.csa-international.org).

Safe Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, de American National Standards Institute, 11 West 43rd Street, New York, NY 10036-8002 (téléphone : 212-642-4900, site Internet : www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B, de National Fire Protection Association, P.O. Box 9101, Quincy, MA 02269-9101 (téléphone : 617-770-3000, site Internet : 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, de U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 (téléphone : 1-866-512-1800) (il y a 10 bureaux régionaux--le téléphone de la région 5, Chicago, est 312-353-2220, site Internet : www.osha.gov).

2-6. Information EMF

Considérations sur le soudage et les effets de basse fréquence et des champs magnétiques et électriques.

Le courant de soudage, pendant son passage dans les câbles de soudage, causera des champs électromagnétiques. Il y a eu et il y a encore un certain souci à propos de tels champs. Cependant, après avoir examiné plus de 500 études qui ont été faites pendant une période de recherche de 17 ans, un comité spécial ruban bleu du National Research Council a conclu : « L'accumulation de preuves, suivant le jugement du comité, n'a pas démontré que l'exposition aux champs magnétiques et champs électriques à haute fréquence représente un risque à la santé humaine ». Toutefois, des études sont toujours en cours et les preuves continuent à être examinées. En attendant que les conclusions finales de la recherche soient établies, il vous serait souhaitable de réduire votre exposition aux champs électromagnétiques pendant le soudage ou le coupage.

Pour réduire les champs magnétiques sur le poste de travail, appliquer les procédures suivantes :

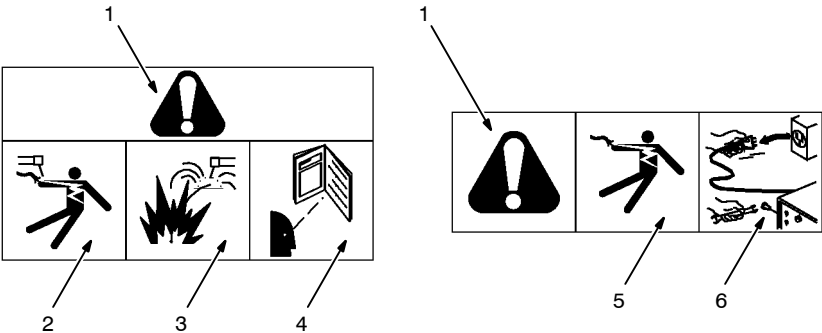
1. Garder les câbles ensemble, les torsader, les scotcher, ou les recouvrir d'une housse.
2. Disposer les câbles d'un côté et à distance de l'opérateur.
3. Ne pas courber pas et ne pas entourer pas les câbles autour de votre corps.
4. Garder le poste de soudage et les câbles le plus loin possible de vous.
5. Connecter la pince sur la pièce aussi près que possible de la soudure.

En ce qui concerne les implants médicaux :

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

SECTION 3 – DEFINITIONS

3-1. Nameplate Safety Symbols



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

2 Electric shock from welding electrode or wiring can kill.

3 Sparks from arcing electrode can cause explosion or fire – disconnect cable for process not in use.

4 Read Owner's Manual for connection procedures.

5 Electric shock from wiring can kill.

6 Disconnect input power before working on unit or making terminal strip connections.

Nameplate D-179 389

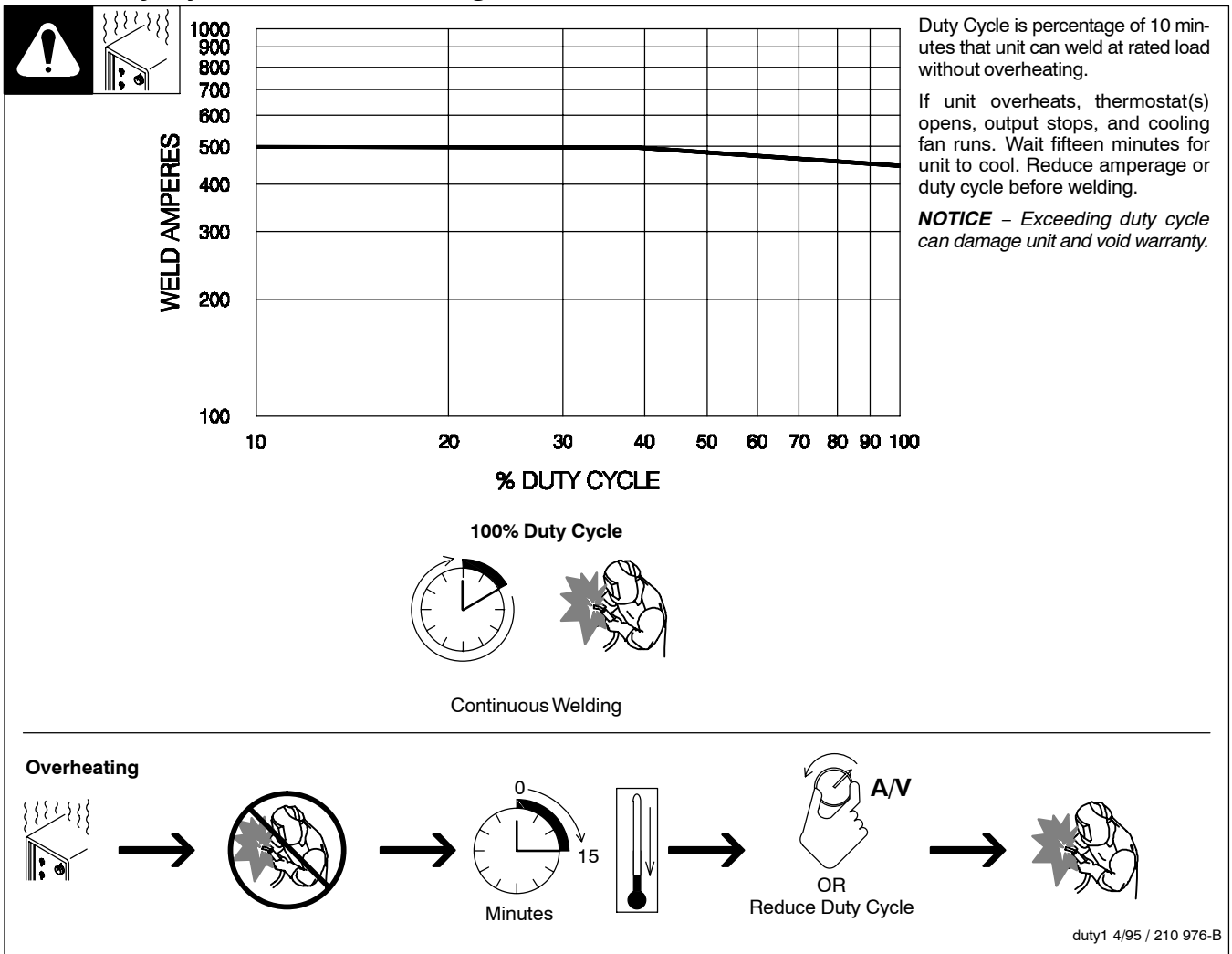
SECTION 4 – INSTALLATION

4-1. Specifications

Model	Rated Welding Output	Amperage/Voltage Range	Max OCV-DC	Amperes Input at Rated Load Output 60 Hz, Three-Phase				
				230 V	460 V	575 V	KVA	KW
450 Amp	450 A @ 38 Volts DC, 100% Duty Cycle	5 – 500A In CC Mode	78 VDC In CC Mode	58	29	23	22.8	21.4
		10 – 38V In CV Mode	78 VDC In CV Mode	*1.66	*0.83	*0.66	*0.66	*0.26

