

INSTRUCTION MANUAL

652cvcc & 782cvcc

DC WELDING POWER SOURCES



This manual provides complete instructions for the following power sources starting with Serial No. M0R1603036, January 1996:

- ESAB ITEM NO. 36004 - 652cvcc - 230/460 vac, 3 ph., 60 Hz
- * ESAB ITEM NO. 36014 - 782cvcc - 230/460 vac, 3ph., 60 Hz
- ESAB ITEM NO. 36006 - 652cvcc - 230/460/575 vac, 3 ph., 60 Hz
- ESAB ITEM NO. 36005 - 782cvcc - 220/400 vac, 3 ph., 50 Hz
- ESAB ITEM NO. 36018 - 782cvcc - 220/400 vac, 3 ph., 50 Hz CE Label
- ESAB ITEM NO. 36856 - 782cvcc - 220/400 vac, 3 ph., 60 Hz

* Manufactured for export service only.

NOTE: 652cvcc and 782cvcc were originally called V 652cvcc and V 782cvcc respectively.

CAUTION

These INSTRUCTIONS are for experienced operators. If you are not fully familiar with the principles of operation and safe practices for arc welding equipment, we urge you to read our booklet, "Precautions and Safe Practices for Arc Welding, Cutting, and Gouging," Form 52-529. Do NOT permit untrained persons to install, operate, or maintain this equipment. Do NOT attempt to install or operate this equipment until you have read and fully understand these instructions. If you do not fully understand these instructions, contact your supplier for further information. Be sure to read the Safety Precautions before installing or operating this equipment.

**Be sure this information reaches the operator.
You can get extra copies through your supplier.**



**ESAB Welding &
Cutting Products**

USER RESPONSIBILITY

This equipment will perform in conformity with the description thereof contained in this manual and accompanying labels and/or inserts when installed, operated, maintained and repaired in accordance with the instructions provided. This equipment must be checked periodically. Malfunctioning or poorly maintained equipment should not be used. Parts that are broken, missing, worn, distorted or contaminated should be replaced immediately. Should such repair or replacement become necessary, the manufacturer recommends that a telephone or written request for service advice be made to the Authorized Distributor from whom it was purchased.

This equipment or any of its parts should not be altered without the prior written approval of the manufacturer. The user of this equipment shall have the sole responsibility for any malfunction which results from improper use, faulty maintenance, damage, improper repair or alteration by anyone other than the manufacturer or a service facility designated by the manufacturer.

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SAFETY PRECAUTIONS



WARNING: These Safety Precautions are for your protection. They summarize precautionary information from the references listed in Additional Safety Information section. Before performing any installation or operating procedures, be sure to read and follow the safety precautions listed below as well as all other manuals, material safety data sheets, labels, etc. Failure to observe Safety Precautions can result in injury or death.



PROTECT YOURSELF AND OTHERS -- Some welding, cutting, and gouging processes are noisy and require ear protection. The arc, like the sun, emits ultraviolet (UV) and other radiation and can injure skin and eyes. Hot metal can cause burns. Training in the proper use of the processes and equipment is essential to prevent accidents. Therefore:

1. Always wear safety glasses with side shields in any work area, even if welding helmets, face shields, and goggles are also required.
2. Use a face shield fitted with the correct filter and cover plates to protect your eyes, face, neck, and ears from sparks and rays of the arc when operating or observing operations. Warn bystanders not to watch the arc and not to expose themselves to the rays of the electric-arc or hot metal.
3. Wear flameproof gauntlet type gloves, heavy long-sleeve shirt, cuffless trousers, high-topped shoes, and a welding helmet or cap for hair protection, to protect against arc rays and hot sparks or hot metal. A flameproof apron may also be desirable as protection against radiated heat and sparks.
4. Hot sparks or metal can lodge in rolled up sleeves, trouser cuffs, or pockets. Sleeves and collars should be kept buttoned, and open pockets eliminated from the front of clothing
5. Protect other personnel from arc rays and hot sparks with a suitable non-flammable partition or curtains.
6. Use goggles over safety glasses when chipping slag or grinding. Chipped slag may be hot and can fly far. Bystanders should also wear goggles over safety glasses.



FIRES AND EXPLOSIONS -- Heat from flames and arcs can start fires. Hot slag or sparks can also cause fires and explosions. Therefore:

1. Remove all combustible materials well away from the work area or cover the materials with a protective non-flammable covering. Combustible materials include wood, cloth, sawdust, liquid and gas fuels, solvents, paints and coatings, paper, etc.
2. Hot sparks or hot metal can fall through cracks or crevices in floors or wall openings and cause a hidden smoldering fire or fires on the floor below. Make certain that such openings are protected from hot sparks and metal.
3. Do not weld, cut or perform other hot work until the workpiece has been completely cleaned so that there are no substances on the workpiece which might produce flammable or toxic vapors. Do not do hot work on closed containers. They may explode.
4. Have fire extinguishing equipment handy for instant use, such as a garden hose, water pail, sand bucket, or portable fire extinguisher. Be sure you are trained in its use.

5. Do not use equipment beyond its ratings. For example, overloaded welding cable can overheat and create a fire hazard.
6. After completing operations, inspect the work area to make certain there are no hot sparks or hot metal which could cause a later fire. Use fire watchers when necessary.
7. For additional information, refer to NFPA Standard 51B, "Fire Prevention in Use of Cutting and Welding Processes", available from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.



ELECTRICAL SHOCK -- Contact with live electrical parts and ground can cause severe injury or death. DO NOT use AC welding current in damp areas, if movement is confined, or if there is danger of falling.

1. Be sure the power source frame (chassis) is connected to the ground system of the input power.
2. Connect the workpiece to a good electrical ground.
3. Connect the work cable to the workpiece. A poor or missing connection can expose you or others to a fatal shock.
4. Use well-maintained equipment. Replace worn or damaged cables.
5. Keep everything dry, including clothing, work area, cables, torch/electrode holder, and power source.
6. Make sure that all parts of your body are insulated from work and from ground.
7. Do not stand directly on metal or the earth while working in tight quarters or a damp area; stand on dry boards or an insulating platform and wear rubber-soled shoes.
8. Put on dry, hole-free gloves before turning on the power.
9. Turn off the power before removing your gloves.
10. Refer to ANSI/ASC Standard Z49.1 (listed on next page) for specific grounding recommendations. Do not mistake the work lead for a ground cable.



ELECTRIC AND MAGNETIC FIELDS -- May be dangerous. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding and cutting current creates EMF around welding cables and welding machines. Therefore:

1. Welders having pacemakers should consult their physician before welding. EMF may interfere with some pacemakers.
2. Exposure to EMF may have other health effects which are unknown.
3. Welders should use the following procedures to minimize exposure to EMF:
 - A. Route the electrode and work cables together. Secure them with tape when possible.
 - B. Never coil the torch or work cable around your body.
 - C. Do not place your body between the torch and work cables. Route cables on the same side of your body.
 - D. Connect the work cable to the workpiece as close as possible to the area being welded.
 - E. Keep welding power source and cables as far away from your body as possible.

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FUMES AND GASES -- Fumes and gases, can cause discomfort or harm, particularly in confined spaces. Do not breathe fumes and gases. Shielding gases can cause phyxiation. Therefore:

1. Always provide adequate ventilation in the work area by natural or mechanical means. Do not weld, cut, or gouge on materials such as galvanized steel, stainless steel, copper, zinc, lead, beryllium, or cadmium unless positive mechanical ventilation is provided. Do not breathe fumes from these materials.
2. Do not operate near degreasing and spraying operations. The heat or arc rays can react with chlorinated hydrocarbon vapors to form phosgene, a highly toxic gas, and other irritant gases.
3. If you develop momentary eye, nose, or throat irritation while operating, this is an indication that ventilation is not adequate. Stop work and take necessary steps to improve ventilation in the work area. Do not continue to operate if physical discomfort persists.
4. Refer to ANSI/ASC Standard Z49.1 (see listing below) for specific ventilation recommendations.
5. **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 §25249.5 et seq.)**

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CYLINDER HANDLING -- Cylinders, mishandled, can rupture and violently release gas. Sudden rupture cylinder, valve, or relief device can injure or kill. Therefore:

1. Use the proper gas for the process and use the proper pressure reducing regulator designed to operate from the compressed gas cylinder. Do not use adaptors. Maintain hoses and fittings in good condition. Follow manufacturer's operating instructions for mounting regulator to a compressed gas cylinder.
2. Always secure cylinders in an upright position by chain or strap to suitable hand trucks, undercarriages, benches, walls, post, or racks. Never secure cylinders to work tables or fixtures where they may become part of an electrical circuit.
3. When not in use, keep cylinder valves closed. Have valve protection cap in place if regulator is not connected. Secure and move cylinders by using suitable hand trucks. Avoid rough handling of cylinders.
4. Locate cylinders away from heat, sparks, and flames. Never strike an arc on a cylinder.
5. For additional information, refer to CGA Standard P-1, "Precautions for Safe Handling of Compressed Gases in Cylinders", which is available from Compressed Gas Association, 1235 Jefferson Davis Highway, Arlington, VA 22202.



EQUIPMENT MAINTENANCE -- Faulty or improperly maintained equipment can cause injury or death. Therefore:

1. Always have qualified personnel perform the installation, troubleshooting, and maintenance work. Do not perform any electrical work unless you are qualified to perform such work.
2. Before performing any maintenance work inside a power source, disconnect the power source from the incoming electrical power.
3. Maintain cables, grounding wire, connections, power cord, and power supply in safe working order. Do not operate any equipment in faulty condition.
4. Do not abuse any equipment or accessories. Keep equipment away from heat sources such as furnaces, wet conditions such as water puddles, oil or grease, corrosive atmospheres and inclement weather.
5. Keep all safety devices and cabinet covers in position and in good repair.
6. Use equipment only for its intended purpose. Do not modify it in any manner.



ADDITIONAL SAFETY INFORMATION -- For more information on safe practices for electric arc welding and cutting equipment, ask your supplier for a copy of "Precautions and Safe Practices for Arc Welding, Cutting and Gouging", Form 52-529.

The following publications, which are available from the American Welding Society, 550 N.W. LeJuene Road, Miami, FL 33126, are recommended to you:

1. ANSI/ASC Z49.1 - "Safety in Welding and Cutting"
2. AWS C5.1 - "Recommended Practices for Plasma Arc Welding"
3. AWS C5.2 - "Recommended Practices for Plasma Arc Cutting"
4. AWS C5.3 - "Recommended Practices for Air Carbon Arc Gouging and Cutting"
5. AWS C5.5 - "Recommended Practices for Gas Tungsten Arc Welding"
6. AWS C5.6 - "Recommended Practices for Gas Metal Arc Welding"
7. AWS SP - "Safe Practices" - Reprint, Welding Handbook.
8. ANSI/AWS F4.1, "Recommended Safe Practices for Welding and Cutting of Containers That Have Held Hazardous Substances."



MEANING OF SYMBOLS - As used throughout this manual: Means Attention! Be Alert! Your safety is involved.



Means immediate hazards which, if not avoided, will result in immediate, serious personal injury or loss of life.



Means potential hazards which could result in personal injury or loss of life.



Means hazards which could result in minor personal injury.

PRÉCAUTIONS DE SÉCURITÉ

AVERTISSEMENT: Ces règles de sécurité ont pour objet d'assurer votre protection. Veuillez à lire et à observer les précautions énoncées ci-dessous avant de monter l'équipement ou de commencer à l'utiliser. Tout défaut d'observation de ces précautions risque d'entraîner des blessures graves ou mortelles.

1. **PROTECTION INDIVIDUELLE**-- Les brûlures de la peau et des yeux dues au rayonnement de l'arc électrique ou du métal incandescent, lors du soudage au plasma ou à l'électrode ou lors du gougeage à l'arc, peuvent s'avérer plus graves que celles résultant d'une exposition prolongée au soleil. Aussi convient-il d'observer les précautions suivantes:

a. Portez un écran facial adéquat muni des plaques protectrices et des verres filtrants appropriés afin de vous protéger les yeux, le visage, le cou et les oreilles des étincelles et du rayonnement de l'arc électrique lorsque vous effectuez des soudures ou des coupes ou lorsque vous en observez l'exécution.

