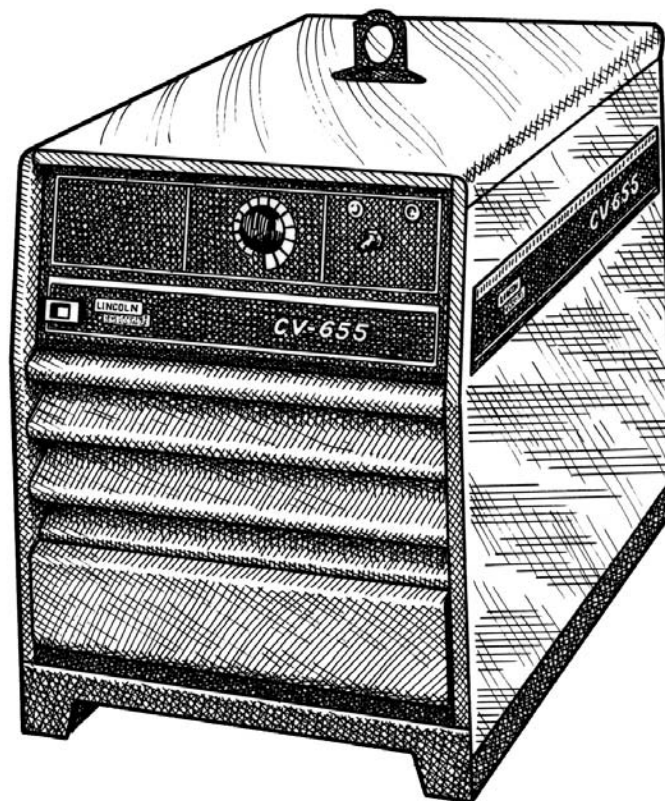


# CV-655

For use with machine Code Number 10120 thru 10129.

## Safety Depends on You

Lincoln arc welding and cutting equipment is designed and built with safety in mind. However, your overall safety can be increased by proper installation ... and thoughtful operation on your part. **DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT.** And, most importantly, think before you act and be careful.



IP23

## OPERATOR'S MANUAL



**LINCOLN**<sup>®</sup>  
**ELECTRIC**

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- World's Leader in Welding and Cutting Products •
- Sales and Service through Subsidiaries and Distributors Worldwide •

Cleveland, Ohio 44117-1199 U.S.A. TEL: 216.481.8100 FAX: 216.486.1751 WEB SITE: [www.lincolnelectric.com](http://www.lincolnelectric.com)

## ⚠ WARNING

### ⚠ CALIFORNIA PROPOSITION 65 WARNINGS ⚠

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

The Above For Diesel Engines

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

The Above For Gasoline Engines

**ARC WELDING CAN BE HAZARDOUS. PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS SHOULD CONSULT WITH THEIR DOCTOR BEFORE OPERATING.**

Read and understand the following safety highlights. For additional safety information, it is strongly recommended that you purchase a copy of "Safety in Welding & Cutting - ANSI Standard Z49.1" from the American Welding Society, P.O. Box 351040, Miami, Florida 33135 or CSA Standard W117.2-1974. A Free copy of "Arc Welding Safety" booklet E205 is available from the Lincoln Electric Company, 22801 St. Clair Avenue, Cleveland, Ohio 44117-1199.

**BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS.**



### FOR ENGINE powered equipment.

1.a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.



1.b. Operate engines in open, well-ventilated areas or vent the engine exhaust fumes outdoors.



1.c. Do not add the fuel near an open flame welding arc or when the engine is running. Stop the engine and allow it to cool before refueling to prevent spilled fuel from vaporizing on contact with hot engine parts and igniting. Do not spill fuel when filling tank. If fuel is spilled, wipe it up and do not start engine until fumes have been eliminated.

1.d. Keep all equipment safety guards, covers and devices in position and in good repair. Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.

1.e. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.

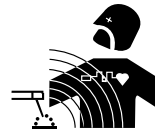


1.f. Do not put your hands near the engine fan. Do not attempt to override the governor or idler by pushing on the throttle control rods while the engine is running.

1.g. To prevent accidentally starting gasoline engines while turning the engine or welding generator during maintenance work, disconnect the spark plug wires, distributor cap or magneto wire as appropriate.



1.h. To avoid scalding, do not remove the radiator pressure cap when the engine is hot.



### ELECTRIC AND MAGNETIC FIELDS may be dangerous

2.a. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding current creates EMF fields around welding cables and welding machines

2.b. EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.

2.c. Exposure to EMF fields in welding may have other health effects which are now not known.

2.d. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

2.d.1. Route the electrode and work cables together - Secure them with tape when possible.

2.d.2. Never coil the electrode lead around your body.

2.d.3. Do not place your body between the electrode and work cables. If the electrode cable is on your right side, the work cable should also be on your right side.

2.d.4. Connect the work cable to the workpiece as close as possible to the area being welded.

2.d.5. Do not work next to welding power source.

Mar '95



## ELECTRIC SHOCK can kill.

- 3.a. The electrode and work (or ground) circuits are electrically "hot" when the welder is on. Do not touch these "hot" parts with your bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.
- 3.b. Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground.
- In addition to the normal safety precautions, if welding must be performed under electrically hazardous conditions (in damp locations or while wearing wet clothing; on metal structures such as floors, gratings or scaffolds; when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with the workpiece or ground) use the following equipment:**
- Semiautomatic DC Constant Voltage (Wire) Welder.
  - DC Manual (Stick) Welder.
  - AC Welder with Reduced Voltage Control.
- 3.c. In semiautomatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semiautomatic welding gun are also electrically "hot".
- 3.d. Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.
- 3.e. Ground the work or metal to be welded to a good electrical (earth) ground.
- 3.f. Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.
- 3.g. Never dip the electrode in water for cooling.
- 3.h. Never simultaneously touch electrically "hot" parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.
- 3.i. When working above floor level, use a safety belt to protect yourself from a fall should you get a shock.
- 3.j. Also see Items 6.c. and 8.



## ARC RAYS can burn.

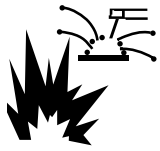
- 4.a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to ANSI Z87.1 standards.
- 4.b. Use suitable clothing made from durable flame-resistant material to protect your skin and that of your helpers from the arc rays.
- 4.c. Protect other nearby personnel with suitable, non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.



## FUMES AND GASES can be dangerous.

- 5.a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. **When welding with electrodes which require special ventilation such as stainless or hard facing (see instructions on container or MSDS) or on lead or cadmium plated steel and other metals or coatings which produce highly toxic fumes, keep exposure as low as possible and below Threshold Limit Values (TLV) using local exhaust or mechanical ventilation. In confined spaces or in some circumstances, outdoors, a respirator may be required. Additional precautions are also required when welding on galvanized steel.**
- 5.b. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.
- 5.c. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.
- 5.d. Read and understand the manufacturer's instructions for this equipment and the consumables to be used, including the material safety data sheet (MSDS) and follow your employer's safety practices. MSDS forms are available from your welding distributor or from the manufacturer.
- 5.e. Also see item 1.b.

Mar '95

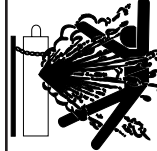


### WELDING SPARKS can cause fire or explosion.

6.a. Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire.

Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydraulic lines. Have a fire extinguisher readily available.

- 6.b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to "Safety in Welding and Cutting" (ANSI Standard Z49.1) and the operating information for the equipment being used.
- 6.c. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.
- 6.d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been "cleaned". For information, purchase "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances", AWS F4.1 from the American Welding Society (see address above).
- 6.e. Vent hollow castings or containers before heating, cutting or welding. They may explode.
- 6.f. Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.
- 6.g. Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.
- 6.h. Also see item 1.c.



### CYLINDER may explode if damaged.

7.a. Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.

- 7.b. Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.
- 7.c. Cylinders should be located:
  - Away from areas where they may be struck or subjected to physical damage.
  - A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.
- 7.d. Never allow the electrode, electrode holder or any other electrically "hot" parts to touch a cylinder.
- 7.e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.
- 7.f. Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.
- 7.g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-1, "Precautions for Safe Handling of Compressed Gases in Cylinders," available from the Compressed Gas Association 1235 Jefferson Davis Highway, Arlington, VA 22202.



### FOR ELECTRICALLY powered equipment.

- 8.a. Turn off input power using the disconnect switch at the fuse box before working on the equipment.
- 8.b. Install equipment in accordance with the U.S. National Electrical Code, all local codes and the manufacturer's recommendations.
- 8.c. Ground the equipment in accordance with the U.S. National Electrical Code and the manufacturer's recommendations.

Mar '95

## PRÉCAUTIONS DE SÛRETÉ

Pour votre propre protection lire et observer toutes les instructions et les précautions de sûreté spécifiques qui paraissent dans ce manuel aussi bien que les précautions de sûreté générales suivantes:

### Sûreté Pour Soudage A L'Arc

1. Protégez-vous contre la secousse électrique:
  - a. Les circuits à l'électrode et à la pièce sont sous tension quand la machine à souder est en marche. Eviter toujours tout contact entre les parties sous tension et la peau nue ou les vêtements mouillés. Porter des gants secs et sans trous pour isoler les mains.
  - b. Faire très attention de bien s'isoler de la masse quand on soude dans des endroits humides, ou sur un plancher métallique ou des grilles métalliques, principalement dans les positions assis ou couché pour lesquelles une grande partie du corps peut être en contact avec la masse.
  - c. Maintenir le porte-électrode, la pince de masse, le câble de soudage et la machine à souder en bon et sûr état de fonctionnement.
  - d. Ne jamais plonger le porte-électrode dans l'eau pour le refroidir.
  - e. Ne jamais toucher simultanément les parties sous tension des porte-électrodes connectés à deux machines à souder parce que la tension entre les deux pinces peut être le total de la tension à vide des deux machines.
  - f. Si on utilise la machine à souder comme une source de courant pour soudage semi-automatique, ces précautions pour le porte-électrode s'appliquent aussi au pistolet de soudage.
2. Dans le cas de travail au dessus du niveau du sol, se protéger contre les chutes dans le cas où on reçoit un choc. Ne jamais enrouler le câble-électrode autour de n'importe quelle partie du corps.
3. Un coup d'arc peut être plus sévère qu'un coup de soleil, donc:
  - a. Utiliser un bon masque avec un verre filtrant approprié ainsi qu'un verre blanc afin de se protéger les yeux du rayonnement de l'arc et des projections quand on soude ou quand on regarde l'arc.
  - b. Porter des vêtements convenables afin de protéger la peau de soudeur et des aides contre le rayonnement de l'arc.
  - c. Protéger l'autre personnel travaillant à proximité au soudage à l'aide d'écrans appropriés et non-inflammables.
4. Des gouttes de laitier en fusion sont émises de l'arc de soudage. Se protéger avec des vêtements de protection libres de l'huile, tels que les gants en cuir, chemise épaisse, pantalons sans revers, et chaussures montantes.

5. Toujours porter des lunettes de sécurité dans la zone de soudage. Utiliser des lunettes avec écrans latéraux dans les zones où l'on pique le laitier.
6. Eloigner les matériaux inflammables ou les recouvrir afin de prévenir tout risque d'incendie dû aux étincelles.
7. Quand on ne soude pas, poser la pince à un endroit isolé de la masse. Un court-circuit accidentel peut provoquer un échauffement et un risque d'incendie.
8. S'assurer que la masse est connectée le plus près possible de la zone de travail qu'il est pratique de le faire. Si on place la masse sur la charpente de la construction ou d'autres endroits éloignés de la zone de travail, on augmente le risque de voir passer le courant de soudage par les chaînes de levage, câbles de grue, ou autres circuits. Cela peut provoquer des risques d'incendie ou d'échauffement des chaînes et des câbles jusqu'à ce qu'ils se rompent.
9. Assurer une ventilation suffisante dans la zone de soudage. Ceci est particulièrement important pour le soudage de tôles galvanisées plombées, ou cadmiées ou tout autre métal qui produit des fumées toxiques.
10. Ne pas souder en présence de vapeurs de chlore provenant d'opérations de dégraissage, nettoyage ou pistologie. La chaleur ou les rayons de l'arc peuvent réagir avec les vapeurs du solvant pour produire du phosgène (gas fortement toxique) ou autres produits irritants.
11. Pour obtenir de plus amples renseignements sur la sûreté, voir le code "Code for safety in welding and cutting" CSA Standard W 117.2-1974.

## PRÉCAUTIONS DE SÛRETÉ POUR LES MACHINES À SOUDER À TRANSFORMATEUR ET À REDRESSEUR

1. Relier à la terre le châssis du poste conformément au code de l'électricité et aux recommandations du fabricant. Le dispositif de montage ou la pièce à souder doit être branché à une bonne mise à la terre.
2. Autant que possible, l'installation et l'entretien du poste seront effectués par un électricien qualifié.
3. Avant de faire des travaux à l'intérieur de poste, la débrancher à l'interrupteur à la boîte de fusibles.
4. Garder tous les couvercles et dispositifs de sûreté à leur place.



# Thank You

for selecting a **QUALITY** product by Lincoln Electric. We want you to take pride in operating this Lincoln Electric Company product  
•• as much pride as we have in bringing this product to you!

## **Please Examine Carton and Equipment For Damage Immediately**

When this equipment is shipped, title passes to the purchaser upon receipt by the carrier. Consequently, Claims for material damaged in shipment must be made by the purchaser against the transportation company at the time the shipment is received.

Please record your equipment identification information below for future reference. This information can be found on your machine nameplate.

Product \_\_\_\_\_

Model Number \_\_\_\_\_

Code Number or Date Code \_\_\_\_\_

Serial Number \_\_\_\_\_

Date Purchased \_\_\_\_\_

Where Purchased \_\_\_\_\_

Whenever you request replacement parts or information on this equipment, always supply the information you have recorded above. The code number is especially important when identifying the correct replacement parts.

## **On-Line Product Registration**

- Register your machine with Lincoln Electric either via fax or over the Internet.
- For faxing: Complete the form on the back of the warranty statement included in the literature packet accompanying this machine and fax the form per the instructions printed on it.
- For On-Line Registration: Go to our **WEB SITE at [www.lincolnelectric.com](http://www.lincolnelectric.com)**. Choose "Quick Links" and then "Product Registration". Please complete the form and submit your registration.

**Read this Operators Manual completely** before attempting to use this equipment. Save this manual and keep it handy for quick reference. Pay particular attention to the safety instructions we have provided for your protection. The level of seriousness to be applied to each is explained below:

### **⚠ WARNING**

This statement appears where the information **must** be followed **exactly** to avoid **serious personal injury** or **loss of life**.

### **⚠ CAUTION**

This statement appears where the information **must** be followed to avoid **minor personal injury** or **damage to this equipment**.