*While idling

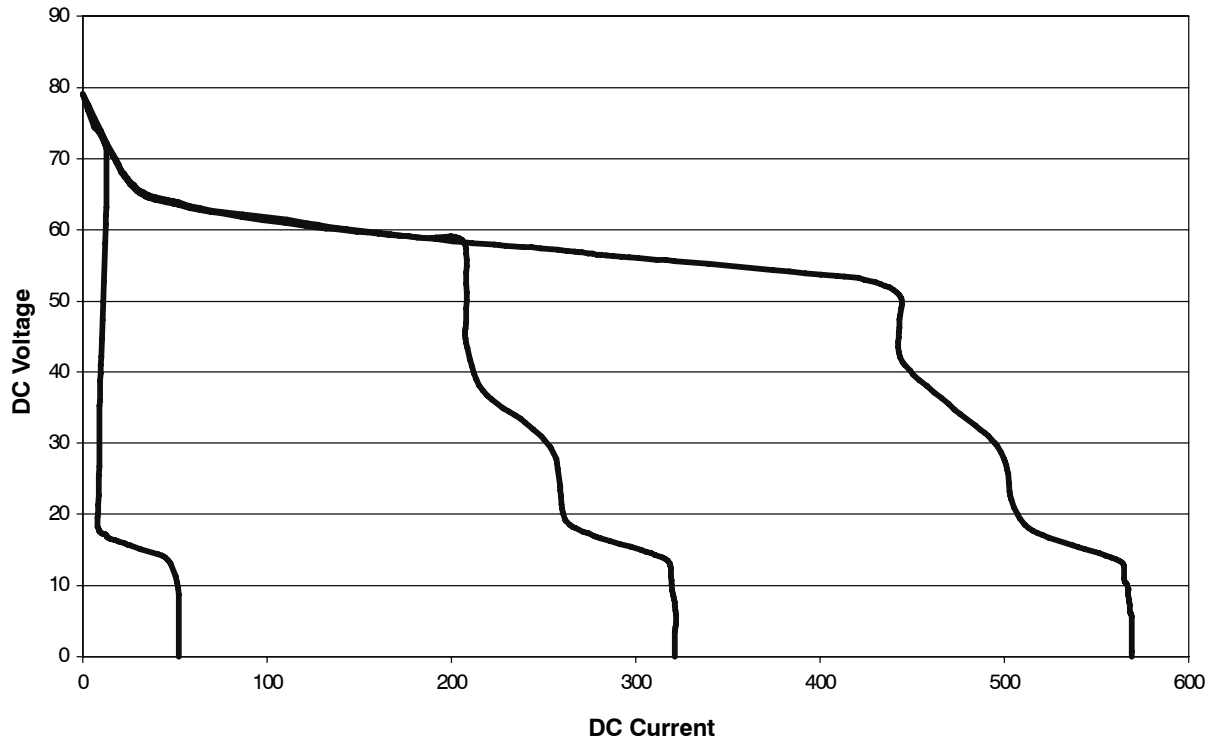
4-2. Duty Cycle And Overheating



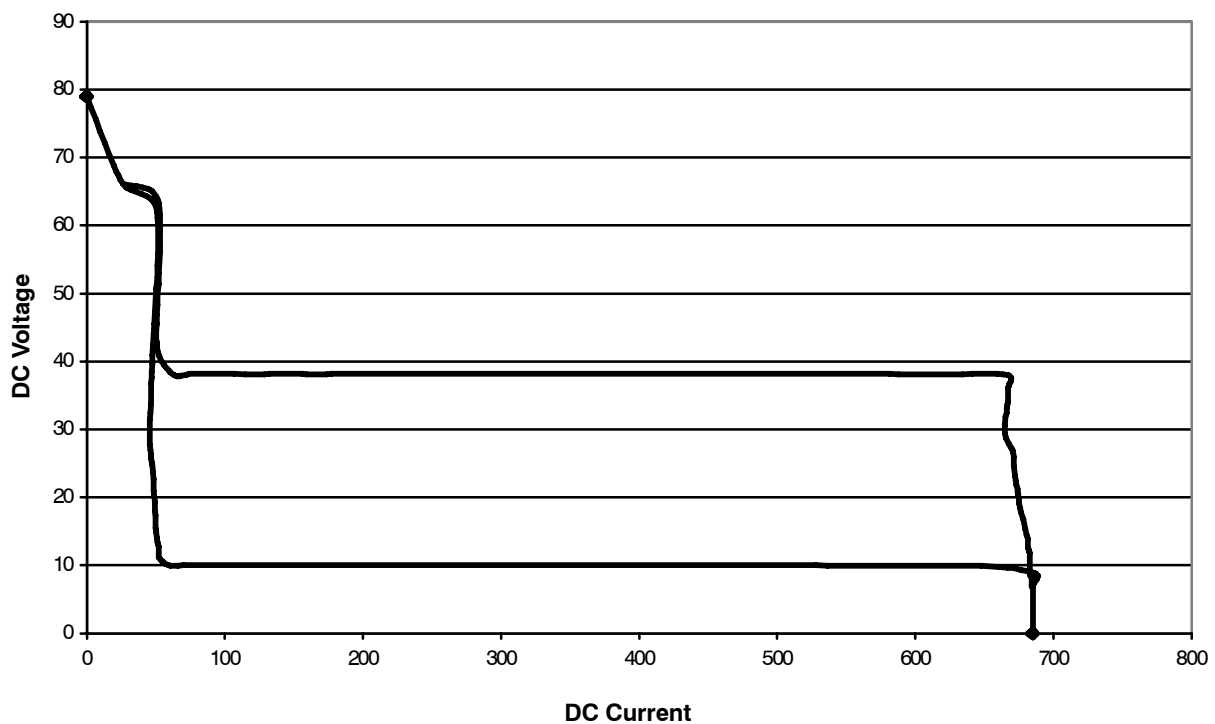
4-3. Volt-Ampere Curves

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

A. CC Mode



B. CV Mode

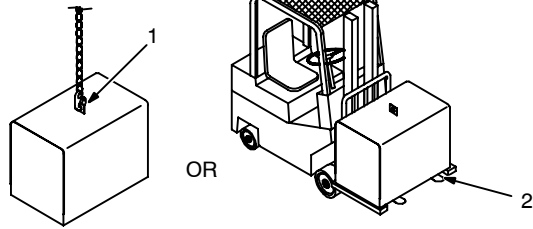


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4-4. Selecting A Location



Movement



- 1 Lifting Eye
- 2 Lifting Forks

Use lifting eye or lifting forks to move unit.

If using lifting forks, extend forks beyond opposite side of unit.

- 3 Rating Label

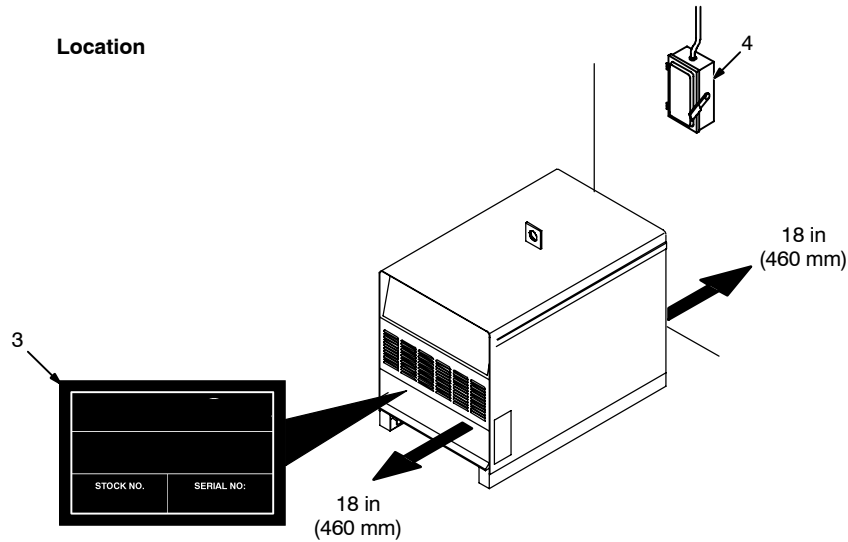
Use rating label to determine input power needs.

- 4 Line Disconnect Device

Locate unit near correct input power supply.

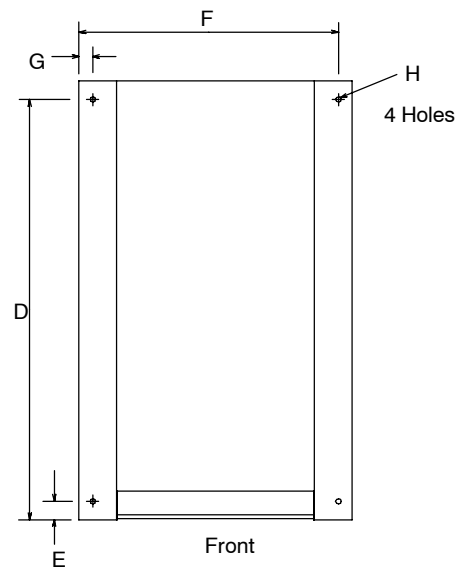
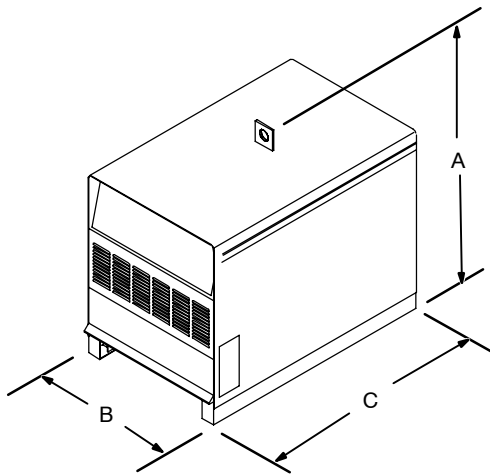
⚠ Special installation may be required where gasoline or volatile liquids are present – see NEC Article 511 or CEC Section 20.

Location



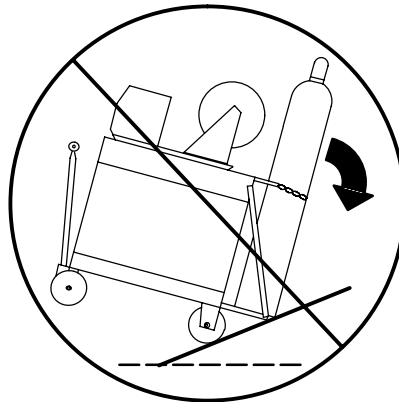
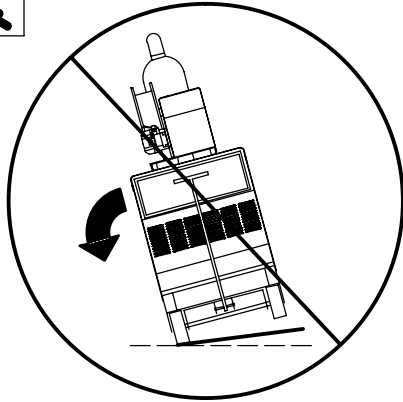
4-5. Dimensions And Weights

Dimensions	
A	32-1/2 in (826 mm) including lift eye
B	23 in (585 mm)
C	38 in (966 mm) including strain relief
D	35 in (889 mm)
E	1-1/4 in (32 mm)
F	21-1/8 in (537 mm)
G	1-1/8 in (29 mm)
H	7/16 in (11 mm) Dia
Weight	
	376 lb (171 kg)



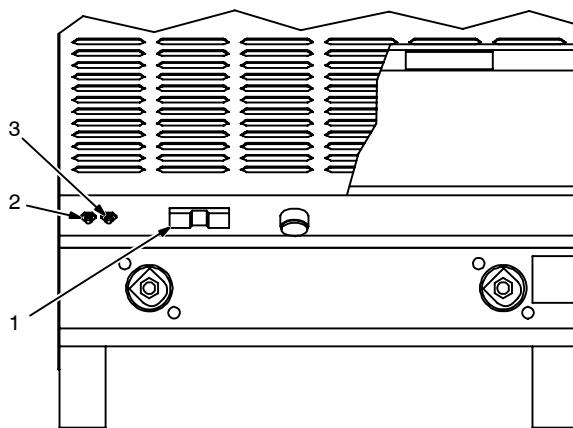
800 453-A / 801 530

4-6. Tipping



⚠ Be careful when placing or moving unit over uneven surfaces.

4-7. 115 VAC Receptacle And Circuit Breakers



⚠ Turn Off power before connecting to receptacle.

- 1 115 V 15 A AC Receptacle RC15

Power is shared between RC15 and Remote 14 receptacle RC14 (see Section 4-11).