AVERTISSEZ les personnes se trouvant à proximité de façon à ce qu'elles ne regardent pas l'arc et à ce qu'elles ne s'exposent pas à son rayonnement, ni à celui du métal incandescent.

b. Portez des gants ignifugés à crispins, une tunique épaisse à manches longues, des pantalons sans rebord, des chaussures à embout d'acier et un casque de soudage ou une calotte de protection, afin d'éviter d'exposer la peau au rayonnement de l'arc électrique ou du métal incandescent. Il est également souhaitable d'utiliser un tablier ininflammable de façon à se protéger des étincelles et du rayonnement thermique.

c. Les étincelles ou les projections de métal incandescent risquent de se loger dans des manches retroussées, des bords relevés de pantalons ou dans des poches. Aussi convient-il de garder boutonnés le col et les manches et de porter des vêtements sans poches à l'avant.

d. Protégez des étincelles et du rayonnement de l'arc électrique les autres personnes travaillant à proximité à l'aide d'un écran ininflammable adéquat.

e. Ne jamais omettre de porter des lunettes de sécurité lorsque vous vous trouvez dans un secteur où l'on effectue des opérations de soudage ou de coupage à l'arc. Utilisez des lunettes de sécurité à écrans ou verres latéraux pour piquer ou meûler le laitier. Les piquetures incandescentes de laitier peuvent être projetées à des distances considérables. Les personnes se trouvant à proximité doivent également porter des lunettes de protection.

f. Le gougeage à l'arc et le soudage à l'arc au plasma produisent un niveau de bruit extrêmement élevé (de 100 à 114 dB) et exigent par conséquent l'emploi de dispositifs appropriés de protection auditive.

2. **PRÉVENTION DES INCENDES**-- Les projections de laitier incandescent ou d'étincelles peuvent provoquer de graves incendies au contact de matériaux combustibles solides, liquides ou gazeux. Aussi faut-il observer les précautions suivantes:

a. Éloigner suffisamment tous les matériaux combustibles du secteur où l'on exécute des soudures ou des coupes à l'arc, à moins de les recouvrir complètement d'une bâche non-inflammable. Ce type de matériaux comprend notamment le bois, les vêtements, la sciure, l'essence, le kérosène, les peintures, les solvants, le gaz naturel, l'acétylène, le propane et autres substances combustibles semblables.

b. Les étincelles ou les projections de métal incandescent peuvent tomber dans des fissures du plancher ou dans des ouvertures des murs et y déclencher une ignition lente cachée. Veiller à protéger ces ouvertures des étincelles et des projections de métal.

c. N'exécutez pas de soudures, de coupes, d'opérations de gougeage ou autres travaux à chaud à la surface de barils, bidons, réservoirs ou autres contenants usagés, avant de les avoir nettoyés de toute trace de substance susceptible de produire des vapeurs inflammables ou toxiques.

d. En vue d'assurer la prévention des incendies, il convient de disposer d'un matériel d'extinction prêt à servir immédiatement, tel qu'un tuyau d'arrosage, un seau à eau, un seau de sable ou un extincteur portatif.

e. Une fois le travail à l'arc terminé, inspectez le secteur de façon à vous assurer qu'aucune étincelle ou projection de métal incandescent ne risque de provoquer ultérieurement un feu.

3. **CHOC ÉLECTRIQUE**-- Le gougeage à l'arc et à l'arc au plasma exige l'emploi de tensions à vide relativement importantes; or, celles-ci risquent de causer des dommages corporels graves et même mortels en cas d'utilisation inadéquate. La gravité du choc électrique reçu dépend du chemin suivi par le courant à travers le corps humain et de son intensité.

a. Ne laissez jamais de surfaces métalliques sous tension venir au contact direct de la peau ou de vêtements humides. Veillez à porter des gants bien secs.

b. Si vous devez effectuer un travail sur une surface métallique ou dans un secteur humide, veillez à assurer votre isolation corporelle en portant des gants secs et des chaussures à semelles de caoutchouc et en vous tenant sur une planche ou une plate-forme sèche.

c. Mettez toujours à la terre le poste de soudage/coupage en le reliant par un câble à une bonne prise de terre.

d. N'utilisez jamais de câbles usés ou endommagés. Ne surchargez jamais le câble. Utilisez toujours un équipement correctement entretenu.

e. Mettez l'équipement hors tension lorsqu'il n'est pas en service. une mise à la masse accidentelle peut en effet provoquer une surchauffe de l'équipement et un danger d'incendie. Ne pas enrôler ou passer le câble autour d'une partie quelconque du corps.

f. Vérifiez si le câble de masse est bien relié à la pièce en un point aussi proche que possible de la zone de travail. Le branchement des câbles de masse à l'ossature du bâtiment ou en un point éloigné de la zone de travail augmente en effet le risque de passage d'un courant de sortie par des chaînes delevage

- des câbles de grue ou divers chemins électriques.
- g. Empêchez l'apparition de toute humidité, notamment sur vos vêtements, à la surface de l'emplacement de travail, des câbles, du porte-électrode et du poste de soudage/coupage. Réparez immédiatement toute fuite d'eau.
4. VENTILATION-- La respiration prolongée des fumées résultant des opérations de soudage/coupage, à l'intérieur, d'un local clos, peut provoquer des maux et des dommages corporels. Aussi convient-il d'observer les précautions suivantes:
- a. Assurez en permanence une aération adéquate de l'emplacement de travail en maintenant une ventilation naturelle ou à l'aide de moyens mécaniques. N'effectuez jamais de travaux de soudage ou de coupage sur des matériaux de zinc, de plomb, de beryllium ou de cadmium en l'absence de moyens mécaniques de ventilation capables d'empêcher l'inhalation des fumées dégagées par ces matériaux.
- b. N'effectuez jamais de travaux de soudage ou de coupage à proximité de vapeurs d'hydrocarbure chloré résultant d'opérations voisines de dégraissage ou de pulvérisation. La chaleur dégagée ou le rayonnement de l'arc peut déclencher la formation de phosgène -- gaz particulièrement toxique -- et d'autres gaz irritants, à partir des vapeurs de solvant.
- c. Une irritation momentanée des yeux, du nez ou de la gorge constatée au cours de l'utilisation de l'équipement dénote un défaut de ventilation. Arrêtez-vous de travailler afin de prendre les mesures nécessaires à l'amélioration de la ventilation. Ne poursuivez pas l'opération entreprise si le malaise persiste.
- d. Certaines commandes comportent des canalisations où circule de l'hydrogène. L'armoire de commande est munie d'un ventilateur destiné à empêcher la formation de poches d'hydrogène, lesquelles présentent un danger d'explosion; ce ventilateur ne fonctionne que si l'interrupteur correspondant du panneau avant se trouve placé en position ON (Marche). Veillez à manœuvrer cette commande en vérifiant si le couvercle est bien en place, de façon à assurer l'efficacité de la ventilation ainsi réalisée. Ne jamais débrancher le ventilateur.
- e. Les fumées produites par l'opération de soudage ou de coupage peuvent s'avérer toxiques. Aussi est-il nécessaire de disposer en permanence d'un dispositif adéquat de ventilation de type aspirant, afin d'éliminer du voisinage de l'opérateur tout dégagement de fumée visible.
- f. Consultez les recommandations particulières en matière de ventilation indiquées à l'alinéa 6 de la norme Z49.1 de l'AWS.
5. ENTRETIEN DE L'ÉQUIPEMENT-- Un équipement entretenu de façon défectueuse ou inadéquate risque non seulement de réaliser un travail de mauvaise qualité mais, chose plus grave encore, d'entraîner

- des dommages corporels graves, voire mortels en déclenchant des incendies ou des chocs électriques. Observez par conséquent les précautions suivantes:
- a. Efforcez-vous de toujours confier à un personnel qualifié l'installation, le dépannage et l'entretien du poste de soudage et de coupage. N'effectuez aucune réparation électrique sur l'équipement à moins d'être qualifié à cet effet.
- b. Ne procédez jamais à une tâche d'entretien quelconque à l'intérieur du poste de soudage/coupage, avant d'avoir débranché l'alimentation électrique.
- c. Maintenez en bon état de fonctionnement les câbles, le câble de masse, les branchements, le cordon d'alimentation et le poste de soudage/coupage. N'utilisez jamais le poste ou l'équipement s'il présente une défectuosité quelconque.
- d. Prenez soin du poste de soudage et de coupage et des équipements accessoires. Gardez-les à l'écart des sources de chaleur, notamment des fours, de l'humidité, des flaques d'eau maintenez-les à l'abri des traces d'huile ou de graisse, des atmosphères corrosives et des intempéries.
- e. Laissez en place tous les dispositifs de sécurité et tous les panneaux de l'armoire de commande en veillant à les garder en bon état.
- f. Utilisez le poste de soudage/coupage conformément à son usage prévu et n'effectuez aucune modification.
6. INFORMATIONS COMPLÉMENTAIRES RELATIVES À LA SÉCURITÉ--
- Pour obtenir des informations complémentaires sur les règles de sécurité à observer pour le montage et l'utilisation d'équipements de soudage et de coupage électriques et sur les méthodes de travail recommandées, demandez un exemplaire du livret N° 52529 "Precautions and Safe Practices for Arc Welding, Cutting and Gouging" publié par ESAB. Nous conseillons également de consulter les publications suivantes, tenues à votre disposition par l'American Welding Society, 550 N.W. LeJuene Road, Miami, FL 32126:
- a. "Safety in Welding and Cutting" AWS Z49.1
- b. "Recommended Safe Practices for Gas-Shielded Arc Welding" AWS A6. 1.
- c. "Safe Practices for Welding and Cutting Containers That Have Held Combustibles" AWS-A6.0.
- d. "Recommended Safe Practices for Plasma Arc Cutting" AWS-A6. 3.
- e. "Recommended Safe Practices for Plasma Arc Welding" AWS-C5. 1.
- f. "Recommended Safe Practices for Air Carbon Arc Gouging and Cutting" AWS-C5. 3.
- g. "Code For Safety in Welding and Cutting" CSA-Standard W117. 2.

1.1 GENERAL

This manual has been prepared for use by an experienced operator. It provides information to familiarize the operator with the design, installation and operation of the 652cvcc & 782cvcc model power sources. DO NOT attempt to install or operate this equipment until you have read and fully understood these instructions. The information presented here should be given careful consideration to ensure optimum performance of this equipment.

1.2 RECEIVING-HANDLING

Upon receipt, remove all packing material and carefully inspect for any damage that may have occurred during shipment. Any claims for loss or damage that may have occurred in transit must be filed by the purchaser with the carrier. A copy of the bill of lading and freight bill will be furnished by the carrier on request.

When requesting information concerning this equipment, it is essential that Item number, Serial number and Model number of the equipment be supplied.

1.3 DESCRIPTION

The 652cvcc and 782cvcc are multi-process power sources designed for Mig short circuiting and spray transfer (GMAW), flux core (FCAW), and stick (SMAW) welding as well as submerged arc welding (SAW) and air carbon arc cutting/gouging (CAC-A) applications. Table 1-1 outlines the electrical and physical specifications of the available models.

1.3.1 Power Source

The power source is a constant current/constant potential, Silicon Controlled Rectifier (SCR), three phase, star-connected transformer/rectifier type dc unit with solid state contactor and control circuitry. It provides the volt-ampere characteristics desired for conventional MIG, flux core and submerged arc welding in the CV mode or stick welding and arc gouging in the CC mode.

