HOBART®
WELDING PRODUCTS

**OM-222** 164 850T
January 2002

**Processes**

TIG (GTAW) Welding

Stick (SMAW) Welding

Flux Cored (FCAW) Welding

Air Plasma Cutting and Gouging

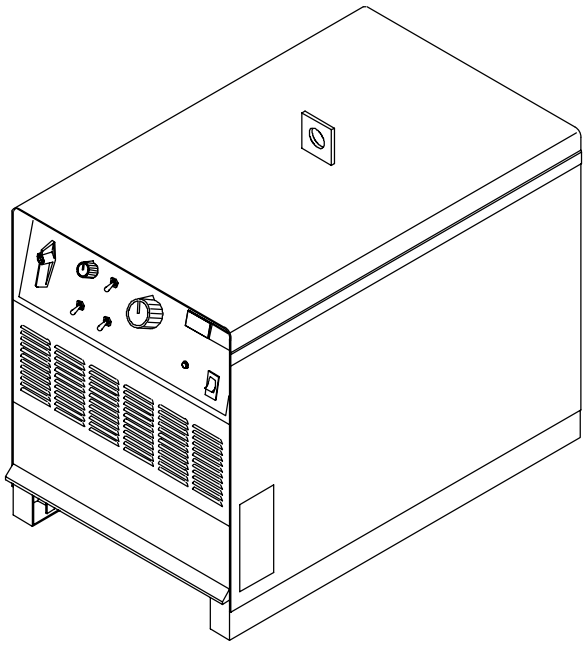
Air Carbon Arc (CAC-A) Cutting and Gouging

**Description**

CC DC 3 Phase

Arc Welding Power Source

# Cyber Arc



## 302, 452, And 652 Models

# OWNER'S MANUAL

# From Hobart to You

*Thank you* and *congratulations* on choosing Hobart. 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.

This Owner's Manual is designed to help you get the most out of your Hobart 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 Hobart 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

Hobart is registered to the ISO 9001 Quality System Standard.

Hobart Welders manufactures a full line of welders and welding related equipment. For information on other quality Hobart products, contact your local Hobart distributor to receive the latest full line catalog or individual catalog sheets. **To locate your nearest distributor or service agency call 1-877-Hobart1.**

## 5/3/1 WARRANTY

Working as hard as you do – every power source from Hobart is backed by the best warranty in the business.

*Hobart offers a Technical Manual which provides more detailed service and parts information for your unit. To obtain a Technical Manual, contact your local distributor. Your distributor can also supply you with Welding Process Manuals such as SMAW, GTAW, GMAW, and GMAW-P.*

HOBART® WELDING PRODUCTS

The following terms are used interchangeably throughout this manual:
TIG = GTAW
Stick = SMAW

## ⚠ WARNING

**This product, when used for welding or cutting, 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.)**

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# SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

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## 1-1. Symbol Usage

Means Warning! Watch Out! There are possible hazards with this procedure! The possible hazards are shown in the adjoining symbols.

▲ **Marks a special safety message.**

☞ *Means "Note"; not safety related.*

This group of symbols means Warning! Watch Out! possible 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 1-4. 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.
- 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.
- 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.
- 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 after removal of input power on inverters.

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

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

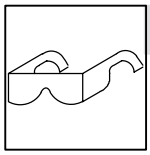
Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- Wear a welding helmet fitted with a proper shade of filter 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 and glare; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (leather and 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 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.

- Protect yourself and others from flying sparks and hot metal.
- Do not weld where flying sparks can strike flammable material.
- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- 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).
- 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 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.



## FLYING METAL can injure eyes.

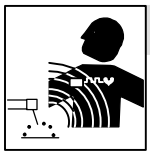
- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.

## 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.

## HOT PARTS can cause severe burns.

- Do not touch hot parts bare handed.
- Allow cooling period before working on gun or torch.



## MAGNETIC FIELDS can affect pacemakers.

- Pacemaker wearers keep away.
- Wearers should consult their doctor before going near arc welding, gouging, or spot welding 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, 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.
- Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

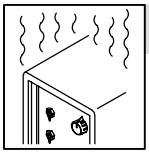
## 1-3. Additional Symbols For Installation, Operation, And Maintenance

### 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.

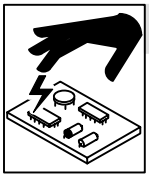
### FALLING UNIT can cause injury.

- 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.



### 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.

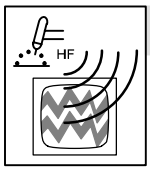
- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.

### 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.




### 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. Principal Safety Standards

*Safety in Welding and Cutting*, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami FL 33126

*Safety and Health Standards*, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

*Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances*, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126

*National Electrical Code*, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

*Safe Handling of Compressed Gases in Cylinders*, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

*Code for Safety in Welding and Cutting*, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

*Safe Practices For Occupation And Educational Eye And Face Protection*, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

*Cutting And Welding Processes*, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

## 1-5. 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.
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 Pacemakers:**

Pacemaker wearers consult your doctor first. If cleared by your doctor, then following the above procedures is recommended.

# SECTION 1 – CONSIGNES DE SECURITE – LIRE AVANT UTILISATION



## 1-1. Signification des symboles

Signifie Mise en garde ! Soyez vigilant ! Cette procédure présente des risques de danger ! Ceux-ci sont identifiés par des symboles adjacents aux directives.

▲ **Identifie un message de sécurité particulier.**

☞ *Signifie NOTA ; n'est pas relatif à la sécurité.*

Ce groupe de symboles signifie Mise en garde ! Soyez vigilant ! Il y a des risques de danger reliés aux CHOCS ÉLECTRIQUES, aux PIÈCES EN MOUVEMENT et aux PIÈCES CHAUDES. Reportez-vous aux symboles et aux directives ci-dessous afin de connaître les mesures à prendre pour éviter tout danger.

## 1-2. Dangers relatifs au soudage à l'arc

▲ **Les symboles présentés ci-après sont utilisés tout au long du présent manuel pour attirer votre attention et identifier les risques de danger. Lorsque vous voyez un symbole, soyez vigilant et suivez les directives mentionnées afin d'éviter tout danger. Les consignes de sécurité présentées ci-après ne font que résumer l'information contenue dans les normes de sécurité énumérées à la section 1-4. Veuillez lire et respecter toutes ces normes de sécurité.**

▲ **L'installation, l'utilisation, l'entretien et les réparations ne doivent être confiés qu'à des personnes qualifiées.**

▲ **Au cours de l'utilisation, tenir toute personne à l'écart et plus particulièrement les enfants.**

### UN CHOC ÉLECTRIQUE peut tuer.

Un simple contact avec des pièces électriques peut provoquer une électrocution ou des blessures graves. L'électrode et le circuit de soudage sont sous tension dès que l'appareil est sur ON. Le circuit d'entrée et les circuits internes de l'appareil sont également sous tension à ce moment-là. En soudage semi-automatique ou automatique, le fil, le dévidoir, le logement des galets d'entraînement et les pièces métalliques en contact avec le fil de soudage sont sous tension. Des matériels mal installés ou mal mis à la terre présentent un danger.

- Ne jamais toucher les pièces électriques sous tension.
- Porter des gants et des vêtements de protection secs ne comportant pas de trous.
- S'isoler de la pièce et de la terre au moyen de tapis ou d'autres moyens isolants suffisamment grands pour empêcher le contact physique éventuel avec la pièce ou la terre.
- Ne pas se servir de source électrique àcourant électrique dans les zones humides, dans les endroits confinés ou là où on risque de tomber.
- Se servir d'une source électrique àcourant électrique UNIQUEMENT si le procédé de soudage le demande.
- Si l'utilisation d'une source électrique àcourant électrique s'avère nécessaire, se servir de la fonction de télécommande si l'appareil en est équipé.
- 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 et mettre à la terre correctement cet appareil conformément à son manuel d'utilisation et aux codes nationaux, provinciaux et municipaux.
- 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.
- Vérifier fréquemment le cordon d'alimentation pour voir s'il n'est pas endommagé ou dénudé – remplacer le cordon immédiatement s'il est endommagé – un câble dénudé peut provoquer une électrocution.
- Mettre l'appareil hors tension quand on ne l'utilise pas.
- 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.
- 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 quand on travaille en hauteur.
- Maintenir solidement en place tous les panneaux et capots.
- 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.

### Il y a DU COURANT CONTINU IMPORTANT dans les convertisseurs après la suppression de l'alimentation électrique.

- 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 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.
- A l'intérieur, ventiler la zone et/ou utiliser un échappement au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage.
- Si la ventilation est insuffisante, utiliser un respirateur à alimentation d'air homologué.
- Lire les spécifications de sécurité des matériaux (MSDSs) et les instructions du fabricant concernant les métaux, les consommables, les revêtements, les nettoyants et les dégraisseurs.
- 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 si nécessaire, en portant un respirateur à alimentation d'air. Les revêtements et tous les métaux renfermant ces éléments peuvent dégager des fumées toxiques en cas de soudage.

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

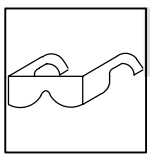
Le rayonnement de l'arc du procédé de soudage génère des rayons visibles et invisibles intenses (ultraviolets et infrarouges) susceptibles de provoquer des brûlures dans les yeux et sur la peau. Des étincelles sont projetées pendant le soudage.

- Porter un casque de soudage muni d'un écran de filtre approprié 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 protections approuvés pour les oreilles si le niveau sondre est trop élevé.
- Utiliser des écrans ou des barrières pour protéger des tiers de l'éclair et de l'éblouissement; demander aux autres personnes de ne pas regarder l'arc.
- Porter des vêtements de protection constitué dans une matière durable, résistant au feu (cuir ou laine) et une protection des pieds.

## 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.

- Se protéger et d'autres personnes de la projection d'étincelles et de métal chaud.
- Ne pas souder dans un endroit là où des étincelles peuvent tomber sur des substances inflammables.
- 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.
- 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).
- Brancher le câble 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 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.



## DES PARTICULES VOLANTES peuvent blesser les yeux.

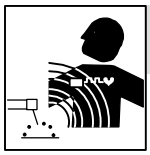
- Le soudage, l'écaillement, le passage de la pièce à la brosse en fil de fer, et le meulage génèrent des étincelles et des particules métalliques volantes. Pendant la période de refroidissement des soudures, elles risquent de projeter du laitier.
- Porter des lunettes de sécurité avec écrans latéraux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

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

- Fermer l'alimentation du gaz 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.

## DES PIÈCES CHAUDES peuvent provoquer des brûlures graves.

- Ne pas toucher des parties chaudes à mains nues
- Prévoir une période de refroidissement avant d'utiliser le pistolet ou la torche.



## LES CHAMPS MAGNÉTIQUES peuvent affecter les stimulateurs cardiaques.

- Porteurs de stimulateur cardiaque, restez à distance.
- Les porteurs d'un stimulateur cardiaque doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de gougeage ou de soudage par points.

## LE BRUIT peut affecter l'ouïe.

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

- Porter des protections approuvés pour les oreilles si le niveau sondre est trop élevé.

## Si des BOUTEILLES sont endommagées, elles pourront exploser.

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, 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.
- Ne pas tenir la tête en face de la sortie en ouvrant la soupape de la bouteille.
- Maintenir le chapeau de protection sur la soupape, sauf en cas d'utilisation ou de branchement de la bouteille.
- Lire et suivre les instructions concernant les bouteilles de gaz comprimé, les équipements associés et les publications P-1 CGA énumérées dans les normes de sécurité.

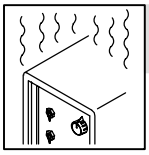
## 1-3. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance

### Risque D'INCENDIE OU D'EXPLOSION.

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

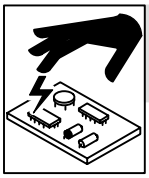
### LA CHUTE DE L'APPAREIL peut blesser.

- Utiliser l'anneau de levage uniquement pour soulever l'appareil, NON PAS les chariot, les bouteilles de gaz ou tout autre accessoire.
- Utiliser un engin d'une capacité appropriée pour soulever 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.



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

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



### 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.

### DES ORGANES MOBILES peuvent provoquer des blessures.

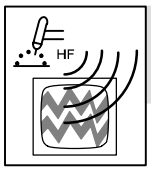
- Ne pas s'approcher des organes mobiles.
- Ne pas s'approcher des points de coincement tels que des rouleaux de commande.

### LES FILS DE SOUDAGE peuvent provoquer des blessures.

- Ne pas appuyer sur la gachette 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.

- Rester à l'écart des organes mobiles comme le ventilateur.
- Maintenir fermés et fixement en place les portes, panneaux, recouvrements et dispositifs de protection.




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

- Le rayonnement haute frequence 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 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.

### LES CHAMPS MAGNÉTIQUES peuvent affecter les stimulateurs cardiaques.

- Porteurs de stimulateur cardiaque, restez à distance.
- Les porteurs d'un stimulateur cardiaque doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de gougeage ou de soudage par points.

## 1-4. Principales normes de sécurité

*Safety in Welding and Cutting,* norme ANSI Z49.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

*Safety and Health Sandards,* OSHA 29 CFR 1910, du Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

*Recommended Safe Practice for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances,* norme AWS F4.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

*National Electrical Code,* NFPA Standard 70, de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

*Safe Handling of Compressed Gases in Cylinders,* CGA Pamphlet P-1, de la Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

*Règles de sécurité en soudage, coupage et procédés connexes,* norme CSA W117.2, de l'Association canadienne de normalisation, vente de normes, 178 Rexdale Boulevard, Rexdale (Ontario) Canada M9W 1R3.

*Safe Practices For Occupation And Educational Eye And Face Protection*, norme ANSI Z87.1, de l'American National Standards Institute, 1430 Broadway, New York, NY 10018.

*Cutting and Welding Processes,* norme NFPA 51B, de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

## 1-5. Information sur les champs électromagnétiques

Données sur le soudage électrique et sur les effets, pour l'organisme, des champs magnétiques basse fréquence

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.