- 2 Circuit Breaker CB1
- 3 Circuit Breaker CB2

CB1 protects the 115 volts ac portion of RC14 and RC15 from overload.

CB2 protects the 24 volts ac portion of RC14 from overload.

Press button to reset breaker.

Ref. 800 166-D

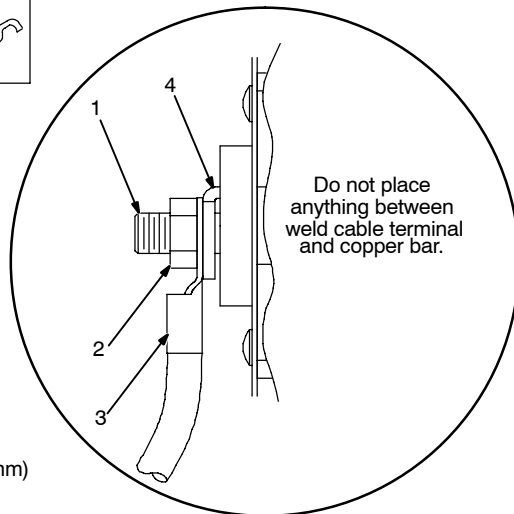
4-8. Weld Output Terminals And Selecting Cable Sizes



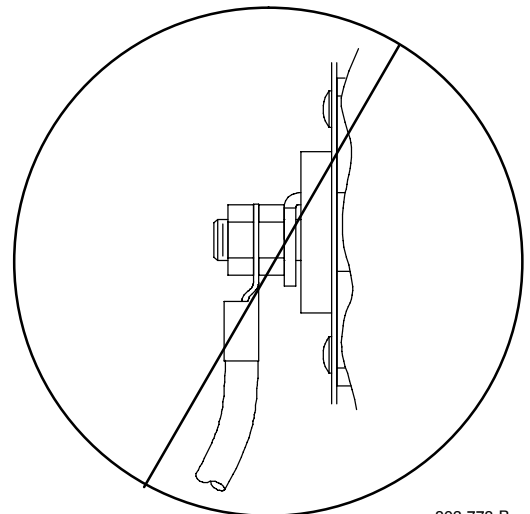
 Turn Off power before connecting to weld output terminals.	Total Cable (Copper) Length In Weld Circuit Not Exceeding								
	100 ft (30 m) Or Less		150 ft (45 m)	200 ft (60 m)	250 ft (70 m)	300 ft (90 m)	350 ft (105 m)	400 ft (120 m)	
	Welding Amperes	10 – 60% Duty Cycle	60 – 100% Duty Cycle	10 – 100% Duty Cycle					
 Positive Terminal + Negative Terminal -	100	4	4	4	3	2	1	1/0	1/0
	150	3	3	2	1	1/0	2/0	3/0	3/0
	200	3	2	1	1/0	2/0	3/0	4/0	4/0
	250	2	1	1/0	2/0	3/0	4/0	2-2/0	2-2/0
	300	1	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-3/0
	350	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-3/0	2-4/0
	400	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-4/0	2-4/0
	500	2/0	3/0	4/0	2-2/0	2-3/0	2-4/0	3-3/0	3-3/0
	600	3/0	4/0	2-2/0	2-3/0	2-4/0	3-3/0	3-4/0	3-4/0
	700	4/0	2-2/0	2-3/0	2-4/0	3-3/0	3-4/0	3-4/0	4-4/0

*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. Contact your distributor for the mm² equivalent weld cable sizes. S-0007-E

4-9. Connecting Weld Output Cables



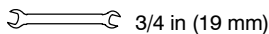
Correct Installation



Incorrect Installation

803 778-B

Tools Needed:



⚠ Turn off power before connecting to weld output terminals.




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

- 1 Weld Output Terminal
- 2 Supplied Weld Output Terminal Nut
- 3 Weld Cable Terminal
- 4 Copper Bar

Remove supplied nut from weld output terminal. Slide weld cable terminal onto weld


output terminal and secure with nut so that weld cable terminal is tight against copper bar. **Do not place anything between weld cable terminal and copper bar. Make sure that the surfaces of the weld cable terminal and copper bar are clean.**

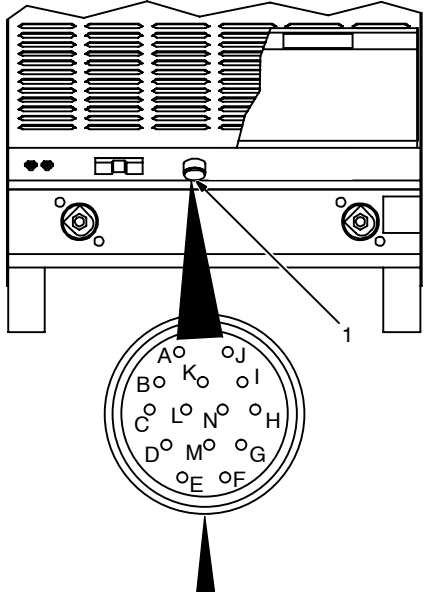
4-10. Remote 14 Receptacle Information

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

*The remaining sockets are not used.

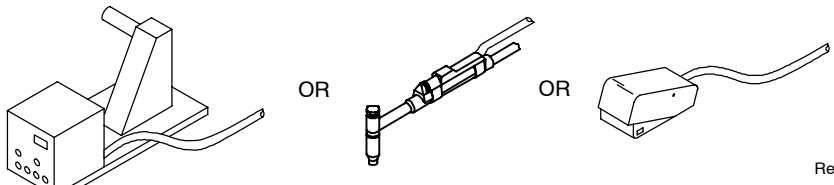
4-11. Connecting Remote Control





⚠ Turn off power before connecting to Remote 14 receptacle.

1 Remote 14 Receptacle RC14
Connect remote control to RC14.



Ref. 800 166-D / Ref. S-0004-A / S-0750

4-12. Electrical Service Guide

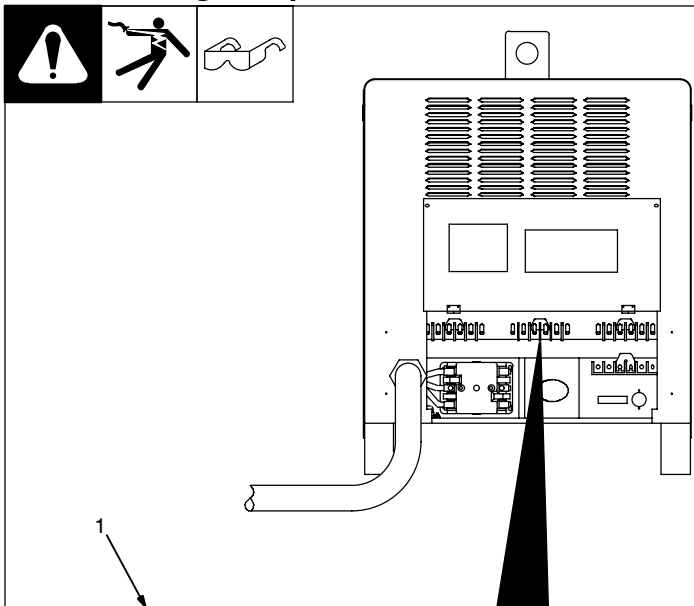
⚠ Failure to follow these electrical service guide recommendations could create an electric shock or fire hazard. These recommendations are for a dedicated branch circuit sized for the rated output and duty cycle of the welding power source.

60 Hertz Models			
Input Voltage	230	460	575
Input Amperes At Rated Output	58	29	23
Max Recommended Standard Fuse Rating In Amperes ¹			
	Time-Delay ²	70	35
Normal Operating ³	90	40	35
Min Input Conductor Size In AWG 4	6	10	10
Max Recommended Input Conductor Length In Feet (Meters)	145 (44)	243 (74)	380 (116)
Min Grounding Conductor Size In AWG 4	8	10	10

Reference: 2005 National Electrical Code (NEC)

- 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" .
- 3 "Normal Operating" (general purpose – no intentional delay) fuses are UL class "K5" (up to and including 60 amp), and UL class "H" (65 amp 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 310.16. 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.

4-13. Placing Jumper Links



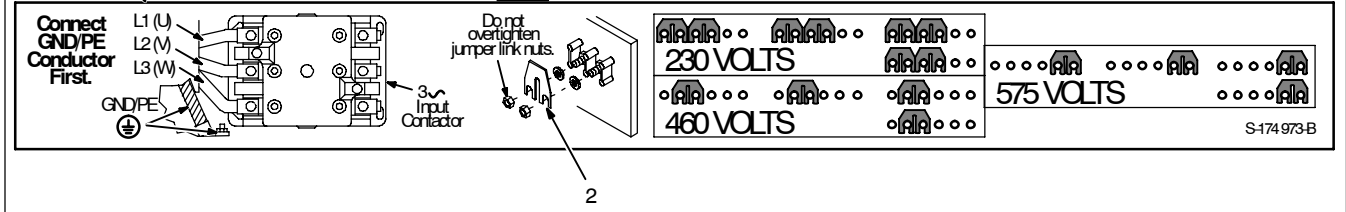
⚠ Disconnect and lockout/tag-out input power before installing or moving jumper links.

Check input voltage available at site.

- 1 Jumper Link Label
- 2 Jumper Links

Move jumper links to match input voltage.

Close access door, or go on to Section 4-14.