1.3.2 Volt-Ampere Characteristics

The curves shown in Figure 1-1 represent the volt-ampere static characteristics for the power source. The slant of these curves is referred to as the "slope" and is generally defined as the "voltage drop per 100 amperes of current use". These curves show the

Table 1-1. Specifications for 652cvcc and 782cvcc

OPEN CIRCUIT VOLTAGE (U ₀)				54 vdc (cv)/59 vdc (cc)	
RATED OUTPUT	DUTY CYCLE			60%	100%
	Current (I ₂)			750 A	650 A (60Hz)/600 A (50Hz)
	Voltage (U ₂)			44 V	44 V
RATED INPUT	3 Phase	60 Hz	Volts (U ₁)	Current (I ₁) Flat	Current (I ₁) Flat
			230 V	124 A	108 A
			460 V	62 A	54 A
	50 Hz	575 V	50 A	43 A	
		220 V	127 A	102 A	
		400 V	70 A	56 A	
Power Factor at Rated Output				83%	
Welding Range				750 A/44 V - 50 A/14 V	
Auxiliary Power				115 V ac @ 10 A, 60 Hz	
PHYSICAL SPECIFICATIONS				60 Hz.	50 Hz.
Height (without lift eye)				25.0" (62.2 cm)	
Width				18.8" (48.3 cm)	
Depth				32.5" (81.9 cm)	
Net Weight				493 lbs (224 kg)	528 lbs (240 kg)
Shipping Weight				503 lbs (228 kg)	538 lbs (244 kg)

NOTE: The 652cvcc/782cvcc may also operate from a 200 (208)-volt a.c. primary input using the 230-volt change over connections. However, when connected to this source (200-volt), the output voltage is derated from 44-volts to 40-volts @ 600 amps.

output voltage available at any given output current from the minimum to the maximum setting of the voltage control. Because the volt-ampere slope is fixed, it is possible to select welding conditions by estimating the open-circuit voltage required for the load current when operating in the CV mode.

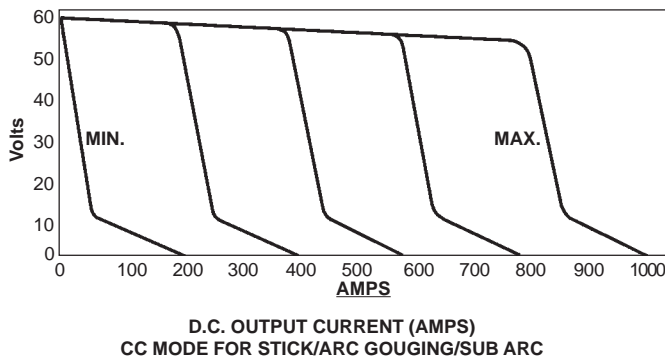
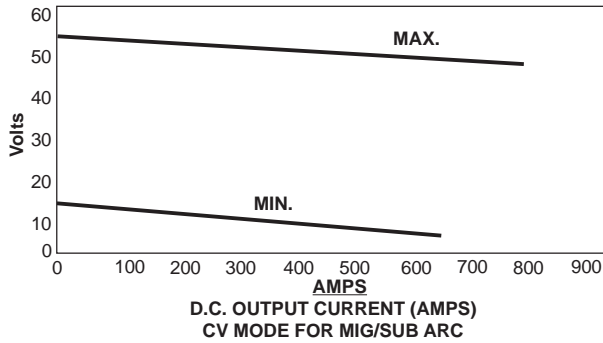


Figure 1-1. Volt-Ampere Curves

1.4 OPTIONAL ACCESSORIES

1.4.1 Remote Control Kit (Item No. 36010)

This Remote Control Kit consists of a 14 pin receptacle and assembly that permits the use of the HC-3B Remote Control (Item No. 33838) as described below.

1.4.2 HC-3B Remote Hand Control (Item No. 33838)

This control provides remote output control and provides a contactor closure switch to close the contactor making the output terminals “hot”. The panel/remote switch on the front panel must be placed in the remote position when using this accessory.

1.4.3 TR-23A Truck Kit (Item No. 36224)

This truck kit provides complete mobility of the power source. The kit consists of front castors, rear cylinder rack and wheels, gas cylinder bracket, cylinder chain, and pull handle.

1.4.4 Swivel Mount Kit (Item No. 36172)

This kit allows the MIG 2E and MIG 4HD wire feeders to be mounted to the top of the power source on an insulated swivel mount. This allows the feeder to freely rotate, relieving potential wire feed problems while increasing the working area of the torch.

1.4.5 External Grounding Conductor Protection Kit (Item No. 36098)

This kit, when installed, will de-energize the power source output if current flow is detected in the external ground conductor. When this happens, the Fault light on the front control panel will light. It will remain lit until the fault is corrected or the power source power switch (S1) is turned off.

1.4.6 Automatic Fan Kit (Item No. 36707)

With this kit installed, the fan will start to operate when the welding arc is initiated and will continue to run for 5 minutes after the arc has been extinguished.

NOTE: This option can only be installed in units manufactured after Serial No. MX-1709000 in which the large R5 resistor was moved from top center of “A” frame to the base in front of the fan bracket.

1.5 SAFETY

Before the equipment is put into operation, the safety section at the front of this manual should be read completely. This will help avoid possible injury due to misuse or improper installation.

The definitions relating to the:

-  **DANGER**
-  **WARNING**
-  **CAUTION**

safety notations are described at the end of the Safety Section in the front of this manual — **read them and their specific text references carefully.**

2.1 LOCATION

A proper installation site is necessary for the power source to provide dependable service. A proper installation site permits freedom of air movement through the unit while minimizing exposure to dust, dirt, moisture, and corrosive vapors. A minimum of 18 inches (46 cm) is required between the side and rear panels of the power source and the nearest obstruction. The selected site should also allow easy removal of the power source outer enclosure for maintenance. See Table 1-1 for overall dimensions of the unit.

2.2 RECEIVING, UNPACKING AND PLACEMENT

- A. Immediately upon receipt of the power source, inspect for damage which may have occurred in transit. Notify the carrier of any defects or damage.
- B. Remove the power source from the container. Remove all packing materials. Check the container for any loose parts.
- C. Check air passages at front and rear of cabinet, making sure that no packing materials that may obstruct air flow through the power source.
- D. Install the lifting ring furnished with the power sources into the top of the unit.

CAUTION

For lifting purposes and for keeping dust, moisture, and other foreign material from entering the power source, the lifting eyebolt must be fully tightened with a tool.

- E. After selecting an installation site (see paragraph 2.1), place the power source in the desired location. The unit may be lifted either by using the lifting ring or by forklift truck. If a forklift is used for lifting the unit, be sure that the lift forks are long enough to extend completely under the base.

CAUTION

Do not use filters on this unit as they would restrict the volume of intake air required for proper cooling. Output ratings on this unit are based on an unobstructed supply of cooling air drawn over its internal components. Warranty is void if any type of filtering device is used.

2.3 PRIMARY (INPUT) ELECTRICAL CONNECTION

This power source is a three-phase unit and must be connected to a three-phase power supply. It is recommended that the unit be operated on a dedicated circuit to prevent impairment of performance due to an overloaded circuit.



ELECTRIC SHOCK CAN KILL! Before making electrical input connections to the power source, "Machinery Lockout Procedures" should be employed. If the connections are to be made from a line disconnect switch, place the switch in the off position and padlock it to prevent inadvertent tripping. If the connection is made from a fusebox, remove the corresponding fuses and padlock the box cover. If it is not possible to use padlocks, attach a red tag to the line disconnect switch (or fuse box) warning others that the circuit is being worked on.

- A. The primary power leads must be insulated copper conductors. Three power leads and one ground wire are required. Either rubber covered cable or conduit (flexible or solid) may be used. Table 2-1 provides recommended input conductors and line fuse sizes.
- B. Remove the top cover. Identify primary power input connections on the power switch, chassis ground lug on the "A" frame, and primary input terminal board. Refer to Figures 2-1 and 2-2.

Table 2-1. Recommended Sizes for Input Conductors and Line Fuses

Rated Input @ 100% Duty Cycle		Input & GND Conductor* CU/AWG	Fuse Size Amps
Volts	Amps		
220	102	No. 2**	175
230	100	No. 2**	175
400	56	No. 6	90
460	54	No. 6	90
575	43	No. 8	75

* Sized per National Code for 80 °C rated copper conductors @ 30 °C ambient. Not more than three conductors in raceway or cable. Local codes should be followed if they specify sizes other than those listed above.

** Wire per National Electric Code Table 310-16 using 90° C rated conductors (e.g. THW-2, THWN, THHN).

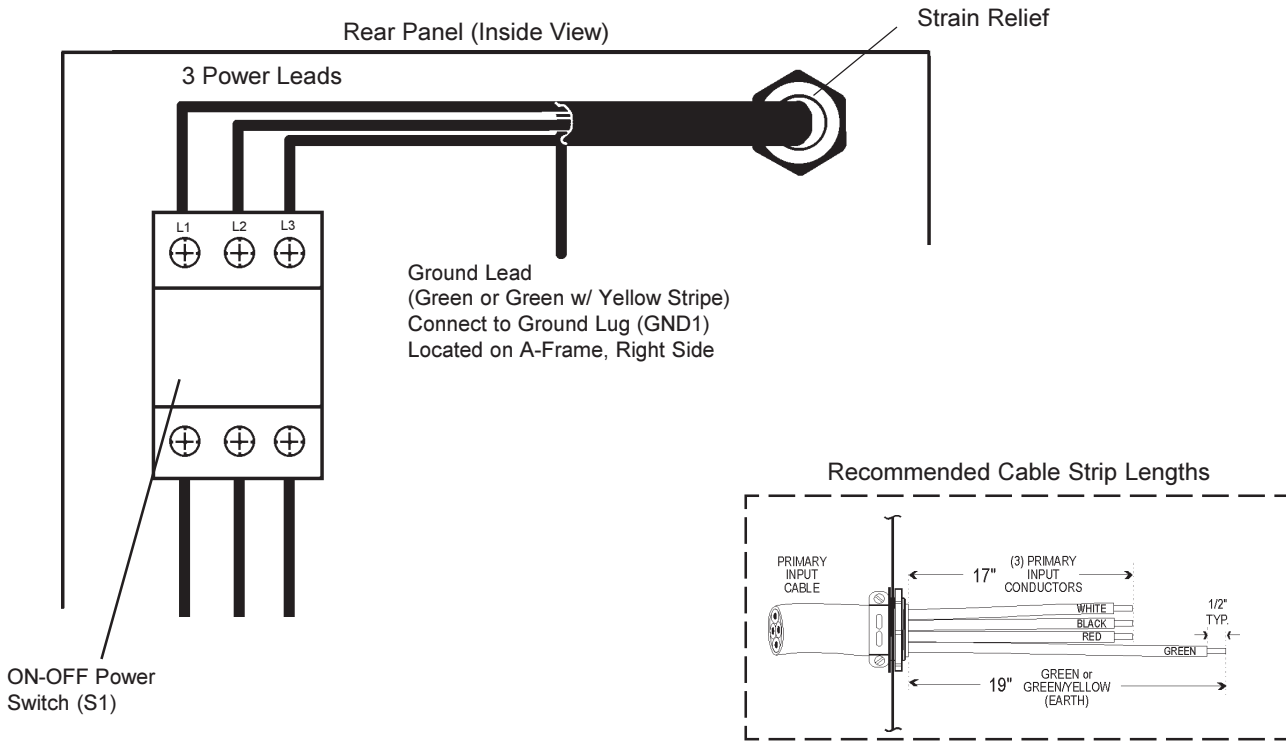


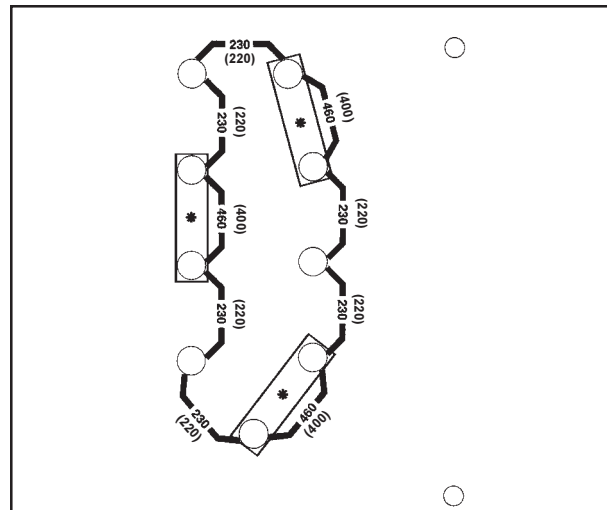
Figure 2-1. Connecting Primary Power Leads

- C. When using the provided strain relief, refer to Figure 2-1 for proper cable strip lengths. It is important to follow the cable strip guide to ensure that if the primary input cable is ever pulled from the strain relief, the input conductors will be pulled from the ON/OFF power switch before the ground lead is pulled from the ground lug. Once stripped, thread the input and ground conductors through the large strain-relief in the rear panel of the power source. Connect the ground wire to the terminal lug located on the right rear A-frame leg inside the power source. Connect the primary power leads to terminals L1, L2, and L3 on the input power switch. Secure the strain relief on the input cable.