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## TECHNICAL SPECIFICATIONS – CV-655

<b>INPUT - THREE PHASE ONLY</b>					
<u>Standard Voltage</u>	<u>Input Current at Rated Output</u>		<u>Code Number</u>		
	<u>100% Duty Cycle</u>	<u>60% Duty Cycle</u>			
230/460/60	94/47	116/58	10120		
230/460/575/60	94/47/38	116/58/47	10121		
208/416/60	104/52	128/64	10122		
460/60	47	58	10123		
575/60	38	47	10124		
230/400/50/60*	94/54	116/67	10125		
380/500/50/60*	56/43	69/53	10126		
440/50/60	49	60	10127		
200/400/50/60	107/54	132/67	10128		
415/50/60	52	64	10129		
<b>RATED OUTPUT</b>					
<u>Duty Cycle</u>	<u>Amps</u>		<u>Volts at Rated Amperes</u>		
100% Duty Cycle NEMA Class I (100)*	650		44		
60% Duty Cycle	815		44		
<b>OUTPUT</b>					
<u>Current Range</u>	<u>Maximum Open Circuit Voltage</u>		<u>Auxiliary Power</u>		
70-815	48		See the OPERATION section for Auxiliary Power information by model		
<b>RECOMMENDED INPUT WIRE AND FUSE SIZES</b>					
<u>INPUT VOLTAGE /</u>	<u>HERTZ FREQUENCY</u>	<u>INPUT AMPERE RATING ON NAMEPLATE</u>	<u>TYPE 75°C COPPER WIRE IN CONDUIT AWG(IEC-MM<sup>2</sup>) SIZES 40°C (104°F) Ambient</u>	<u>TYPE 75°C GROUND WIRE IN CONDUIT AWG(IEC-MM<sup>2</sup>) SIZES</u>	<u>TYPE 75°C (SUPER LAG) OR BREAKER SIZE (AMPS)<sup>1</sup></u>
208	60	104	1 (43)	6 (14)	200 Amp
230	60	94	2 (34)	6 (14)	175 Amp
416	60	52	6 (14)	8 (8.4)	90 Amp
460	60	47	6 (14)	8 (8.4)	90 Amp
575	60	38	8 (8.4)	8 (8.4)	70 Amp
200	50/60	107	1 (43)	6 (14)	200 Amp
230	50/60	94	2 (34)	6 (14)	175 Amp
380	50/60	56	6 (14)	8 (8.4)	100 Amp
400	50/60	54	6 (14)	8 (8.4)	100 Amp
415	50/60	52	6 (14)	8 (8.4)	90 Amp
440	50/60	49	6 (14)	8 (8.4)	90 Amp
500	50/60	43	8 (8.4)	8 (8.4)	80 Amp
<b>PHYSICAL DIMENSIONS</b>					
<u>HEIGHT</u>	<u>WIDTH</u>	<u>DEPTH</u>	<u>WEIGHT</u>		
27.5 in 699 mm	22.2 in 564 mm	38.0 in 965 mm	652 lbs. 283 kg.		

\* European models meet IEC974-1 standards.

<sup>1</sup>Also called "inverse time" or "thermal/magnetic" circuit breakers; circuit breakers which have a delay in tripping action that decreases as the magnitude of the current increases.

CV-655





## GRAPHIC SYMBOLS THAT APPEAR ON RATING PLATE (LOCATED ON CASE BACK)



3 Phase transformer with rectified DC output



**INPUT POWER**



**THREE PHASE**

**NEMA EW 1 (100%)**

Designates welder complies with National Electrical Manufacturers Association requirements EW 1 Class I with 100% duty cycle at 650Amps output. (Domestic, Canadian, and Export models)

**IEC 974-1**

Designates welder complies with International Electrotechnical Commission requirements 974-1. (European Models)



Constant Voltage Output Characteristics



**GMAW**



**FCAW**



Designates welder can be used in environments with increased hazard of electric shock. (European models)



Designates welder complies with low voltage directive and with EMC directive. (European models)



Designates welder complies with both Underwriters Laboratories (UL) standards and Canadian Standards Association (CSA) standards. (Canadian Model)



Designates welder complies with Underwriters Laboratories (UL) standards. (Domestic Models)

Read entire installation section before starting installation.

## SAFETY PRECAUTIONS

### ⚠ WARNING



#### ELECTRIC SHOCK can kill.

- Only qualified personnel should perform this installation.
- Turn the input power OFF at the disconnect switch or fuse box before working on this equipment.
- Turn the Power switch on the CV-655 "OFF" before connecting or disconnecting output cables, wire feeder or remote connections, or other equipment.
- Do not touch electrically hot parts.
- Always connect the Idealarc CV-655 grounding terminal (located on the welder near the reconnect panel) to a good electrical earth ground.

## SELECT SUITABLE LOCATION

Place the welder where clean cooling air can freely circulate in through the front louvers and out through the rear louvers. Dirt, dust or any foreign material that can be drawn into the welder should be kept at a minimum. Failure to observe these precautions can result in excessive operating temperatures and nuisance shut-downs.

## STACKING

The CV-655 may be stacked three-high provided the bottom machine is on a stable, hard, level surface. Be sure that the two pins in the roof fit into the slots in the base of the CV-655 above it.

## TILTING

Do not place the machine on a surface that is inclined enough to create a risk of the machine falling over.

## ELECTRICAL INPUT CONNECTIONS

Before installing the machine check that the input supply voltage, phase, and frequency are the same as the voltage, phase, and frequency as specified on the welder nameplate.

Use input wire sizes that meet local electrical codes or see the **Technical Specifications** page in this manual.

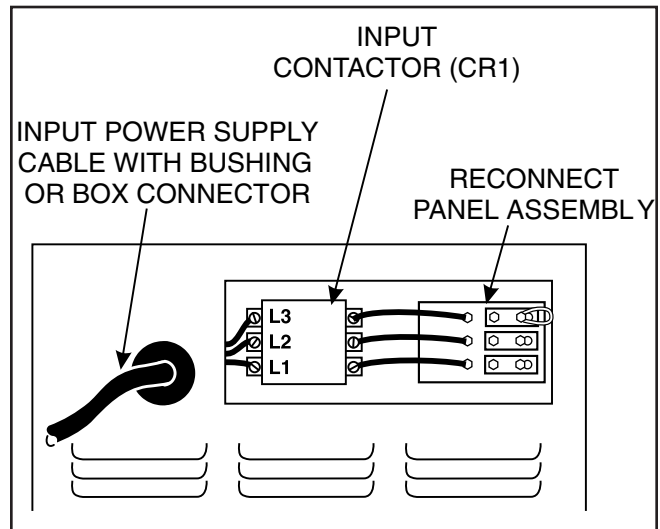


FIGURE A.1 ELECTRICAL INPUT CONNECTIONS

Input power supply entry is through the hole in the Case Back Assembly. See Figure A.1 for the location of the machine's input cable entry opening, Input Contactor (CR1), and reconnect panel.

## FUSE AND WIRE SIZES

Protect the input circuit with the super lag fuses or delay type circuit breakers listed on the **Technical Specifications** page of this manual for the machine being used. They are also called inverse time or thermal/magnetic circuit breakers.

DO NOT use fuses or circuit breakers with a lower amp rating than recommended. This can result in "nuisance" tripping caused by inrush current even when machine is not being used for welding at high output currents.

## GROUND CONNECTION

Ground the frame of the machine. A ground terminal marked with the symbol  $\oplus$  is located inside the case back of the machine near the input contactor. Access to the input box assembly is at the upper rear of the machine. See your local and national electrical codes for proper grounding methods. Use grounding wire sizes that meet local electrical codes or see the **Technical Specifications** page in this manual.

**INPUT POWER SUPPLY CONNECTIONS**

A qualified electrician should connect the input power supply leads.

1. Follow all national and local electrical codes.
2. Use a three-phase line.
3. Remove the input access door at upper rear of the machine.
4. Follow input supply connection diagram located on the inside the door.
5. Connect the three-phase AC power supply leads L1, L2, and L3 to the input contactor terminals in the input box assembly. See Figure A.1.

**RECONNECT PROCEDURE**

**⚠ WARNING**



**Electric Shock Can Kill**

- Disconnect input power before performing this procedure.

Multiple voltage machines are shipped connected to the highest input voltage listed on the machine's rating plate. Before installing the machine, check that the reconnect panel in the input box assembly is connected for the proper voltage.

**⚠ CAUTION**

Failure to follow these instructions can cause immediate failure of components within the machine.

When powering welder from generator be sure to turn off welder first, before generator is shut down, in order to prevent damage to welder!

To reconnect a multiple voltage machine to a different voltage, remove input power and follow the input connection diagram located on the inside of case back input access door.

1. For dual voltage sample machine reconnect instructions, see Figure A.2.

<p><b>⚠ WARNING</b></p> <p><b>HIGH VOLTAGE CAN KILL</b></p> <ul style="list-style-type: none"> <li>• Do not operate with covers removed</li> <li>• Do not touch electrically live parts</li> <li>• Disconnect input power before servicing</li> <li>• Only qualified persons should install, use or service this equipment</li> </ul>	<p style="text-align: center;"><b>DUAL VOLTAGE MACHINE</b></p> <p style="text-align: center;"><b>INPUT SUPPLY CONNECTION DIAGRAM</b></p> <p style="text-align: center;"><b>IMPORTANT: CHANGE LINK POSITIONS AND CONTROL TRANSFORMER CONNECTIONS.</b></p> <p style="text-align: center;"><b>NOTE: MACHINES ARE SHIPPED FROM FACTORY CONNECTED FOR OVER 300 VOLTS</b></p>
<p style="text-align: center;"><b>CONNECTION FOR HIGHEST RATING PLATE VOLTAGE</b></p>	<ol style="list-style-type: none"> <li>1. TURN OFF THE INPUT POWER USING THE DISCONNECT SWITCH AT THE FUSE BOX.</li> <li>2. DISCONNECT AND INSULATE THE H2 LEAD TERMINAL WITH TAPE TO PROVIDE AT LEAST 600 VOLT INSULATION.</li> <li>3. CONNECT L1, L2 &amp; L3 INPUT SUPPLY LINES AND H1 &amp; H3 CONTROL TRANSFORMER LEADS TO THE INPUT SIDE OF CR1 CONTACTOR AS SHOWN.</li> <li>4. CONNECT TERMINAL MARKED Ⓛ TO GROUND PER LOCAL AND NATIONAL ELECTRIC CODES.</li> <li>5. MOUNT THE LINKS IN THE POSITIONS SHOWN; DOUBLE OR TRIPLE STACK THE LINKS IN THREE POSITIONS. LOOP THE FLEX LEAD IN THE POSITION SHOWN; POSITIONING THE LUGS TO MAINTAIN MAXIMUM CLEARANCE TO THE LINKS. INSTALL AND TIGHTEN ALL OF THE HEX NUTS.</li> </ol>
<p style="text-align: center;"><b>CONNECTION FOR LOWEST RATING PLATE VOLTAGE</b></p>	<ol style="list-style-type: none"> <li>1. TURN OFF THE INPUT POWER USING THE DISCONNECT SWITCH AT THE FUSE BOX.</li> <li>2. DISCONNECT AND INSULATE THE H3 LEAD TERMINAL WITH TAPE TO PROVIDE AT LEAST 600 VOLT INSULATION.</li> <li>3. CONNECT L1, L2 &amp; L3 INPUT SUPPLY LINES AND H1 &amp; H2 CONTROL TRANSFORMER LEADS TO THE INPUT SIDE OF CR1 CONTACTOR AS SHOWN.</li> <li>4. CONNECT TERMINAL MARKED Ⓛ TO GROUND PER LOCAL AND NATIONAL ELECTRIC CODES.</li> <li>5. MOUNT THE LINKS IN THE POSITIONS SHOWN. CONNECT THE FLEX LEAD AS SHOWN; POSITIONING THE LUGS TO MAINTAIN MAXIMUM CLEARANCE TO THE LINKS. INSTALL AND TIGHTEN ALL OF THE HEX NUTS.</li> </ol>
<p style="text-align: center;">THE LINCOLN ELECTRIC CO., CLEVELAND OHIO U.S.A.</p>	<p>D-UF</p> <p>M18225</p>

**FIGURE A.2 Dual Voltage Machine Reconnection Procedure**

## OUTPUT CONNECTIONS

### ELECTRODE AND WORK CABLES



Use the shortest possible cable lengths. See Table A.1 for recommended cable sizes based on length.

**TABLE A.1**  
Cable Sizes for Combined Lengths of Copper  
Electrode and Work Cable

Cable Length ft. (m)	Parallel Cables	Cable Size
0 (0) to 100 (30.4)	2	2/0 (70mm <sup>2</sup> )
100 (30.4) to 200 (60.8)	2	3/0 (95mm <sup>2</sup> )
200 (60.8) to 250 (76.2)	2	4/0 (120mm <sup>2</sup> )



The output terminals are located at the lower front of the welder behind a hinged door. Refer to figure A.3. Route the welding cables through the slotted strain reliefs of the base to the welding terminals.

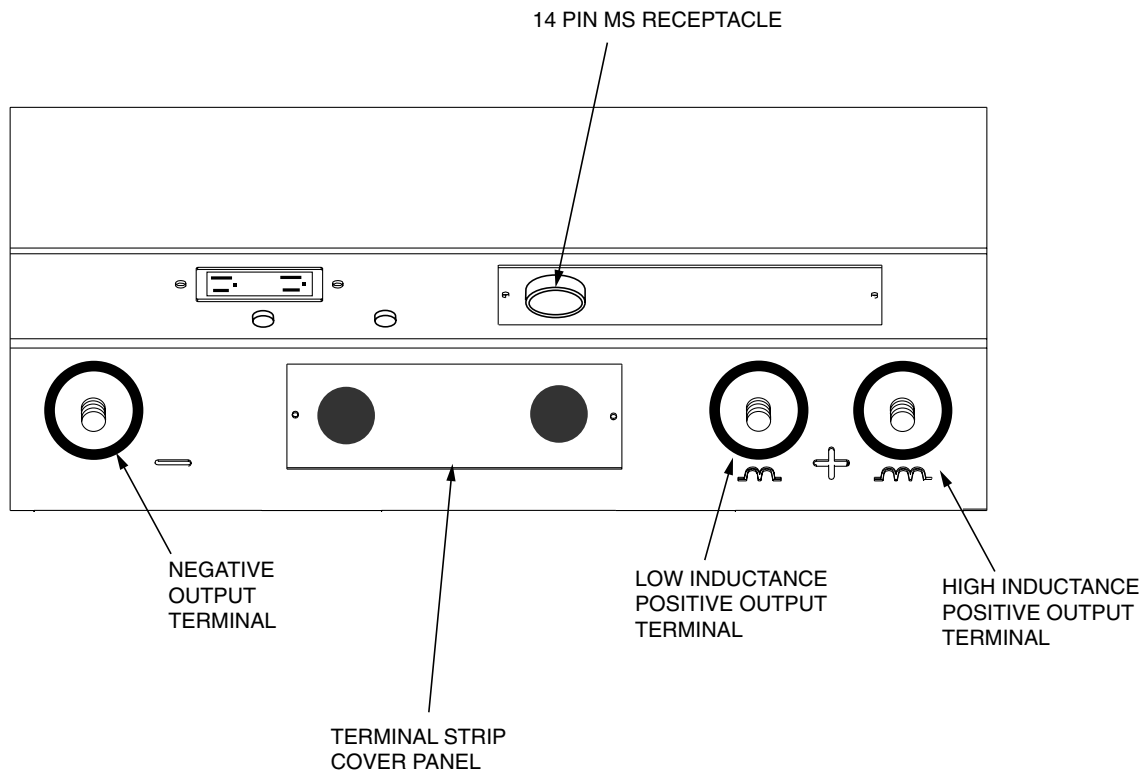
#### For Positive Polarity:

1. Connect the electrode cable to either the low inductance terminal (marked "  ") or the high inductance terminal (marked "  "). See OPERATION section "Positive Output Terminals" for an explanation of the use of high or low inductance terminals.

2. Connect the work cable to the negative terminal marked "-".
3. Remove the terminal strip access cover panel on the lower case front. Refer to figure A.3 for the location.
4. Work Sense lead #21 from the 14 Pin MS-receptacle must be connected to "-21" on the terminal strip.  
**Note: This is how the CV-655 is shipped from the factory.**
5. Replace the terminal strip access cover panel.

#### For Negative Polarity:

1. Connect the work cable to either the low inductance terminal (marked "  ") or the high inductance terminal (marked "  "). See OPERATION section "Positive Output Terminals" for an explanation of the use of high or low inductance terminals.
2. Connect the electrode cable to the negative terminal marked "-".
3. Remove the terminal strip access cover panel on the lower case front. Refer to figure A.3 for the location.
4. Work Sense lead #21 from the 14 Pin MS-receptacle must be connected to "+21" on the terminal strip.
5. Replace the terminal strip access cover panel.



**FIGURE A.3** Output Connections

## AUXILIARY POWER AND CONTROL CONNECTIONS

Located at the lower front of the welder behind a hinged door is a 115VAC duplex receptacle for auxiliary power (Domestic and Canadian Models only) and a 14 Pin MS type receptacle for connection of auxiliary equipment such as wire feeders. Also, terminal strips with 115VAC and connections for auxiliary equipment are located behind the access panel on the lower case of the welder. A 220VAC receptacle for a water cooler (European and Export Models only) is located on the case back.