Afin de réduire les champs électromagnétiques dans l'environnement de travail, respecter les consignes suivantes :

1 Garder les câbles ensembles en les torsadant ou en les attachant avec du ruban adhésif.

2 Mettre tous les câbles du côté opposé 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.

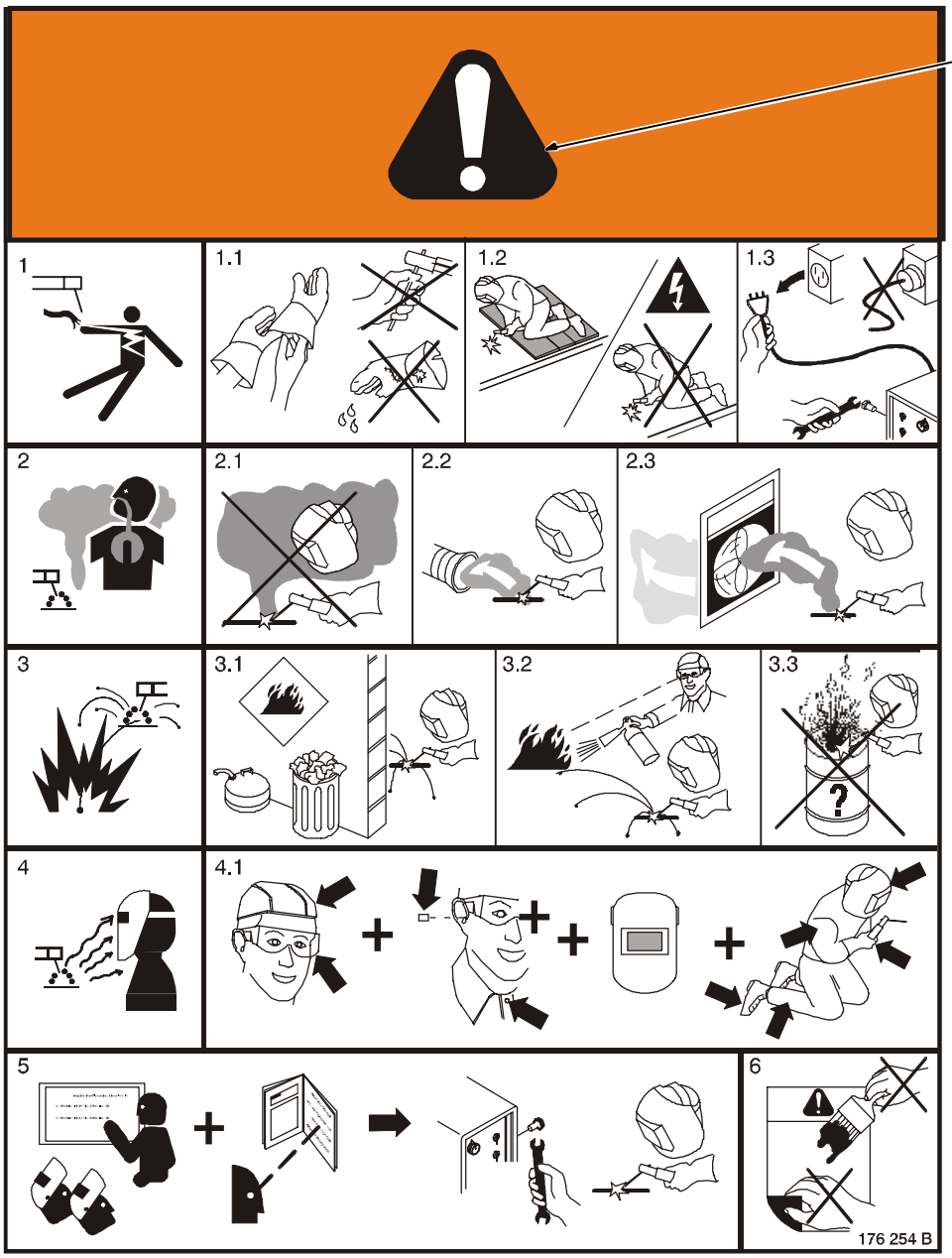
5 Relier la pince de masse le plus près possible de la zone de soudure.

**Consignes relatives aux stimulateurs cardiaques :**

Les personnes qui portent un stimulateur cardiaque doivent avant tout consulter leur docteur. Si vous êtes déclaré apte par votre docteur, il est alors recommandé de respecter les consignes ci–dessus.

# SECTION 2 – DEFINITIONS

## 2-1. General Precautionary Label




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

1 Electric shock from welding electrode or wiring can kill.

1.1 Wear dry insulating gloves. Do not touch electrode with bare hand. Do not wear wet or damaged gloves.

1.2 Protect yourself from electric shock by insulating yourself from work and ground.

1.3 Disconnect input plug or power before working on machine.

2 Breathing welding fumes can be hazardous to your health.

2.1 Keep your head out of the fumes.

2.2 Use forced ventilation or local exhaust to remove the fumes.

2.3 Use ventilating fan to remove fumes.

3 Welding sparks can cause explosion or fire.

3.1 Keep flammables away from welding. Do not weld near flammables.

3.2 Welding sparks can cause fires. Have a fire extinguisher nearby, and have a watchperson ready to use it.

3.3 Do not weld on drums or any closed containers.

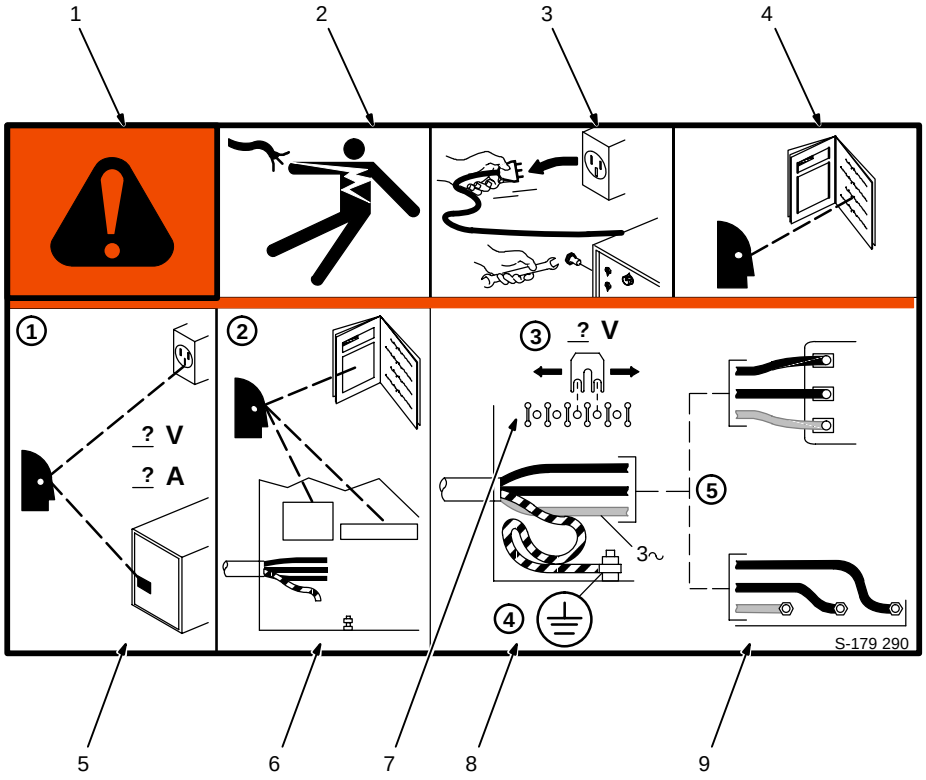
4 Arc rays can burn eyes and injure skin.

4.1 Wear hat and safety glasses. Use ear protection and button shirt collar. Use welding helmet with correct shade of filter. Wear complete body protection.

5 Become trained and read the instructions before working on the machine or welding.

6 Do not remove or paint over (cover) the label.

## 2-2. Input Connection Label




1 Warning! Watch Out! There are possible hazards as shown by the symbols.
2 Electric shock from wiring can kill.
3 Disconnect input plug or power before working on machine.
4 Read the Owner's Manual before working on this machine.
5 Consult rating label for input power requirements, and check power available at the job site – they must match.
6 Read Owner's Manual and inside labels for connection points and procedures.
7 Move jumper links as shown on inside label to match voltage at job site.
8 Having a loop of extra length, connect grounding conductor first.
9 Connect line input conductors as shown on inside label – double-check all connections, jumper link positions, and input voltage before applying power.

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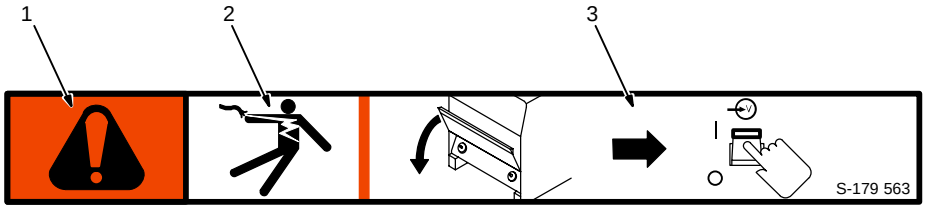
## 2-3. Electric Shock And Airflow Label




1 Warning! Watch Out! There are possible hazards as shown by the symbols.
2 Electric shock from wiring and exposed weld terminals can kill.
3 Close door before turning on unit.

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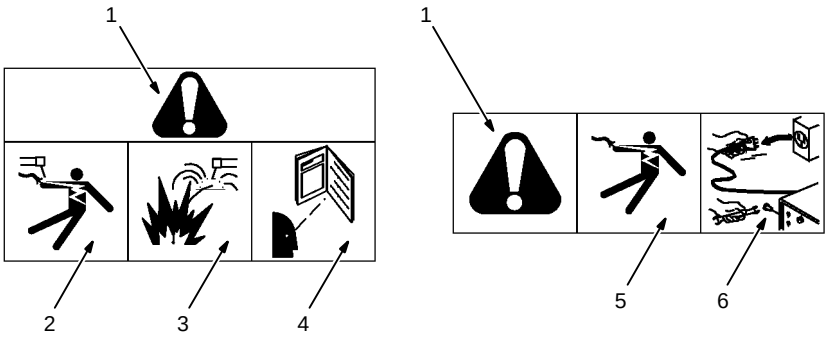
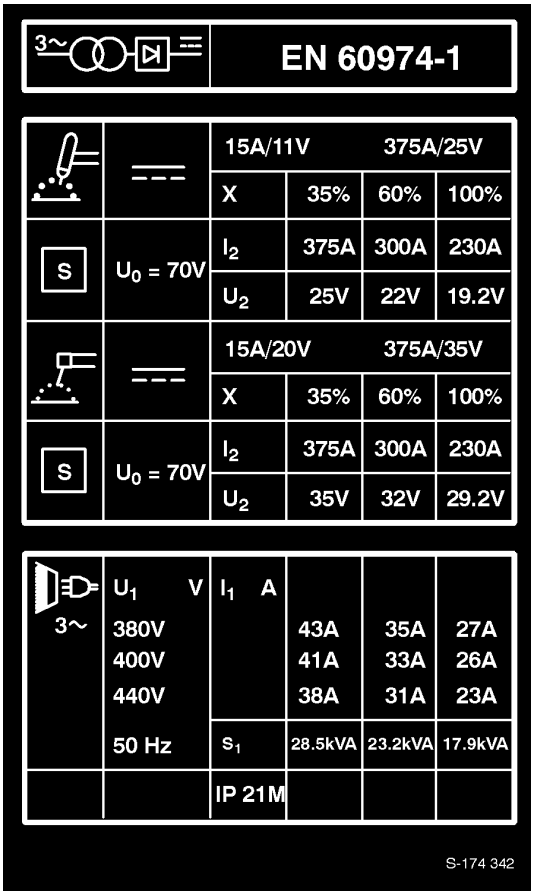
## 2-4. Nameplate Safety Symbols




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

## 2-5. Manufacturer's Rating Labels For CE Products



| 3~ | EN 60974-1 | | | | |
|---|---|---|---|---|---|
| | | 15A/11V | | | 375A/25V |
| | | X | 35% | 60% | 100% |
| S | $U_0$ = 70V | $I_2$ | 375A | 300A | 230A |
| | | $U_2$ | 25V | 22V | 19.2V |
| | | 15A/20V | | | 375A/35V |
| | | X | 35% | 60% | 100% |
| S | $U_0$ = 70V | $I_2$ | 375A | 300A | 230A |
| | | $U_2$ | 35V | 32V | 29.2V |

| 3~ | $U_1$ V | $I_1$ A | | | |
|---|---|---|---|---|---|
| | 380V | | 43A | 35A | 27A |
| | 400V | | 41A | 33A | 26A |
| | 440V | | 38A | 31A | 23A |
| | 50 Hz | $S_1$ | 28.5kVA | 23.2kVA | 17.9kVA |
| | | IP 21M | | | |

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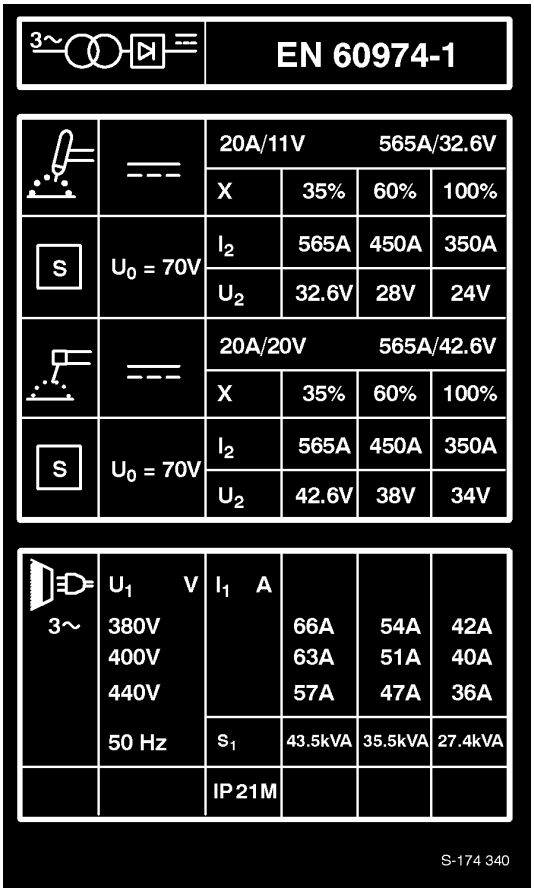

| 3~ | EN 60974-1 | | | | |
|---|---|---|---|---|---|
| | | 20A/11V | | | 565A/32.6V |
| | | X | 35% | 60% | 100% |
| S | $U_0$ = 70V | $I_2$ | 565A | 450A | 350A |
| | | $U_2$ | 32.6V | 28V | 24V |
| | | 20A/20V | | | 565A/42.6V |
| | | X | 35% | 60% | 100% |
| S | $U_0$ = 70V | $I_2$ | 565A | 450A | 350A |
| | | $U_2$ | 42.6V | 38V | 34V |

| 3~ | $U_1$ V | $I_1$ A | | | |
|---|---|---|---|---|---|
| | 380V | | 66A | 54A | 42A |
| | 400V | | 63A | 51A | 40A |
| | 440V | | 57A | 47A | 36A |
| | 50 Hz | $S_1$ | 43.5kVA | 35.5kVA | 27.4kVA |
| | | IP 21M | | | |