! WARNING

The chassis must be connected to an approved electrical ground. Failure to do so may result in electrical shock, severe burns or death.

- D. Check all connections for proper tightness. Ensure all connections are correct and well-insulated.



- * Double Link Provided
- () Connections for 50 Hz Units

Figure 2-2. Input Terminal Board 230/460 (220/400) V illustrated with voltage links in the factory supplied 460 (400) volt configuration.

- E. Figure 2-2 illustrates the input voltage terminal board and the input voltage link connections. The particular voltages from which this power source may be operated are stated on the rating plate. The voltage links were factory set for highest voltage stated on the rating plate. If the power source is to be operated on another stated input voltage, the links must be reset for that particular input voltage. Always verify the input voltage and check the link arrangement regardless of factory setting. The voltage links are set up by reconfiguring the copper link bars to the silk-screened voltage designations for the desired voltage.

2.4 OUTPUT WELDING CONNECTIONS (SECONDARY)



WARNING

Before making any connections to the power source output terminals, make sure that all primary input power to the machine is off.

The output connections are located on the front panel (Figure 2-3). The negative connection is located at the bottom right corner and the positive (high inductance and low inductance) connections are located at the bottom left corner. Two output terminals are provided for each output connection. Each terminal is rated for a maximum output current of 400 amps. When operating in excess of 400 amps, parallel cables must be used, one in each output terminal. Table 2-2 provides the recommended cable output sizes.

2.5 CONTROL CONNECTIONS

Refer to Figure 2-3.

2.5.1 Wire Feeder Control

The Wire feeder control cable connection is provided by a 19-pin receptacle (J1) located on the left-hand side of the power source front panel. This receptacle will operate all ESAB wire feeders with 19 pin control cables including the Mig 2E, Mig 4HD, Mig 28A, Mig 35, Digimig, Digimig Dual as well as the UEC-8, Digimatic II and Analog Interface mechanized controls.

Table 2-2. Output Cable Sizes (Secondary)

Welding Current	Total Length (Feet) of Cable in Weld Circuit*				
	50	100	150	200	250
100	6	4	3	2	1/0
150	4	3	1	1/0	2/0
200	3	1	1/0	2/0	3/0
250	2	1/0	2/0	3/0	4/0
300	1	2/0	3/0	4/0	4/0
400	2/0	3/0	4/0	4/0	2-2/0
500	3/0	3/0	4/0	2-2/0	2-3/0
600	2-2/0	2-2/0	2-3/0	2-3/0	2-4/0
700	2-3/0	2-3/0	2-3/0	2-4/0	2-4/0

* Total cable length includes work and electrode cables. Cable size is based on direct current, insulated copper conductors, 100-percent duty cycle and a voltage drop of 4 or less volts. The welding cable insulator must have a voltage rating that is high enough to withstand the open circuit voltage of the power source.

2.5.2 Remote Control (Optional)

This function is provided by an optional 14-pin receptacle (J2) located on the front panel directly below connector J1. It receives a mating plug from a Hand Control Assembly (optional). This receptacle is operative only if the panel remote switch on the power source front panel is in the "Remote" position.

2.5.3 Auxiliary 115 V AC Receptacle

A 115 Vac receptacle is provided to supply power to accessories such as a water cooler, heated CO₂ regulator, or small hand tools. The receptacle is rated 115 Vac / 10 amps.

2.5.4 - 42V Circuit Breaker (CB1)

The 42V resettable circuit breaker (CB1) protects the 42 volt wire feeder/control circuitry against over current. (Table 5-2 provides troubleshooting information).

2.5.5 - 115V Circuit Breaker (CB2)

The 115V resettable circuit breaker (CB2) protects the 115 volt auxiliary receptacle and wire feeder/control circuitry against over current. (Table 5-2 provides troubleshooting information).

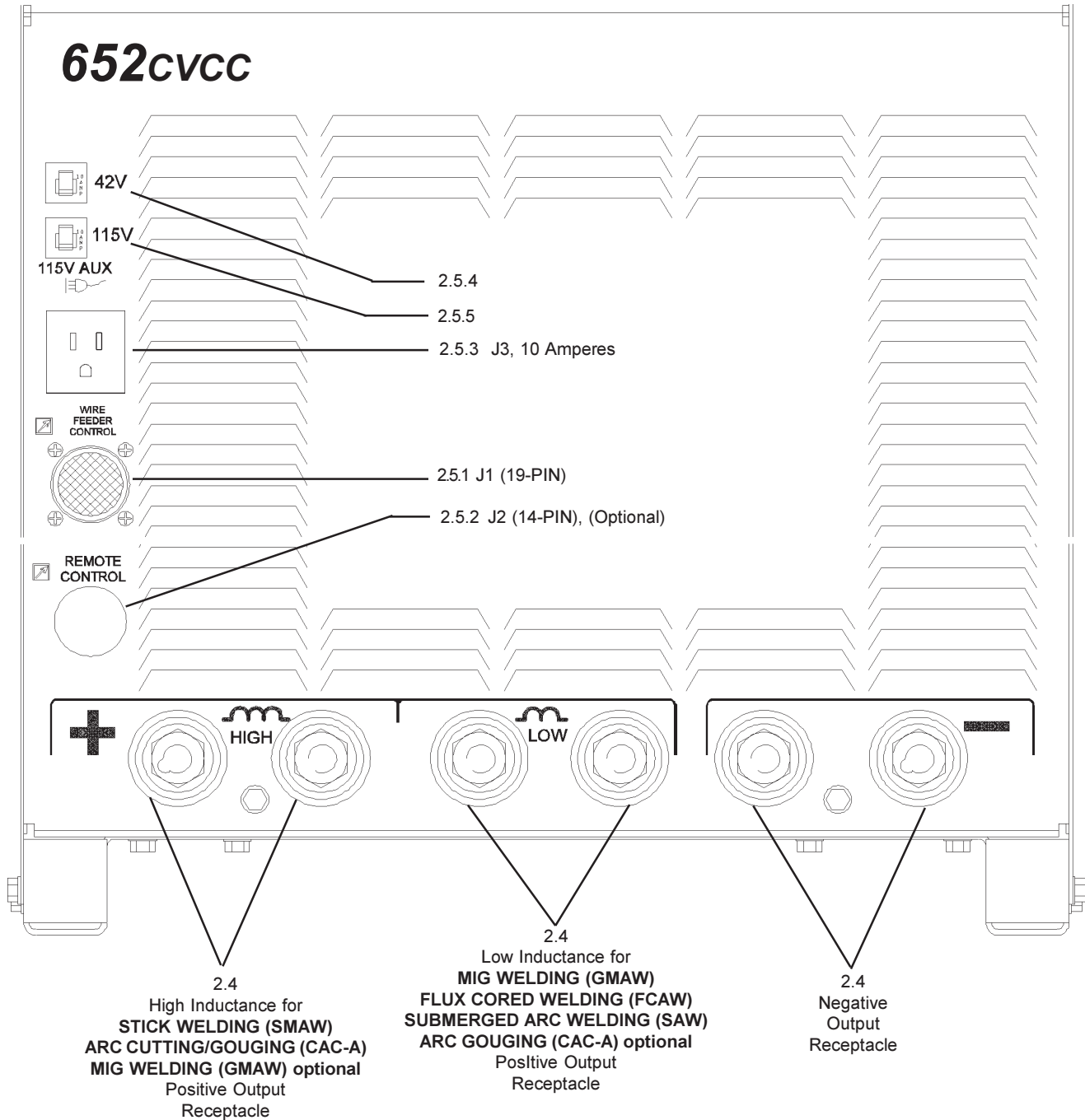


Figure 2-3. Connection Diagram

! CAUTION

Never operate the power source with the cover removed. In addition to the safety hazards, improper cooling may cause damage to the components. Keep side panels closed when unit is energized. Welding helmet, gloves, and other personal protection should always be worn when welding.

3.1 CONTROLS (See Figure 3-1)

3.1.1 Power Switch (ON-OFF)/(I-O)

The power switch is located on the rear panel of the power source. In the "off" ("O") position, the unit is shut down; however, power is still present at the switch itself. To fully shut down the power source, power must be disconnected at the line disconnect switch or the fuse box.

With the switch in the "on" ("I") position, power is provided to the main transformer and the low voltage control circuitry.

3.1.1.1 Power Indicator

This white light will indicate that the power switch is in the "on" position and power has been applied to the main transformer and low voltage circuitry.

3.1.2 Contactor, On/Remote Switch

The Contactor Control switch is located on the front panel of the power source. In the "on" position, the solid state contactor is energized and output power is available at the output terminals. The "Remote" position allows the solid state contactor to be controlled from a remote Mig wire feeder or mechanized sub arc control.

3.1.3 Output Panel/Remote Switch

With this switch in the "Panel" position, output voltage is controlled by adjusting the voltage potentiometer on the front panel to the desired output. In the "Remote" position, output is controlled using an optional remote voltage control via receptacle J2.

3.1.4 Output Voltage/Current Control

This control allows the operator to adjust the output voltage in the CV mode and output current in the CC mode. Placing the Panel/Remote switch in the "Remote" position disables the output control on the front panel.

3.1.5 Process Switch (CC-CV)

The process switch allows for selection of the output characteristics of the power source depending on the welding process being used. The CV position produces a "Flat" volt-amp characteristic and is mostly used for the Mig (GMAW) and Submerged Arc (SAW) welding processes and occasionally with Air Carbon Arc Cutting (CAC-A). The CC position produces a "Drooping" characteristic most popular for Stick (SMAW), CAC-A and sometimes SAW.

3.1.6 Over Temperature Indicator (Temp.)

This amber light will indicate when an internal overheating condition has occurred and one of the thermal switches has opened. User control of the solid state contactor will be interrupted and power source output will shut down to protect critical components. Once cooled to a safe temperature, the thermal switch will automatically reset and output control will be restored.

3.1.7 Voltmeter and Ammeter

A digital voltmeter and ammeter provides an accurate indication of dc output voltage and current.

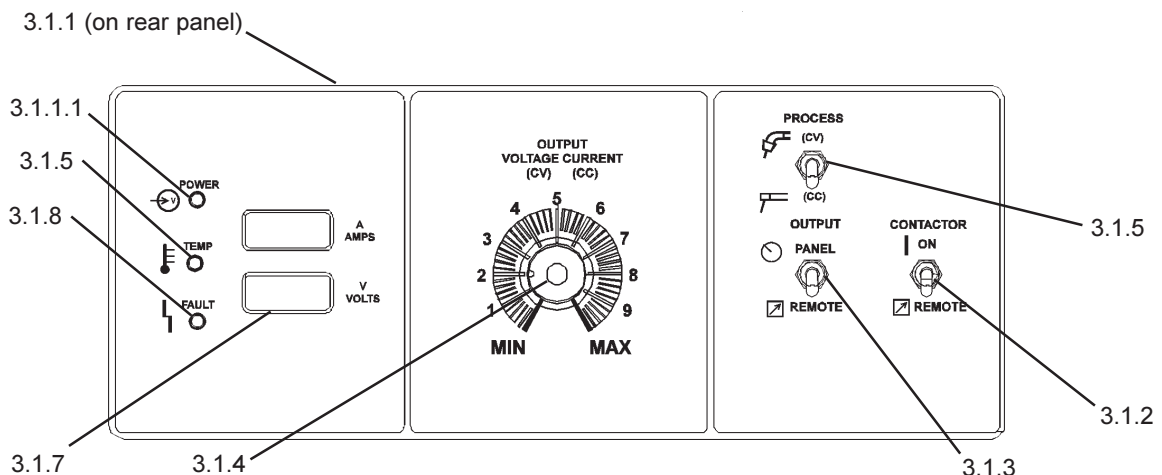


Figure 3-1. Control Locations

3.1.8 Fault Indicator

If an optional External Ground Conductor Protection Kit was installed, this red light, when lit, will signal that current was flowing through the external ground conductor. It will also light if a short occurs (momentary or permanent) between the +12 volt J1-E; the +10 volt (J2-E) and either the chassis ground or the negative terminal of the power source. The power source output terminals are de-energized and the fault must be corrected before resuming operation.