### AUXILIARY POWER TABLE

Voltage and Circuit Breaker Ratings at Auxiliary Power Connections for Various Models

Auxiliary Power Connections	Domestic Models (60Hz)	Canadian Model (230/460/575V/60 Hz)	European Models (50/60 Hz)	Export Models (50/60 Hz)
At Duplex Receptacle	115V 20A	115V 15A	No Duplex	No Duplex
Terminal strip terminals 31 & 32	115V 20A	115V 15A	115V 15A	115V 15A
MS-Receptacle pins A & J	115V 20A	115V 15A	Open Circuit	115V 15A
MS-Receptacle pins I & K	42V 10A	42V 10A	42V 10A	42V 10A
At 220V Receptacle	No Receptacle	No Receptacle	220V 2A	220V 2A

### 115VAC DUPLEX RECEPTACLE (DOMESTIC AND CANADIAN MODELS ONLY)

The 115VAC duplex receptacle is protected by a circuit breaker located below the receptacle (see Auxiliary Power Table). Receptacle is a NEMA 5-20R (protected by a 20 amp breaker) on Domestic Models and a NEMA 5-15R (protected by a 15 amp breaker) on Canadian Models.

### 230VAC RECEPTACLE (EUROPEAN AND EXPORT MODELS ONLY)

A Continental European receptacle is located on the rear panel for supplying 220VAC to a water cooler. The receptacle has a protective cover to prevent incidentally contact and is a Schuko type. The circuit is protected by a 2 amp circuit breaker also located on the rear panel. This circuit is electrically isolated from all other circuits, but on the European Models one line is connected to chassis ground.

### 14 PIN MS TYPE RECEPTACLE

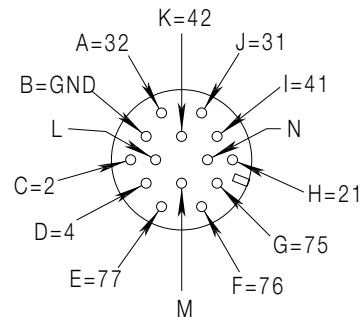
(For MS3106A-20-27PX Plug. L.E.C. Part #S12020-32)

Refer to the figure A.4 for the available circuits in the 14 pin receptacle.

42 VAC is available at receptacle pins I and K. A 10 amp circuit breaker protects this circuit.

115 VAC is available at receptacle pins A and J (Domestic, Canadian and Export Models). This circuit is protected by a circuit breaker (see Auxiliary Power Table). Note that the 42 VAC and 115 VAC circuits are electrically isolated from each other. However, on the European model one line of the 115VAC is connected to chassis ground.

**FIGURE A.4 FRONT VIEW OF 14-PIN CONNECTOR RECEPTACLE**



PIN	LEAD NO.	FUNCTION
A	32	115 VAC
B	GND	Chassis Connection
C	2	Trigger Circuit
D	4	Trigger Circuit
E	77	Output Control
F	76	Output Control
G	75	Output Control
H	21	Work Sense Connection <sup>2</sup>
I	41	42 VAC
J	31	115 VAC <sup>1</sup>
K	42	42 VAC
L	---	---
M	---	---
N	---	---

<sup>1</sup>. 115VAC circuit is not present on IEC 974-1 models.

<sup>2</sup>. As shipped from the factory Lead #21 from the 14 Pin connector is connected to "21" on the terminal strip. This is the configuration for positive welding. If welding negative polarity, connect lead #21 to the "+21" connection point on the terminal strip.

## TERMINAL STRIPS

Terminal strips are available behind the cover panel on the lower case front to connect wire feeder control cables that do not have a 14 Pin MS-type connector. Refer to figure A.3 for the location of this cover panel. These terminals supply the connections as shown in the following Terminal Strip charts. See Auxiliary Power Table for rating of circuit breaker in 115VAC circuit. Remove a plug button from the terminal strip cover and install an appropriate strain relief clamp for the cable being used. NOTE: There are two work sense lead connection points on the terminal strip. Connect both the work sense lead #21 from the 14 pin connector and #21 lead of the control cable to “-21” when welding positive polarity or to “+21” when welding negative polarity.

### TERMINAL STRIP 1 (T.S.1)

Lead No.	Function
75	Output Control
76	Output Control
77	Output Control

### TERMINAL STRIP 2 (T.S.2)

Lead No.	Function
+21	Work Connection
-21	Work Connection <sup>2</sup>
41	42 VAC
4	Trigger Circuit
2	Trigger Circuit
31	115 VAC <sup>1</sup>
32	115 VAC <sup>1</sup>

<sup>1</sup> 115VAC circuit is not present on IEC 974-1 models.

<sup>2</sup> As shipped from the factory Lead #21 from the 14 Pin connector is connected to “-21” on the terminal strip. This is the configuration for positive welding. If welding negative polarity, connect lead #21 to the “+21” connection point on the terminal strip.



## SAFETY PRECAUTIONS

Read and understand this entire section before operating the machine.

### GENERAL WARNINGS

#### WARNING



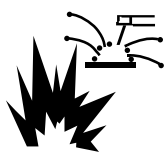
#### **ELECTRIC SHOCK can kill.**

- Do not touch electrically live parts or electrode with skin or wet clothing.
- Insulate yourself from work and ground.
- Always wear dry insulating gloves.



#### **FUMES AND GASES can be dangerous.**

- Keep your head out of fumes.
- Use ventilation or exhaust to remove fumes from breathing zone.



#### **WELDING SPARKS can cause fire or explosion**

- Keep flammable material away.
- Do not weld on containers that have held combustibles.



#### **ARC RAYS can burn.**

- Wear eye, ear and body protection.

Observe additional Safety Guidelines detailed throughout this manual.

## GENERAL DESCRIPTION

The CV-655 is an energy efficient constant voltage DC power source that produces outstanding arc characteristics.

Four models are available:

Domestic - all 60 Hertz models except 230/460/575v.  
NEMA Class 1 rated

Canadian - 230/460/575v 60 Hertz  
NEMA Class 1 rated

European - 50/60 Hertz models rated for IEC 974-1  
Export - 50/60 Hertz models NEMA Class 1 rated

## RECOMMENDED PROCESSES AND EQUIPMENT

The CV-655 is designed for GMAW (MIG), FCAW, (except NR-203 family electrodes) and CV semi-automatic submerged arc welding processes (SAW), plus the capability of air carbon arc gouging (AAC) up to 3/8" (10mm) diameter carbons. Limited CV automatic submerged arc welding with 5/64" and smaller wires.

The CV-655 is recommended for use with Lincoln's DH-10 or LN-10 as well as the LN-7\*, LN-7 GMA\*, LN-742, LN-8\*, LN-9\*, LN-9 GMA\*, LN-23P and LN-25 semiautomatic wire feeders. It is also recommended for use with the NA-3, NA-5 and NA-5R automatic feeders, but "cold starting" for sub-arc cannot be used (it must be jumpered out).

\* The 14-pin MS receptacle on the European models does not provide 115 VAC for these feeders; 115 VAC must be obtained from terminal strip.

There are no provisions on the CV-655 for paralleling.

## DESIGN FEATURES AND ADVANTAGES

- Two inductance positions: operator can choose the optimum arc characteristics.
- Power on/off switch with pilot light and thermostat tripped indicator light.
- Full range output voltage control for easy operation.
- Panel switches for remote or local output control, and output on or remote selection.
- Hinged cover to protect output terminals and auxiliary connections.
- 42 VAC, 10 amp auxiliary power available for the wire feeder; circuit breaker protected.

CV-655

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## DESIGN FEATURES AND ADVANTAGES (CONT'D)

- 115 VAC, auxiliary power available for the wire feeder; circuit breaker protected. 20 amp breaker on Domestic model and 15 amp breaker on Canadian, European, and Export Models.
- 115VAC duplex plug receptacle available on Domestic and Canadian Models. 20 amp breaker on Domestic Models and 15 amp breaker on Canadian Model.
- Single MS-type (14-pin) connection for wire feeder.
- Thermal Fan Control with electronic and thermostatic protection for current overload and excessive temperatures.
- Optional Field Installed Digital or Analog Voltmeter/Ammeter kits are available.
- 220 VAC receptacle on European and Export models for connecting to a water cooler. Protected by 2 amp breaker.

## WELDING CAPABILITY

The CV-655 has the following Output and Duty Cycle based on operation for a 10 minute period:

650 Amps, 44 Volts at 100%  
815 Amps, 44 Volts at 60%

## CONTROLS AND SETTINGS

All operator controls and adjustments are located on the case front of the CV-655. Refer to Figures B.1, and B.2 and corresponding explanations.

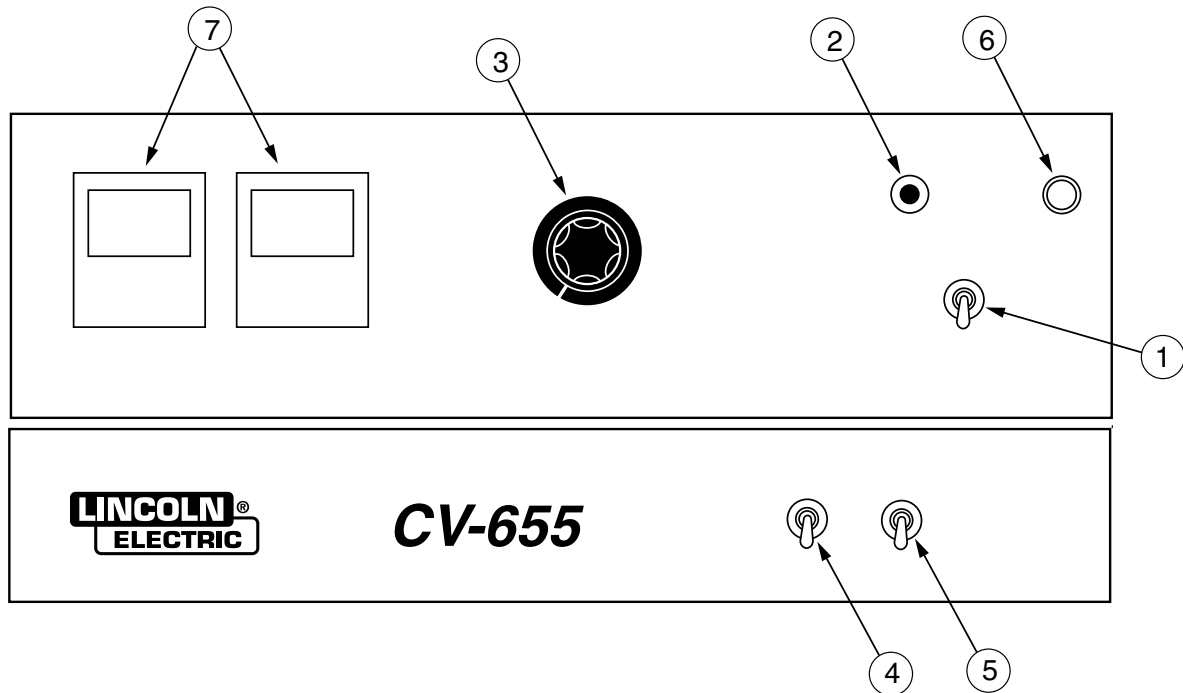







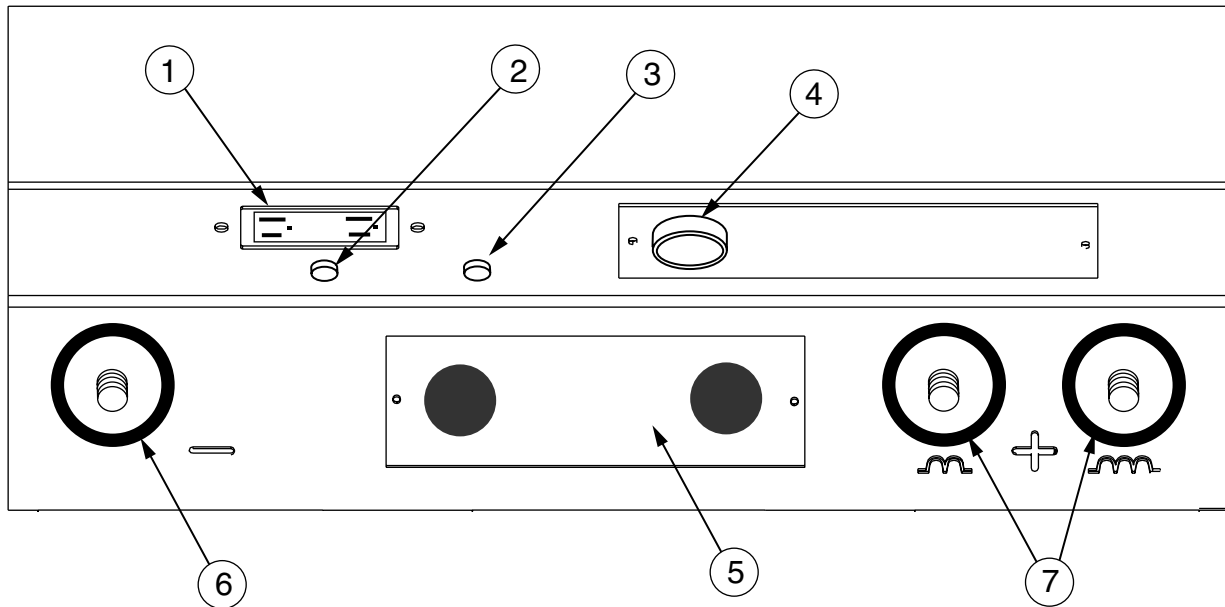


FIGURE B.1 CONTROL PANEL CONTROLS

1. **INPUT POWER ON/OFF SWITCH** - This toggle switch turns the machine on or off. Putting the switch in the ON  position energizes the machine's input contactor applying input power to the machine. Switching the switch to the OFF  position de-energizes the input contactor.
2. **PILOT LIGHT** - When the power switch is in the ON position the machine's white pilot light will illuminate. If the input contactor de-energizes the machine in an overload situation the pilot will still illuminate. In this situation it will be necessary to reset the machine by switching the power switch to the OFF then ON position. (See **Overload Protection** Section)
3. **OUTPUT VOLTAGE CONTROL** - This control provides continuous control of the machine's output voltage from minimum to maximum (typical full pot range between 15 to 44 volts) as it is rotated clockwise. 
4. **OUTPUT TERMINALS ON/REMOTE** - When this switch is in the REMOTE  position, the CV-655's output terminals will be electrically "cold" until a remote device such as a wire feeder closes the #2 and #4 circuit in the MS-receptacle or terminal strip. When this switch is in the ON position the machine's output terminals will be electrically energized all the time.
5. **LOCAL/REMOTE CONTROL SWITCH** - When this switch is set to the LOCAL  position, control of the output voltage is via the output voltage control on the CV-655's control panel. When this switch is set to the REMOTE  position, control is through a remote source such as a wire feeder via the #75, #76, and #77 leads in the MS-receptacle or terminal strip.
6. **THERMAL PROTECTION LIGHT**  - If the machine overheats due to lack of proper air flow through the machine or due to exceeding the machine's duty cycle, thermostats will disable the welding output and this light will illuminate. Input power is still applied to the machine and the cooling fan will continue to run. When the machine cools the welding output will resume.
7. **OPTIONAL VOLTMETER & AMMETER** - Digital or analog meter kits are available as field installed options. Refer to the **Accessories Section** of this manual.


CV-655


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**FIGURE B.2 LOWER CASE FRONT CONTROLS & CONNECTIONS**

**1. 115VAC DUPLEX RECEPTACLE (Domestic and Canadian Models)** This receptacle provides up to 20 amps of 115 VAC auxiliary power on the Domestic Models and up to 15 amps on the Canadian Model.

**2. 115VAC CIRCUIT BREAKER**  - This breaker protects the 115 VAC auxiliary circuits located in the duplex receptacle, terminal strip and MS-receptacle. Breaker is rated 20 amps on Domestic Models and 15 amps on all other models.

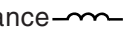

**3. 42VAC 10 AMP CIRCUIT BREAKER**  - This breaker protects the 42VAC auxiliary circuits located in the terminal strip and MS-receptacle.

