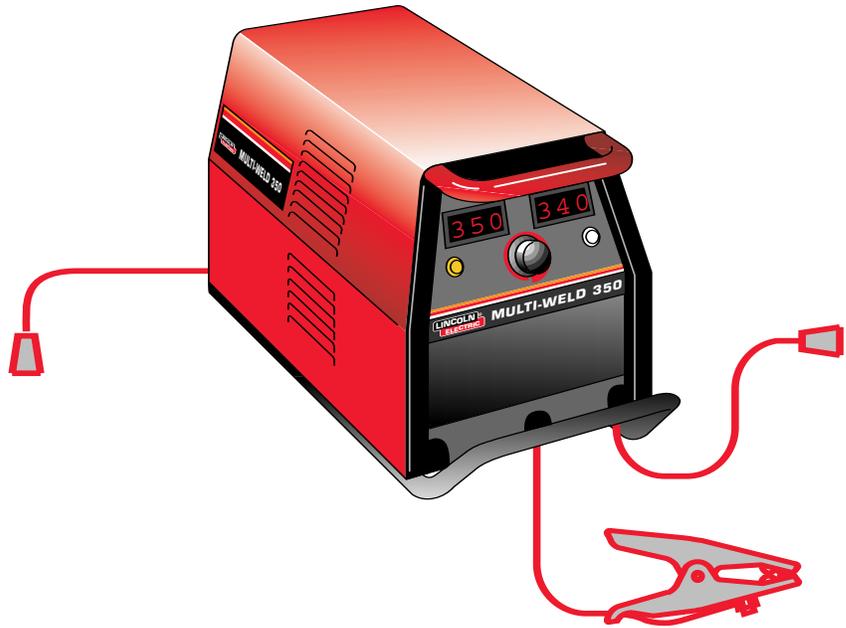


# Multi-Weld™ 350 Arc Converter

For use with machines having Code Numbers: **10645**  
**10736**  
**11148**

## 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.



## OPERATOR'S MANUAL



**LINCOLN**®  
**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.

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## 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.

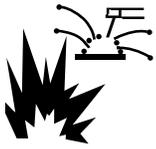
- 4.a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to ANSI Z87.1 standards.
- 4.b. Use suitable clothing made from durable flame-resistant material to 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.

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### 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.

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## 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 pistelage. 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.

Mar. '93

*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 - Multi-Weld 350 (K1735-1)

<b>ELECTRICAL SPECIFICATIONS</b>			
	<b>AMPS (DC+)</b>	<b>VOLTS (DC+)</b>	
Output Rating @ 50°C (122°F)	350	34	
Input Rating @ 50°C (122°F)	165	80	
Max. Input Range		50-113 (Peak)	
Max. O.C.V.		78	
Output Preset Range	30-350	15-40	
<b>PHYSICAL DIMENSIONS</b>			
<b>HEIGHT</b>	<b>WIDTH</b>	<b>DEPTH</b>	<b>NET WEIGHT</b>
11.6 in 295 mm	10.0 in 254 mm	21.5 in 546 mm	59.5 lbs. 27.0 kg.
<b>TEMPERATURE RANGES</b>			
<b>OPERATING TEMPERATURE RANGE</b>		<b>STORAGE TEMPERATURE RANGE</b>	
-40 to +122°F -20 to + 50°C		-40 to +185°F -40 to +85°C	

MULTI-WELD 350



## PRODUCT DESCRIPTION

The Multi-Weld 350 converter (K1735-1) is part of a Multi-Weld system, ideally suited for construction site welding, which uses a single DC power source, as the

only input supply, and provides independent full range control of up to 350A continuous with each converter arc for + polarity stick and wire processes, as well as for arc-air gouging. (See Figure 1).