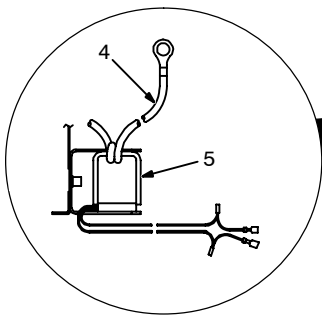
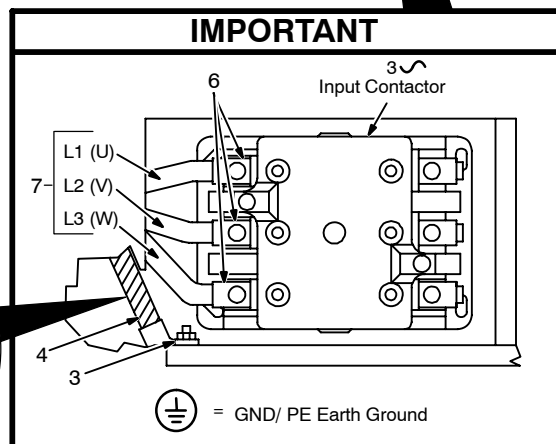
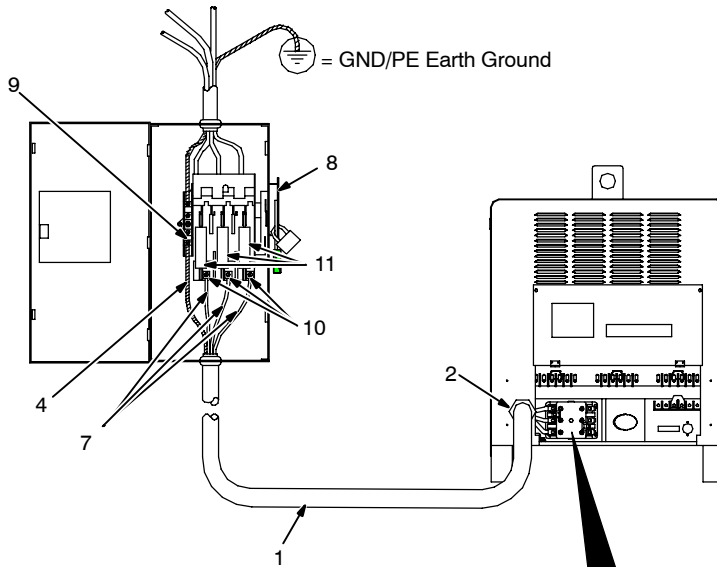
Tools Needed:

- Wrench 3/8 in
- Screwdriver 3/8 in

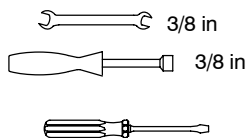
S-174 973-B

Ref. 800 103-A

4-14. Connecting Input Power



Tools Needed:



- ⚠ Installation must meet all National and Local Codes – have only qualified persons make this installation.**
- ⚠ Disconnect and lockout/tagout input power before connecting input conductors from unit.**
- ⚠ Make input power connections to the welding power source first.**
- ⚠ Always connect green or green/yellow conductor to supply grounding terminal first, and never to a line terminal.**

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

- 1 Input Power Conductors (Customer Supplied Cord)

Select size and length of conductors using Section 4-12. Conductors must comply with national, state, and local electrical codes. If applicable, use lugs of proper amperage capacity and correct hole size.

Welding Power Source Input Power Connections

- 2 Strain Relief

Route conductors (cord) through strain relief and tighten screws.

- 3 Machine Grounding Terminal

- 4 Green Or Green/Yellow Grounding Conductor

- 5 Reed Switch (Ground Current Sensor) (Optional)

Connect green or green/yellow grounding conductor to welding power source grounding terminal first. If unit is equipped with optional ground current sensor, route grounding conductor through reed switch two times and connect to grounding terminal.

- 6 Welding Power Source Line Terminals

- 7 Input Conductors L1 (U), L2 (V) And L3 (W)

Connect input conductors L1 (U), L2 (V) and L3 (W) to welding power source line terminals.

Close and secure access door on welding power source.

Disconnect Device Input Power Connections

- 8 Disconnect Device (switch shown in OFF position)

- 9 Disconnect Device (Supply) Grounding Terminal

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

- 10 Disconnect Device Line Terminals

Connect input conductors L1 (U), L2 (V) And L3 (W) to disconnect device line terminals.

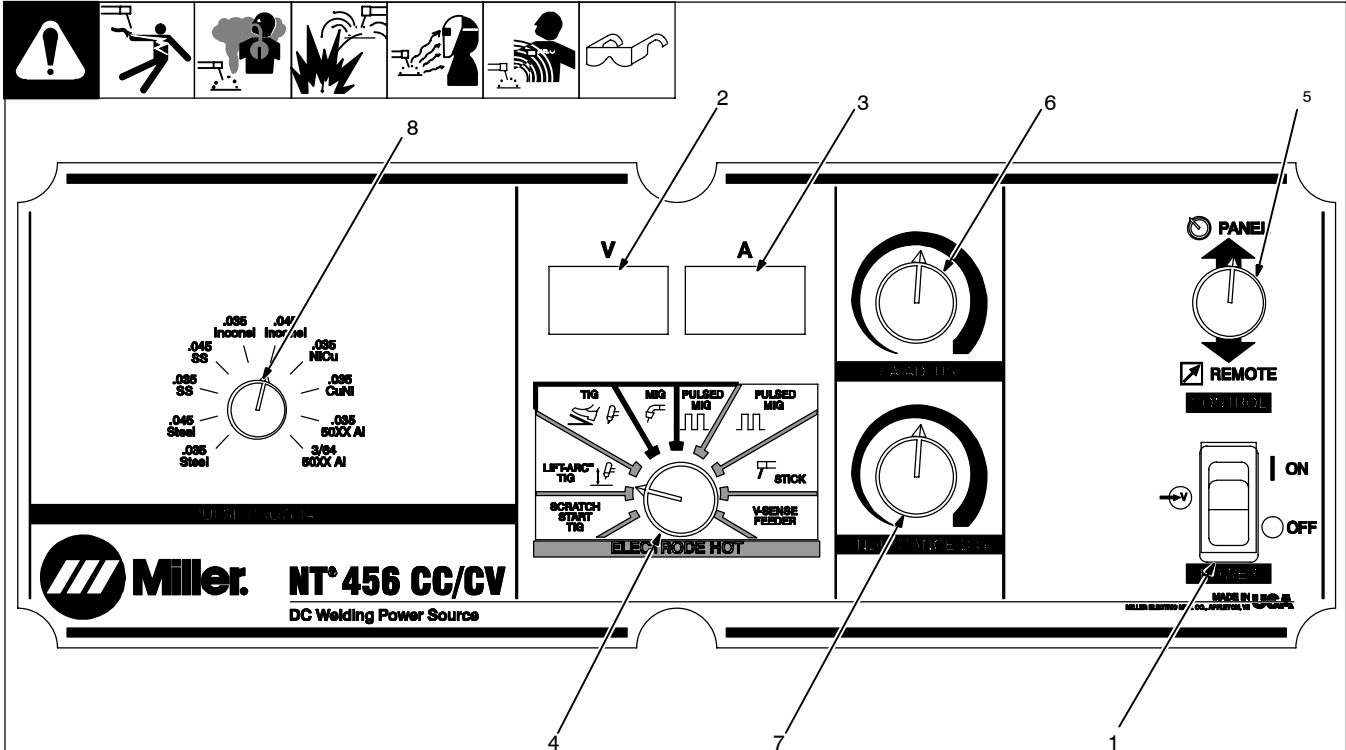
- 11 Overcurrent Protection

Select type and size of overcurrent protection using Section 4-12 (fused disconnect switch shown).

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

SECTION 5 – OPERATION

5-1. Controls



229 450-A

1 Power Switch

This unit is equipped with a fan motor that is thermostatically controlled and only runs when cooling is needed (fan-on-demand). If unit is not equipped with fan-on-demand, fan motor runs when power is on.

2 Voltmeter (see Section 5-2)

3 Ammeter (see Section 5-2)

4 Mode Switch

Use Mode switch to determine both process and output On/Off control. Orange areas highlight "contactor on" positions.

For air carbon arc cutting (CAC-A) and gouging, place Mode switch in Stick position. For best results, place Inductance/DIG control in the maximum position.

5 Panel/Remote Control Switch

For front panel control, place switch in Panel position, and use the V/A Adjust control to set amperage or voltage, depending on Mode switch selection.

For remote control, make connections to Remote 14 receptacle (see Section 4-11), and place switch in Remote position. In TIG modes, output available through the remote control is a percent of the V/A Adjust control

setting. Value selected on V/A Adjust control is maximum output available through the remote control. In the MIG, Pulsed MIG, and V-Sense feeder modes, a remote control provides full range of unit output regardless of V/A Adjust control setting. A remote control is not functional in the Stick mode. If connection to Remote 14 receptacle is removed, and Panel/Remote control switch remains in Remote position, output is controlled with the V/A Adjust control.

6 V/A (Voltage/Amperage) Adjust Control

With Mode switch in any Stick or TIG position, use control to adjust amperage from 5 to 500 amps. With Mode switch in a V-Sense Feeder or MIG position, use control to adjust voltage from 10 to 38 volts. In a Pulsed MIG mode, wire feed speed is set with the wire feeder, and the V/A Adjust control is used to set an arc power that corresponds to the wire feed speed (30-780 ipm).

7 Inductance/Dig Control

Control adjusts Dig when Stick mode is selected on mode switch. When set towards minimum, short-circuit amperage at low arc voltage is the same as normal welding amperage. When set to max, control increases short-circuit amperage at low arc voltage. This allows the operator to use a very short arc length without sticking the electrode. As

control is adjusted, the amount of Dig selected is displayed on the amps meter as a percentage (0 to 100%) of full range, and *DIG* is displayed on the volts meter.

For air carbon arc cutting (CAC-A) and gouging, place Inductance/DIG control in the maximum position.

Control adjusts inductance when a MIG or V-Sense Feeder mode is selected. Inductance determines the "wetness" of the weld puddle. As setting is increased towards maximum, "wetness" (puddle fluidity) increases. As control is adjusted, the amount of inductance selected is displayed on the amps meter as a percentage (0 to 100%) of full range, and *IND* is displayed on the volts meter.

This control is not functional when one of the TIG modes is selected.


Change control setting to best suite application.


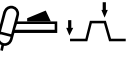


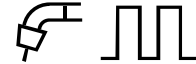
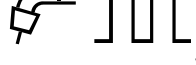


Units without Inductance/Dig control have Inductance/Dig factory set at 20%.

8 Pulse Program Select Switch

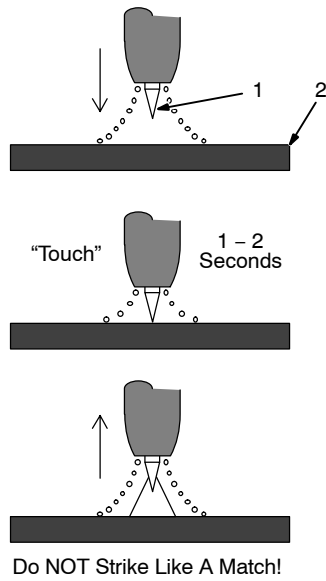
Use control to select one of ten programs, each with different preset pulsing parameters, including welding wire diameter and type.