**4. 14 PIN MS-RECEPTACLE** - This connector provides easy connection for a wire feeder control cable. It provides connections for auxiliary power, output switching, remote output control, wire feeder voltmeter sense lead and ground. Refer to **14 Pin MS Type Receptacle** in the Installation Section of this manual for information about the circuits made available at this receptacle.

**5. TERMINAL STRIP COVER PANEL** - Remove this panel to gain access to the circuits made available at the terminal strip. This terminal strip contains the same circuits as the 14 pin MS-receptacle. The cover also provides for installation of cable strain relief clamps.

**6. NEGATIVE OUTPUT TERMINAL** - This output terminal is for connecting a welding cable. To change

welding polarity and for proper welding cable size refer to **Electrode and Work Cables** in the Installation Section of this manual.

**7. POSITIVE OUTPUT TERMINALS** - These output terminals are for connecting a welding cable to either the High Inductance  or Low Inductance  Terminal for desired arc characteristics. High Inductance is recommended for Stainless Steel welding. Low Inductance is recommended for Short Arc GMAW. For Spray Arc and other processes either may be used to provide the preferred starting and welding arc characteristics: High Inductance will provide a “softer” arc, but will not provide as “crisp” of an arc start as the Low Inductance. To change welding polarity and for proper welding cable size refer to **Electrode and Work Cables** in the Installation Section of this manual.

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## CASE BACK CONNECTIONS

### 220VAC AUXILIARY RECEPTACLE (European and Export Models)

This receptacle provides up to 2 amps of 220VAC auxiliary power for a water cooler.

### 220VAC 2 AMP CIRCUIT BREAKER (European and Export Models)

This breaker protects the 220VAC auxiliary circuit located in the 220VAC receptacle.

### CAUTION

When using a CV-655 with wire feeders, there will be a small spark if the electrode contacts the work or ground with several seconds after releasing the trigger.

When used with some wire feeders with the electrical trigger interlock in the ON position, the arc might restart if the electrode touches the work or ground during these several seconds.

## AUXILIARY POWER

42 volt AC auxiliary power, as required for some wire feeders, is available through the wire feeder receptacle. A 10 amp circuit breaker protects the 42 volt circuit from overloads.

CV-655 machines can also supply 115 volt AC auxiliary power through the wire feeder receptacle. A 20 amp circuit breaker on the Domestic model, and a 15 amp on the Canadian and Export models protects the 115 volt circuit from overloads. 115VAC is not available in the MS-receptacle on the European models.

### CAUTION

Note that some types of equipment, especially pumps and large motors, have starting currents which are significantly higher than their running current. These higher starting currents may cause the circuit breaker to open. If this situation occurs, the user should refrain from using the CV-655 auxiliary power for that equipment.

## THERMAL FAN CONTROL

The machine's cooling fan remains off when the temperature of the rectifiers and windings inside the machine are below that requiring air flow cooling, as determined by electronic monitoring of several thermal sensors and the welding current of the machine. The fan may remain off until welding begins, but once the fan is activated, it will remain on for at least 5 minutes to assure proper cooling. This feature saves energy and also minimizes the amount of dirt and other air borne particles being drawn into the machine.

## OVERLOAD PROTECTION

This welder has thermostatic protection from excessive duty cycles, overloads, loss of cooling, and high ambient temperatures. When the welder is subjected to an overload or loss of cooling, a thermostat will open. This condition will be indicated by the illumination of the yellow Thermostatic Protection Light on the case front (see Figure B.1). The fan will continue to run to cool the power source. No welding is possible until the machine is allowed to cool and the Thermostatic Protection Light goes out.

The CV-655 also has over-current protection. When the load exceeds a threshold current (about 900 amps), overcurrent shut down will occur after a period of time that shortens as the current increases beyond this threshold. If the current reaches about 1000 amps the output will be "clamped" at about 1000 amps and shut down will occur in about 5 seconds. When this overload shut down occurs the short circuit output of the machine drops to only about 20 amps, but the input contactor and input pilot light will remain on until reset by turning the power switch off, then back on with overload removed.

## FAN MOTOR FUSE (EUROPEAN MODEL)

A 10 amp slow blow fuse protects the fan motor circuit. This fuse is located inside the CV-655 mounted on the fan motor bracket.

The CV-655 can be used to power any of the following Lincoln Wire feeders:

### SEMI-AUTOMATIC WIRE FEEDERS

- DH-10
- LN-10
- LN-7 GMA\*
- LN-742
- LN-7
- LN-9\*
- LN-9 GMA\*
- LN-23P
- LN-25
- LN-8\*

### AUTOMATIC WIRE FEEDERS\*#

- NA-3
- NA-5
- NA-5R

\* European CV-655 models only provide 115VAC for these feeders at the terminal strip (TS2)

# "Cold starting for sub-arc cannot be used. (It must be jumpered out. See Auto Feeder manual)

### FIELD INSTALLED OPTIONS

**K1482-1 Digital Ammeter/Voltmeter Kit** - Installs easily to the front control panel and provides digital display of actual welding voltage and amperage while welding. (Installation instructions are included with the kit).

**K1483-1 Analog Ammeter/Voltmeter Kit** - Installs easily to the front control panel and provides analog display of actual welding voltage and amperage while welding. (Installation instructions are included with the kit).

**K1484-1 Dual Feeder Kit** - This kit replaces the 14 Pin MS-receptacle panel on the lower case front of the CV-655. It provides two 14 Pin MS-receptacles and a built in transfer circuit for connecting and operating two like-polarity wire feeders. European CV-655 models can only use 42V feeders with this kit. (Installation instructions are included with the kit).


**K1485-1 Cable Hanger Bracket** - Mounts over standard lift bale of the CV-655 and provides a cable hanger on both sides of the power source, each side capable of holding up to 100 ft. of weld cable. (Installation instructions are included with the kit).

**K1486-1 Air Filter Kit** - Removable metal filter easily slides in and out of a bracket which mounts to the front of the CV-655. Filter is designed to trap 80% of entering particles which are 5 microns, or larger, in size. (Installation instructions are included with the kit).

**NOTE:** A dirty air filter may cause the thermal protection of the CV-655 to prematurely activate. Remove and blow out, or wash and dry, the filter every two months, or less if in extremely dirty conditions. Replace if necessary.

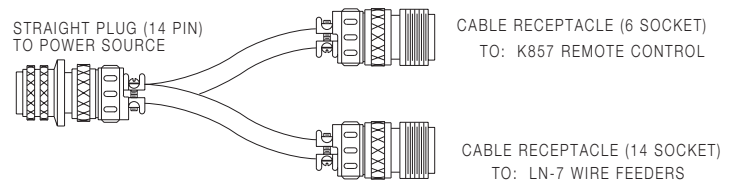
**Undercarriage (K817P, K842)** - The CV-655 is designed for use with the Lincoln K817P or K842 Undercarriage. Complete installation instructions are included with each undercarriage. When any of the undercarriages are installed, the CV-655 lift bail is no longer functional. Do not attempt to lift the machine with the undercarriage attached. The undercarriage is designed for moving the machine by hand only. Mechanized towing can lead to injury and /or damage to the CV-655.

### REMOTE OUTPUT CONTROL (K775 or K857 WITH K864 ADAPTER)

An optional "remote output control" is available. This is the same remote control that is used on other Lincoln power sources (K775). The K775 consists of a control box with 28 ft (8.5m) of four conductor cable. This connects to terminals 75, 76, and 77 on the terminal strip and the case grounding screw so marked with the symbol  on the machine. These terminals are located behind the cover panel on the lower connection panel of the CV-655. This control will give the same control as the output control on the machine.

The K857 has a 6-pin MS-style connector. The K857 requires a K864 adapter cable which connects to the 14-pin connector on the CV-655.

### REMOTE CONTROL ADAPTER CABLE (K864)



A "V" cable 12" (.30m) long to connect a K857 Remote Control (6 pin connector) with a wire-feeder (14-pin connector) and the machine (14-pin connector). If a remote control is used alone the wire-feeder connection is then not used.



## SAFETY PRECAUTIONS

### WARNING



**ELECTRIC SHOCK can kill.**

- Only qualified personnel should perform this maintenance.
- Turn the input power OFF at the disconnect switch or fuse box before working on this equipment.
- Do not touch electrically hot parts.

---

## GENERAL MAINTENANCE

1. The fan motor has sealed bearings which require no service.
2. In extremely dusty locations, dirt may restrict the cooling air causing the welder to run hot with premature tripping of thermal protection. Blow out the welder with low pressure air at regular intervals to eliminate excessive dirt and dust build-up on internal parts.
3. Periodically check the welding cables. Inspect for any slits or punctures. Also make sure that all connections are tight.

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## HOW TO USE TROUBLESHOOTING GUIDE

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### WARNING

Service and Repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

This Troubleshooting Guide is provided to help you locate and remedy possible problems with machine setup or operation. Simply follow the three-step procedure listed below.

**Step 1. LOCATE PROBLEM (SYMPTOM).**

Look under the column labeled “PROBLEM (SYMPTOMS)”. This column describes possible symptoms that the machine may exhibit. Find the listing that best describes the symptom that the machine is exhibiting.

**Step 2. PERFORM EXTERNAL TESTS.**

The second column labeled “POSSIBLE AREAS OF MISADJUSTMENT(S)” lists the obvious external possibilities that may contribute to the machine symptom. Perform these tests/checks in the order listed. In general, these tests can be conducted without removing the case wrap-around cover.

**Step 3. PERFORM COMPONENT TESTS.**

If you have exhausted all of the recommended tests in Step 2, Consult your Local Authorized Field Service Facility.

### CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **LOCAL AUTHORIZED LINCOLN ELECTRIC FIELD SERVICE FACILITY** for assistance before you proceed.

---

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
<b>PROBLEMS</b>		
Input contactor (CR1) chatters.	<ol style="list-style-type: none"> <li>1. Faulty input contactor (CR1).</li> <li>2. Low line voltage.</li> </ol>	
Machine input contactor does not operate.	<ol style="list-style-type: none"> <li>1. Make sure the proper three-phase input power is applied to the CV655 machine.</li> <li>2. The input contactor may be faulty.</li> <li>3. The power switch (SW1) may be faulty.</li> <li>4. The pilot transformer may be faulty.</li> </ol>	
Machine input contactor operates, but no output when trying to weld.	<ol style="list-style-type: none"> <li>1. Electrode or work cables may be loose or broken.</li> <li>2. Firing P.C. board is not connected or is faulty. See PC board LED information.</li> <li>4. Trigger circuit may not be working. Place Output Terminals Switch to the ON position, or place a jumper wire across #2 and #4 on the terminal strip. LED 6 on the control PC board should go ON. If it does not light check for opens in the #2 and #4 circuit. See wiring diagram. If LED 6 does light the control board may be faulty.</li> <li>5. If the thermal protection light is ON the machine is overheated. The choke or secondary thermostats may be open. Make sure the fan is operating and remove the cause of the overheating problem. See PC board LED information.</li> </ol>	<p>If all recommended possible areas of misadjustments have been checked and the problem persists, <b>contact your local Lincoln Authorized Field Service Facility.</b></p>

 **CAUTION**

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

CV-655



Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
<b>PROBLEMS</b>		
Machine has maximum output, but no control.	<ol style="list-style-type: none"> <li>1. Check the Local/Remote output switch (SW3) and associated leads. See wiring diagram.</li> <li>2. Make sure the remote control leads #75, #76 and /or #77 are NOT grounded to the negative welding output.</li> <li>3. The output control potentiometer may be faulty.</li> <li>4. The control board or control board transformer (T3) may be faulty.</li> </ol>	
Machine has minimum output and no control.	<ol style="list-style-type: none"> <li>1. The remote control leads #75, #76 and/or #77 may be grounded to the positive welding output.</li> </ol>	<p>If all recommended possible areas of misadjustments have been checked and the problem persists, <b>contact your local Lincoln Authorized Field Service Facility.</b></p>
Machine does not have maximum output.	<ol style="list-style-type: none"> <li>1. Make sure the correct three-phase input is applied to the CV655 machine.</li> <li>2. The output control potentiometer may be faulty.</li> <li>3. The Local/Remote switch (SW3) may be faulty.</li> <li>4. The control or firing boards may be faulty. See PC board LED information.</li> </ol>	
Poor arc striking with semiautomatic or automatic wire feeders.	<ol style="list-style-type: none"> <li>1. Make sure the welding cables and connections are secure.</li> <li>2. Check for correct welding procedures.</li> </ol>	

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CV-655



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PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
<b>PROBLEMS</b>		
Variable or sluggish welding arc.	<ol style="list-style-type: none"> <li>1. Make sure the welding cables are sized correctly and the connections are tight.</li> <li>2. Make sure the welding procedures are correct.</li> </ol>	<p>If all recommended possible areas of misadjustments have been checked and the problem persists, <b>contact your local Lincoln Authorized Field Service Facility.</b></p>
Machine will not shut off.	<ol style="list-style-type: none"> <li>1. The input power switch (SW1) may be faulty.</li> <li>2. The input contactor (CR1) may be faulty.</li> </ol>	
Output Control Pot not functioning in "Local" control.	<ol style="list-style-type: none"> <li>1. Check the Local/Remote control switch and associated leads. See wiring diagram.</li> <li>2. The machine output control potentiometer may be faulty. Also check associated leads. See wiring diagram.</li> </ol>	
No output control in "Remote" control.	<ol style="list-style-type: none"> <li>1. Output Control Switch in wrong position.</li> <li>2. Faulty Output Control Switch.</li> <li>3. Faulty Remote Control Pot.</li> <li>4. Leads or connections open in control circuit. (#75, #76, #77)</li> </ol>	

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CV-655



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PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
<b>PROBLEMS</b>		
Machine will not weld. OCV is less than 1 volt.	<ol style="list-style-type: none"> <li>1. The machine may be in a over-load condition. Remove the short circuit or excessive load on the output terminals.</li> <li>2. See the PC board LED information.</li> </ol>	<p>If all recommended possible areas of misadjustments have been checked and the problem persists, <b>contact your local Lincoln Authorized Field Service Facility.</b></p>
The wire feeder will not come on.	<ol style="list-style-type: none"> <li>1. Either the 42VAC or the 115VAC circuit breakers may be tripped. Reset if necessary.</li> <li>2. Check for the presence of the required voltage to operate the wire feeder.</li> <li>3. The control cable or wire feeder may be faulty.</li> </ol>	
Poor starting.	<ol style="list-style-type: none"> <li>1. The capacitor discharge resistor (R2) may be faulty. See wiring diagram.</li> <li>2. The control board may be faulty. See PC board LED information.</li> </ol>	

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CV-655





Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
<b>PROBLEMS</b>		
Poor arc characteristics.	<ol style="list-style-type: none"> <li>1. The positive welding cable may be connected to the wrong inductance tap.</li> <li>2. The output capacitors may be faulty. <b>Warning:</b>The liquid electrolyte in these capacitors is toxic. Avoid contact with any portion of your body. Clean up vented electrolyte using rubber gloves and a water dampened cloth. Any electrolyte which gets on the skin, clean with soap and water.</li> <li>3. The control board may be faulty. See PC board LED information.</li> </ol>	<p>If all recommended possible areas of misadjustments have been checked and the problem persists, <b>contact your local Lincoln Authorized Field Service Facility.</b></p>
115VAC receptacle not working. (60HZ machines only)	<ol style="list-style-type: none"> <li>1. Check the 115VAC circuit breaker. Reset if necessary. Make sure the load on the receptacle does not exceed the rating of the 115VAC breaker (either 15A or 20A). See wiring diagram.</li> </ol>	