3.1.9 Over Current Protection

The 652cvcc and 782cvcc incorporate automatic over current protection. If an over current condition occurs, the automatic circuitry will “fold back” the output current to a level that will prevent damage to the power source. The power source will remain in this low current “fold back” mode until the arc is broken, the torch trigger is released or the contactor switch is reset.

3.1.10 High & Low Inductance Receptacles

The 652cvcc and 782cvcc provides high and low inductance output connections (see figure 2-3). Both are positive output terminals. The high inductance terminal slows the power source dynamic response. This means the output current will build at a slower rate compared to the low inductance terminals. The welding process and application will determine which terminal should be used. The chart below provides suggested terminal connections.

Process Switch Inductance	CC		CV	
	High	Low	High	Low
Mig Solid Wire (GMAW)	X		X ¹	X
Flux Cored (FCAW)	X			X
Sub Arc (SAW)	X		X ²	X
Arc Gouging (CAC-A)	X	X ³	X	

1. Small diameter wires (<1/16-inch) with argon mixtures.
2. <3/32-inch diameter wires.
3. Fast dynamic response (optional setting only).

3.2 SEQUENCE OF OPERATION

Prior to performing the steps below, open the wall disconnect switch or remove the fuse from the fuse box to electrically isolate the power source.



WARNING

ELECTRIC SHOCK CAN KILL! "Machinery Lock-out Procedures" should be employed. If it is not possible to use padlocks, attach a red tag to the line disconnect switch (or fuse box) warning others that the circuit is being worked on.

3.2.1 General Procedures for the CV-MIG (GMAW), SUB ARC (SAW) and CC-STICK (SMAW), SUB ARC (SAW) Processes

- A. Make the secondary output connections to the positive and negative output receptacles. See paragraph 3.1.10 and figure 2-3.
- B. Make the control connections. Refer to the appropriate wire feeder, mechanized control, and/or torch instruction booklets for additional process requirements or control connections.
- C. If primary input connections have been made to the power switch, and on the input terminal board to match the incoming voltage, close the main wall disconnect switch or reinstall fuses in the fuse box.

3.2.2 Specific Procedures for the CV-MIG (GMAW) and SUB ARC (SAW) Processes

- A. Set the Output Panel/Remote switch to the desired setting.
- B. Set the Process switch to the CV position.
- C. Set the contactor switch to "Remote".



WARNING

ELECTRIC SHOCK CAN KILL! When the contactor switch is in the "ON" position, output power will be present throughout the welding circuit; ie. cables, wire feeder, wire spool, drive stand, gun, and electrode. Be sure all are clear of the work-piece or arcing will result.

- D. Set the power switch on the rear panel to the "on" ("I") position.
- E. To preset the approximate welding voltage, place the Contactor switch to the "on" position. This will energize the power source output, allowing the voltage to be preset using the Output Voltage/Current Control dial and observing the voltmeter.
- F. After setting the desired voltage condition, turn the contactor switch back to the “re-remote” position. This position requires a re-remote start control in order to start the welding sequence.

- G. Begin welding. Observe the voltmeter, ammeter, and the weld. Readjust the voltage and wire feed speed settings as necessary to obtain a satisfactory weld.
- H. When welding is completed, release torch switch. (This action will deenergize the power source solid state contactor and remove dc power from the output terminals.)

3.2.3 Specific Procedures for the CC-Stick Welding (SMAW) and Arc Gouging (CAC-A) Processes

- A. Place the Output Panel/Remote switch into PANEL position if output current is regulated from the Output Voltage/Current dial on the panel, or in REMOTE position if output current is regulated from the optional Hand Control.

- B. Set the Output Voltage/Current Control to provide the approximate desired welding current using 0 (zero) to 875 amps as the power source current range and 0 to 10 on the control knob as the reference. Example - set knob to "5" for approximately 450 amps output.
- C. Set the Contactor switch to the ON position -- this will energize the solid-state contactor and all associated circuitry up to the output terminals.
- D. Place the Process Control switch in the CC position.
- E. Commence welding by touch or scratch starting the electrode.

4.1 GENERAL

CAUTION

If this power source does not operate properly, stop work immediately and investigate the cause of the malfunction. Maintenance work must be performed by an experienced person, and electrical work by a trained electrician. Do not permit untrained persons to inspect, clean, or repair this power source. Use only recommended replacement parts.

WARNING

Be sure that the branch circuit or main disconnect switch is off, or electrical input fuses are removed, before attempting any inspection or work inside the power source. Placing the power switch in the off position does not remove all power from inside the power source.

4.2 CLEANING

Periodically, remove the cover from the power source and blow accumulated dust and dirt from the air passages and interior components by using clean low pressure air. The frequency of cleaning required depends upon the environment in which the power source is used.

It is imperative that all air passages be kept as clean as possible in order to allow adequate air flow to provide proper cooling.

After cleaning with low pressure air, check for and tighten any loose hardware, including all electrical connections. Check for frayed and/or cracked insulation on all power cables and replace if necessary.

WARNING

Failure to replace worn or damaged cables may result in a bare cable touching a grounded object. The resulting electrical arc may injure unprotected eyes and will present a serious fire hazard. Body contact with a bare cable, connector, or conductor may result in severe electrical shock, causing serious burns or death.

4.3 INSPECTION AND SERVICE

Keep the power source dry, free of oil and grease, and protected at all times from damage by hot metal and sparks.

4.3.1 Fan Motor

Keep the fan motor free of accumulated dust and lint.

4.3.2 Transformer

Other than periodically cleaning the dust and dirt from the transformer, no maintenance is required. Ensure that only clean, dry, low pressure air is used.

4.3.3 Wire Feeder and Control Circuits

These circuits are protected by two 10 amp circuit breakers mounted in the front panel. If these open, the contactor and wire feeder will not operate.

4.3.4 Over Temperature Protection

If the power source reaches an abnormally high internal temperature, the thermal protection will deenergize the contactor circuit, shutting down the power source but leaving the cooling fan on. After the power source has cooled to a safe level, the thermal protection will automatically reset. While deenergized, the contactor and wire feeder cannot be operated.

4.3.5 Digital Voltmeter/Ammeter Calibration

To verify the accuracy of the digital volt/ammeter combination, the following calibration procedure can be performed periodically:

1. Place the Panel/Remote switch in Panel position.
2. Disconnect cables from the output terminals and then connect an accurate DC voltmeter to the output terminals.
3. Place the Contactor switch in the On position.
4. With the primary input power on, turn the Voltage control knob until you get 25V on the DC voltmeter. Compare the reading with the reading on the digital voltmeter on the front panel.
5. If there is a difference in the voltage readings, open front control panel by removing the two mounting screws from the upper corners, remove meter board from its four mounting posts, and adjust the trimpot (R13) on the meter board with a small screwdriver until the digital meter reading matches the DC voltmeter reading. When satisfied, reassemble meter board and front control panel.

5.1 GENERAL



WARNING

DISCONNECT primary power at wall switch, or circuit breaker, before attempting inspection or work inside the power source.

If the power source is operating improperly, the following troubleshooting information may be used to locate the source of the trouble.

Check the problem against the symptoms in the following troubleshooting guide (Table 5-2.) The remedy for the problem may be quite simple. If the cause cannot be quickly located, open up the unit and perform a simple visual inspection of all the components and wiring. Check for proper terminal connections, loose or burned wiring or components, blown fuses, bulged or leaking capacitors, or any other sign of damage or discoloration.

5.2 TESTING AND REPLACING BRIDGE ASSEMBLY COMPONENTS

The SCRs used in the power source are devices which allow current to flow in only one direction. The SCRs are designed to provide long trouble-free operation; however, should a failure occur, they may require replacement.

A. Testing SCRs.

1. Remove top and right side panel from the power source.
2. Locate the main rectifier assembly containing the SCRs.
3. Electrically isolate main bridge assembly by disconnecting resistor R5.
4. With the ohmmeter on RX1 scale, place the positive lead on the anode (end of SCR with screw threads) and the negative lead on the cathode (positive output terminal on the front panel). The meter should read minimum of 20 meg ohms.
5. Reverse leads and check each SCR. All readings should again show high resistance. The SCRs are bad if they show low resistance in either direction.

6. Check the gate circuit on the SCRs by installing a jumper from the gate lead to the anode of the SCR. The meter should read less than 5 ohms. Remove the jumper from the gate. The meter reading should increase (30-50 ohms).

IMPORTANT

When replacing SCR's, make sure mounting surfaces are clean. Using Alcoa No. 2 EJC Electrical Joint Compound or an equivalent, apply a thin coat to the SCR mounting surface and positively locate in place on the heatsinks. Place the clamp in position with the bolts through the holes in the heatsinks and proceed as follows:

1. Tighten the bolts evenly until finger tight noting that the nuts are not rotating.
2. Tighten the bolts 3/4 turn plus an 1/8 turn using a socket wrench on the bolt heads and rotating only in 1/4 turn increments plus 1/8 turn alternating between the bolts noting that the nuts are not rotating.

Table 5-1. PCB Voltage Tests*

NOTE

All voltage readings are taken with the front access panel open and the power switch "ON".



WARNING

Electrical service and repair should be attempted only by a trained electrician.