5-2. Meter Functions For CC/CV Models

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

Mode	Meter Reading At Idle	
 Scratch Start TIG	V <div style="border: 1px solid black; padding: 2px; display: inline-block;">78.0</div> Actual Volts (OCV)	A <div style="border: 1px solid black; padding: 2px; display: inline-block;">85</div> Preset Amps
 Lift-Arc TIG (GTAW)	V <div style="border: 1px solid black; padding: 2px; display: inline-block;">8.0</div> Actual Volts	A <div style="border: 1px solid black; padding: 2px; display: inline-block;">85</div> Preset Amps
 TIG (GTAW)	V <div style="border: 1px solid black; padding: 2px; display: inline-block;"> </div> Blank	A <div style="border: 1px solid black; padding: 2px; display: inline-block;">85</div> Preset Amps
 MIG (GMAW)	V <div style="border: 1px solid black; padding: 2px; display: inline-block;">24.5</div> Preset Volts	A <div style="border: 1px solid black; padding: 2px; display: inline-block;"> </div> Blank
 Pulsed MIG (GMAW-P)	V <div style="border: 1px solid black; padding: 2px; display: inline-block;"> </div> Blank	A <div style="border: 1px solid black; padding: 2px; display: inline-block;">780</div> IPM (30-780)
 Pulsed MIG (GMAW-P) Voltage-Sensing Wirefeeder	V <div style="border: 1px solid black; padding: 2px; display: inline-block;">78.0</div> Actual Voltage (OCV)	A <div style="border: 1px solid black; padding: 2px; display: inline-block;">780</div> IPM (30-780)
 Panel Control SMAW	V <div style="border: 1px solid black; padding: 2px; display: inline-block;">78.0</div> Actual Volts (OCV)	A <div style="border: 1px solid black; padding: 2px; display: inline-block;">85</div> Preset Amps
 Voltage-Sensing Wirefeeder	V <div style="border: 1px solid black; padding: 2px; display: inline-block;">78.0</div> Flashes OCV And Preset Volts	A <div style="border: 1px solid black; padding: 2px; display: inline-block;"> </div> Blank

5-3. Lift-Arc TIG Procedure For CC/CV Models



With Mode switch in the Lift-Arc TIG position, start an arc as follows:

- 1 TIG Electrode
- 2 Workpiece

Touch tungsten electrode to workpiece at weld start point, **hold electrode to workpiece for 1-2 seconds**, and slowly lift electrode. An arc will form when electrode is lifted.

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.

Ref. S-156 279

SECTION 6 – MAINTENANCE & TROUBLESHOOTING

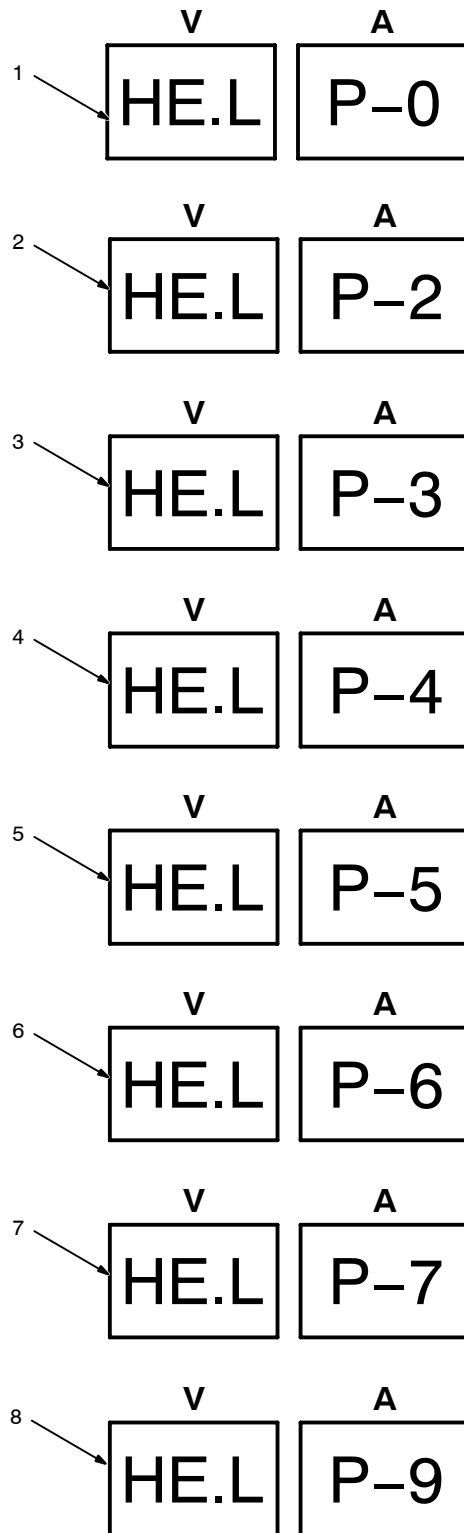
6-1. Routine Maintenance

				<p>⚠ Disconnect power before maintaining.</p> <p> <i>Maintain more often during severe conditions.</i></p>
	<p>✓ = Check ◇ = Change ● = Clean Δ = Repair ☆ = Replace * To be done by Factory Authorized Service Agent</p>			
Every 3 Months	 ✓ ☆ Labels		 ✓ ● Weld Terminals	
Every 3 Months	 ✓ Δ ☆ Cables And Cords			
Every 6 Months	 ●: During heavy service, clean monthly.			

6-2. Fuse F1

			<p>⚠ Disconnect input power before opening rear access door.</p> <p>1 Fuse F1 (See Parts List For Rating)</p> <p>Fuse F1 protects control transformer from overload. If F1 opens, weld output and fan motor stops. Replace F1.</p> <p>Close door when finished.</p>
<p>Tools Needed:</p> 3/8 in			
			Ref. 800 101-C

6-3. Voltmeter/Ammeter Help Displays



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

1 Help 0 Display

Indicates a shorted thermistor in the transformer of the unit. If this display is shown, contact a Factory Authorized Service Agent.

2 Help 2 Display

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

3 Help 3 Display

Indicates the transformer of the unit has overheated. The unit has shut down to allow the fan to cool it (see Section 4-2). Operation will continue when the unit has cooled.

4 Help 4 Display

Indicates a malfunction in the thermal protection circuitry located on the secondary heat sink of the unit. If this display is shown, contact a Factory Authorized Service Agent.

5 Help 5 Display

Indicates the secondary heat sink of the unit has overheated. The unit has shut down to allow the fan to cool it (see Section 4-2). Operation will continue when the unit has cooled.

6 Help 6 Display

This is a two-stage error. The warning stage occurs when the primary voltage drops more than 12% below the linked primary voltage setting for more than 30 seconds. The display flashes a HELP 6 message during idle, but the welder continues to operate normally. Once the primary voltage returns to less than 10% below the linked primary voltage setting the flashing error ceases.

The shutdown stage occurs when the primary voltage drops more than 20% below the linked primary voltage setting for more than 30 seconds. A constant HELP 6 message is displayed, and weld output is disabled. Once the primary voltage returns to less than 10% below the linked primary voltage setting, the constant error message ceases, and weld output is enabled.

NOTE: Operating the welder out of the normal operating range ($\pm 12\%$ of the linked primary) will affect the output and reliability of the welder, and is not recommended.

7 Help 7 Display

This is a two-stage error. The warning stage occurs when the primary voltage rises more than 12% above the linked primary voltage setting for more than 30 seconds. The display flashes a HELP 7 message during idle, but the welder continues to operate normally. Once the primary voltage returns to less than 10% above the linked primary voltage setting the flashing error ceases.

The shutdown stage occurs when the primary voltage rises more than 20% above the linked primary voltage setting for more than 30 seconds. A constant HELP 7 message is displayed, and weld output is disabled. Once the primary voltage returns to less than 10% above the linked primary voltage setting the constant error message ceases, and weld output is enabled.

NOTE: Operating the welder out of the normal operating range ($\pm 12\%$ of the linked primary) will affect the output and reliability of the welder, and is not recommended.