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CV-655



Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
<b>PROBLEMS</b>		
Thermal Protection Light comes ON and fan does not run.  <b>NOTE:</b> Fan is thermal controlled and does not continuously run when machine is powered up.	<ol style="list-style-type: none"> <li>1. Check for obstructions that could prevent the fan from turning.</li> <li>2. Check the fan control circuit. See wiring diagram.</li> <li>3. The fan motor may be faulty.</li> <li>4. The Thermal Fan/Snubber PC board may be faulty. See PC board LED information.</li> </ol>	
Fan runs continuously.	<ol style="list-style-type: none"> <li>1. The Thermal Fan Thermistor may be faulty. See wiring diagram.</li> <li>2. The Thermal Fan/Snubber PC board may be faulty. See PC board LED information.</li> </ol>	
One or both Digital Meters not lighting.	<ol style="list-style-type: none"> <li>1. The meters may not be receiving the voltages from the auxiliary transformer. Check plug P13. See wiring diagram.</li> <li>2. The Digital meter PC board may be faulty.</li> </ol>	If all recommended possible areas of misadjustments have been checked and the problem persists, <b>contact your local Lincoln Authorized Field Service Facility.</b>
Digital Voltmeter not working properly or erratic display.	<ol style="list-style-type: none"> <li>1. Meter may not be receiving auxiliary or sensing voltages. Make sure plug P12 &amp; P13 are securely plugged into the Digital meter PC board and also plug P3 is securely plugged into the control board.</li> <li>2. There may be an open in the voltage feedback circuit. See wiring diagram.</li> <li>3. The Digital meter PC board may be faulty.</li> </ol>	

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Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
<b>PROBLEMS</b>		
Digital Ammeter not working properly or erratic display.	<ol style="list-style-type: none"> <li>1. The meter PC board may not be receiving the auxiliary or sensing voltages. Check plug P3 and plugs P12 &amp; P13. See wiring diagram.</li> <li>2. The current feedback circuit may be faulty. From the shunt to the control board. See wiring diagram.</li> <li>3. The Digital meter PC board may be faulty.</li> </ol>	<p>If all recommended possible areas of misadjustments have been checked and the problem persists, <b>contact your local Lincoln Authorized Field Service Facility.</b></p>
Analog Meters not reading, or not reading correctly.	<ol style="list-style-type: none"> <li>1. The meters may not be receiving voltage or current feedback signals. Make sure plug P3 is securely plugged in the control board and plug J14 (in-line connector) is securely seated in the plug assembly from the control board.</li> <li>2. Check the current feedback and voltage feedback circuits. See wiring diagram.</li> <li>3. The meter(s) may be defective.</li> </ol>	
220VAC receptacle not working. (50/60 HZ machines only)	<ol style="list-style-type: none"> <li>1. Check the circuit breaker. Reset if necessary.</li> <li>2. Check for broken or loose connections in the 220VAC circuit. See wiring diagram.</li> </ol>	

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CV-655



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## PC BOARD TROUBLESHOOTING GUIDE - FIRING PRINTED CIRCUIT BOARD

1. All 10 LED's must be ON when the POWER SOURCE is turned ON and the wire feeder's trigger is closed, or a jumper is placed between 2 & 4, or the "OUTPUT TERMINALS SWITCH" is in the ON position.
2. LED's 7, 8, and 9 indicate AC power being supplied to the P.C. board from auxiliary windings (T1). If a light is not on, turn the machine off and unplug P5 from the firing board. Turn the machine back on and check the following voltages:

Light that was off	Check AC voltage between	Voltage should be approximately
7	P5 pins 15 & 16 (wires 203,204)	32VAC
8	P5 pins 7 & 8 (wires 205,206)	32VAC
9	P5 pins 5 & 6 (wires 207,208)	32VAC

3. If all voltages are present, turn power off, and plug P5 back into J5. Turn power back on. If LED's are still out, replace firing Printed Circuit Board (PCB).
4. If voltages were not present then check the wiring back to the auxiliary windings for a possible open.
5. LED 10 senses when 2 and 4 are closed. Close 2 & 4, LED 10 should be "on". Open 2 & 4, LED 10 should be "off".
6. LED's 1 through 6 indicate gate signals are being sent to the main SCR's 1 through 6 respectively. If LED5 is on (CONTROL BOARD), along with LED7, 8, and 9 on firing (PCB), and LED's 1 through 6 are not on, check to make sure lead 231 between control board and firing board is not broken.
7. If any one of LED 1 through 6 are not on and LED's 7,8, and 9 are on, replace the firing (PCB) .

## PC BOARD TROUBLESHOOTING GUIDE - CONTROL PRINTED CIRCUIT BOARD

1. LED1 indicates AC input voltage necessary to generate the DC supply voltages is present. These voltages power the control board circuitry. LED2 indicates the -10V supply is OK. LED3 indicates the +16V supply is OK. If LED1, 2, or 3 are not ON when machine POWER IS ON, Replace Printed Circuit Board.
2. LED4 should not be on. If this LED comes on while welding, the machine will phase back to about 10 amps and stay there. This was do to either a short across output, or a current draw of about 1000A. Remove short or reduce output current. If no short or 1000 amp load exists, replace Control Printed Circuit Board.
3. LED5 indicates control voltage is present. With trigger circuit OPEN and CONTROL POT set to minimum, LED5 should be very bright. Closing trigger circuit and Turning CONTROL POT towards maximum, LED5 should dim and then go out. Replace Printed Circuit Board if LED5 does not go ON.
4. LED6 indicates trigger condition. LED6 ON indicates trigger is CLOSED. LED6 OFF indicates trigger is OPEN. If LED6 does not come ON, look for open connections in the 2 & 4 circuit.
5. LED7 indicates welder output voltage is being sensed on the control board. When turning the Control Pot towards maximum, LED7 should glow brighter. If LED7 does not light, made sure lead 222 from the negative output lead is connected to J1 PIN 14.
6. LED8 indicates a fault condition. When LED8 is ON the machine is phased back to 10 amps and will stay there until the POWER SWITCH is turned OFF then back ON. This fault is do to a short across welder's output, or 1000 amp current draw. If no short or 1000 amp load exists, replace Control Printed Circuit Board.
7. LED's 9 & 11 should be OFF on CV-655 machines.
8. LED10 should be ON when machine power is ON. If not replace Control (PCB).

### CAUTION

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CV-655



Observe all Safety Guidelines detailed throughout this manual

## PC BOARD TROUBLESHOOTING GUIDE - THERMAL FAN/ SNUBBER PRINTED CIRCUIT BOARD

**NOTE:** Fan will run for minimum of 5 minutes once fan turns on.

1. LED1 when ON indicates fan should be running. If ON and machine is cold, replace Printed Circuit Board.
2. LED2 when ON indicates welding current greater than 50 amps. If ON and not drawing more than 40 amps, replace Printed Circuit Board.
3. LED3 when ON indicates Main SCR'S need cooling and turns fan ON. If ON and machine is cold, replace Printed Circuit Board.
4. LED4 when ON indicates an open Thermal Fan Thermistor, or open connection to Printed Circuit Board. Fan will run constantly. Check Thermal Fan Thermistor for an open. If open replace. If not open Replace Printed Circuit Board.
5. LED5 when ON indicates an open thermostat. Thermal Protection light should also be ON. If Thermal Protection light is not ON, and LED5 is ON, replace Printed Circuit Board.
6. LED6 when ON indicates fan should be running. LED6 will be ON whenever LED's 2, 3 4 or 5 is ON. If LED's 2, 3, 4, or 5 are not ON when LED6 is ON, replace Printed Circuit Board.

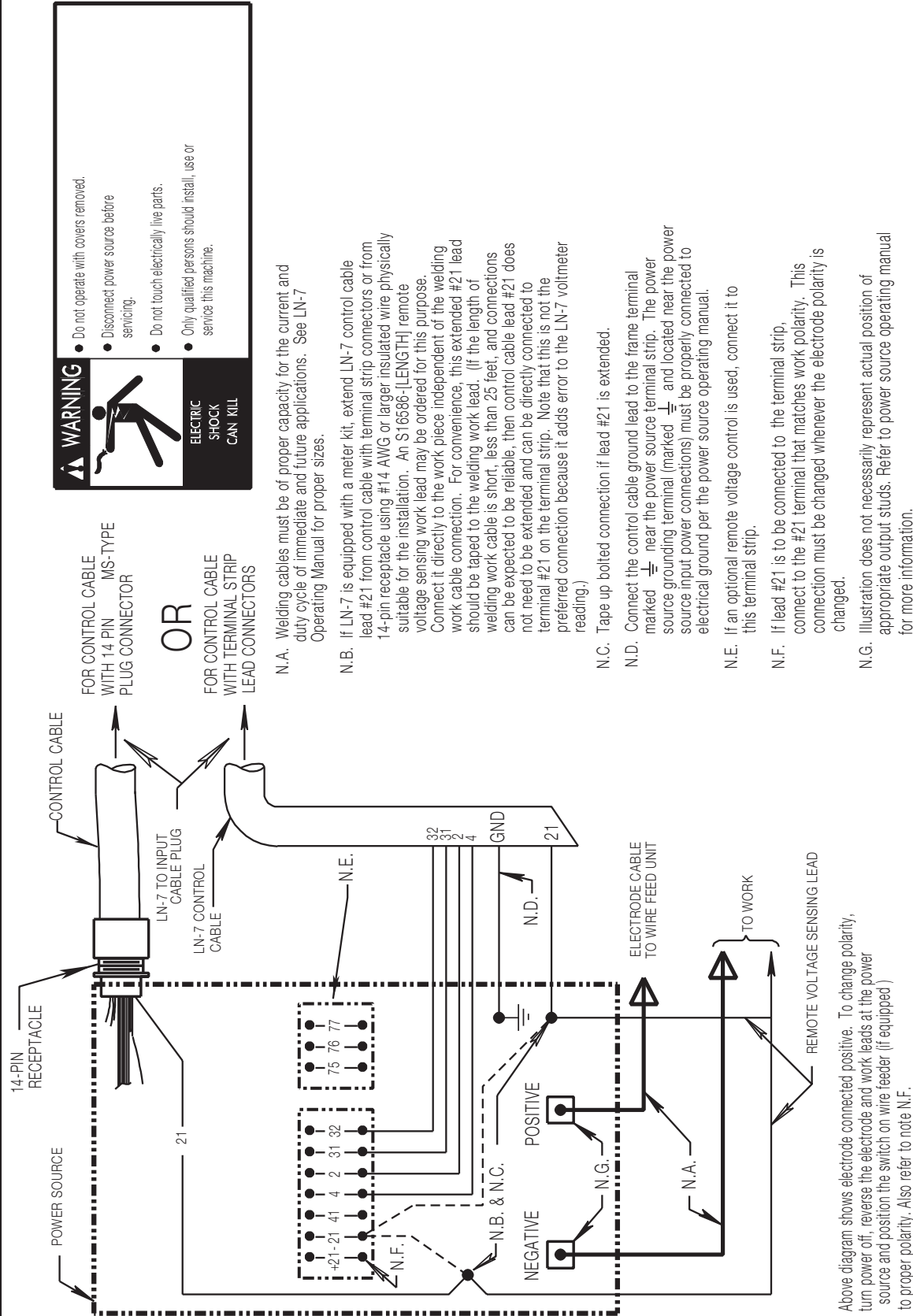
### CAUTION

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CV-655



**CONNECTION OF LN-7 TO THE CV-655, DC-655 OR DC-600 POWER SOURCE**



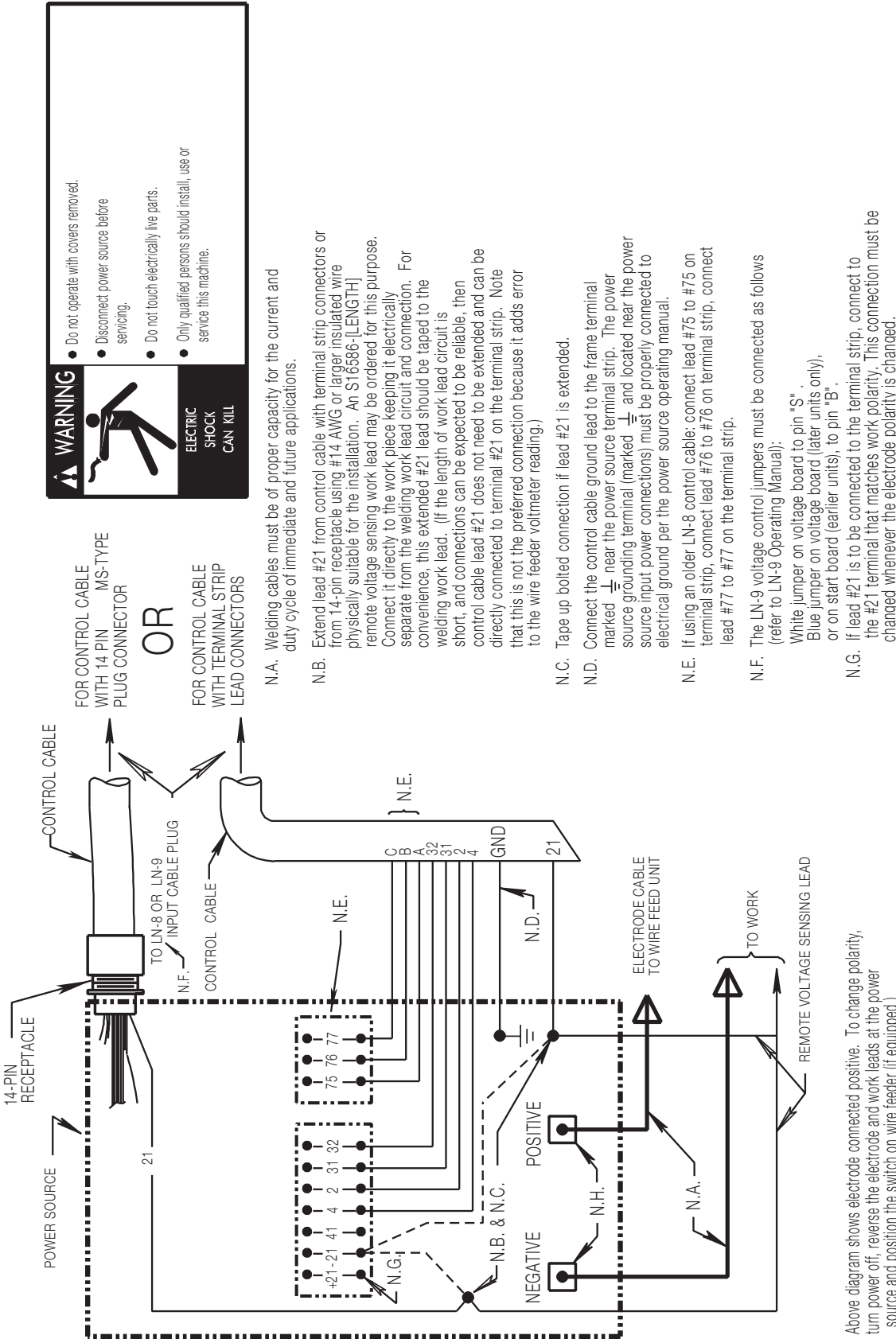
10-30-98F  
 S22976

Above diagram shows electrode connected positive. To change polarity, turn power off, reverse the electrode and work leads at the power source and position the switch on wire feeder (if equipped) to proper polarity. Also refer to note N.F.

For proper setting of switches on power source, see power source operating manual.