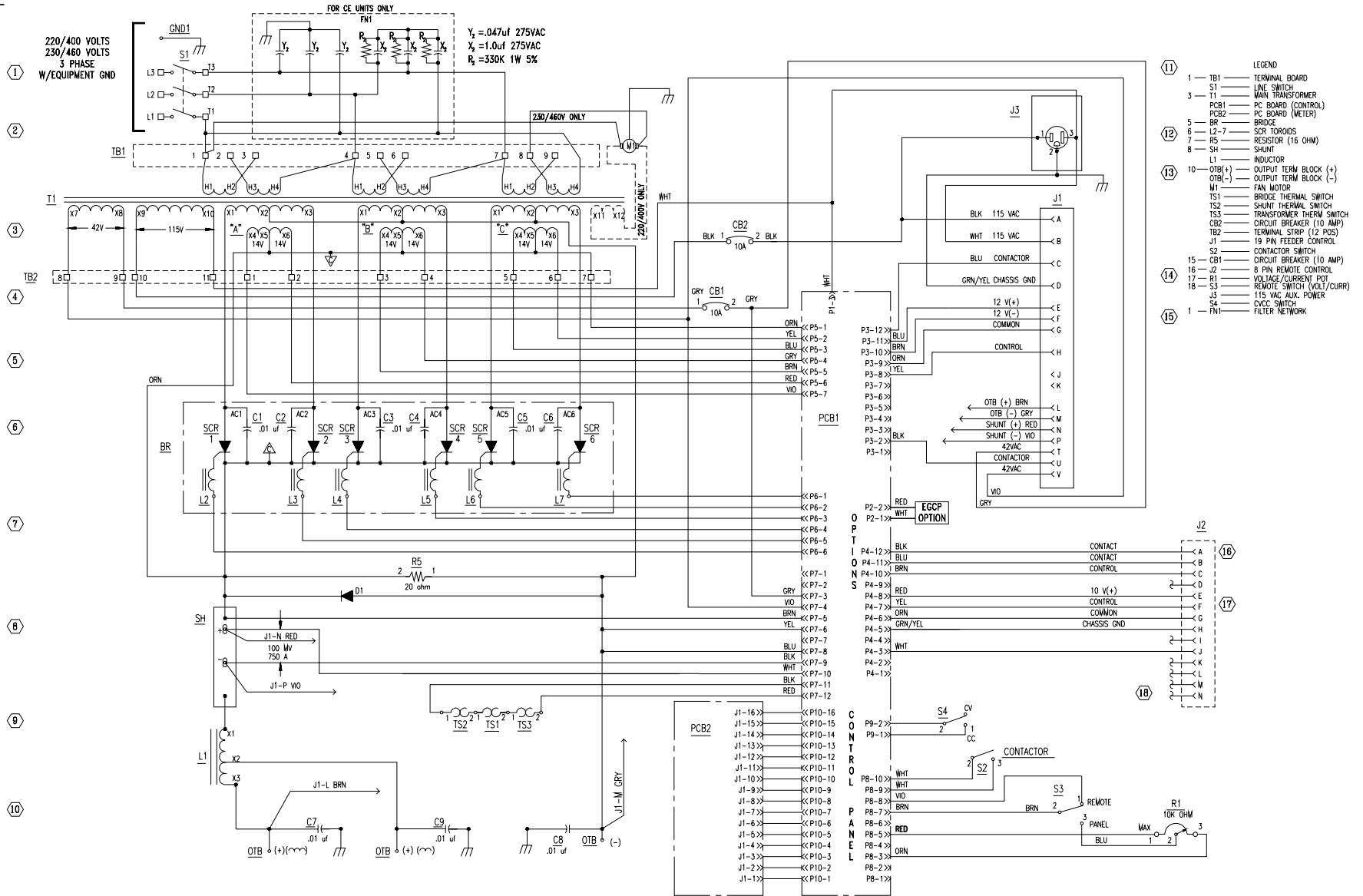
SCR VOLTAGES (OUTPUT)		
FROM	TO	READING
P8-5	OTB+	+10 V dc
P8-7	OTB+	0-10 V dc**
P6-6 (SCR1) P6-5 (SCR2) P6-4 (SCR3) P6-3 (SCR4) P6-2 (SCR5) P6-1 (SCR6)	OTB+	.3 V dc with contactor on

* Refer to Schematic Diagram

** Varies with VCP (R1)

Table 5-2. Troubleshooting Guide

CONDITION	ACTION
Unit Inoperative	<ul style="list-style-type: none"> A. No input power. Check main line (user's) switch fuses -- replace if needed. B. Poor or improper input (terminal board) connections. C. Defective on/off switch on rear panel -- replace. D. Thermal light on. Main transformer overheating. Also check for proper cooling, proper primary hookup, or shorted turn on secondary. E. Thermal light on. Fan motor not operating -- check motor and leads. F. External Ground Conductor fault indicator "ON". - Check for cause and correct. Turn power switch "OFF" then "ON" to reset. G. Loss of primary phase. Check that LED on control PCB is not lit. If lit, find & replace defective fuse.
No Output -- Fan Running	<ul style="list-style-type: none"> A. Poor or improper electrical input -- check input connections on TB. B. Poor connections at output terminals/work station -- check, tighten or replace. C. Main transformer overheating -- thermal switches tripped due to restricted cooling air. Temperature light on front panel will be lit. Let unit cool down. D. PC board defective or loose PC board connector(s) -- if loose, reinsert; if defective, replace.
Limited Output or Low Open-Circuit Voltage	<ul style="list-style-type: none"> A. Input voltage jumper links on terminal board improperly set -- check for proper voltage. B. Poor output connections. Take apart, clean, and reassemble. C. Panel-Remote switch in Remote position and remote voltage pot disabled. D. Over current condition had occurred. Unit is in "fold back" mode. See Section 3.1.9.
Erratic Weld Current	<ul style="list-style-type: none"> A. Welding cable size too small -- use correct cables. B. Loose welding cable connection (will usually get hot) -- tighten connections. C. Improper wire feeder setup. D. Defective SCR in bridge rectifier. E. PC board defective -- replace.
High Output, No Voltage Control	<ul style="list-style-type: none"> A. PC board defective or loose -- reset and/or replace board.
No 115 Volt ac Output	<ul style="list-style-type: none"> A. Circuit breaker tripped. Check 115V CB2 -- Reset.
Line Fuse Blows When Power Source is First Turned On	<ul style="list-style-type: none"> A. Shorted SCR in Main Bridge -- replace. B. Shorted capacitor in Capacitor Bank.
Wire Feeder is Inoperative	<ul style="list-style-type: none"> A. Loose feeder control cable -- Check and tighten all connections. B. A Circuit Breaker tripped -- Check 42V CB1 and 115V CB2 -- Reset.



NOTE: Recent modifications to the power source may not be reflected in this schematic. For up-to-date information on your model, refer to the schematic on the inside cover of the power source or contact the factory.

Figure 5-1. Schematic Diagram -652cvcc/ 782cvcc, 230/460 vac, 60 Hz and 220/400 vac, 50 Hz

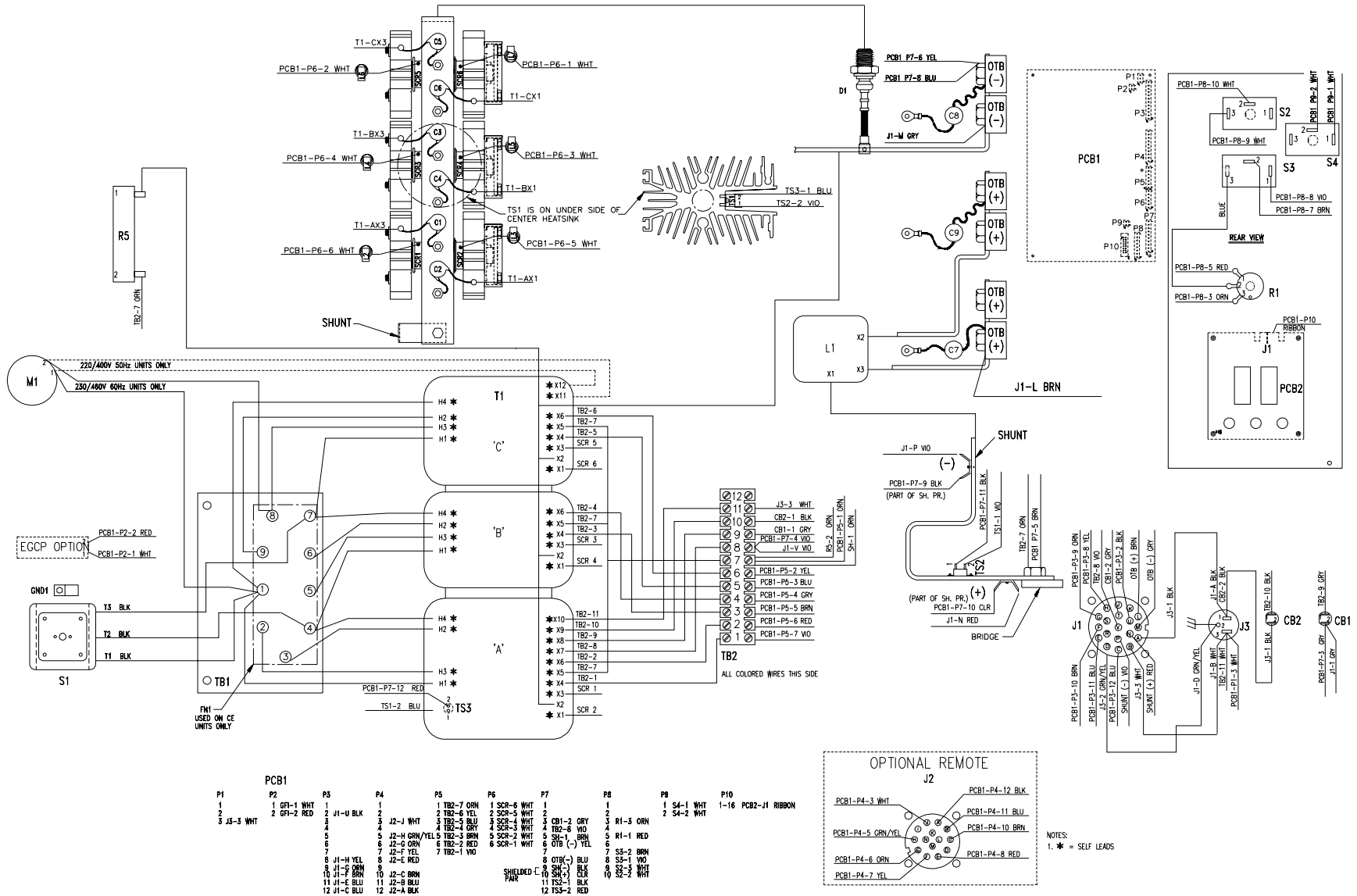
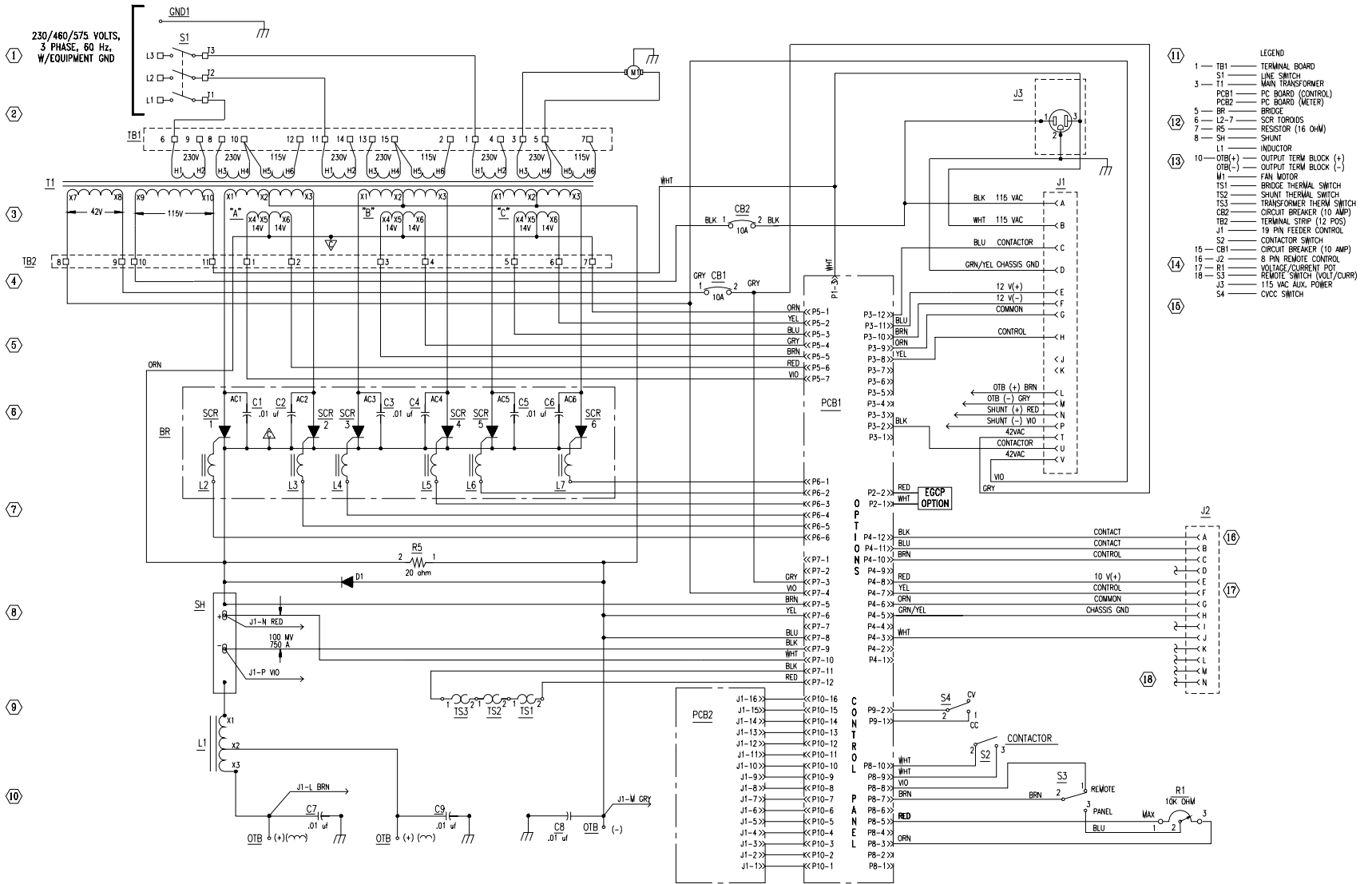


Figure 5-2. Wiring Diagram - 782cvcc, 220/400 vac, 50 Hz



NOTE: Recent modifications to the power source may not be reflected in this schematic. For up-to-date information on your model, refer to the schematic on the inside cover of the power source or contact the factory.