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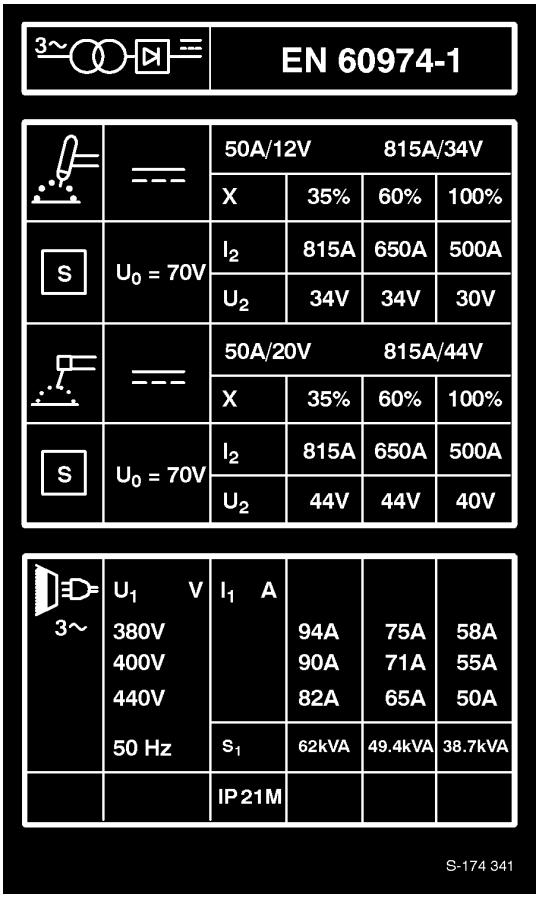

| 3~ | EN 60974-1 | | | | |
|---|---|---|---|---|---|
| | | 50A/12V | | | 815A/34V |
| | | X | 35% | 60% | 100% |
| S | $U_0$ = 70V | $I_2$ | 815A | 650A | 500A |
| | | $U_2$ | 34V | 34V | 30V |
| | | 50A/20V | | | 815A/44V |
| | | X | 35% | 60% | 100% |
| S | $U_0$ = 70V | $I_2$ | 815A | 650A | 500A |
| | | $U_2$ | 44V | 44V | 40V |

| 3~ | $U_1$ V | $I_1$ A | | | |
|---|---|---|---|---|---|
| | 380V | | 94A | 75A | 58A |
| | 400V | | 90A | 71A | 55A |
| | 440V | | 82A | 65A | 50A |
| | 50 Hz | $S_1$ | 62kVA | 49.4kVA | 38.7kVA |
| | | IP 21M | | | |

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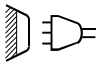
☞ *Match label to one on unit. See Section 3-4.*

## 2-6. Symbols And Definitions

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

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A | Amperes |  | Amperage Control/ Panel |  | Gas Tungsten Arc Welding (GTAW) |  | Shielded Metal Arc Welding (SMAW) |
|  | Temperature |  | Do Not Switch While Welding |  | Arc Force (DIG) | % | Percent |
|  | Output |  | Circuit Breaker |  | Remote | V | Volts |
|  | Protective Earth (Ground) |  | Positive |  | Negative |  | Input |
|  | On |  | Off | Hz | Hertz |  | Direct Current |
| $U_0$ | Rated No Load Voltage (Average) | $U_1$ | Primary Voltage | $U_2$ | Conventional Load Voltage |  | Line Connection |
| $I_1$ | Primary Current | $I_2$ | Rated Welding Current | X | Duty Cycle |  | Three-Phase Transformer Rectifier |
| IP | Degree Of Protection |  | Three-Phase | $S_1$ | KVA |  | Work Connection |
|  | Wire Feeder |  | Electrode Connection | | | | |

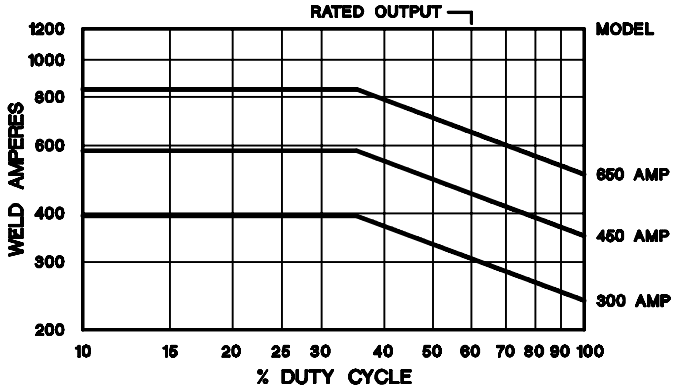
# SECTION 3 – INSTALLATION

## 3-1. Specifications

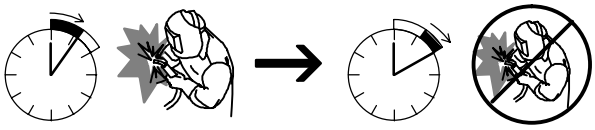
| Model | Rated Welding Output | Amp Range DC | Maximum Open-Circuit Voltage DC | IP Rating | Amperes Input at Rated Load Output, 50 or 60 Hz, Three-Phase | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 200 V | 230 V | 380 V | 400 V | 440 V | 460 V | 575 V | KVA | KW |
| 300 Amp | 300 A @ 32 Volts DC, 60% Duty Cycle | 15 – 395 | 72 (70) | 21M | 70<br>4.0* | 61<br>3.6* | 35<br>1.1* | 33<br>1.1* | 31<br>1.0* | 31<br>3.1* | 25<br>1.5* | 24.5<br>1.3* | 13.8<br>0.67* |
| 450 Amp | 450 A @ 38 Volts DC, 60% Duty Cycle | 20 – 590 | 72 (70) | 21M | 102<br>3.5* | 89<br>3.1* | 54<br>1.5* | 51<br>1.4* | 47<br>1.2* | 45<br>1.5* | 36<br>1.2* | 35.5<br>1.2* | 23.3<br>0.51* |
| 650 Amp | 650 A @ 44 Volts DC, 60% Duty Cycle | 50 – 850 | 72 (70) | 21M | — | 124<br>5.2* | 75<br>1.7* | 71<br>1.6* | 65<br>1.5* | 62<br>2.6* | 50<br>2.1* | 49.4<br>2.1* | 36<br>0.58* |

*While idling
( ) Indicates specification differences for CE models

## 3-2. Duty Cycle And Overheating




**Example: 60% Duty Cycle =**



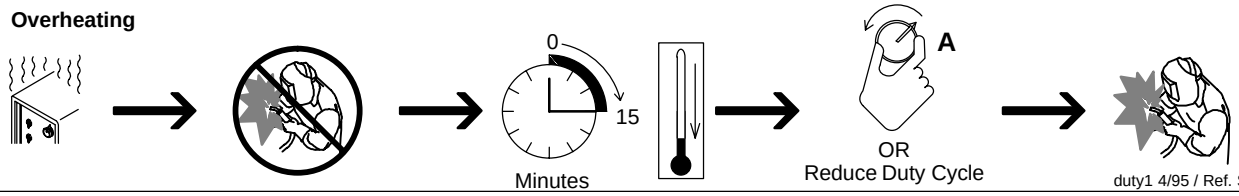
6 Minutes Welding — 4 Minutes Resting

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

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

▲ **Exceeding duty cycle can damage unit and void warranty.**

**Overheating**




Minutes

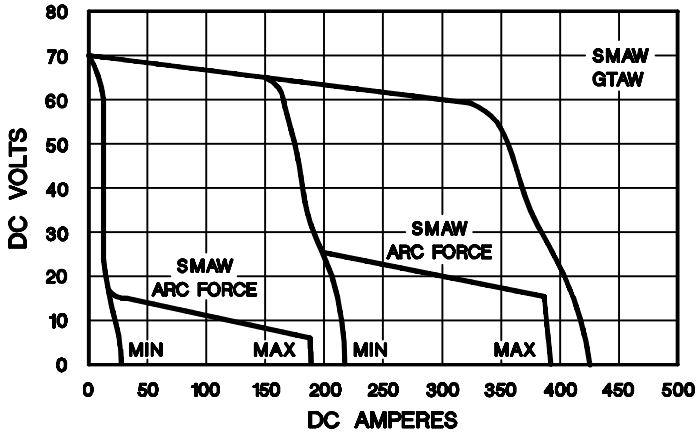
OR
Reduce Duty Cycle

duty1 4/95 / Ref. SA-168 919

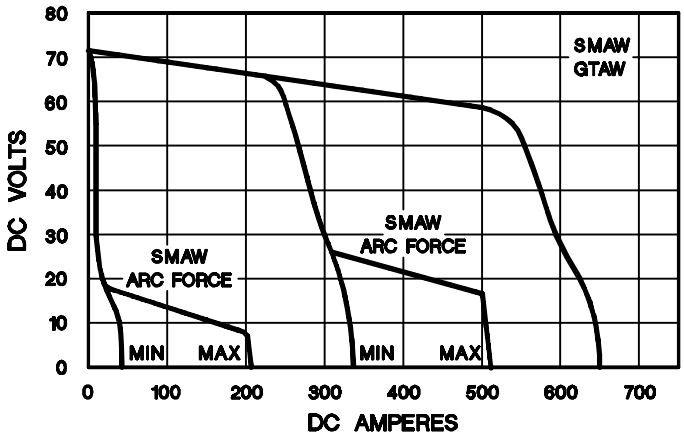
## 3-3. Volt-Ampere Curves

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

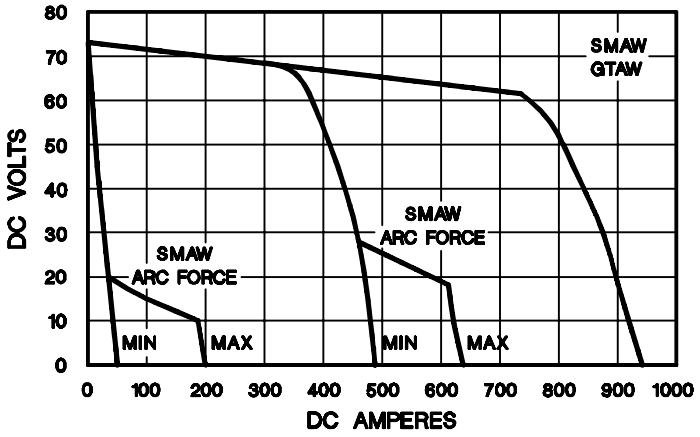
### A. 300 Amp Model




### B. 450 Amp Model



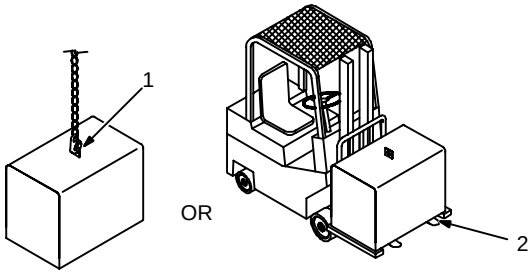

### C. 650 Amp Model



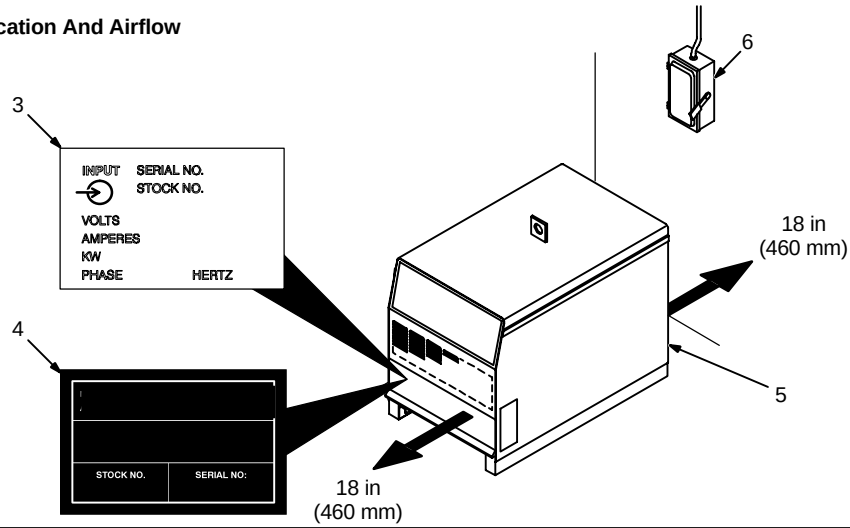

va_curve1 – 4/95 – SA-171 221 / SA-171 222 / SA-171 223

## 3-4. Selecting A Location

**Movement**




**Location And Airflow**




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 (Non CE Models Only)

Use rating label to determine input power needs. Label located under front access door.

4 Plate Label (CE Models Only)

Label located under front access door.