**CONNECTION OF LN-8 OR LN-9 TO THE CV-655, DC-655 OR DC-600 POWER SOURCE**



**WARNING**  
 ELECTRIC SHOCK CAN KILL

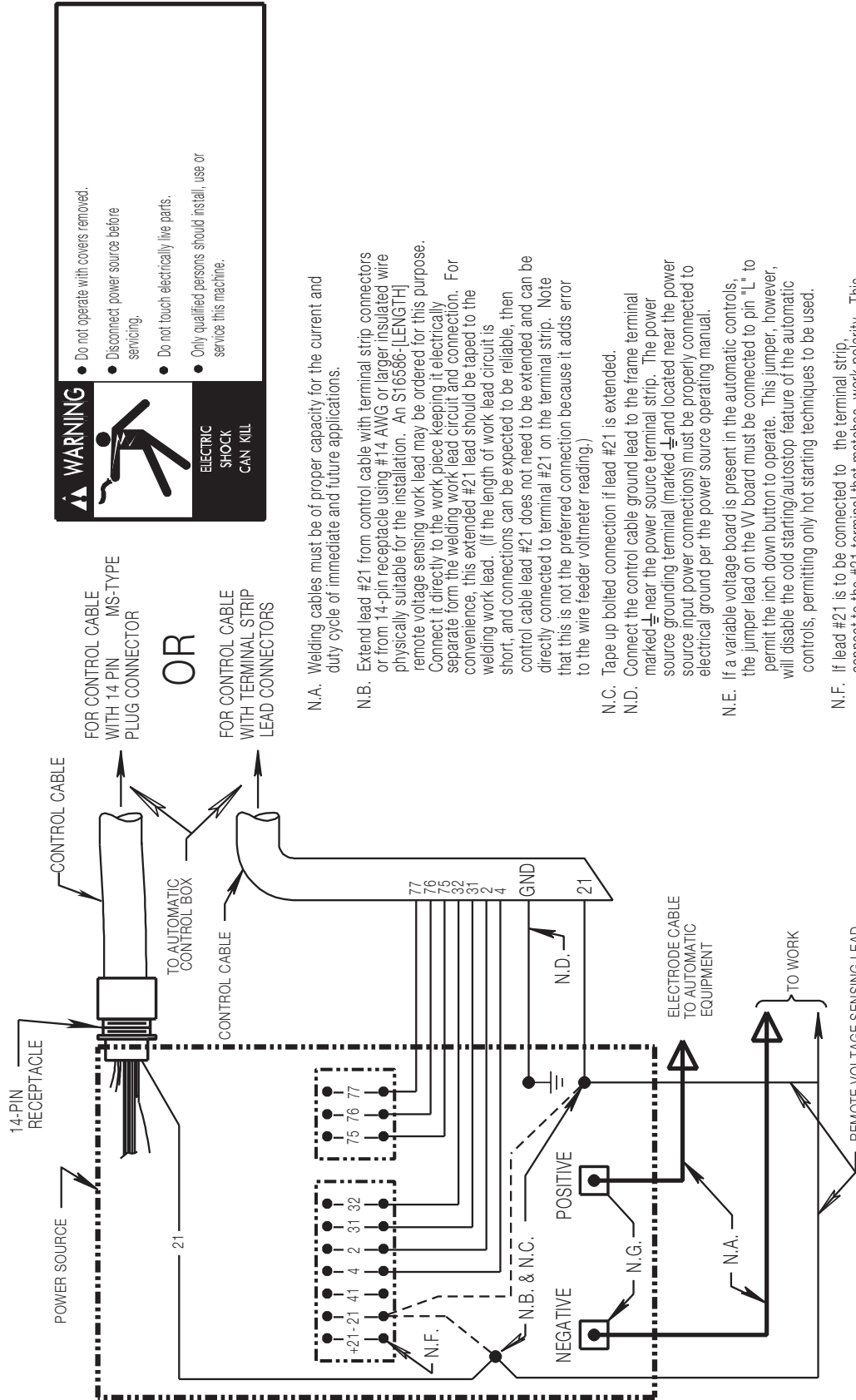
- Do not operate with covers removed.
- Disconnect power source before servicing.
- Do not touch electrically live parts.
- Only qualified persons should install, use or service this machine.

- N.A. Welding cables must be of proper capacity for the current and duty cycle of immediate and future applications.
- N.B. Extend lead #21 from control cable with terminal strip connectors or from 14-pin receptacle using #14 AWG or larger insulated wire physically suitable for the installation. An S16586-[LENGTH] remote voltage sensing work lead may be ordered for this purpose. Connect it directly to the work piece keeping it electrically separate from the welding work lead circuit and connection. For convenience, this extended #21 lead should be taped to the welding work lead. (If the length of work lead circuit is short, and connections can be expected to be reliable, then control cable lead #21 does not need to be extended and can be directly connected to terminal #21 on the terminal strip. Note that this is not the preferred connection because it adds error to the wire feeder voltmeter reading.)
- N.C. Tape up bolted connection if lead #21 is extended.
- N.D. Connect the control cable ground lead to the frame terminal marked  $\perp$  near the power source terminal strip. The power source grounding terminal (marked  $\perp$  and located near the power source input power connections) must be properly connected to electrical ground per the power source operating manual.
- N.E. If using an older LN-8 control cable; connect lead #75 to #75 on terminal strip, connect lead #76 to #76 on terminal strip, connect lead #77 to #77 on the terminal strip.
- N.F. The LN-9 voltage control jumpers must be connected as follows (refer to LN-9 Operating Manual):  
 White jumper on voltage board to pin "S".  
 Blue jumper on voltage board (later units only), or on start board (earlier units), to pin "B".
- N.G. If lead #21 is to be connected to the terminal strip, connect to the #21 terminal that matches work polarity. This connection must be changed whenever the electrode polarity is changed.
- N.H. Illustration does not necessarily represent actual position of appropriate output studs. Refer to power source instruction manual for more info.

Above diagram shows electrode connected positive. To change polarity, turn power off, reverse the electrode and work leads at the power source and position the switch on wire feeder (if equipped) to proper polarity. Also refer to note N.F.

For proper setting of switches on power source, see power source operating manual.

**CONNECTION OF NA-3, LT-5 OR LT-7 TO THE CV-655, DC-655 OR DC-600 POWER SOURCE**



**WARNING**

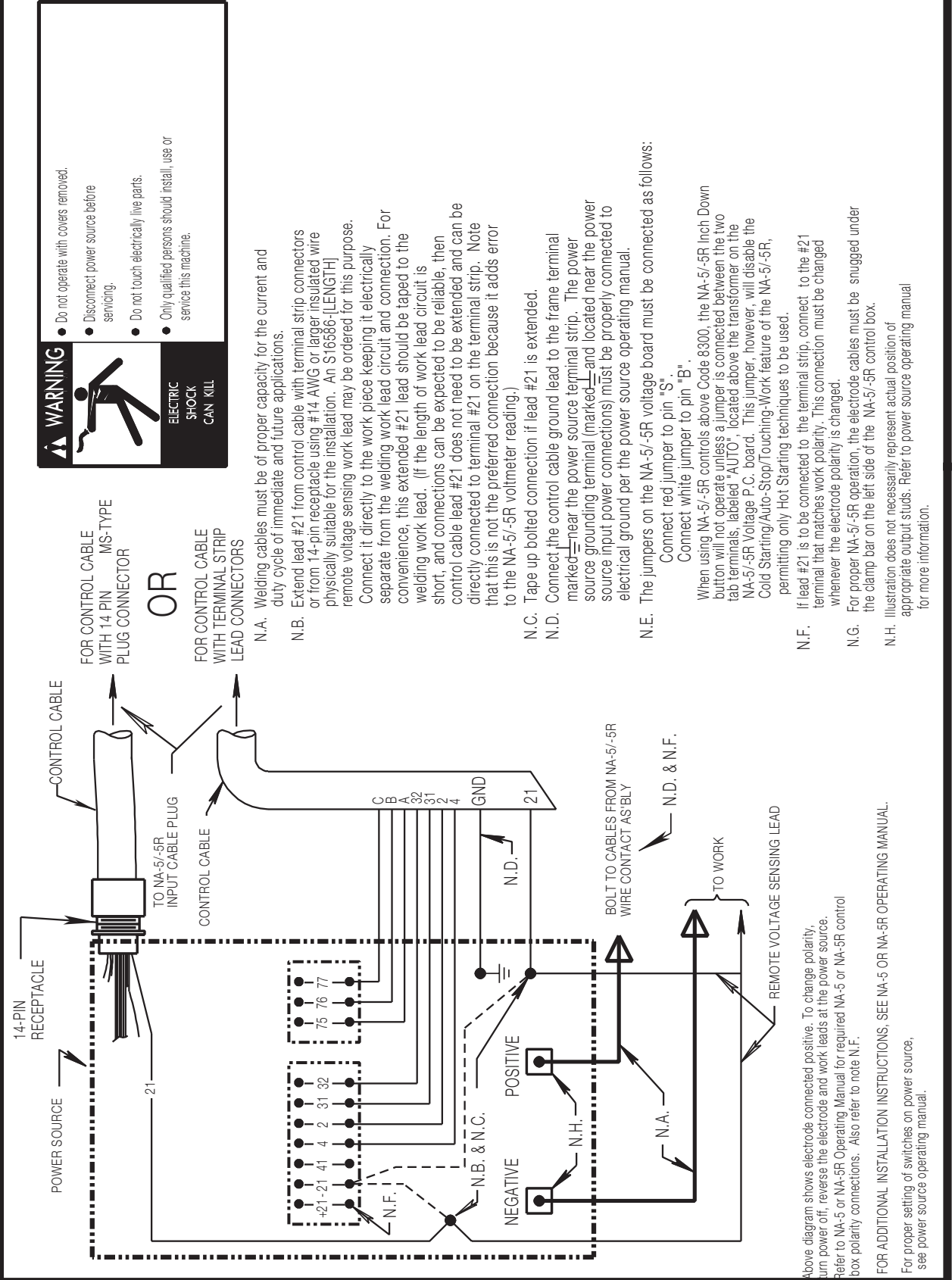
**ELECTRIC SHOCK CAN KILL.**

- Do not operate with covers removed.
- Disconnect power source before servicing.
- Do not touch electrically live parts.
- Only qualified persons should install, use or service this machine.

- N.A. Welding cables must be of proper capacity for the current and duty cycle of immediate and future applications.
- N.B. Extend lead #21 from control cable with terminal strip connectors or from 14-pin receptacle using #14 AWG or larger insulated wire physically suitable for the installation. An S16586-[LENGTH] remote voltage sensing work lead may be ordered for this purpose. Connect it directly to the work piece keeping it electrically separate from the welding work lead circuit and connection. For convenience, this extended #21 lead should be taped to the welding work lead. (If the length of work lead circuit is short, and connections can be expected to be reliable, then control cable lead #21 does not need to be extended and can be directly connected to terminal #21 on the terminal strip. Note that this is not the preferred connection because it adds error to the wire feeder voltmeter reading.)
- N.C. Tape up bolted connection if lead #21 is extended.
- N.D. Connect the control cable ground lead to the frame terminal marked  $\perp$  near the power source terminal strip. The power source grounding terminal (marked  $\perp$  and located near the power source input power connections) must be properly connected to electrical ground per the power source operating manual.
- N.E. If a variable voltage board is present in the automatic controls, the jumper lead on the VV board must be connected to pin "L" to permit the inch down button to operate. This jumper, however, will disable the cold starting/autostop feature of the automatic controls, permitting only hot starting techniques to be used.
- N.F. If lead #21 is to be connected to the terminal strip, connect to the #21 terminal that matches work polarity. This connection must be changed whenever the electrode polarity is changed.
- N.G. Illustration does not necessarily represent actual position of appropriate output studs. Refer to power source operating manual for more information.

Above diagram shows electrode connected positive. To change polarity, turn power off, reverse the electrode and work leads at the power source. Reverse the leads on the back of the ammeter and voltmeter in the automatic control box.  
Also refer to note N.F.  
For proper setting of switches on power source, see power source operating manual.

**CONNECTION OF NA-5/-5R TO THE CV-655, DC-655 OR DC-600 POWER SOURCE**

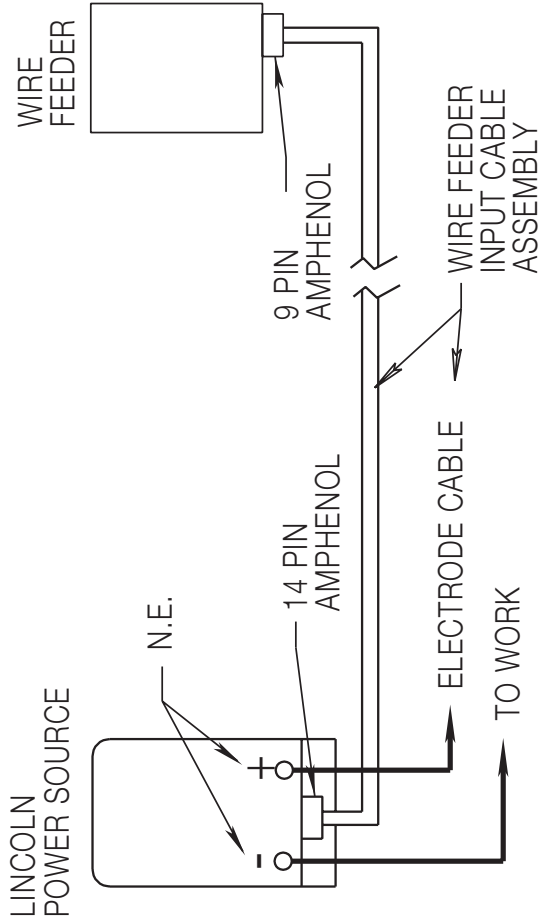


10-30-98F  
S2979

Above diagram shows electrode connected positive. To change polarity, turn power off, reverse the electrode and work leads at the power source. Refer to NA-5 or NA-5R Operating Manual for required NA-5 or NA-5R control box polarity connections. Also refer to note N.F.

FOR ADDITIONAL INSTALLATION INSTRUCTIONS, SEE NA-5 OR NA-5R OPERATING MANUAL. For proper setting of switches on power source, see power source operating manual.

**CONNECTION OF DH-10 OR LN-10 TO POWER SOURCE WITH 14 PIN AMPHENOL**



**WARNING**

- Do not operate with covers removed.
- Disconnect power source before servicing.
- Do not touch electrically live parts.
- Only qualified persons should install, use or service this machine.

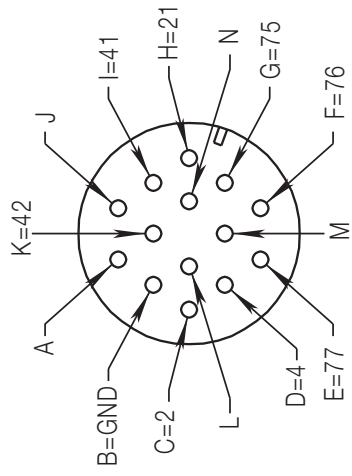
**ELECTRIC SHOCK CAN KILL**

N.A. WELDING CABLE MUST BE SIZED FOR CURRENT AND DUTY CYCLE OF APPLICATION.  
 N.B. DIAGRAM SHOWS ELECTRODE POSITIVE. TO CHANGE POLARITY, TURN POWER "OFF", REVERSE ELECTRODE AND WORK CABLES AT POWER SOURCE.  
 N.C. PINS NOT LISTED ARE NOT CONNECTED ON CABLE.  
 N.D. IF LEAD #21 IS TO BE CONNECTED TO THE TERMINAL STRIP, CONNECT TO THE #21 TERMINAL THAT MATCHES WORK POLARITY. THIS CONNECTION MUST BE CHANGED WHENEVER THE ELECTRODE POLARITY IS CHANGED.  
 N.E. ILLUSTRATION DOES NOT NECESSARILY REPRESENT ACTUAL POSITION OF APPROPRIATE OUTPUT STUDS. REFER TO POWER SOURCE OPERATING MANUAL FOR MORE INFORMATION.

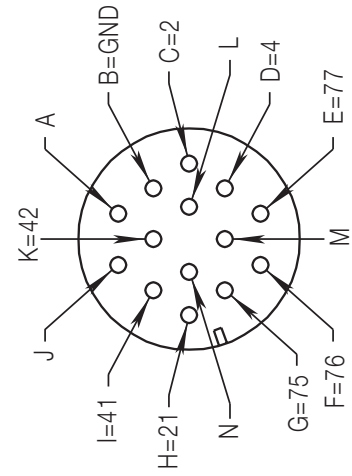
FOR PROPER SETTINGS OF SWITCHES ON POWER SOURCE, SEE POWER SOURCE OPERATING MANUAL.