8 Help 9 Display

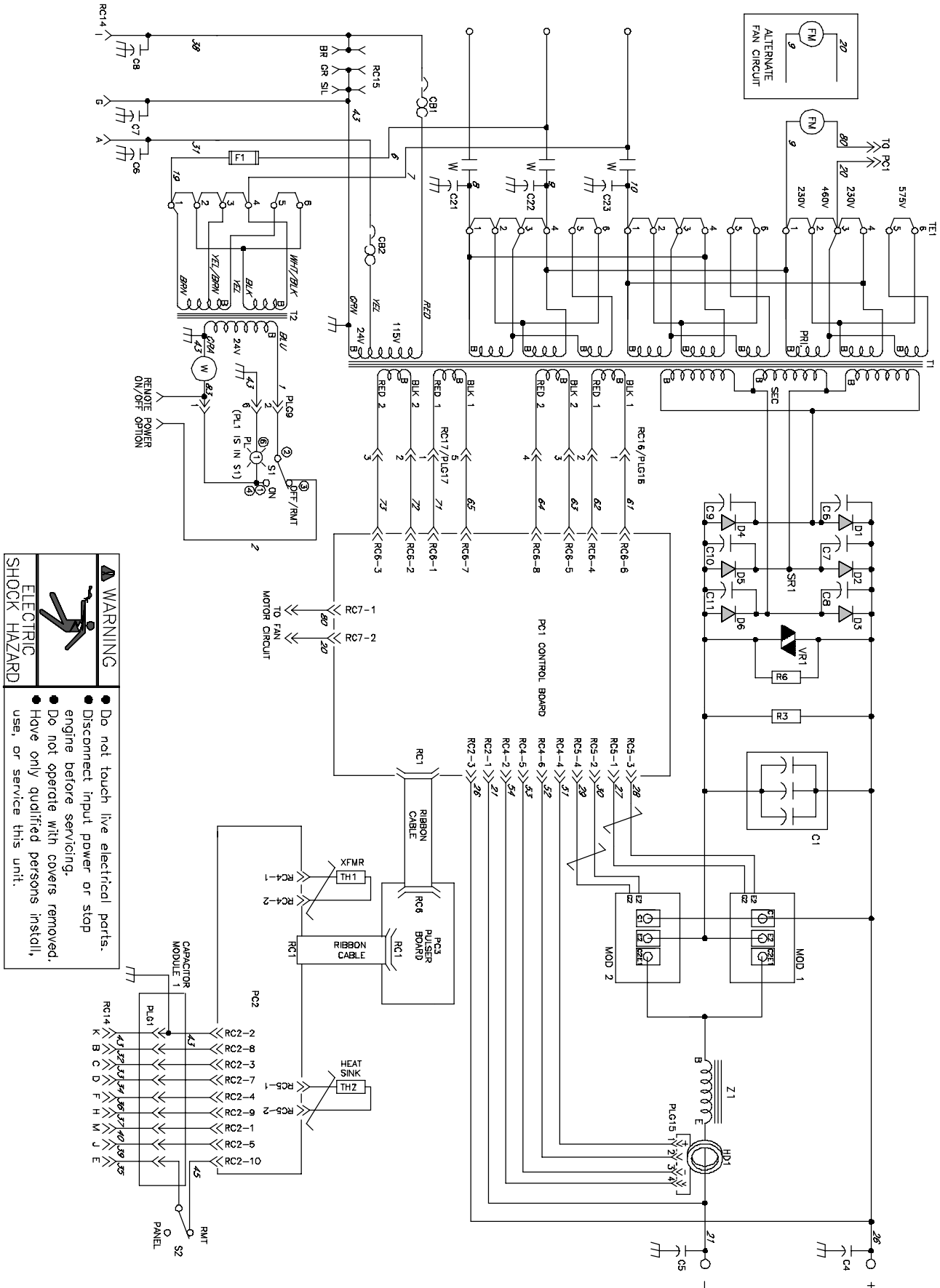
Indicates a shorted thermistor on the secondary heat sink of the unit. If this display is shown, contact a Factory Authorized Service Agent.

6-4. Troubleshooting



Trouble	Remedy
No weld output; unit completely inoperative; pilot light PL1 off.	Place line disconnect device in On position (see Section 4-14).
	Check for open line fuse(s), and replace if open (see Section 4-14).
	Check for proper input power connections (see Section 4-14).
	Check for proper jumper link position (see Section 4-13).
	Check fuse F1, and replace if necessary (see Section 6-2).
Meter displays a HELP message.	If meters display a HELP message, see Section 6-3.
No weld output; pilot light PL1 on.	Unit overheated. Allow unit to cool with fan On (see Section 4-2).
	If using remote control, place Panel/Remote control switch in Remote position, and connect remote control (see Sections 4-11 and 5-1). If remote is not being used, place switch in Panel position (see Section 5-1).
	Check position of Mode switch (see Section 5-1).
	Check, repair, or replace remote control.
Limited weld output and low open-circuit voltage.	Check position of Panel/Remote control switch (see Section 5-1).
	Check for open line fuse(s), and replace if open (see Section 4-14).
	Check for proper input power connections (see Section 4-14).
	Check for proper jumper link position (see Section 4-13).
	Clean and tighten all weld output connections.
Unit provides only maximum or minimum weld output.	Check position of Panel/Remote control switch (see Section 5-1).
	Have Factory Authorized Service Agent check control board PC1, front panel display board PC2, pulser interface board PC3, and hall device HD1.
Erratic or improper weld output.	Use proper size and type of weld cable (see Section 4-8).
	Clean and tighten all weld connections.
	Check wire feeder installation according to Owner's Manual.
	Check position of Mode switch (see Section 5-1).
	Have Factory Authorized Service Agent check control board PC1, front panel display board PC2, pulser interface board PC3, and hall device HD1.
No 115 volts AC output at duplex receptacle or Remote 14 receptacle.	Reset circuit breaker CB1 (see Section 4-7).
No 24 volts AC output at Remote 14 receptacle.	Reset circuit breaker CB2 (see Section 4-7).
Fan not operating. Note: If unit has Fan-On-Demand, fan motor only runs when cooling is required.	Check for and remove anything blocking fan movement.
	Have Factory Authorized Service Agent check fan motor.
Wandering arc; poor control of arc direction.	Reduce gas flow rate.
	Select proper size tungsten.
	Properly prepare tungsten.
Tungsten electrode oxidizing and not remaining bright after conclusion of weld.	Shield weld zone from drafts.
	Increase postflow time.
	Check and tighten all gas fittings.
	Properly prepare tungsten. Check for water in torch, and repair torch if necessary. See torch Owner's Manual.
Digital meter not working properly.	Have Factory Authorized Service Agent check front panel display board PC2 and connections, and replace if necessary.

SECTION 7 - ELECTRICAL DIAGRAM



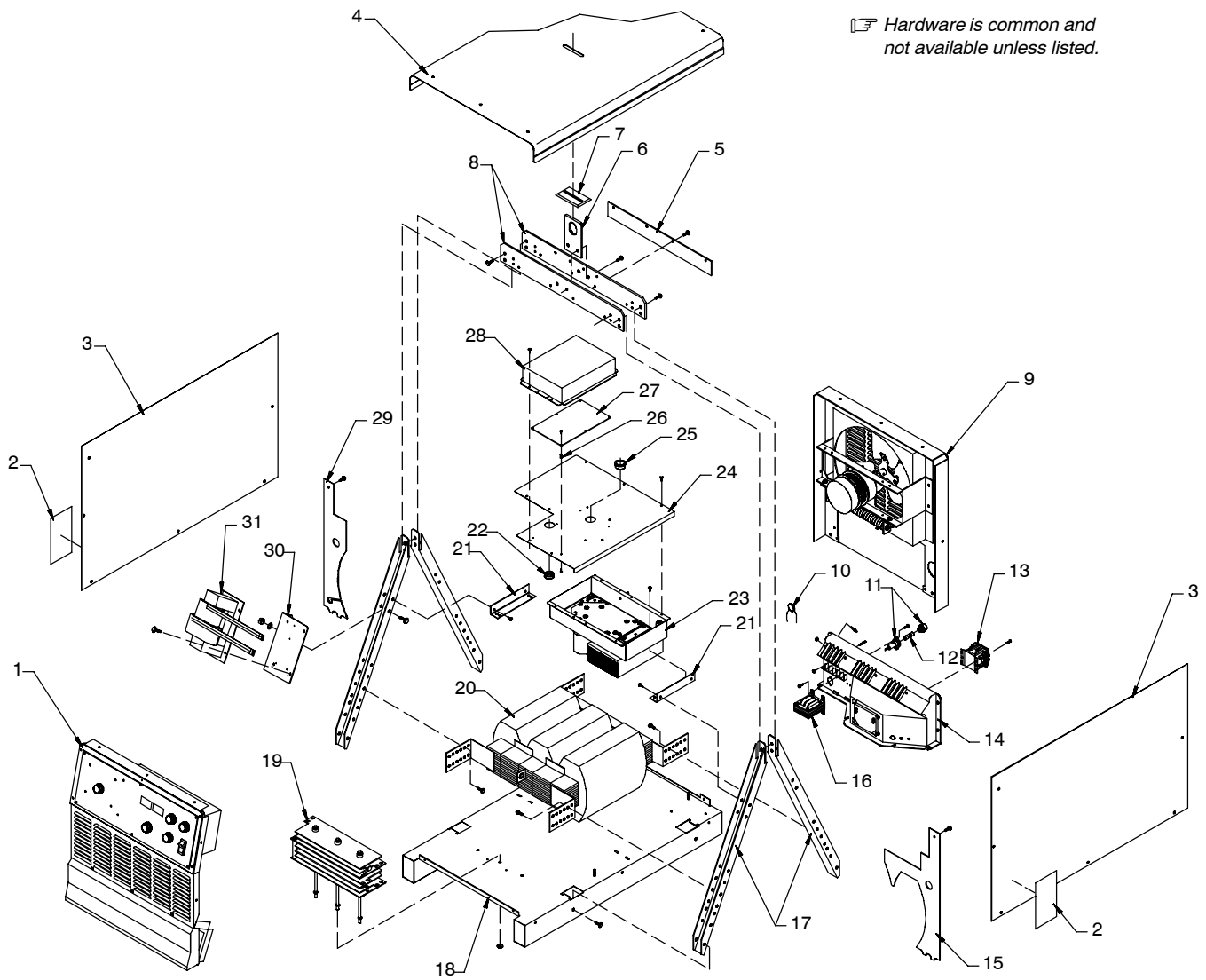
WARNING

ELECTRIC SHOCK HAZARD

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

Figure 7-1. Circuit Diagram For NT 456 CC/CV Models

SECTION 8 – PARTS LIST



803 621-C

Figure 8-1. Main Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
----------	------------	----------	-------------	----------

Figure 8-1. Main Assembly

1		Fig 8-2	PANEL, Front w/Components	1
2		217 136	LABEL,WARNING ELECTRIC SHOCK	2
3		+179 432	PANEL, SIDE	2
4		179 431	COVER, TOP	1
5		213 898	BAFFLE, AIR UPPER IGBT ASSY	1
6		162 830	LIFT EYE	1
7		177 279	GASKET, LIFT EYE	1
8		162 820	BAR, MTG LIFT EYE	2
9		Fig 8-4	PANEL, REAR	1
10	C21,22,23	163 906	CAPACITOR	3
11		159 034	HOLDER, FUSE MINTR 10.3MM X 33.3 TO 38.1MM PANEL MT	1
12	F1	156 065	FUSE, CRTG .5 AMP 600 V TIME DELAY	1
13	W	160 793	CONTACTOR, DEF PRP 60A 3P 24VAC COIL W/BOXLUG	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
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Figure 8-1. Main Assembly (Continued)