5 Rating Label (CE Models Only)

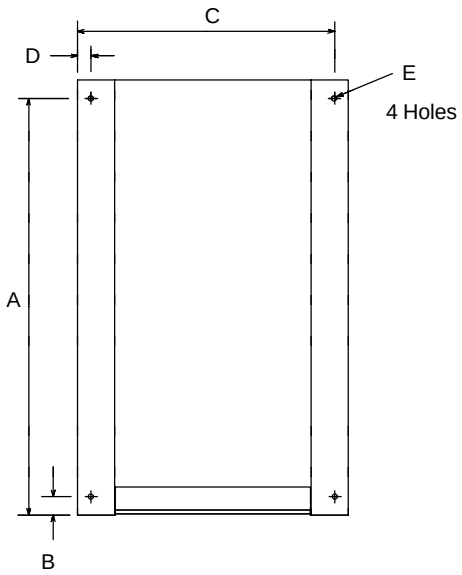
Use rating label to determine input power needs. Label located on rear access door (see Section 2-5).

6 Line Disconnect Device

Locate unit near correct input power supply.

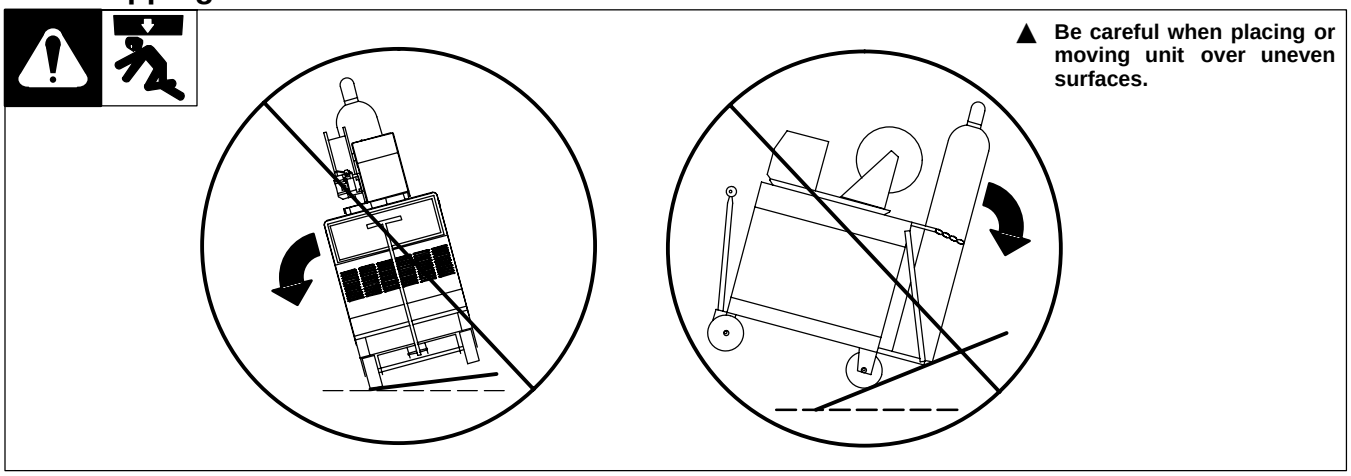
▲ **Special installation may be required where gasoline or volatile liquids are present – see NEC Article 511 or CEC Section 20.**

## 3-5. Dimensions And Weights



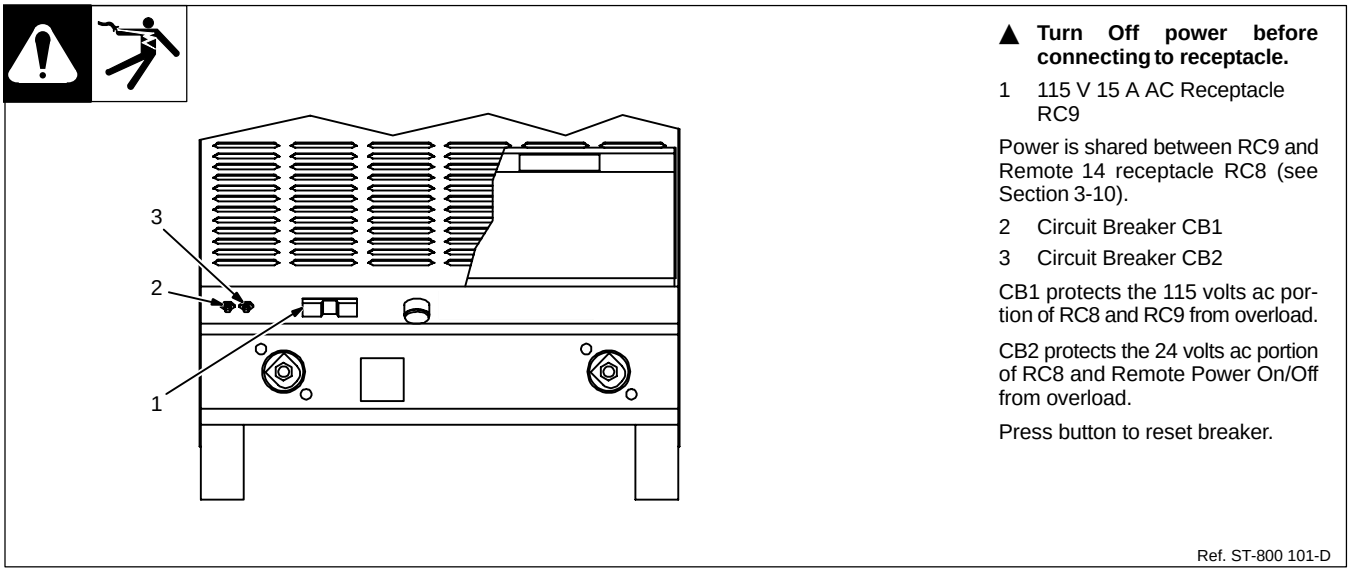

| Dimensions | |
|---|---|
| Height | 27-1/4 in (692 mm) |
| Width | 22-1/4 in (565 mm) |
| Depth* | 35-3/4 in (908 mm) |
| A** | 35 in (889 mm) |
| B*** | 1-1/4 in (32 mm) |
| C | 21-1/8 in (537 mm) |
| D | 1-1/8 in (29 mm) |
| E | 7/16 in (11 mm) Dia |
| *300 Amp Model = 28-1/4 in (718 mm)<br>**300 Amp Model = 27-1/2 in (699 mm)<br>***300 Amp Model = 3/4 in (19 mm) | |
| **Weight** | |
| 300 Amp | 352 lb (160 kg) |
| 450 Amp | 404 lb (183 kg) |
| 650 Amp | 505 lb (299 kg) |

## 3-6. Tipping



▲ **Be careful when placing or moving unit over uneven surfaces.**

## 3-7. 115 VAC Receptacle And Circuit Breakers




▲ **Turn Off power before connecting to receptacle.**

1 115 V 15 A AC Receptacle RC9

Power is shared between RC9 and Remote 14 receptacle RC8 (see Section 3-10).

2 Circuit Breaker CB1

3 Circuit Breaker CB2

CB1 protects the 115 volts ac portion of RC8 and RC9 from overload.

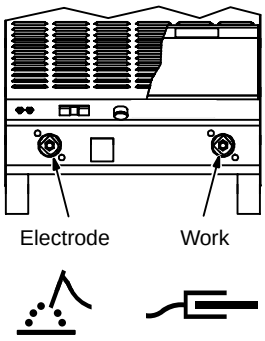
CB2 protects the 24 volts ac portion of RC8 and Remote Power On/Off from overload.

Press button to reset breaker.

Ref. ST-800 101-D

## 3-8. Weld Output Terminals And Selecting Cable Sizes

| ▲Turn Off power before connecting to weld output terminals | Welding Amperes | 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 | 60 – 100% Duty Cycle | 10 – 100% Duty Cycle | | | | | |
| | 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 |
| | 800 | 4/0 | 2-2/0 | 2-3/0 | 2-4/0 | 3-4/0 | 3-4/0 | 4-4/0 | 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. S-0007-D

## 3-9. Remote 14 Receptacle Information

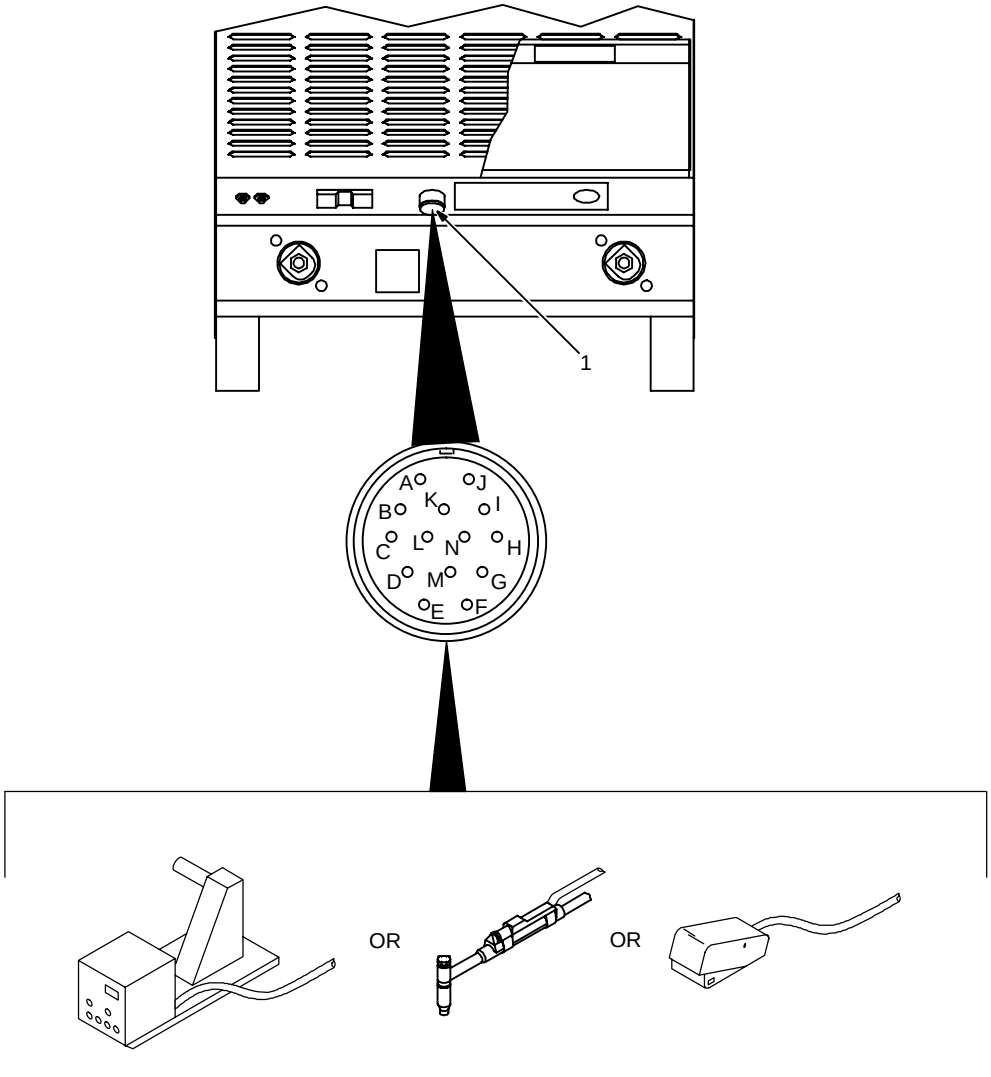
| | Socket | Information |
|---|---|---|
| **24 VOLTS AC** OUTPUT (CONTACTOR) | A | 24 volts ac. Protected by circuit breaker CB2. |
| | B | Contact closure to A completes 24 volts ac contactor control circuit. |
| **REMOTE OUTPUT CONTROL** | C | Command reference; 0 to +10 volts dc. |
| | D | Remote control circuit common. |
| | E | 0 to +10 volts dc input command signal from remote control. |
| A/V AMPERAGE VOLTAGE | F | Current feedback; 1 volt per 100 amperes. |
| | H | Voltage feedback; 1 volt per 10 arc volts. |
| **115 VOLTS AC** OUTPUT (CONTACTOR) | I | 115 volts, 15 amperes, 60 Hz ac. Protected by circuit breaker CB1. |
| | J | Contact closure to I completes 115 volts ac contactor control circuit. |
| **GND** | K | Chassis common. |
| | G | Circuit common for 24 and 115 volts ac circuits. |
| **REMOTE POWER ON/OFF** | * | To remote On/Off switch. |
| | * | |
| **REMOTE VOLTAGE SENSING** | * | Voltage sensing signal from Negative (-) weld output terminal. |
| | * | Voltage sensing signal from Positive (+) weld output terminal. |

* Not Used

## 3-10. Connecting Remote Control

1 Remote 14 Receptacle RC8

Connect remote control to RC8.