FUNCTIONS ARE LISTED FOR REFERENCE ONLY AND EACH MAY OR MAY NOT BE PRESENT IN YOUR EQUIPMENT.  
 (SEE APPROPRIATE WIRING DIAGRAM)

PIN	LEAD	FUNCTION
B	GND	CHASSIS CONNECTION
C	2	TRIGGER CIRCUIT
D	4	TRIGGER CIRCUIT
E	77	OUTPUT CONTROL
F	76	OUTPUT CONTROL
G	75	OUTPUT CONTROL
H	21	WORK
I	41	42V AC
K	42	42V AC

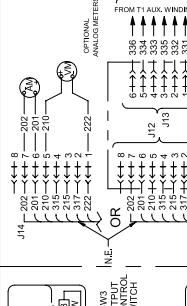
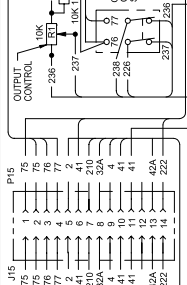
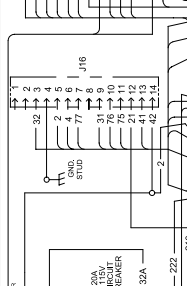
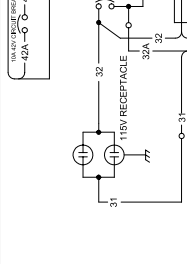
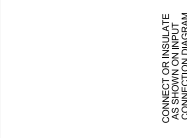
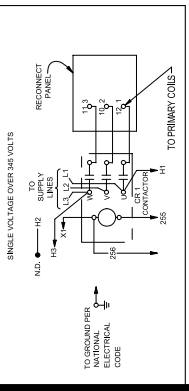
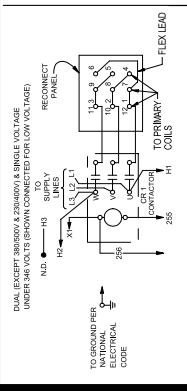
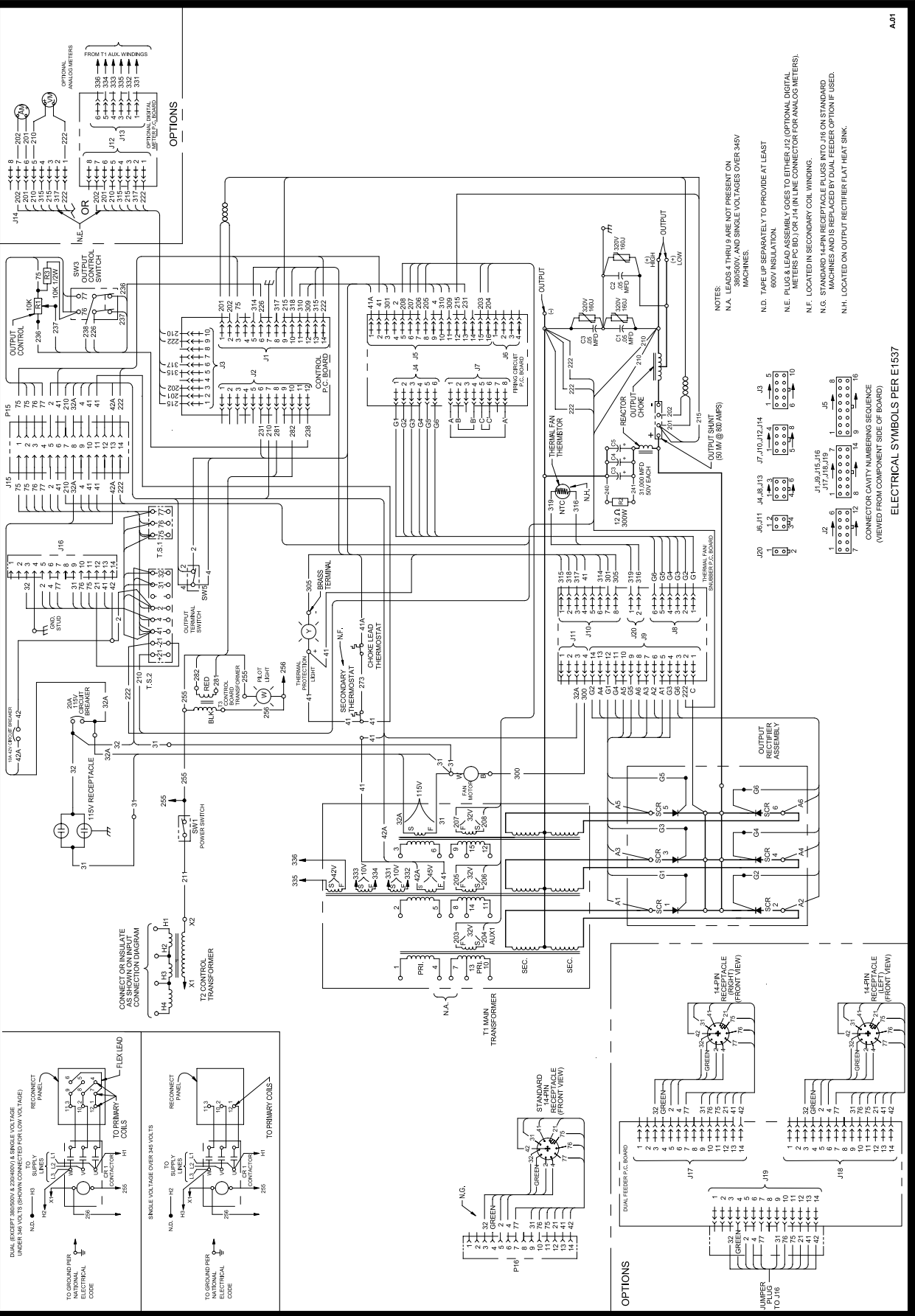


14-SOCKET BOX RECEPTACLE, FRONT VIEW AND 14-PIN CABLE PLUG, REAR VIEW

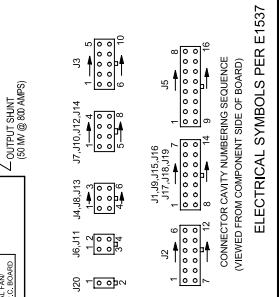


14-SOCKET BOX RECEPTACLE, REAR VIEW AND 14-PIN CABLE PLUG, FRONT VIEW

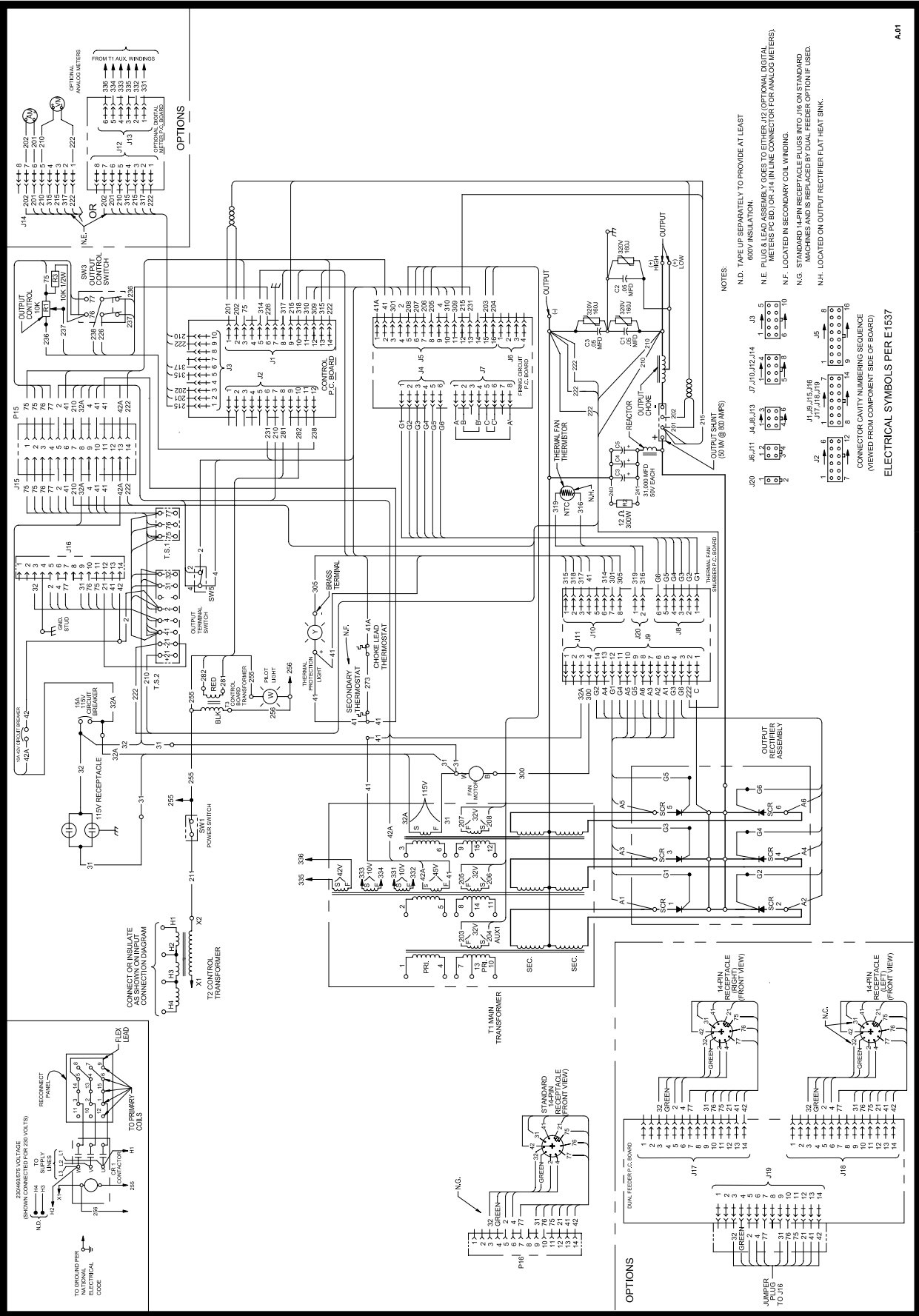
CV655 WIRING DIAGRAM Codes 10120, 10122, 10123, 10124



NOTES:  
 N.A. LEADS 4 THRU 9 ARE NOT PRESENT ON 380/50V AND SINGLE VOLTAGE OVER 345V MACHINES.  
 N.D. TAPE UP SEPARATELY TO PROVIDE AT LEAST 600V INSULATION.  
 N.E. PLUG & LEAD ASSEMBLY GOES TO EITHER J12 (OPTIONAL DIGITAL METERS PC BOARD) OR J14 (IN LINE CONNECTOR FOR ANALOG METERS).  
 N.F. LOCATED IN SECONDARY COIL WINDING.  
 N.G. STANDARD 14-PIN RECEPTACLE PLUGS INTO J16 ON STANDARD MACHINES AND IS REPLACED BY DUAL FEEDER OPTION IF USED.  
 N.H. LOCATED ON OUTPUT RECTIFIER FLAT HEAT SINK.