Figure 5-3. Schematic Diagram - 652cvcc, 230/460/575 vac, 60 Hz

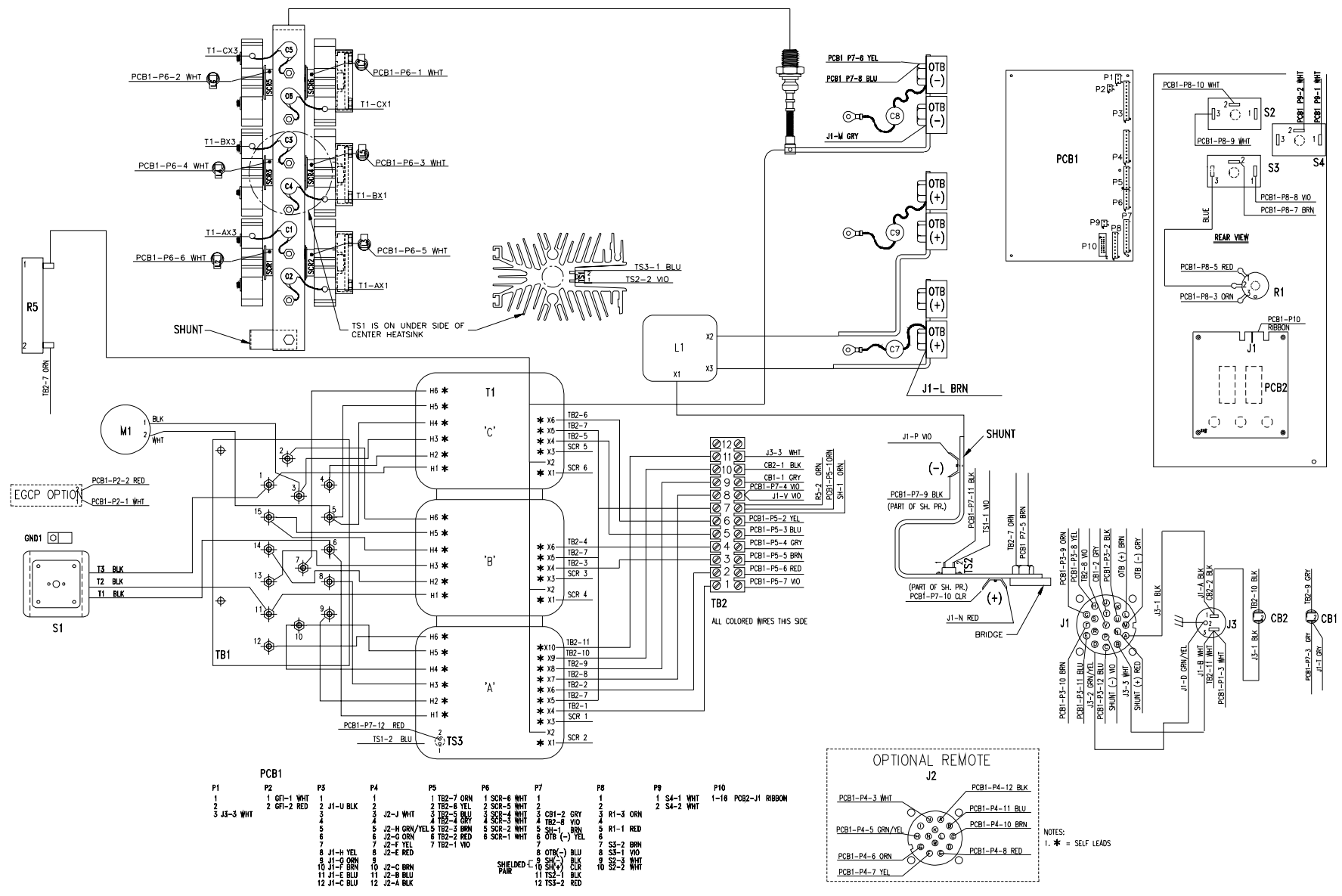


Figure 5-4. Wiring Diagram - 652cvcc, 230/460/575 vac, 60 Hz

6.1 GENERAL

Always provide the series or serial number of the unit on which the parts will be used. The serial number is stamped on the unit nameplate.

6.2 ORDERING

To assure proper operation, it is recommended that only genuine ESAB parts and products be used with this equipment. The use of non-ESAB parts may void your warranty.

The illustrations that follow cover all power sources listed on the front cover of this manual.

Replacement parts may be ordered from your ESAB distributor. For a list of Authorized Distributors in your area, contact ESAB at 1-800-ESAB-123.

For your convenience an ESAB Communication Guide listing important contact phone numbers has been printed on the rear cover of this book.

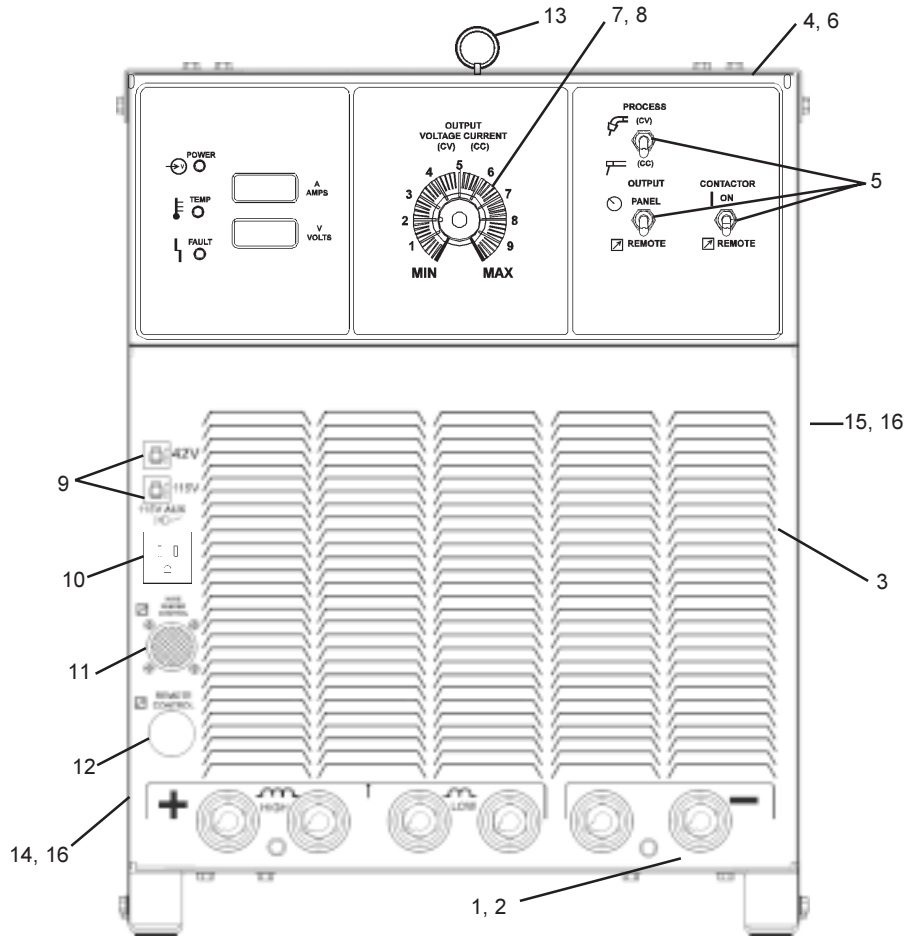
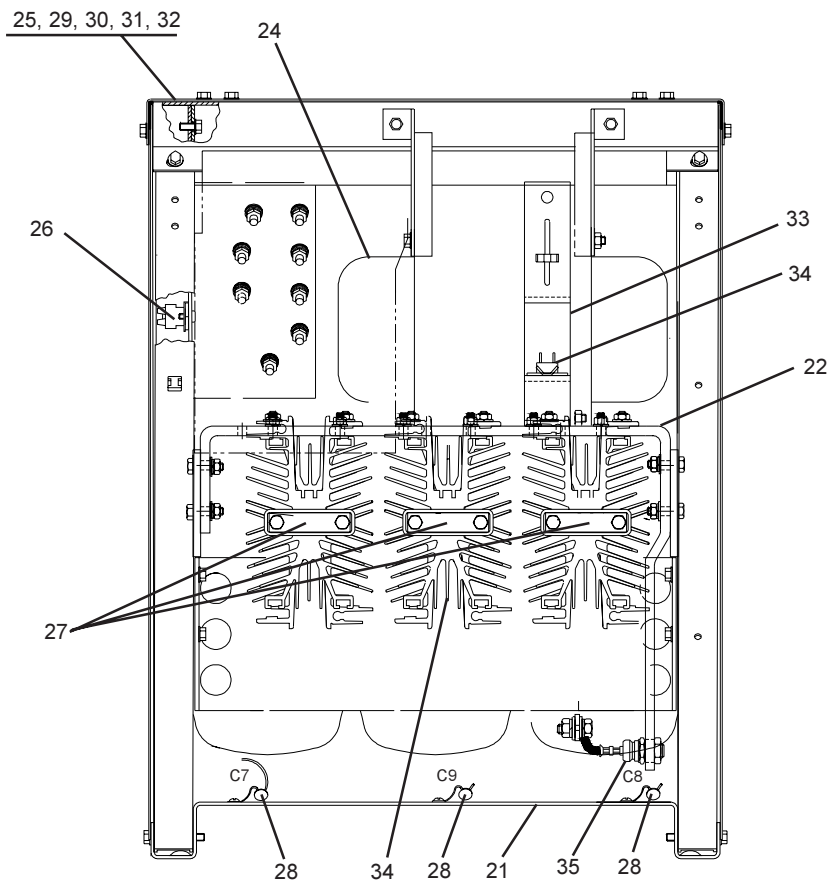


Figure 6-1. 652/782cvcc Power Source (Front View)

NO.	QTY. REQ.	ITEM NO.	DESCRIPTION	CIRCUIT SYMBOL
1	6	13733935	RECEPTACLE, PANEL	OTB
2	6	13792513	CONNECTOR, QUICK (NOT SHOWN)	
3	1	36041GY	PANEL, FRONT, 652cvcc	
	1	36033GY	PANEL, FRONT, 782cvcc	
4	1	36042GY	PANEL ASSY., CONTROL	
5	3	634515	SWITCH, TOGGLE, SPDT	S2, S3, S4
6	1	36152	OVERLAY, CONTROL PANEL	
7	1	13730632	POTENTIOMETER, 10K	R1
8	1	950584	KNOB	
9	2	950122	CIRCUIT BREAKER, 10 AMP	CB1, CB2
10	1	952219*	OUTLET, 110V	J3
11	1	952209	RECEPTICAL ASSY., 19-PIN	J1
12**	1	36010	RECEPTICAL ASSY., 14-PIN (OPTIONAL KIT)	J2
13**	1	672786	EYEBOLT, LIFTING	
14	1	36045YL	PANEL, LEFT SIDE, YELLOW	
15	1	36052YL	PANEL, RIGHT SIDE, YELLOW	
16	2	13734588	DECAL, ESAB	

* Starting with Serial No. MX-1621001, the square-shape outlet replaced the round-shape outlet 951033. 952219 will not fit in front panel of prior manufactured units.
 ** Not factory assembled to power source.