Ref. ST-800 101-D

## 3-11. Electrical Service Guide

| 60 Hertz Models | 300 Amp Model | | | | 450 Amp Model | | | | 650 Amp Model | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Input Voltage** | 200 | 230 | 460 | 575 | 200 | 230 | 460 | 575 | 230 | 460 | 575 |
| **Input Amperes At Rated Output** | 70 | 61 | 31 | 25 | 102 | 89 | 45 | 36 | 124 | 62 | 50 |
| **Max Recommended Standard Fuse Rating In Amperes [1]** | | | | | | | | | | | |
| **Time-Delay [2]** | 80 | 70 | 35 | 30 | 125 | 110 | 50 | 45 | 150 | 70 | 60 |
| **Normal Operating 3** | 110 | 90 | 45 | 35 | 150 | 125 | 70 | 50 | 175 | 90 | 70 |
| **Min Input Conductor Size In AWG/ Kcmil** | 6 | 8 | 10 | 12 | 4 | 4 | 8 | 10 | 3 | 8 | 8 |
| **Max Recommended Input Conductor Length In Feet (Meters)** | 149 (45) | 131 (40) | 356 (108) | 342 (104) | 136 (41) | 180 (55) | 319 (97) | 335 (102) | 144 (44) | 210 (64) | 328 (100) |
| **Min Grounding Conductor Size In AWG/Kcmil** | 6 | 8 | 10 | 12 | 6 | 6 | 8 | 10 | 6 | 8 | 8 |

Reference: 1999 National Electrical Code (NEC)

1 Consult factory for circuit breaker applications.

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).

| 50 Hertz Models | 300 Amp Model | | | 450 Amp Model | | | 650 Amp Model | | |
|---|---|---|---|---|---|---|---|---|---|
| **Input Voltage** | 380 | 400 | 440 | 380 | 400 | 440 | 380 | 400 | 440 |
| **Input Amperes At Rated Output** | 35 | 33 | 31 | 54 | 51 | 47 | 75 | 71 | 65 |
| **Max Recommended Standard Fuse Rating In Amperes [1]** | | | | | | | | | |
| **Time-Delay [2]** | 40 | 40 | 35 | 60 | 60 | 50 | 90 | 80 | 80 |
| **Normal Operating 3** | 60 | 50 | 50 | 80 | 80 | 70 | 125 | 110 | 100 |
| **Min Input Conductor Size In AWG/Kcmil** | 10 | 10 | 10 | 8 | 8 | 8 | 6 | 6 | 6 |
| **Max Recommended Input Conductor Length In Feet (Meters)** | 243 (74) | 269 (82) | 326 (99) | 218 (66) | 241 (73) | 292 (89) | 219 (67) | 242 (74) | 293 (89) |
| **Min Grounding Conductor Size In AWG/Kcmil** | 10 | 10 | 10 | 8 | 8 | 8 | 6 | 6 | 8 |

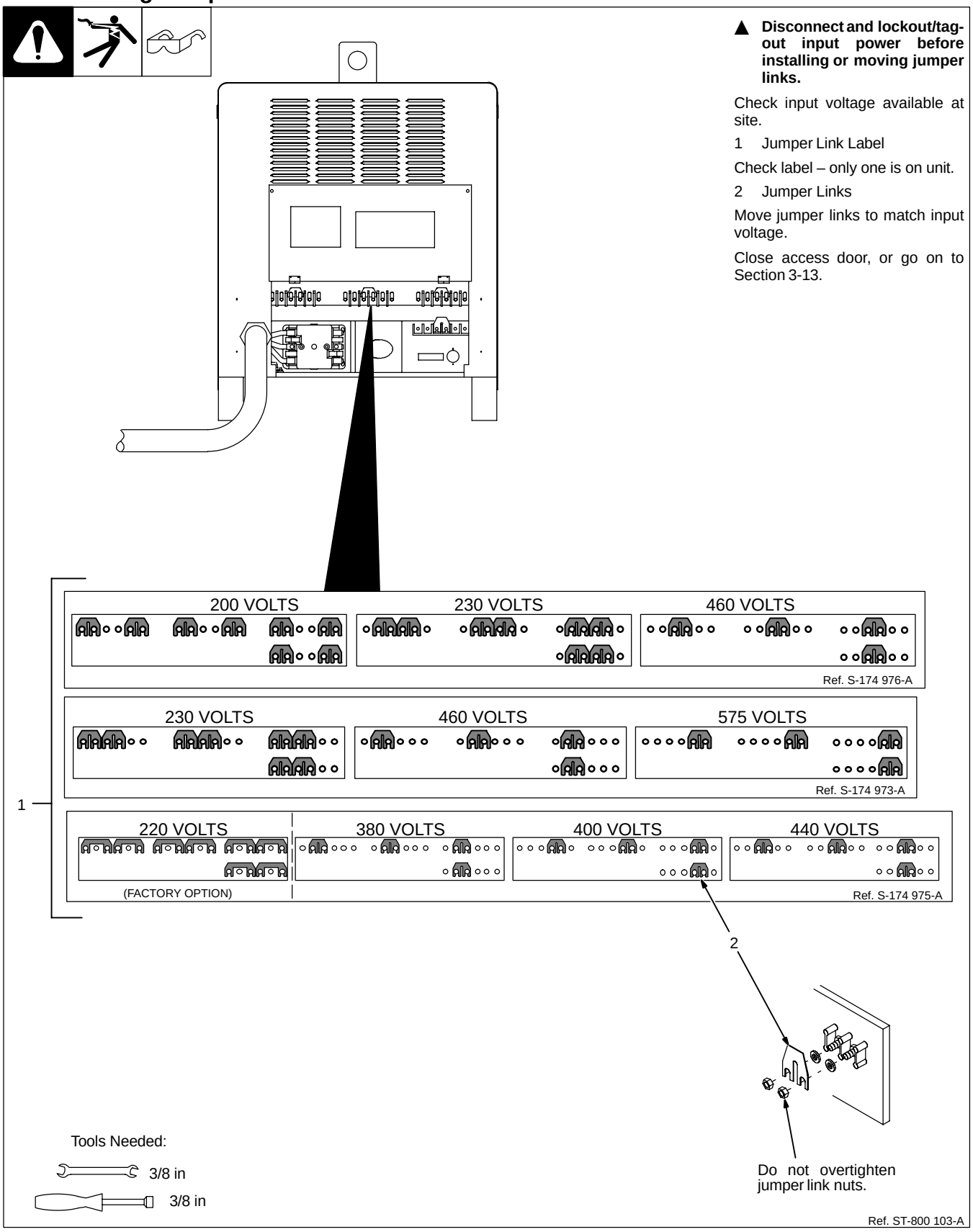
Reference: 1999 National Electrical Code (NEC)

1 Consult factory for circuit breaker applications.

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).

## 3-12. 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

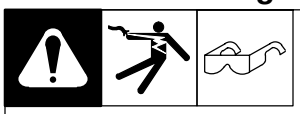
Check label – only one is on unit.

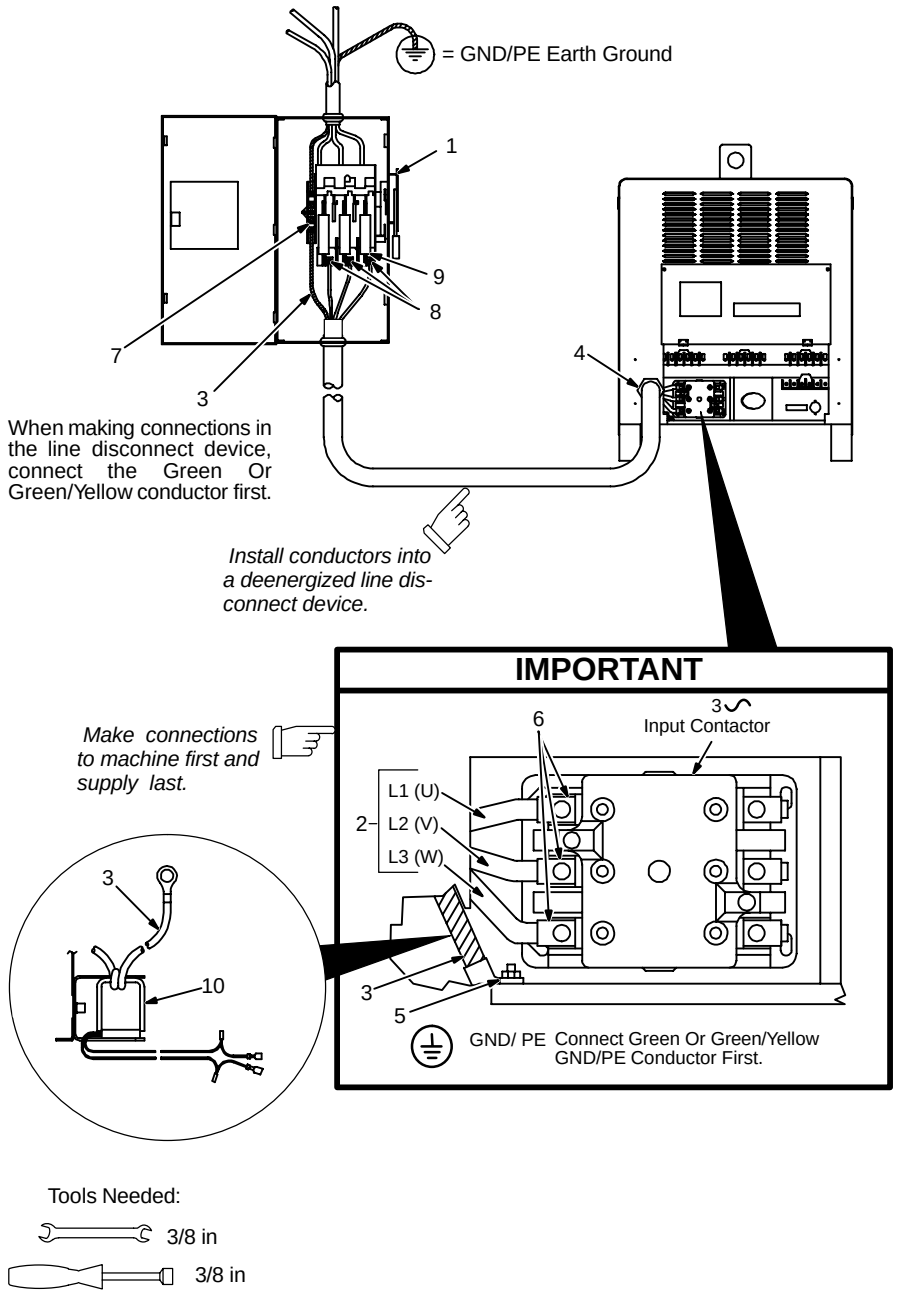
2 Jumper Links

Move jumper links to match input voltage.

Close access door, or go on to Section 3-13.

## 3-13. Connecting Input Power






Tools Needed:

3/8 in

3/8 in

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

▲ **Have only qualified persons make this installation.**

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

1 Line Disconnect Device

2 Input Conductors

3 Grounding Conductor

Select size and length using Section 3-11. Conductors must comply with national, state, and local electrical codes. If applicable, use lugs of proper amperage capacity and correct hole size.

4 Strain Relief

Route conductors through strain relief.

5 Machine Grounding Terminal

6 Line Terminals

▲ **Make input power connections to the welding power source before making connections into a deenergized line disconnect device.**

Connect green or green/yellow grounding conductor to machine grounding terminal first. Then connect input conductors to line terminals.

Close access door.

7 Disconnect Device (Supply) Grounding Terminal

8 Disconnect Device Line Terminals

▲ **In the deenergized line disconnect device, connect green or green/yellow grounding conductor to supply grounding terminal first, never to a line terminal. Be sure grounding conductor goes to an earth ground.**

Connect input conductors to line terminals.

9 Overcurrent Protection

Select type and size using Section 3-11 (fused disconnect switch shown).

Close door on line disconnect device.

10 Reed Switch (Ground Current Sensor) (Optional)

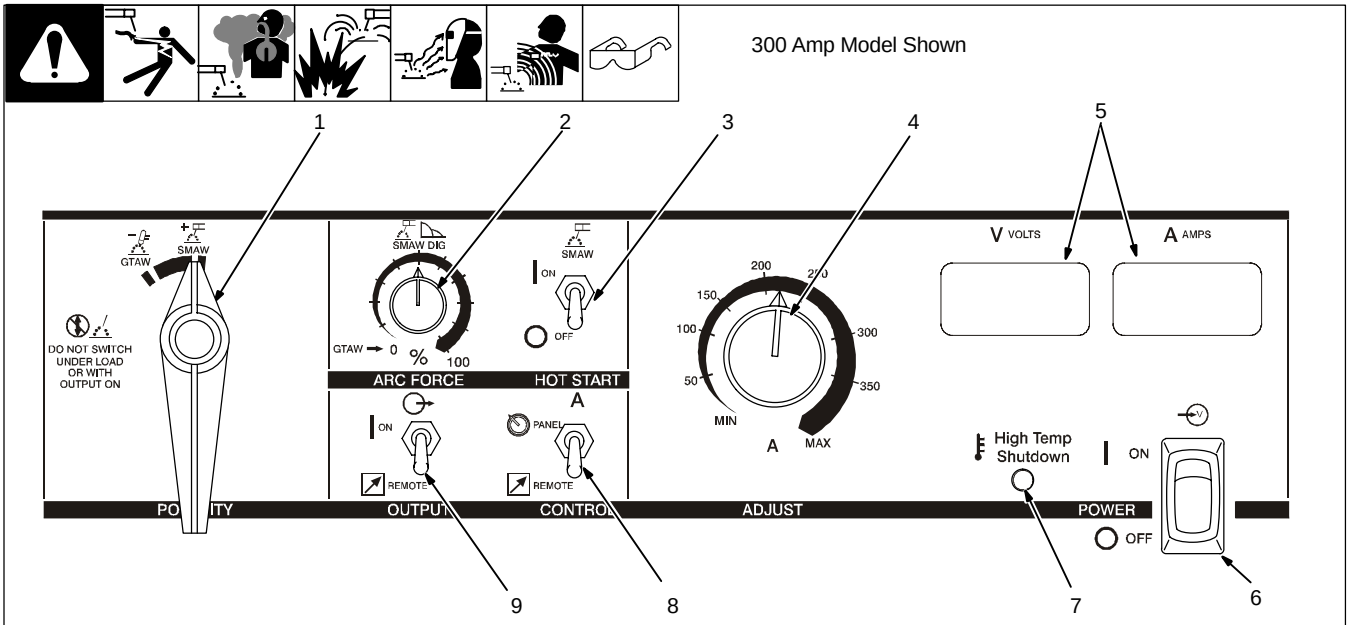
If unit is equipped with optional ground current sensor, route grounding conductor through reed switch two times and connect to ground terminal.

Close access door.

ST-800 103-B / Ref. ST-801 116

# SECTION 4 – OPERATION

## 4-1. Controls (Non CE Models)




Ref. ST-165 596-D

1 Polarity Selector Switch (Optional On 50 Hz Models)

To change polarity on models not equipped with a Polarity Selector switch, reverse work and electrode cables at the weld output terminals (see Section 3-8).

▲ **Turn Off Power before reversing cables.**

2 Arc Force (Dig) Control

Control increases SMAW short-circuit amperage which allows the operator to use a very short arc length without sticking the electrode.

Set control at 0 for normal welding amperage. Turn clockwise to increase short-circuit amperage.