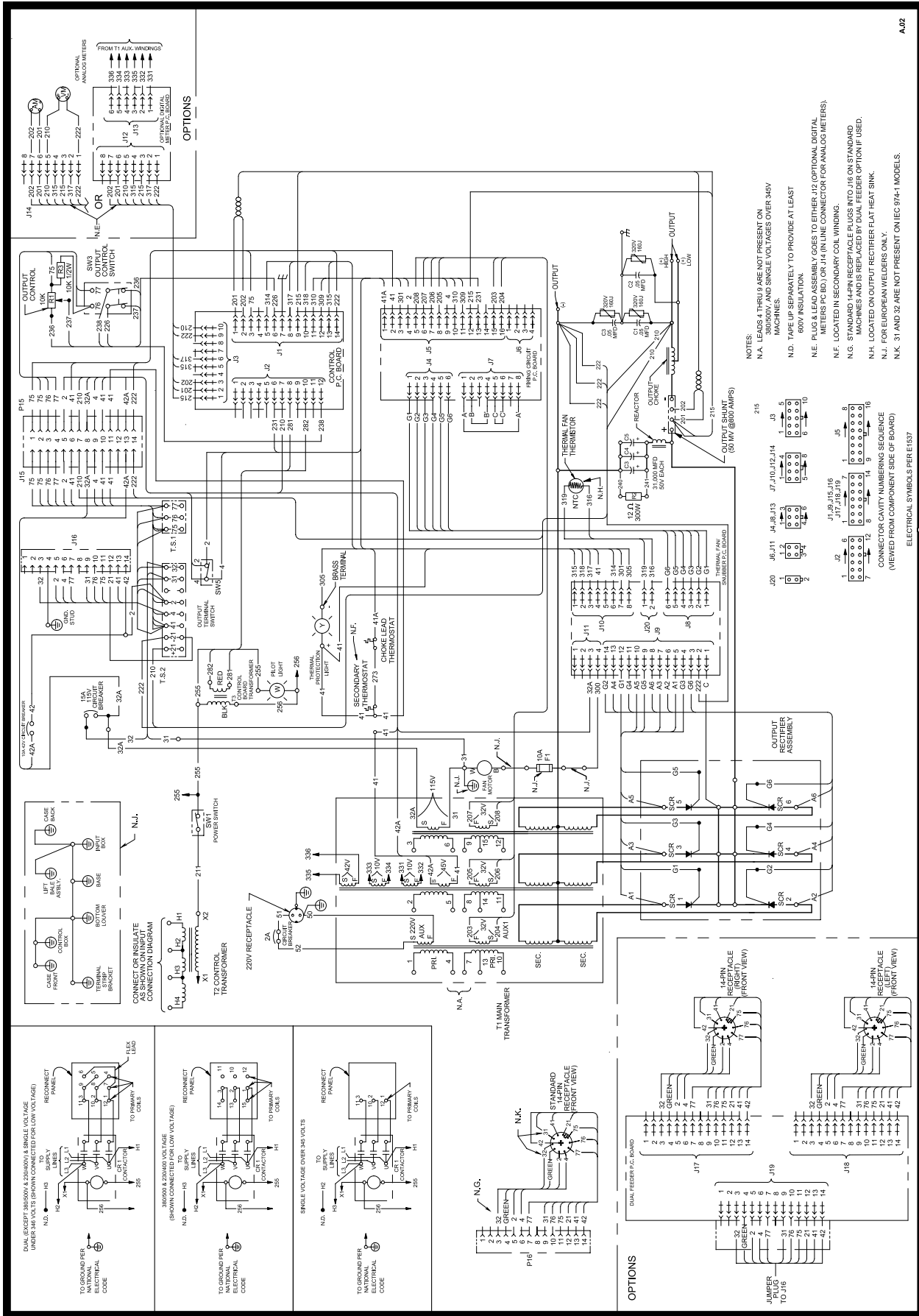


CV655 WIRING DIAGRAM Code 10121

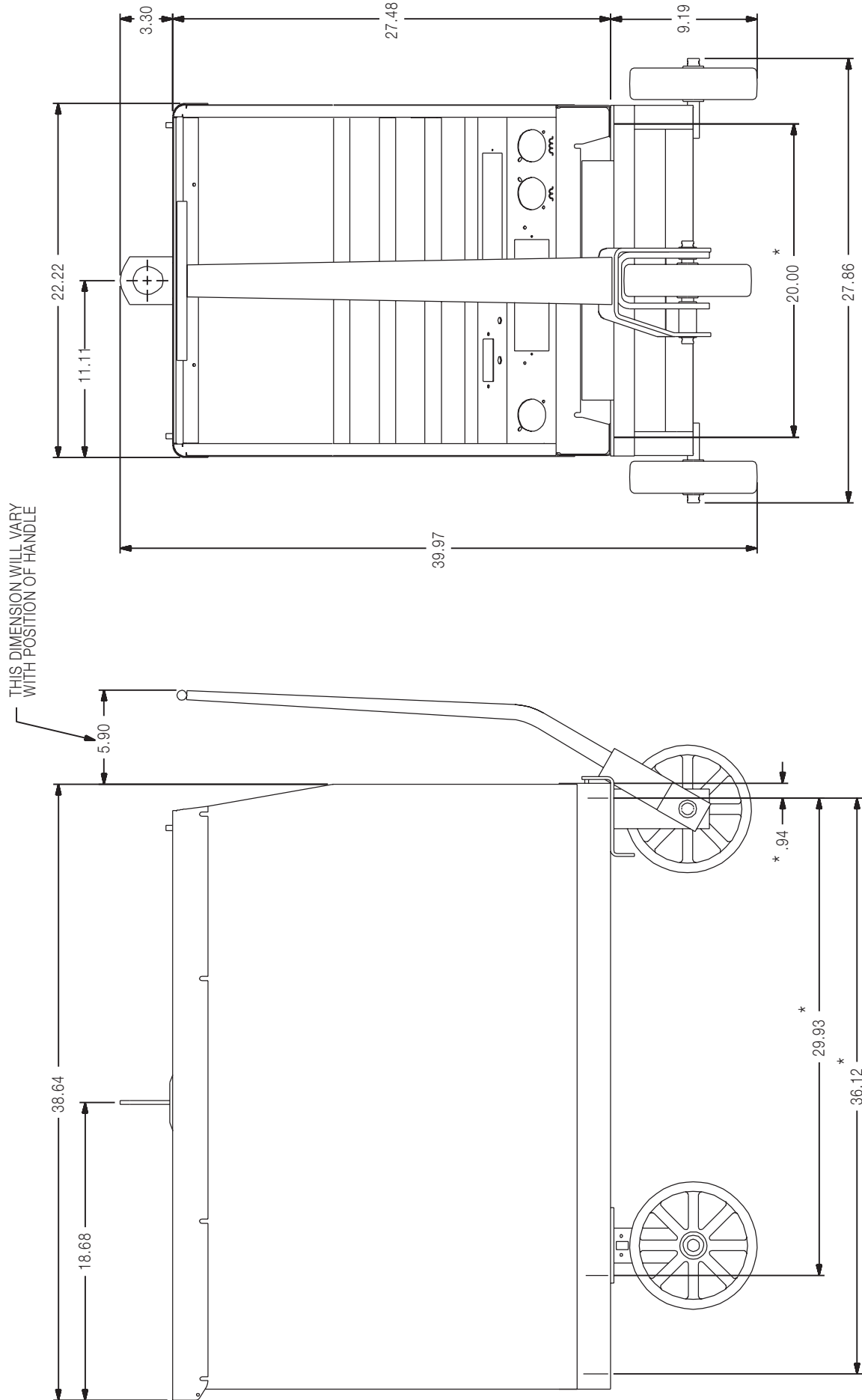


G3038-1

# CV655 WIRING DIAGRAM Codes 10125, 10126, 10127, 10128, 10129



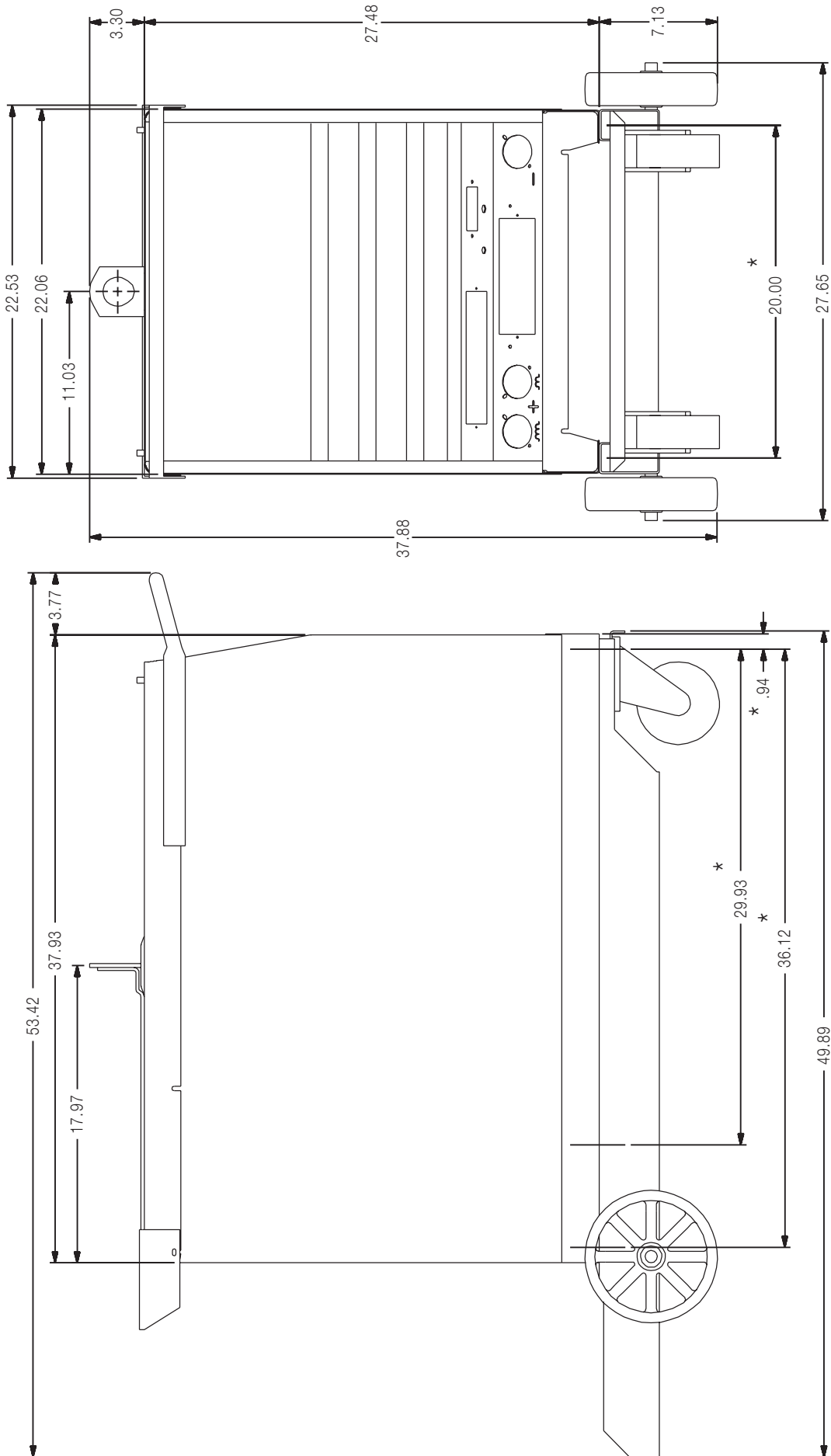




THIS DIMENSION WILL VARY WITH POSITION OF HANDLE

\* LOCATION OF BASE MOUNTING HOLES

1-9-98M  
M18349  
DIMENSION PRINT (WITH K817P UNDERCARRIAGE)



5-16-97  
M18350

\* LOCATION OF BASE MOUNTING HOLES

DIMENSION PRINT (WITH K842 UNDERCARRIAGE)

# NOTES

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# NOTES

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<b>WARNING</b>	<ul style="list-style-type: none"> <li>● Do not touch electrically live parts or electrode with skin or wet clothing.</li> <li>● Insulate yourself from work and ground.</li> </ul>	<ul style="list-style-type: none"> <li>● Keep flammable materials away.</li> </ul>	<ul style="list-style-type: none"> <li>● Wear eye, ear and body protection.</li> </ul>
Spanish <b>AVISO DE PRECAUCION</b>	<ul style="list-style-type: none"> <li>● No toque las partes o los electrodos bajo carga con la piel o ropa mojada.</li> <li>● Aíslese del trabajo y de la tierra.</li> </ul>	<ul style="list-style-type: none"> <li>● Mantenga el material combustible fuera del área de trabajo.</li> </ul>	<ul style="list-style-type: none"> <li>● Protéjase los ojos, los oídos y el cuerpo.</li> </ul>
French <b>ATTENTION</b>	<ul style="list-style-type: none"> <li>● Ne laissez ni la peau ni des vêtements mouillés entrer en contact avec des pièces sous tension.</li> <li>● Isolez-vous du travail et de la terre.</li> </ul>	<ul style="list-style-type: none"> <li>● Gardez à l'écart de tout matériel inflammable.</li> </ul>	<ul style="list-style-type: none"> <li>● Protégez vos yeux, vos oreilles et votre corps.</li> </ul>
German <b>WARNUNG</b>	<ul style="list-style-type: none"> <li>● Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung!</li> <li>● Isolieren Sie sich von den Elektroden und dem Erdboden!</li> </ul>	<ul style="list-style-type: none"> <li>● Entfernen Sie brennbares Material!</li> </ul>	<ul style="list-style-type: none"> <li>● Tragen Sie Augen-, Ohren- und Körperschutz!</li> </ul>
Portuguese <b>ATENÇÃO</b>	<ul style="list-style-type: none"> <li>● Não toque partes elétricas e electrodos com a pele ou roupa molhada.</li> <li>● Isole-se da peça e terra.</li> </ul>	<ul style="list-style-type: none"> <li>● Mantenha inflamáveis bem guardados.</li> </ul>	<ul style="list-style-type: none"> <li>● Use proteção para a vista, ouvido e corpo.</li> </ul>
Japanese <b>注意事項</b>	<ul style="list-style-type: none"> <li>● 通電中の電気部品、又は溶材にヒフやぬれた布で触れないこと。</li> <li>● 施工物やアースから身体が絶縁されている様にして下さい。</li> </ul>	<ul style="list-style-type: none"> <li>● 燃えやすいものの側での溶接作業は絶対にしてはなりません。</li> </ul>	<ul style="list-style-type: none"> <li>● 目、耳及び身体に保護具をして下さい。</li> </ul>
Chinese <b>警告</b>	<ul style="list-style-type: none"> <li>● 皮膚或濕衣物切勿接觸帶電部件及鎢條。</li> <li>● 使你自已與地面和工件絕緣。</li> </ul>	<ul style="list-style-type: none"> <li>● 把一切易燃物品移離工作場所。</li> </ul>	<ul style="list-style-type: none"> <li>● 佩戴眼、耳及身體勞動保護用具。</li> </ul>
Korean <b>위험</b>	<ul style="list-style-type: none"> <li>● 전도체나 용접봉을 젖은 형갑 또는 피부로 절대 접촉치 마십시오.</li> <li>● 모재와 접지를 접촉치 마십시오.</li> </ul>	<ul style="list-style-type: none"> <li>● 인화성 물질을 접근시키지 마십시오.</li> </ul>	<ul style="list-style-type: none"> <li>● 눈, 귀와 몸에 보호장구를 착용하십시오.</li> </ul>
Arabic <b>تحذير</b>	<ul style="list-style-type: none"> <li>● لا تلمس الاجزاء التي يسري فيها التيار الكهربائي أو الألكترود بجلد الجسم أو بالملابس المبللة بالماء.</li> <li>● ضع عازلا على جسمك خلال العمل.</li> </ul>	<ul style="list-style-type: none"> <li>● ضع المواد القابلة للاشتعال في مكان بعيد.</li> </ul>	<ul style="list-style-type: none"> <li>● ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.</li> </ul>

**READ AND UNDERSTAND THE MANUFACTURER'S INSTRUCTION FOR THIS EQUIPMENT AND THE CONSUMABLES TO BE USED AND FOLLOW YOUR EMPLOYER'S SAFETY PRACTICES.**

**SE RECOMIENDA LEER Y ENTENDER LAS INSTRUCCIONES DEL FABRICANTE PARA EL USO DE ESTE EQUIPO Y LOS CONSUMIBLES QUE VA A UTILIZAR, SIGA LAS MEDIDAS DE SEGURIDAD DE SU SUPERVISOR.**

**LISEZ ET COMPRENEZ LES INSTRUCTIONS DU FABRICANT EN CE QUI REGARDE CET EQUIPMENT ET LES PRODUITS A ETRE EMPLOYES ET SUIVEZ LES PROCEDURES DE SECURITE DE VOTRE EMPLOYEUR.**

**LESEN SIE UND BEFOLGEN SIE DIE BETRIEBSANLEITUNG DER ANLAGE UND DEN ELEKTRODENEINSATZ DES HERSTELLERS. DIE UNFALLVERHÜTUNGSVORSCHRIFTEN DES ARBEITGEBERS SIND EBENFALLS ZU BEACHTEN.**

			
<ul style="list-style-type: none"> <li>● Keep your head out of fumes.</li> <li>● Use ventilation or exhaust to remove fumes from breathing zone.</li> </ul>	<ul style="list-style-type: none"> <li>● Turn power off before servicing.</li> </ul>	<ul style="list-style-type: none"> <li>● Do not operate with panel open or guards off.</li> </ul>	<b>WARNING</b>
<ul style="list-style-type: none"> <li>● Los humos fuera de la zona de respiración.</li> <li>● Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases.</li> </ul>	<ul style="list-style-type: none"> <li>● Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio.</li> </ul>	<ul style="list-style-type: none"> <li>● No operar con panel abierto o guardas quitadas.</li> </ul>	Spanish <b>AVISO DE PRECAUCION</b>
<ul style="list-style-type: none"> <li>● Gardez la tête à l'écart des fumées.</li> <li>● Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail.</li> </ul>	<ul style="list-style-type: none"> <li>● Débranchez le courant avant l'entretien.</li> </ul>	<ul style="list-style-type: none"> <li>● N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés.</li> </ul>	French <b>ATTENTION</b>
<ul style="list-style-type: none"> <li>● Vermeiden Sie das Einatmen von Schweißrauch!</li> <li>● Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes!</li> </ul>	<ul style="list-style-type: none"> <li>● Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öffnen; Maschine anhalten!)</li> </ul>	<ul style="list-style-type: none"> <li>● Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen!</li> </ul>	German <b>WARNUNG</b>
<ul style="list-style-type: none"> <li>● Mantenha seu rosto da fumaça.</li> <li>● Use ventilação e exaustão para remover fumo da zona respiratória.</li> </ul>	<ul style="list-style-type: none"> <li>● Não opere com as tampas removidas.</li> <li>● Desligue a corrente antes de fazer serviço.</li> <li>● Não toque as partes elétricas nuas.</li> </ul>	<ul style="list-style-type: none"> <li>● Mantenha-se afastado das partes moventes.</li> <li>● Não opere com os painéis abertos ou guardas removidas.</li> </ul>	Portuguese <b>ATENÇÃO</b>
<ul style="list-style-type: none"> <li>● ヒュームから頭を離すようにして下さい。</li> <li>● 換気や排煙に十分留意して下さい。</li> </ul>	<ul style="list-style-type: none"> <li>● メンテナンス・サービスに取りかかる際には、まず電源スイッチを必ず切して下さい。</li> </ul>	<ul style="list-style-type: none"> <li>● パネルやカバーを取り外したまま機械操作をしないで下さい。</li> </ul>	Japanese <b>注意事項</b>
<ul style="list-style-type: none"> <li>● 頭部遠離煙霧。</li> <li>● 在呼吸區使用通風或排風器除煙。</li> </ul>	<ul style="list-style-type: none"> <li>● 維修前切斷電源。</li> </ul>	<ul style="list-style-type: none"> <li>● 儀表板打開或沒有安全罩時不準作業。</li> </ul>	Chinese <b>警告</b>
<ul style="list-style-type: none"> <li>● 얼굴로부터 용접가스를 멀리하십시오.</li> <li>● 호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시오.</li> </ul>	<ul style="list-style-type: none"> <li>● 보수전에 전원을 차단하십시오.</li> </ul>	<ul style="list-style-type: none"> <li>● 판넬이 열린 상태로 작동치 마십시오.</li> </ul>	Korean <b>위험</b>
<ul style="list-style-type: none"> <li>● ابعد رأسك بعيداً عن الدخان.</li> <li>● استعمل التهوية أو جهاز ضغط الدخان للخارج لكي تبعد الدخان عن المنطقة التي تتنفس فيها.</li> </ul>	<ul style="list-style-type: none"> <li>● أقطع التيار الكهربائي قبل القيام بأية صيانة.</li> </ul>	<ul style="list-style-type: none"> <li>● لا تشغيل هذا الجهاز اذا كانت الاغطية الحديدية الواقية ليست عليه.</li> </ul>	Arabic <b>تحذير</b>

**LEIA E COMPREENDA AS INSTRUÇÕES DO FABRICANTE PARA ESTE EQUIPAMENTO E AS PARTES DE USO, E SIGA AS PRÁTICAS DE SEGURANÇA DO EMPREGADOR.**

使う機械や溶材のメーカーの指示書をよく読み、まず理解して下さい。そして貴社の安全規定に従って下さい。

請詳細閱讀並理解製造廠提供的說明以及應該使用的銀焊材料，並請遵守貴方的有閣勞動保護規定。

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

اقرأ بتمعن وافهم تعليمات المصنع المنتج لهذه المعدات والمواد قبل استعمالها واتبع تعليمات الوقاية لصاحب العمل.



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