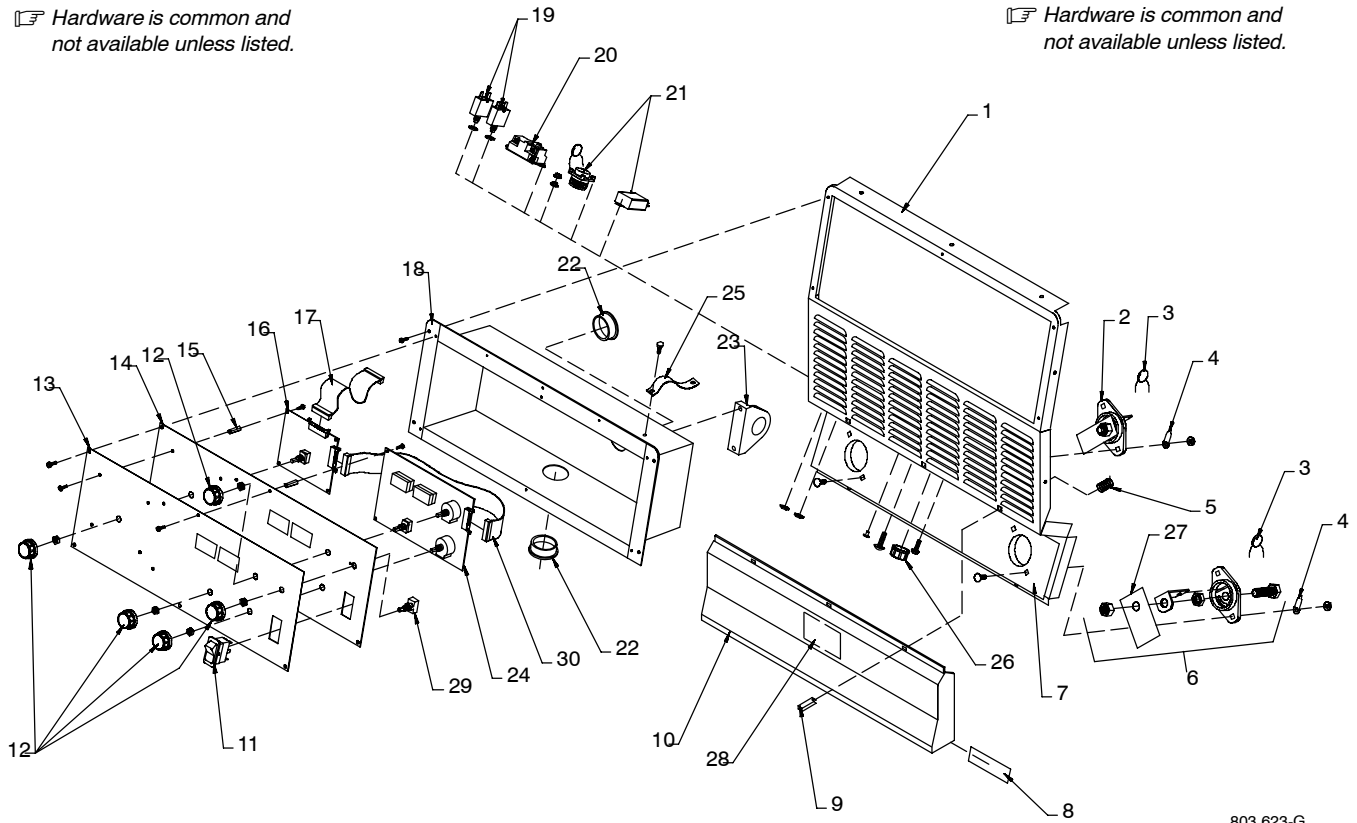
14	TE1	159 244	PRIMARY BOX (Includes),	1
		601 835	NUT, 10-32 BRASS	24
		038 887	STUD, PRIMARY BOARD BRS 10-32 X 1.375	24
		010 913	WASHER, FLAT .218IDX0.460ODX.031T BRS	24
		038 618	LINK, JUMPER TERM BD PRI	8
15		212 095	BAFFLE, AIR	1
16	T2	159 042	XFMR, CONTROL 50VA 24V 230/460/575 PRI 60HZ	1
17		162 816	CHANNEL, UPRIGHT	4
18		215 211	BASE	1
19	SR1	207 663	RECTIFIER, SI DIODE 500 AMP	1
20	T1	224 297	XFMR, POWER MAIN 230/460/575	1
	TH1	223 386	THERMISTOR, NTC 10K OHM @ 25 DEG C 34IN LEAD	1
	RC16,17	212 420	HOUSING RCPT+PINS, (SERVICE KIT) 3PIN/5PIN	1
	PLG16,17	217 885	HOUSING, PLUG+SKTS (SERVICE KIT)3 SKT/5 SKT	1
21		212 316	BRACKET, MOUNTING IGBT ASSEMBLY	2
22		179 276	BUSHING, SNAP-IN NYL 1.000 ID X 1.375 MTG HOLE CENT	1
23		Fig 8-3	ASSEMBLY, IGBT/CAPACITOR	1
24		234 503	COVER, IGBT/CAPACITOR ASSEMBLY	1
25		057 358	BUSHING, SNAP-IN NYL 1.000 ID X 1.375 MTG HOLE	1
26		190 512	STAND-OFF, NO 6-32 X .640 LG .250 HEX AL FEM	6
27	PC1	222 309	CIRCUIT CARD ASSY,CONTROL	1
	PLG8/RC2	131 204	HOUSING, PLUG & SOCKETS	1
	PLG4/RC4	115 093	HOUSING, PLUG & SOCKETS	1
	PLG5/RC5	115 094	HOUSING, PLUG & SOCKETS	1
	PLG6/RC6	115 092	HOUSING, PLUG & SOCKETS	1
	PLG7/RC7	131 054	HOUSING, PLUG & SOCKETS	1
28		234 502	COVER, PC BOARD	1
29		212 594	BAFFLE, AIR	1
30		193 462	BRACKET, MOUNTING CONTACTOR	1
31	Z1	211 150	STABILIZER	1

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

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

☞ Hardware is common and not available unless listed.

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803 623-G

Figure 8-2. Panel, Front With Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
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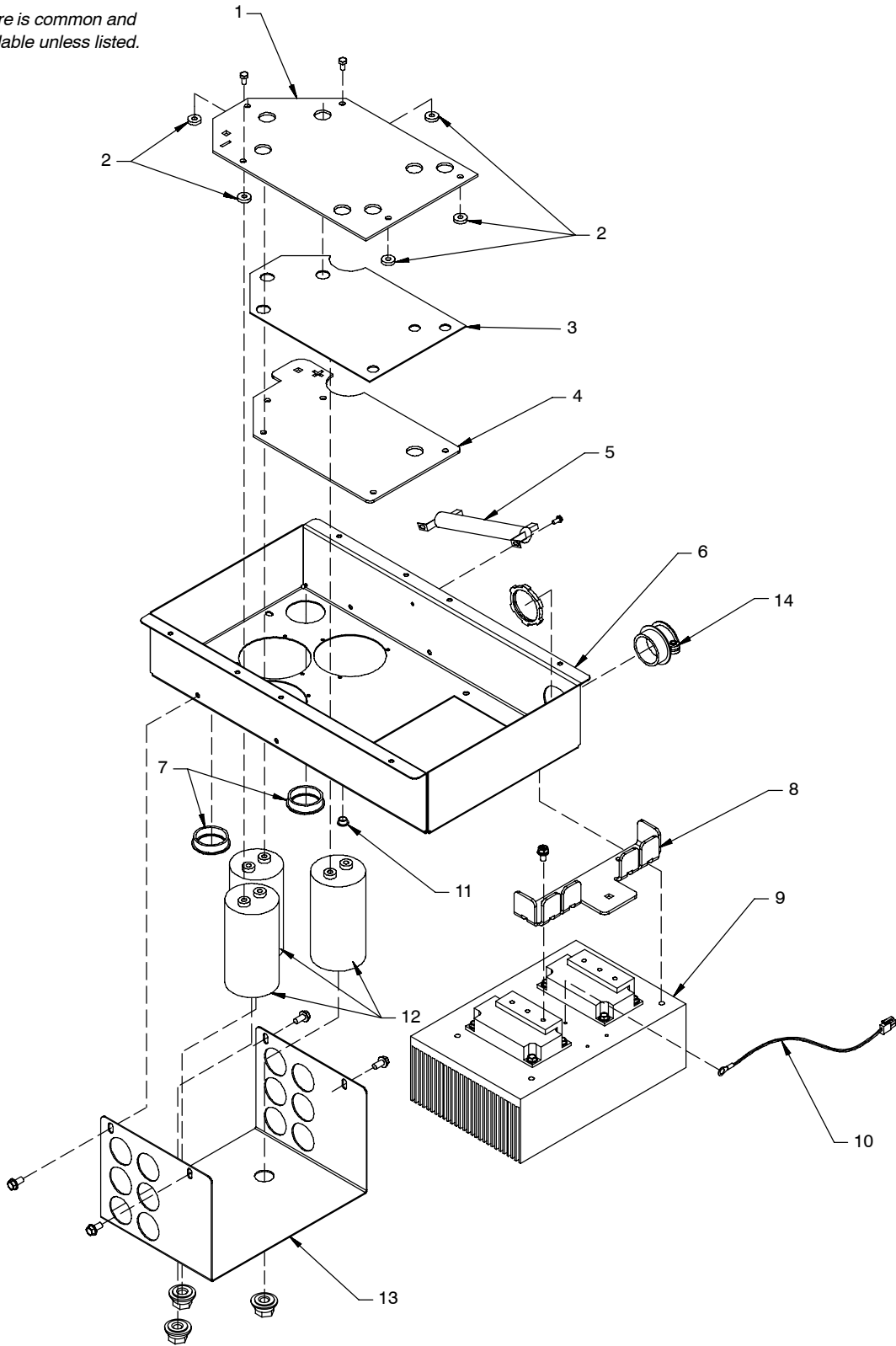
Figure 8-2. Panel, Front With Components (Fig 8-1 Item 1)