3 Hot Start Switch

Turn switch On for SMAW and Off for GTAW welding.

4 Amperage Adjustment Control

5 Digital Meters (Optional)

6 Power Switch With Indicator Light

7 High Temperature Shutdown Light

8 Remote Amperage Control Switch

For front panel control, place switch in Panel position. For remote control, place switch in Remote position, and connect remote device (see Section 3-10).

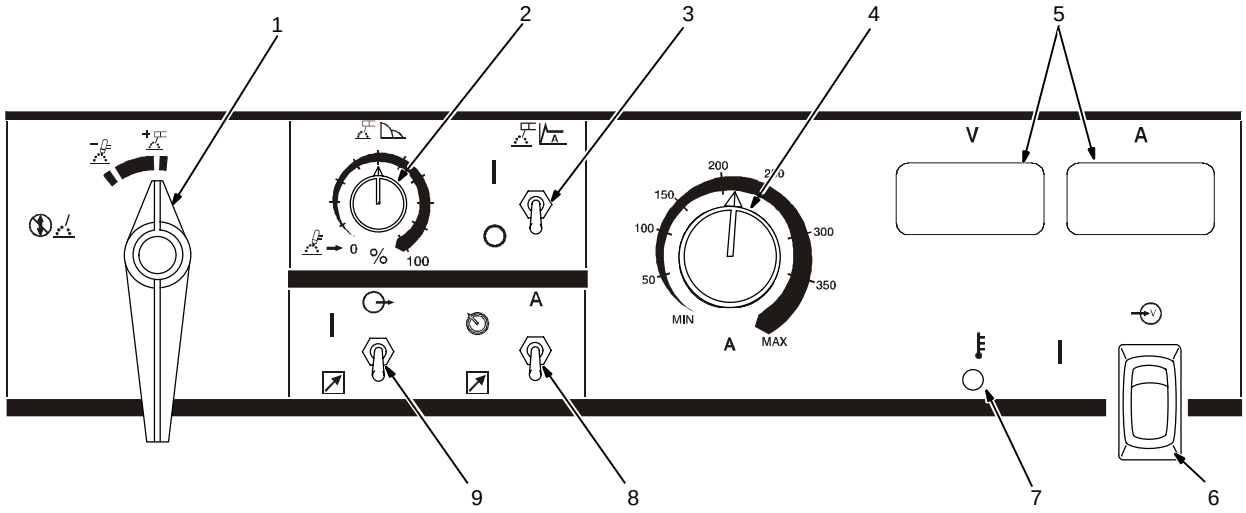
9 Output Switch (Contactor)

For front panel control of output, place switch in Panel position. For remote control of output, place switch in Remote position, and connect remote device (see Section 3-10).

▲ **Turn Off power before connecting remote device.**

## 4-2. Controls (CE Models)

300 Amp Model Shown




Ref. ST-173 450-B

1 Polarity Selector Switch (Optional On 50 Hz Models)

To change polarity on models not equipped with a Polarity Selector switch, reverse work and electrode cables at the weld output terminals (see Section 3-8).

▲ **Turn Off Power before reversing cables.**

2 Arc Force (Dig) Control

Control increases SMAW short-circuit amperage which allows the operator to use a very short arc length without sticking the electrode.

Set control at 0 for normal welding amperage. Turn clockwise to increase short-circuit amperage.

3 Hot Start Switch

Turn switch On for SMAW and Off for GTAW welding.

4 Amperage Adjustment Control

5 Digital Meters (Optional)

6 Power Switch With Indicator Light

7 High Temperature Shutdown Light

8 Remote Amperage Control Switch

For front panel control, place switch in Panel position. For remote control, place switch in Remote position, and connect remote device (see Section 3-10).

9 Output Switch (Contactor)

For front panel control of output, place switch in Panel position. For remote control of output, place switch in Remote position, and connect remote device (see Section 3-10).

▲ **Turn Off power before connecting remote device.**

# SECTION 5 – MAINTENANCE AND TROUBLESHOOTING

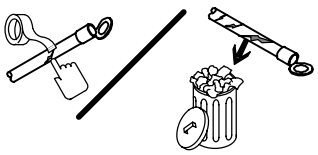
## 5-1. Routine Maintenance

▲ **Disconnect power before maintaining.**

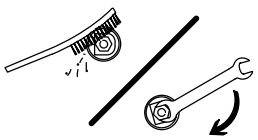
**3 Months**

Replace unreadable labels.


Repair or replace cracked weld cable.

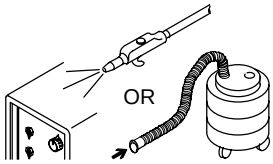


Clean and tighten weld terminals.

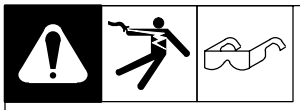


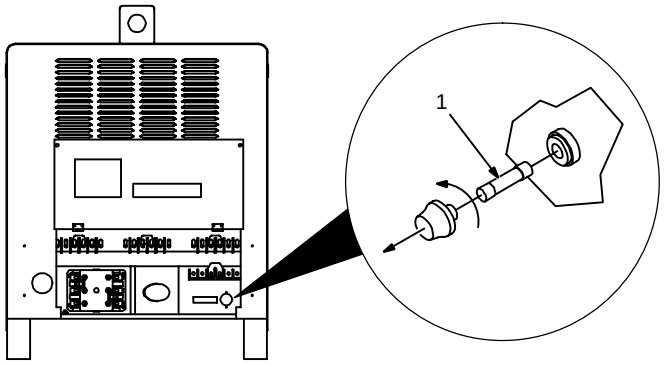
**6 Months**

Blow out or vacuum inside. During heavy service, clean monthly.



## 5-2. Fuse F1



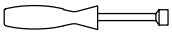



▲ **Turn Off power before opening rear access door.**

1 Fuse F1 (See Parts List For Rating)

Fuse F1 protects control transformer from overload. If F1 opens, weld output and fan motor stops. Replace F1.

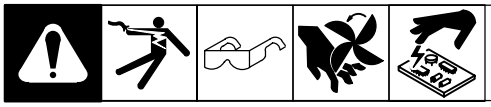
Tools Needed:



3/8 in

Ref. ST-800 101-C

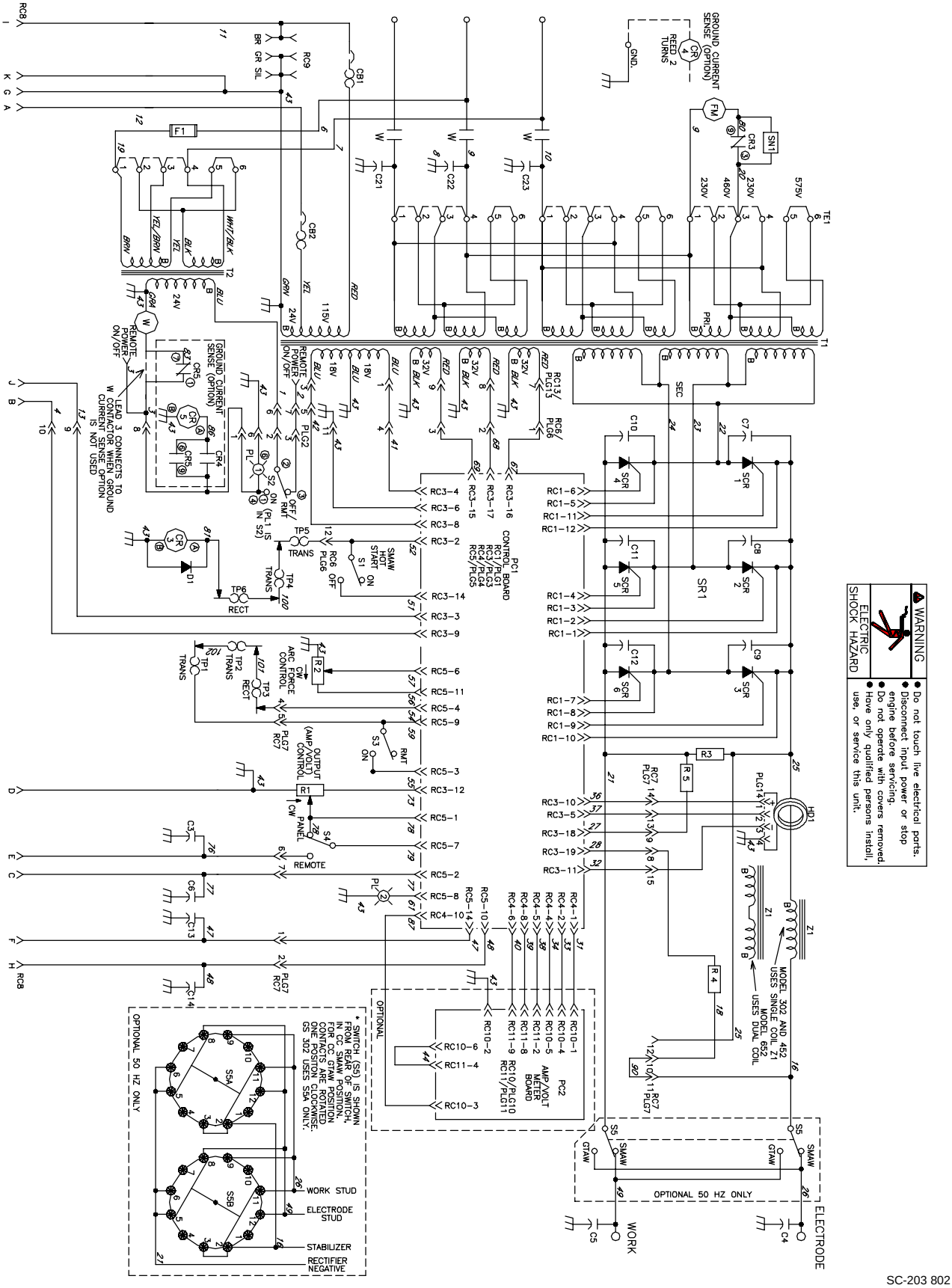
## 5-3. Troubleshooting



| Trouble | Remedy |
|---|---|
| No weld output; unit completely inoperative. | Place line disconnect switch in On position (see Section 3-13). |
| | Check fuse F1, and replace if necessary (see Section 5-2). |
| | Check and replace line fuse(s), if necessary, or reset circuit breaker (see Section 3-13). |
| | Check for proper input power connections (see Section 3-13). |
| | Check for proper jumper link position (see Section 3-12). |
| No weld output; Power switch pilot light on; fan on. | If using remote control, place Output (Contactor) switch in Remote 14 position, and connect remote control (see Section 3-10). If remote is not being used, place switch in On position. |
| | Check, repair, or replace remote control. |
| | Unit overheated. Allow unit to cool with fan On (see Section 3-2). |
| | Have Factory Authorized Service Agent check control board PC1. |
| Unit provides only maximum or minimum weld output. | Have Factory Authorized Service Agent check control board PC1 and hall device HD1. |
| Erratic or improper weld output. | Use proper size and type of weld cable (see Section 3-8). |
| | Clean and tighten all weld connections. |
| | Check position of Polarity selector switch (see Section 4-1). |
| | Have Factory Authorized Service Agent check control board PC1 and hall device HD1. |
| No 115 volts ac output at duplex receptacle, Remote 14 receptacle, or terminal strip 1T. | Reset circuit breaker CB1 (see Section 3-7). |
| No 24 volts ac output at Remote 14 receptacle, or terminal strip 1T. | Reset circuit breaker CB2 (see Section 3-7). |
| Fan not operating. NOTE: fan only runs when cooling is necessary. | Check for and remove anything blocking fan movement. |
| | Have Factory Authorized Service Agent check fan motor. |

# SECTION 6 – ELECTRICAL DIAGRAM

For Primary Circuit Diagram Portion, refer to Circuit Diagram located inside wrapper of welding power source.




SC-203 802

**Figure 6-1. Circuit Diagram**

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

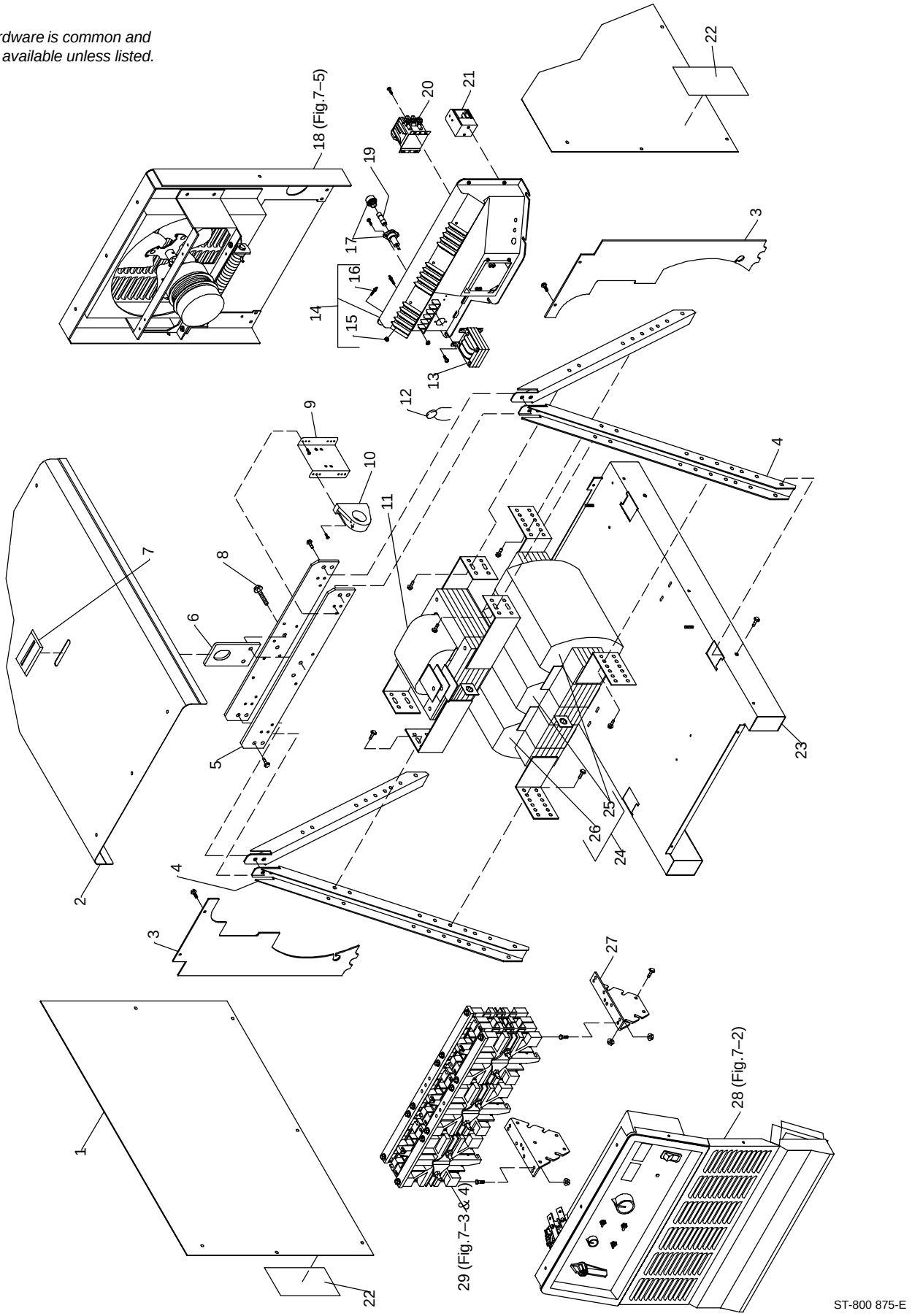



**Figure 7-1. Main Assembly (452 Model Illustrated)**

| Item No. | Dia. Mkgs. | Part No. | Description | Quantity Model 302 | 452 | 652 |
|---|---|---|---|---|---|---|