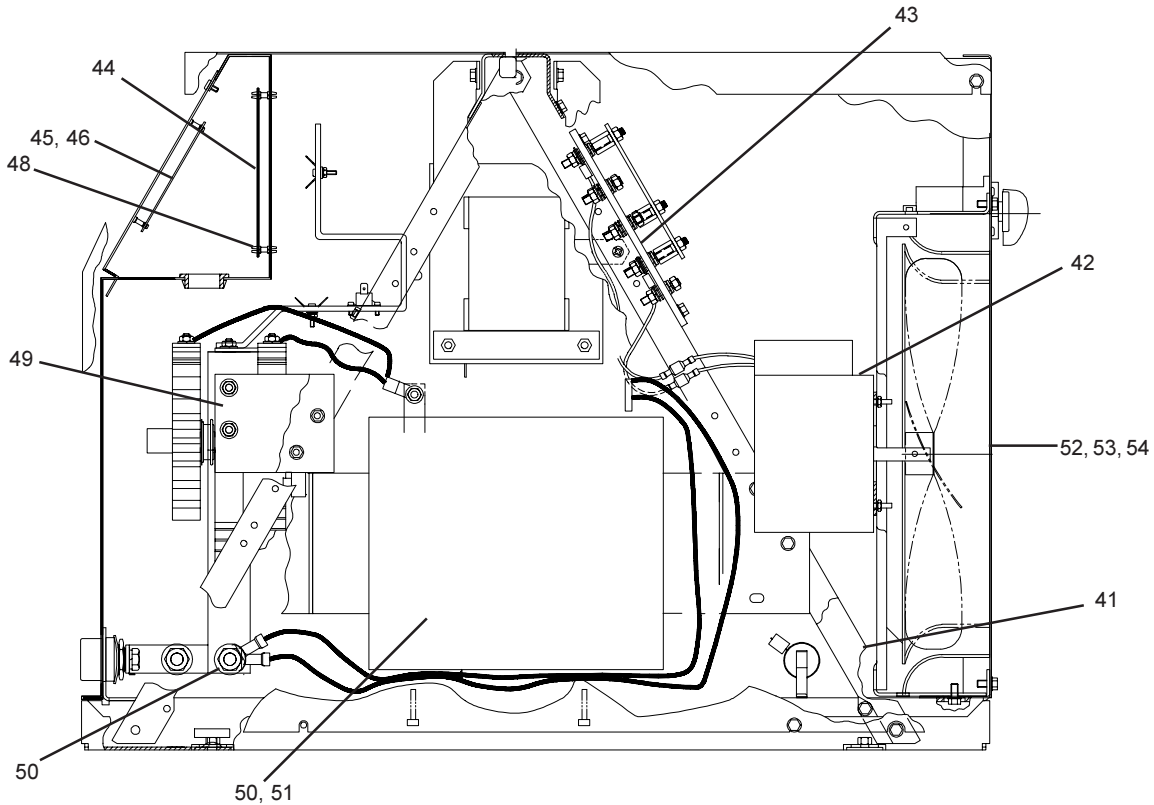


**Figure 6-2. 652/782_{cvcc} Power Source
Inside Front View**

NO.	QTY. REQ.	ITEM NO.	DESCRIPTION	CIRCUIT SYMBOL
21	1	36036GY	BASE, GRAY	
22	1	36639**	BUSBAR, BRIDGE	
24	1	36101	INDUCTOR ASSY.	L1
25	1	36046YL	TOP COVER, YELLOW	
26	1	952073	TERMINAL BLOCK, 12 POS.	TB2
27	3	36650**	SCR ASS'Y (includes Heatsinks, 2 SCR'S - 952142)	SCR1-6
28	2	672348	CAPACITOR, 0.01 μ f, 1KV	C7, C8, C9
29	1	2091514	LABEL, WARNING	
30	1	99512240	LABEL, CAUTION LIFT	
31	1	954008	DECAL, DANGER HIGH VOLTAGE	
32*	1	954638	LABEL, SCHEMATIC, 230/460V, 60Hz & 220/400v, 50Hz	
	1	954560	LABEL, SCHEMATIC, 230/460/575V	
33	1	36640	SHUNT	SH1
34	2	950711	SWITCH, THERMAL	TS1, TS2
35	1	950768	RECTIFIER, SILICA	D1

* Located on underside of Top Cover.

** Units made prior to MX-I645041 used Heatsinks 36127, 36128, and 36129, Bridge Busbar 36032, and Shunt 36105, SCR's did not change.



**Figure 6-3. 652/782cvcc Power Source
(Right Side View)**

NO.	QTY. REQ.	ITEM NO.	DESCRIPTION	CIRCUIT SYMBOL
41	4	36048GY	LEG, A-FRAME	
42	1	2062334	MOTOR, FAN	M1
43*	1	36091	BOARD, INPUT TERM., 230/460V	TB1
	1	32236	BOARD, INPUT TERM., 220/400V, 50 Hz	TB1
	1	36110	BOARD, INPUT TERM., 230/460/575V	TB1
44	1	38130	PC BOARD ASS'Y., CONTROL	PCB1
45	1	36121	PC BOARD ASS'Y., DIGITAL METER	PCB2
46	1	36092	CABLE, RIBBON, 12"	P10
48	4	950708	BOARD SUPPORT, CIRCUIT LOCKING	
49	1	36174	BRACKET, HEATSINK	
50*	1	36099	TRANSFORMER ASS'Y., MAIN, 230/460V	T1
	1	36519	TRANSFORMER ASS'Y., MAIN, 220/400V, 50Hz	T1
	1	36111	TRANSFORMR ASS'Y., MAIN, 575V	T1
51	1	2062211	THERMOSTAT 180°C (included with all T1 Transformers)	TS3
52	1	36044GY	PANEL, REAR, GRAY	
53	1	954520	LABEL, RATING, 230/460V (652cvcc)	
	1	954522	LABEL, RATING, 575V (652cvcc)	
	1	954563	LABEL, RATING, 230/460V, (782cvcc)	
	1	954634	LABEL, RATING, 220/400V (782cvcc)	
54	1	13732733	DECAL, COPPER ONLY	

* Some 50 Hz power sources were made to single 400V input power prior to Serial No. MC-I624001. No terminal board was used with the 400 V version. These units used Main Transformer Assembly 36108.

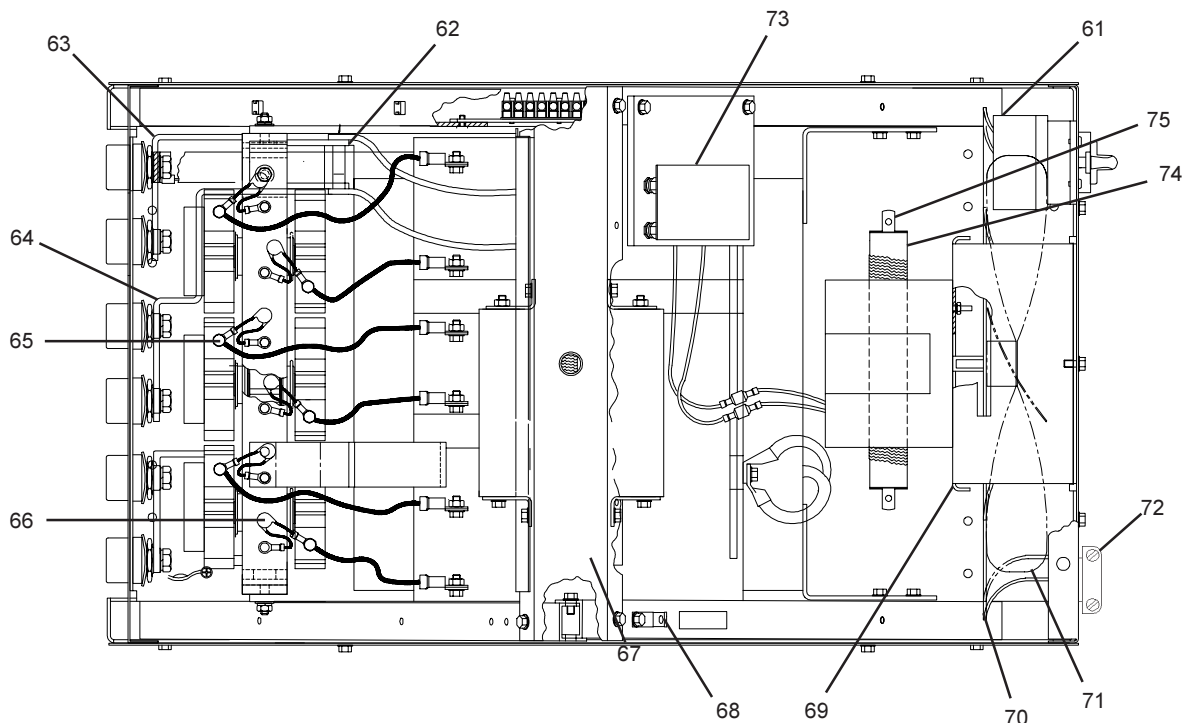


Figure 6-4. 652/782_{CVCC} Power Source
(Inside Top View)

NO.	QTY. REQ.	ITEM NO.	DESCRIPTION	CIRCUIT SYMBOL
61	1	950945	SWITCH, POWER 600V, 100A	S1
62	2	36020	BUSBAR, INTERMEDIATE	
63	2	36029	BUSBAR, OUTPUT, HI INDUCTANCE	
64	1	36028	BUSBAR, OUTPUT, LO INDUCTANCE	
65	6	13735018	CORE, TOROID	L2-7
66	6	672348	CAPACITOR, 0.01 μ f, 1 KV	C1-6
67	1	36049GY	BAIL, LIFTING	
68	1	647361	TERMINAL LUG, GROUND	GND1
69	1	36043GY	BRACKET, FAN	
70	1	13735508	SHROUD, FAN	
71	1	36173	BLADE, FAN	
72**	1	950219	STRAIN RELIEF	
73	1	38100*	FILTER NETWORK	FN1
74■	1	17300020	RESISTOR, 300W, 20 OHM	R5
75■	2	99512558	BRACKET, RESISTOR	

* Used only on 220/400 V power sources with CE labels.

** Not factory assembled to the power source.

■ Prior to Serial Number MX-I709001, the R5 resistor was located near top of A-frame.

**ESAB Welding & Cutting Products, Florence, SC Welding Equipment
COMMUNICATIONS GUIDE - CUSTOMER SERVICES**

- A. CUSTOMER SERVICE QUESTIONS:** Telephone (843) 664-5540/Fax: (800) 634-7548
Order Entry Product Availability Pricing Hours: 8:30 AM to 5:00 PM EST
Order Changes Saleable Goods Returns Delivery
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- B. ENGINEERING SERVICE:** Telephone: (843) 664-4416 / Fax : (800) 446-5693
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Warranty Returns Authorized Repair Stations
- C. TECHNICAL SERVICE:** Telephone: (800) ESAB-123/ Fax: (843) 664-4452
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- D. LITERATURE REQUESTS:** Telephone: (843) 664-5501 / Fax: (843) 664-5548
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- F. WELDING EQUIPMENT TRAINING:**
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- G. WELDING PROCESS ASSISTANCE:**
Telephone: (800) ESAB-123 / Fax: (843) 664-4454 Hours: 7:30 AM to 4:00 PM EST
- H. TECHNICAL ASST. CONSUMABLES:**
Telephone: (800) 933-7070 Hours: 7:30 AM to 5:00 PM EST

IF YOU DO NOT KNOW WHOM TO CALL

Telephone: (800) ESAB-123/ Fax: (843) 664-4452/Web: <http://www.esab.com>

Hours: 7:30 AM to 5:00 PM EST