1		204 143	PANEL, FRONT	1
2	POS	181 245	TERMINAL, PWR OUTPUT RED	1
3	C4, 5	230 729	CAPACITOR, CER DISC .1 UF 500 VDC W/TERMS	2
4		010 381	CONNECTOR, RECTIFIER	2
5		161 303	SPRING, CPRSN .600 OD X .072 WIRE X 1.500 PLD	3
6	NEG	181 246	TERMINAL, PWR OUTPUT BLACK	1
7		212 318	PLATE,CONTROL LOWER	1
8		217 865	LABEL,WARNING ELECTRIC SHOCK AND REDUCED AIR	1
9		160 935	CLIP, SPRING	3
10		+172 587	COVER, OUTPUT STUD GENERIC	1
11	S1	159 039	SWITCH, ROCKER SPDT 15A 125VAC ON-NONE-ON ILLUM	1
	PLG 9	185 626	CONN, BODY 56 SERIES 5-FEMALE TERMINALS	
12		174 991	KNOB, POINTER 1.250 DIA X .250 ID W/SPRING CLIP-.21	5
12		174 991	KNOB, POINTER 1.250 DIA X .250 ID W/SPRING CLIP-.21 (FOR MODELS WITH STOCK NO. 907122011 ONLY)	4
		119 951	BLANK, SNAP-IN NYL .437 MTG HOLE BLACK (FOR MODELS WITH STOCK NO. 907122011 ONLY)	1
13		229 450	NAMEPLATE	1
14		218 080	PANEL, FRONT UPPER	1
15		190 512	STAND-OFF, NO 6-32 X .640 LG .250 HEX AL FEM	6
16	PC3	212 800	CIRCUIT CARD ASSY, PULSER INTERFACE W/PROGRAM	1
17		214 606	RIBBON CABLE	1
18		211 149	ELECTRONICS BOX	1
19	CB 1, 2	093 995	CIRCUIT BREAKER, MAN RESET 1P 15A 250VAC FRICT	2
20	RC15	604 176	RCPT, STR DX GRD 2P3W 15A 125V	1
21		229 500	RECEPTACLE, CAPACITOR / SWITCH W/LEADS (Includes)	1
	RC14	143 976	RCPT W/SKTS (SERVICE KIT)	1
	MOD 1	227 590	MODULE,FILTER .1MF X 9 500VDC W/GND	1
	PLG1	200 952	CONN, RECT INSULATION DISPLACEMENT	1
	C6, 7	136 735	CAPACITOR, CER DISC .1 UF 500 VDC STRIP	2
	C8	080 894	CAPACITOR, CER DISC .1 UF 1000 VDC STRIP	1
22		010 494	BUSHING, SNAP-IN NYL 1.375 ID X 1.750 MTG HOLE	2
23	HD1	168 829	TRANSDUCER, CURRENT 1000A MODULE MAX OPEN LOOP	1
24	PC2	235 036	CIRCUIT CARD ASSY, FRONT PANEL & DISPLAY	1
24	PC2	235 037	CIRCUIT CARD ASSY, FRONT PANEL & DISPLAY (FOR MODELS WITH STOCK NO. 907122011 ONLY)	1
	PLG2	115 091	HOUSING, PLG & SKTS, (SERVICE KIT)	1
25		218 352	STRAP,GROUNDING 5.50 IN LONG	1
26		170 391	CONNECTOR, CIRC MS PROTECTIVE	1
27		228 672	LABEL, WELD CABLE LUG	2
28		227 980	LABEL, CAUTION OUTPUT TERMINAL CONNECTION	1
29		229 455	SWITCH, ROTARY 2 POSN 1P .10A 125VAC SOLDER 180DEG	1
30		229 671	CABLE, RIBBON 24 POSN	1

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

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

☞ Hardware is common and not available unless listed.



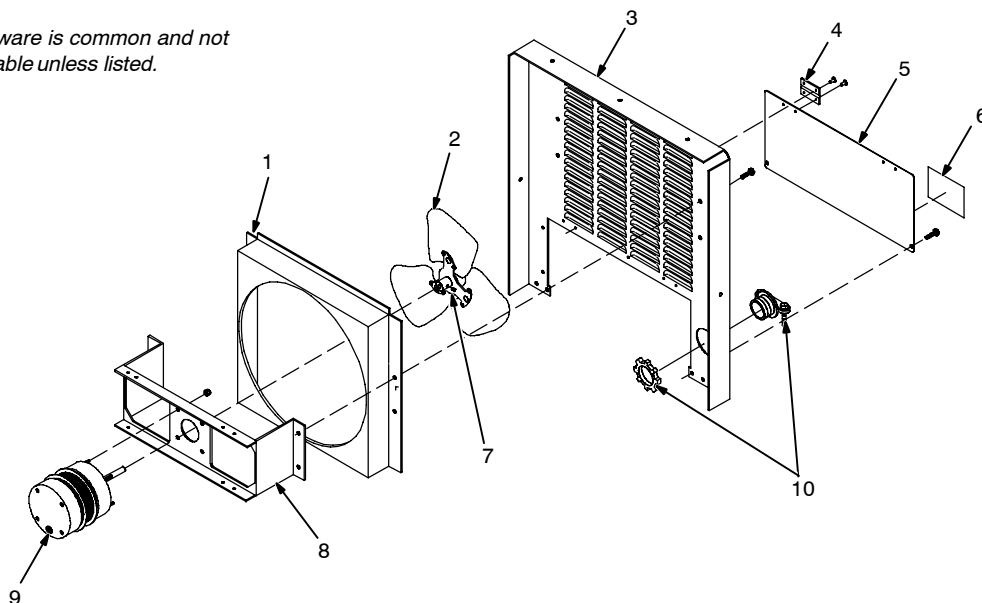
803 937-C

Figure 8-3. IGBT/Capacitor Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
		221 298	Figure 8-3. IGBT/Capacitor Assembly (Fig 8-1 item 23)	
... 1		221 301	BUS PLATE, IGBT TO CAPACITOR NEGATIVE	1
... 2		221 304	STAND-OFF, CONDUCTIVE BUS	5
... 3		221 303	INSULATOR, BUS PLATE	1
... 4		221 300	BUS PLATE, IGBT TO CAPACITOR POSITIVE	1
... 5	R3	188 067	RESISTOR, WW FXD 100 W 200 OHM W/CLIPS	1
... 6		221 299	TRAY, MOUNTING COMPONENTS	1
... 7		010 494	BUSHING, SNAP-IN NYL 1.375 ID X 1.750 MTG HOLE	2
... 8		224 144	BUS BAR, IGBT OUTPUT W/FINS	1
... 9		223 387	ASSY, HEAT SINK/600A IGBT	1
... 10	TH2	188 431	THERMISTOR, NTC 30K OHM @ 25 DEG C 27IN LEAD	1
... 11		010 546	BUSHING, SNAP-IN NYL .375 ID X .500 MTG HOLE	1
... 12	C1	222 654	CAPACITOR, ELCTLT 35000 UF 100 VDC CAN 3.00DIA STU DMNT	3
... 13		222 653	BRACKET, MTG CAPACITOR	1
... 14		010 467	CONN, CLAMP CABLE 1.250	1

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

Hardware is common and not available unless listed.



ST-800 707-C

Figure 8-4. Panel, Rear With Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
Figure 8-4. Panel, Rear With Components (Fig 8-1 Item 9)				
1		173 283	CHAMBER, PLENUM 14 IN	1
2		180 165	BLADE, FAN 14 IN 3WG 28DEG .375 BORE CCW	1
3		162 807	PANEL, REAR	1
4		168 343	HINGE, DOOR PRIMARY	2
5		+162 818	DOOR, ACCESS PRIMARY	1
6		217 733	LABEL, WARNING ELECTRIC SHOCK & INPUT POWER (EN/FR)	1
7		602 177	SCREW, SET .250-20 X .250KNRLPT SCH STL	2
8		124 274	BRACKET, MTG FAN MOTOR	1
9	FM	208 402	MOTOR, 1/12HP 230V 1550RPM 50/60HZ .83A	1
10		010 467	CONNECTOR, CLAMP CABLE 1.250	1

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

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

TRUE BLUE[®]

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Effective January 1, 2007

(Equipment with a serial number preface of "LH" or newer)

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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 one year after the equipment is shipped to a North American distributor or eighteen months after the equipment is shipped to an International distributor.

- 5 Years Parts — 3 Years Labor
 - * Original main power rectifiers
- 3 Years — Parts and Labor
 - * Transformer/Rectifier Power Sources
 - * Plasma Arc Cutting Power Sources
 - * Process Controllers
 - * Semi-Automatic and Automatic Wire Feeders
 - * Inverter Power Sources (Unless Otherwise Stated)
 - * Water Coolant Systems (Integrated)
 - * Intellitig
 - * Engine Driven Welding Generators
(NOTE: Engines are warranted separately by the engine manufacturer.)
- 1 Year — Parts and Labor Unless Specified
 - * Motor Driven Guns (w/exception of Spoolmate Spoolguns)
 - * Positioners and Controllers
 - * Automatic Motion Devices
 - * RFCS Foot Controls
 - * Induction Heating Power Sources, Coolers, and Electronic Controls/Recorders
 - * Water Coolant Systems (Non-Integrated)
 - * Flowgauge and Flowmeter Regulators (No Labor)
 - * HF Units
 - * Grids
 - * Spot Welders
 - * Load Banks
 - * Arc Stud Power Sources & Arc Stud Guns
 - * Racks
 - * Running Gear/Trailers
 - * Plasma Cutting Torches (except APT & SAF Models)
 - * Field Options
(NOTE: Field options are covered under True Blue[®] for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
 - * Bernard-Branded Mig Guns (No Labor)
 - * Weldcraft-Branded TIG Torches (No Labor)
 - * Subarc Wire Drive Assemblies
- 6 Months — Batteries
- 90 Days — Parts
 - * MIG Guns/TIG Torches and Subarc (SAW) Guns

- * Induction Heating Coils and Blankets, Cables, and Non-Electronic Controls
- * APT & SAF Model Plasma Cutting Torches
- * Remote Controls
- * Accessory (Kits)
- * Replacement Parts (No labor)
- * Spoolmate Spoolguns
- * Canvas Covers

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- Consumable components; such as contact tips, cutting nozzles, contactors, brushes, slip rings, relays or parts that fail due to normal wear. (Exception: brushes, slip rings, and relays are covered on Bobcat, Trailblazer, and Legend models.)**
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- 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.

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