**Figure 7-1. Main Assembly**

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | | +179 430 | PANEL, side | 2 | | |
| 1 | | +179 432 | PANEL, side | | 2 | 2 |
| 2 | | 179 429 | COVER, top | 1 | | |
| 2 | | 179 431 | COVER, top | | 1 | 1 |
| 3 | | 164 699 | BAFFLE, air | 2 | 2 | |
| 3 | | 164 700 | BAFFLE, air | | | 2 |
| 4 | | 162 816 | CHANNEL, upright | 4 | 4 | 4 |
| 5 | | 162 820 | BAR, mtg lift eye | 2 | 2 | 2 |
| 6 | | 162 830 | LIFT EYE | 1 | 1 | 1 |
| 7 | | 177 279 | GASKET, lift eye | 1 | 1 | 1 |
| 8 | | 604 536 | SCREW, .312-18 x 1.75 hexhd-pln gr 5 | 2 | 2 | 2 |
| 9 | | 173 605 | BRACKET, mtg LEM | 1 | 1 | 1 |
| 10 | HD1 | 168 829 | TRANSDUCER, current 300A module | 1 | 1 | 1 |
| | PLG14 | 115 094 | CONNECTOR & SOCKETS | 1 | 1 | 1 |
| 11 | Z1 | 165 612 | STABILIZER | 1 | | |
| 11 | Z1 | 165 613 | STABILIZER | | 1 | |
| 11 | Z1 | 180 064 | STABILIZER | | | 1 |
| | | 164 717 | BUS BAR, stabilizer | | | 1 |
| 12 | C21-23 | 163 906 | CAPACITOR, 60 and 50 Hz | 3 | 3 | 3 |
| 13 | T2 | 159 042 | TRANSFORMER, control 50VA 24V 230/460/575 (60Hz) | 1 | 1 | 1 |
| 13 | T2 | 159 041 | TRANSFORMER, control 50VA 24V 200/230/460 (60Hz) | | 1 | |
| 13 | T2 | 159 043 | TRANSFORMER, control 50VA 24V (50Hz) | 1 | 1 | 1 |
| 14 | TE1 | 159 244 | PRIMARY BOX, (consisting of) | 1 | 1 | 1 |
| 15 | | 601 835 | NUT, 10-32 brs | 24 | 24 | 24 |
| 16 | | 038 887 | STUD, pri bd brs 10-32 x 1.375 | 24 | 24 | 24 |
| | | 010 913 | WASHER, flat .218 ID brs | 24 | 24 | 24 |
| | | 601 835 | NUT, 10-32 brs | 24 | 24 | 24 |
| | | 038 618 | LINK, jumper term bd pri | 8 | 8 | 8 |
| 17 | | 159 034 | HOLDER, fuse mintr | 1 | 1 | 1 |
| 18 | | Fig 7-5 | PANEL, rear w/components | 1 | 1 | 1 |
| 19 | F1 | *156 065 | FUSE, crtg .5A 600V time delay | 1 | 1 | 1 |
| 20 | W | 160 760 | CONTACTOR, def prp 40A 3P 24VAC | 1 | | |
| 20 | W | 160 793 | CONTACTOR, def prp 60A 3P 24VAC | | 1 | |
| 20 | W | 160 794 | CONTACTOR, def prp 75A 3P 24V | | | 1 |
| 21 | CR4 | ♦140 750 | SWITCH, reed | 1 | 1 | 1 |
| 22 | | 134 464 | LABEL, warning general precautionary | 2 | 2 | 2 |
| 23 | | 163 533 | BASE | 1 | | |
| 23 | | 163 359 | BASE | | 1 | 1 |
| 24 | T1 | 189 850 | TRANSFORMER, pwr main 200/230/460 (consisting of) | 1 | | |
| 25 | | 165 234 | COIL, pri/sec 200/230/460 (center & RH) | 2 | | |
| 26 | | 165 235 | COIL, pri/sec 200/230/460 (LH) | 1 | | |
| 24 | T1 | 189 851 | TRANSFORMER, pwr main 230/460/575 (consisting of) | 1 | | |
| 25 | | 172 209 | COIL, pri/sec 230/460/575 (center & RH) | 2 | | |
| 26 | | 172 208 | COIL, pri/sec 230/460/575 (LH) | 1 | | |
| 24 | T1 | 189 853 | TRANSFORMER, pwr main 200/230/460 (consisting of) | | 1 | |
| 25 | | 165 232 | COIL, pri/sec 200/230/460 (center & RH) | | 2 | |
| 26 | | 165 233 | COIL, pri/sec 200/230/460 (LH) | | 1 | |
| 24 | T1 | 189 854 | TRANSFORMER, pwr main 230/460/575 (consisting of) | | 1 | |
| 25 | | 172 215 | COIL, pri/sec 230/460/575 (center & RH) | | 2 | |
| 26 | | 172 214 | COIL, pri/sec 230/460/575 (LH) | | 1 | |
| 24 | T1 | 189 856 | TRANSFORMER, pwr main 230/460/575 (consisting of) | | | 1 |
| 25 | | 172 221 | COIL, pri/sec 230/460/575 (center & RH) | | | 2 |
| 26 | | 172 220 | COIL, pri/sec 230/460/575 (LH) | | | 1 |
| 24 | T1 | 189 852 | TRANSFORMER, pwr main 380/400/440 (consisting of) | 1 | | |
| 25 | | 172 404 | COIL, pri/sec (center & RH) | 2 | | |
| 26 | | 172 405 | COIL, pri/sec (LH) | 1 | | |

| Item No. | Dia. Mkgs. | Part No. | Description | Quantity Model 302 | 452 | 652 |
|---|---|---|---|---|---|---|

**Figure 7-1. Main Assembly (Continued)**

| | | | | | | |
|---|---|---|---|---|---|---|
| 24 | T1 | 189 855 | TRANSFORMER, pwr main 380/400/440 (consisting of) | 1 | | |
| 25 | | 172 410 | COIL, pri/sec (center & RH) | 2 | | |
| 26 | | 172 409 | COIL, pri/sec (LH) | 1 | | |
| 24 | T1 | 189 858 | TRANSFORMER, pwr main 380/400/440 (consisting of) | | | 1 |
| 25 | | 172 416 | COIL, pri/sec (center & RH) | | | 2 |
| 26 | | 172 415 | COIL, pri/sec (LH) | | | 1 |
| | TP1,2 | 119 581 | THERMOSTAT, NC (Included w/T1) | 2 | 2 | 2 |
| | TP4,5 | 168 891 | THERMOSTAT, NC (Included w/T1) | 2 | 2 | 2 |
| | PLG13 | 189 873 | CONNECTOR & PINS | 1 | 1 | 1 |
| | PLG6 | 168 847 | CONNECTOR & SOCKETS | 1 | 1 | 1 |
| | RC6 | 168 845 | CONNECTOR & PINS | 1 | 1 | 1 |
| 27 | | 161 294 | BRACKET, mtg rectifier | 2 | 2 | 2 |
| 28 | | Fig 7-2 | PANEL, front w/components | 1 | 1 | 1 |
| 29 | SR1 | 175 070 | RECTIFIER, si diode (Fig 7-3) | 1 | | |
| 29 | SR1 | 192 672 | RECTIFIER, SCR main (Fig 7-4) | | 1 | |
| 29 | SR1 | 192 671 | RECTIFIER, SCR main (Fig 7-4) | | | 1 |
| | PLG7 | 152 249 | CONNECTOR & PINS | 1 | 1 | 1 |
| | RC7 | 168 846 | CONNECTOR & SOCKETS | 1 | 1 | 1 |
| | | 010 467 | CONNECTOR, clamp cable 1.250 | 1 | 1 | 1 |

+When ordering a component originally displaying a precautionary label, the label should also be ordered.
*Recommended Spare Parts.
♦Part of Option 042 983 Ground Current Sensor
**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.**

| Item No. | Dia. Mkgs. | Part No. | Description | Quantity Model 302 | 452 | 652 |
|---|---|---|---|---|---|---|

**Figure 7-2. Panel, Front w/Components (Fig 7-1 Item 28)**

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | S5 | ♦169 331 | SWITCH, mode polarity (single deck) | 1 | | |
| 1 | S5 | ♦169 332 | SWITCH, mode polarity (double deck) | 1 | 1 | |
| 2 | PC1 | 187 822 | CIRCUIT CARD, control (60Hz) | 1 | | |
| 2 | PC1 | 186 937 | CIRCUIT CARD, control (60Hz) | 1 | | |
| 2 | PC1 | 187 825 | CIRCUIT CARD, control (60Hz) | 1 | | |
| 2 | PC1 | 187 823 | CIRCUIT CARD, control (50Hz) | 1 | | |
| 2 | PC1 | 187 824 | CIRCUIT CARD, control (50Hz) | 1 | | |
| 2 | PC1 | 187 826 | CIRCUIT CARD, control (50HZ) | 1 | | |
| | PLG1 | 158 720 | CONNECTOR & SOCKETS, (see Fig 7-3 & 4) | | | |
| | PLG3 | 169 240 | CONNECTOR & SOCKETS | 1 | 1 | 1 |
| | PLG5 | 152 249 | CONNECTOR & SOCKETS | 1 | 1 | 1 |
| 3 | CR3 | 052 964 | RELAY, encl 24VDC DPDT | 1 | 1 | 1 |
| 4 | CR5 | ♦♦006 393 | RELAY, encl 24VAC DPDT | 1 | 1 | 1 |
| 5 | CB1,2 | 093 995 | CIRCUIT BREAKER, man reset 1P 15A 250VAC | 2 | 2 | 2 |
| 6 | RC9 | 604 176 | RECEPTACLE, str dx grd 2P3W 15A 125V | 1 | 1 | 1 |
| 7 | | 163 855 | CONNECTOR/CAPACITOR, w/leads (consisting of) | 1 | 1 | 1 |
| | RC8 | 143 976 | CONNECTOR & SOCKETS, (consisting of) | 1 | 1 | 1 |
| | | 079 534 | CONNECTOR, circ skt push-in 14-18ga | 14 | 14 | 14 |
| | C3 | 163 863 | LEAD ASSEMBLY, elect | 1 | 1 | 1 |
| | C6 | 163 861 | LEAD ASSEMBLY, elect | 1 | 1 | 1 |
| | C13 | 163 858 | LEAD ASSEMBLY, elect | 1 | 1 | 1 |
| | C14 | 163 857 | LEAD ASSEMBLY, elect | 1 | 1 | 1 |
| 8 | | 204143 | PANEL, front | 1 | 1 | 1 |

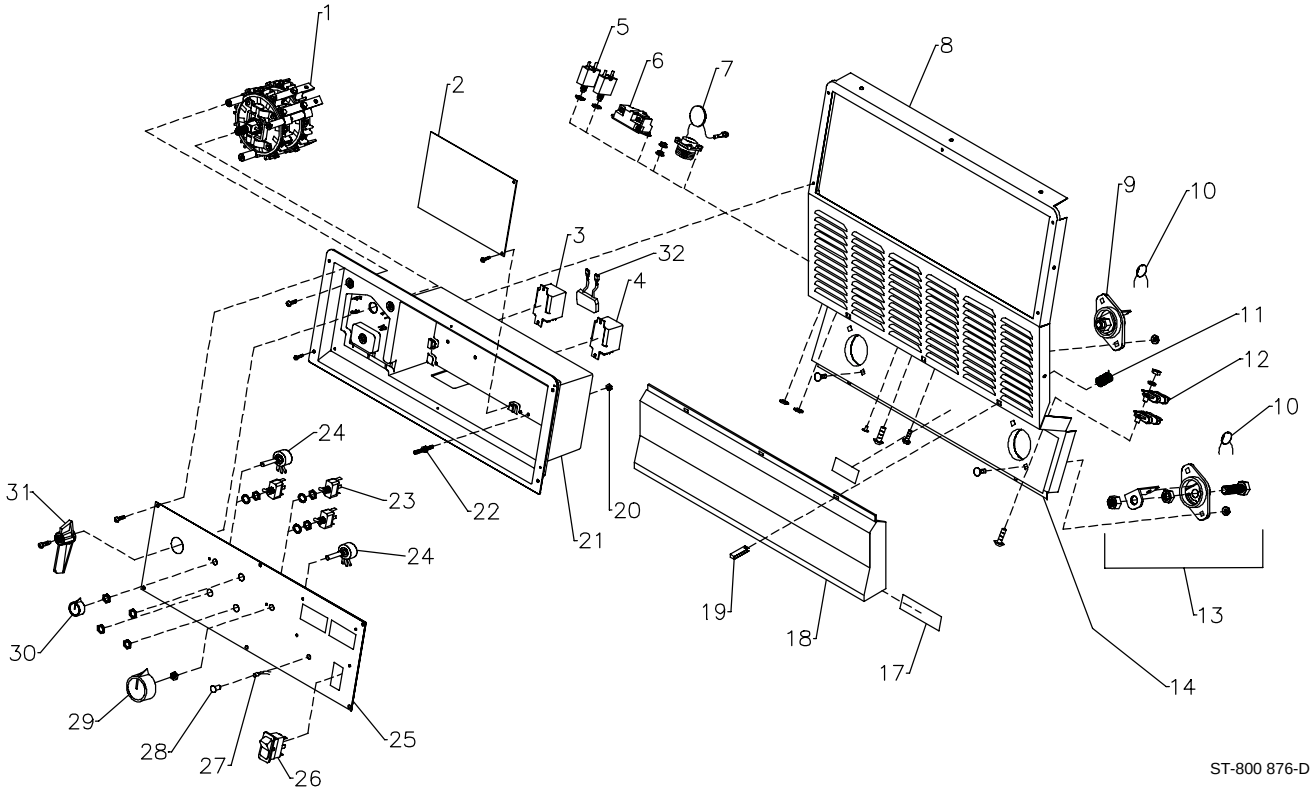



**Figure 7-2. Panel, Front w/Components (452 Model Illustrated)**

| Item No. | Dia. Mkgs. | Part No. | Description | Quantity Model 302 | 452 | 652 |
|---|---|---|---|---|---|---|
| | | | **Figure 7-2. Panel, Front w/Components (Fig 7-1 Item 28) (Continued)** | | | |
| 9 | POS | 181 245 | TERMINAL, pwr output red | 1 | 1 | 1 |
| 10 | C4,5 | 128 750 | CAPACITOR, cer disc .1uf 500VDC | 2 | 2 | 2 |
| 11 | | 161 303 | SPRING, cprsn .600 OD x .072 wire x 1.500 lg | 3 | 3 | 3 |
| 12 | R4,5 | 136 076 | RESISTOR, WW fxd 30W 200 ohm | 2 | 2 | 2 |
| 13 | NEG | 181 246 | TERMINAL, pwr output black | 1 | 1 | 1 |
| 14 | | 174 939 | PLATE, control lower | 1 | 1 | 1 |
| 17 | | 162 891 | LABEL, warning electric shock | 1 | 1 | 1 |
| 18 | | +172 587 | COVER, stud output | 1 | 1 | 1 |
| 19 | | 160 935 | CLIP, spring | 3 | 3 | 3 |
| 20 | | 601 835 | NUT, 10-32 brs | 2 | 2 | 2 |
| | | 010 913 | WASHER, flat .218 ID x .460 OD x .031thk brs | 1 | 1 | 1 |
| 21 | | 159 863 | ELECTRONICS BOX | 1 | 1 | 1 |
| 22 | | 038 887 | STUD, pri bd brs 10-32 x 1.375 | 1 | 1 | 1 |
| 23 | S1,3,4 | 011 609 | SWITCH, tgl SPDT 15A 125VAC | 3 | 3 | 3 |
| 24 | R1,2 | 035 897 | POTENTIOMETER, CP std slot 1/T 2W 1K ohm | 2 | 2 | 2 |
| 25 | | | NAMEPLATE, (order by model and serial number) | 1 | 1 | 1 |
| 26 | S2 | 159 039 | SWITCH, rocker SPDT 15A 125VAC | 1 | 1 | 1 |
| | PLG2 | 185 626 | CONNECTOR, body 56 series | 1 | 1 | 1 |
| 27 | PL2 | 159 522 | LED, yellow | 1 | 1 | 1 |
| 28 | | 159 036 | LENS, LED clear | 1 | 1 | 1 |
| 29 | | 097 924 | KNOB, pointer | 1 | 1 | 1 |
| 30 | | 097 922 | KNOB, pointer | 1 | 1 | 1 |
| 31 | | ♦148 956 | HANDLE, switch | 1 | 1 | 1 |
| 32 | SN1 | ♦197 868 | SNUBBER, assy | 1 | 1 | 1 |
| | | ♦♦♦043 812 | DIGITAL METER KIT, (consisting of) | 1 | 1 | 1 |
| | PC2 | 178 134 | CIRCUIT CARD, digital meter | 1 | 1 | 1 |
| | PLG4,11 | 148 439 | CONNECTOR & SOCKETS | 2 | 2 | 2 |
| | PLG10 | 153 501 | CONNECTOR & SOCKETS | 1 | 1 | 1 |
| | | 192 174 | STAND-OFF | 4 | 4 | 4 |

♦Standard w/60 Hz/Optional w/50 Hz

♦♦Part of Option 042 983 Ground Current Sensor

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

♦♦♦Optional

**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.**

| Item No. | Dia. Mkgs. | Part No. | Description | Quantity |
|---|---|---|---|---|
| | **SR1** | **175 070** | **Figure 7-3. Rectifier, Si Diode (302 Model) (Fig 7-1 Item 29)** | |
| 1 | C7-12 | 048 420 | CAPACITOR, cer disc .01uf 1000VDC | 6 |
| 2 | | 177 316 | HEAT SINK, rect | 3 |
| 3 | | 177 317 | HEAT SINK, rect | 2 |
| 4 | | 166 667 | CLAMP, thyristor rect | 3 |
| 5 | TP3 | 185 679 | THERMOSTAT, NC | 1 |
| 6 | TP6 | 185 680 | THERMOSTAT, NC | 1 |
| 7 | SCR1-6 | 161 668 | THYRISTOR, SCR 300A 300V hockey puck | 6 |
| | PLG1 | 158 720 | CONNECTOR & SOCKETS | 1 |
| 8 | | 188 692 | CLAMP, thyristor rectifier 4.250 | 3 |

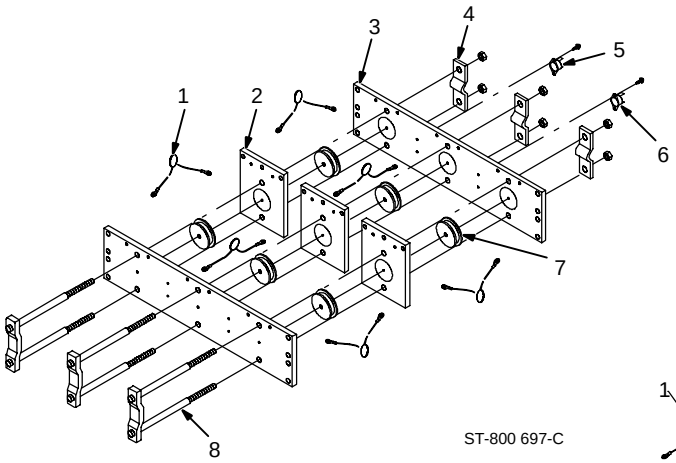



**Figure 7-3. Rectifier, Si Diode SR1 (302 Model)**

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

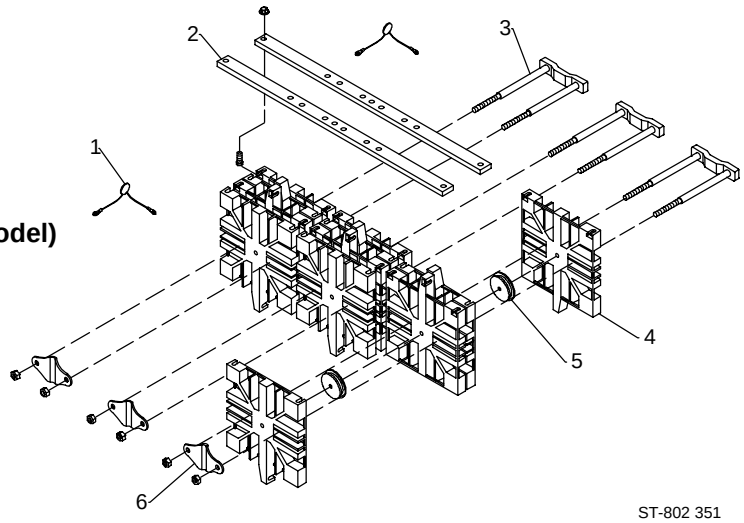



**Figure 7-4. Rectifier, SCR Main SR1 (452 & 652 Model)**

| Item No. | Dia. Mkgs. | Part No. | Description | Quantity | |
|---|---|---|---|---|---|
| | **SR1** | | **Figure 7-4. Rectifier, SCR Main (452 & 652 Model) (Fig 7-1 Item 29)** | 192 672 | 192 671 |
| 1 | C7-12 | 048 420 | CAPACITOR, cer disc .01uf 1000VDC | 6 | 6 |
| 2 | | 191 989 | BAR, mtg rectifier | 2 | 2 |
| 3 | | 188 691 | CLAMP, thyristor rectifier 5.375 | 3 | 3 |
| 4 | | 188 839 | HEAT SINK, rectifier snowflake .800 | 12 | 12 |
| 5 | SCR1-6 | 161 668 | THYRISTOR, SCR 300A 300V hockey puck | 6 | |
| 5 | SCR1-6 | 148 091 | THYRISTOR, SCR 865A 300V hockey puck | | 6 |
| 6 | | 166 667 | CLAMP, spring thyristor rectifier 5.500 | 3 | 3 |
| | PLG1 | 158 720 | CONNECTOR & SOCKETS | 1 | 1 |
| | TP3 | 192 673 | THERMOSTAT, rectifier | 1 | 1 |
| | TP6 | 192 674 | THERMOSTAT, rectifier | 1 | 1 |

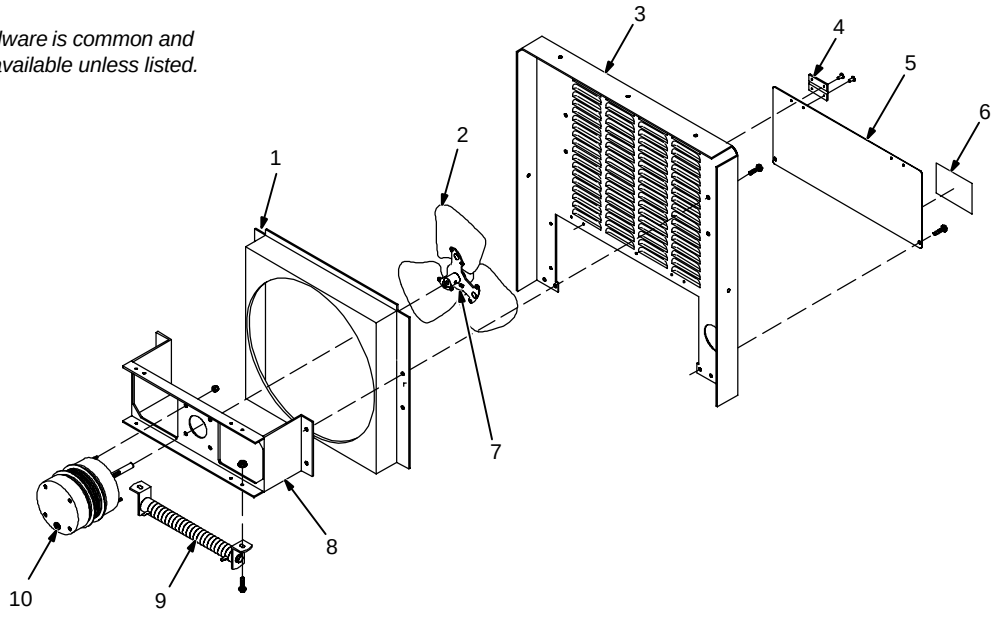
**To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.**

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

**Figure 7-5. Panel, Rear w/Components (Fig 7-1 Item 18)**

| | | | | |
|---|---|---|---|---|
| 1 | | 173 283 | CHAMBER, plenum 14 in | 1 |
| 2 | | 180 165 | BLADE, fan 14 in 3wg 23deg .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 | | 168 384 | LABEL, warning electric shock | 1 |
| 7 | | 602 177 | SCREW, set .250-20 x .250knrlpt sch stl | 2 |
| 8 | | 124 274 | BRACKET, mtg fan motor | 1 |
| 9 | R3 | 097 459 | RESISTOR, WW fxd 375W 20 ohm | 1 |
| 10 | FM | 116 190 | MOTOR, 1/12HP 230V 1550RPM 50/60Hz 1.5A | 1 |
| | | 010 467 | CONNECTOR, clamp cable 1.250 | 1 |

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




ST-800 707-A

**Figure 7-5. Panel, Rear w/Components**

+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.**

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HOBART WELDERS

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## Effective January 1, 2001
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1. 5 Years Parts – 3 Years Labor
   * Original main power rectifiers
   * Inverters (input and output rectifiers only)
2. 3 Years — Parts and Labor
   * Transformer/Rectifier Power Sources
   * Plasma Arc Cutting Power Sources
   * Semi-Automatic and Automatic Wire Feeders
   * Inverter Power Supplies
   * Intellitig
   * Engine Driven Welding Generators **(NOTE: Engines are warranted separately by the engine manufacturer.)**
3. 1 Year — Parts and Labor
   * DS-2 Wire Feeder
   * Motor Driven Guns (w/exception of Spoolmate Spoolguns)
   * Process Controllers
   * Positioners and Controllers
   * Automatic Motion Devices
   * RFCS Foot Controls
   * Induction Heating Power Sources
   * Water Coolant Systems
   * HF Units
   * Grids
   * Maxstar 140
   * Spot Welders
   * Load Banks
   * Hobart Cyclomatic Equipment
   * 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.)
4. 6 Months — Batteries
5. 90 Days — Parts
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   * Canvas Covers

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2. Items furnished by Hobart, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
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Purchase Date (Date which equipment was delivered to original customer.)

Distributor

Address

City

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