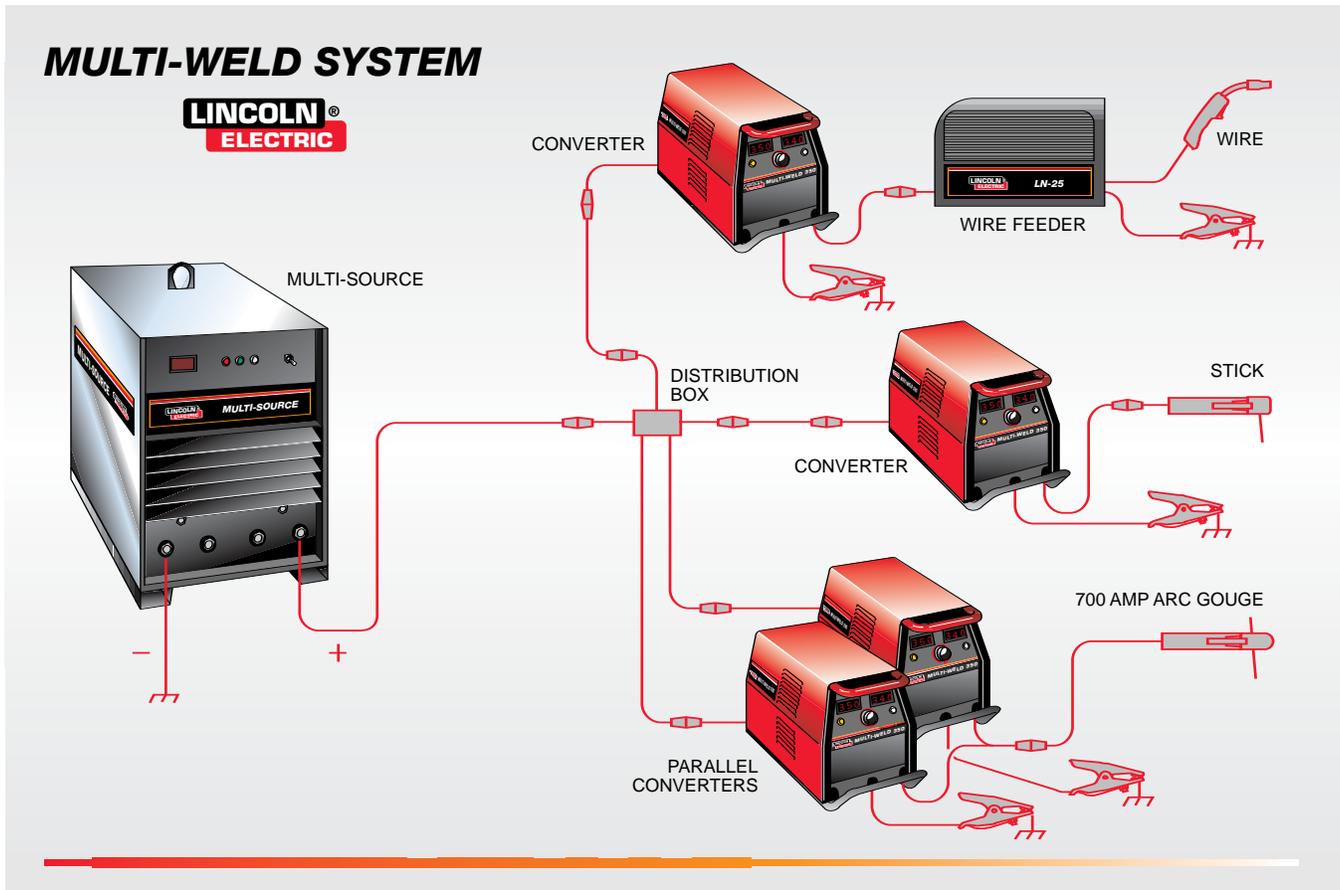


Figure 1

The Multi-Weld 350 is a DC to DC converter which converts higher voltage/lower current input power to lower voltage/higher current output power with over 90% efficiency.

For example; a single 600A continuous rated 70-80v power source could supply up to five Multi-Weld 350 converters each wire welding at 300 amps, or about ten converters for stick welding at 150 amps, with 26-29v at the arcs.

The Arc Converter is a single "world" model built to IEC and CSA standards and meeting the specific needs inherent to construction site welding:

### Versatile

- Constant Current (CC) mode for stick and gouging. Includes Hot Start and Arc Force controls to opti-

mize CC performance, and can be paralleled for higher capacity welding and arc gouging.

- Constant Voltage (CV) mode for positive polarity cored and solid wire welding with arc-powered feeders (such as the LN-25).

### Portable

- Arcs can be moved quickly with the light weight Converter that's easy to carry, or pull, and is small enough to fit through a 15" (38cm) diameter or 12" x 16" (31x 41cm) elliptical man-hole.
- Converter is powered by the welding cable from the DC power source, without the safety hazard of high AC input supply voltages.

MULTI-WELD 350



- Converter welding controls are near the arc without long control cables, and a receptacle is provided for an optional remote for even closer user output control.

### Simple

- Easy installation with 10 ft. (3m) work clip lead and user preference quick-connect "pigtails" for input and electrode weld cables.
- Easy setup with only a few intuitive welding controls and lit displays; including a single Power/Mode switch with Input level light, and a single presettable Output Control with separate digital meters for Amps and Volts, featuring post-weld five second memory display.
- Easy Service with quick to replace cable "pig-tails" and "plug-in" assembly modules, including accessible PC boards and interchangeable "plug-n-play" panel instruments.

### Robust

- Capacity is rated for continuous operation at 350 amps in 50°C (122°F) ambient temperature, and can be paralleled to multiply CC mode output rating.
- Overload protection is provided with electronic limiting of output current, and with thermostat and over-voltage shutdown protection which automatically reset.
- Outdoor operation protected with sealed control and power electronics compartments, with sealed interconnections, housing "potted" circuit boards, and using "Central-Air" cooling with "Fan-As-Needed" for less dirt intake.
- Handling (and mishandling protection) is enhanced with light, but durably designed, aluminum construction with front to back, top and bottom, handles (also serving as "roll bar" and skid), and a sheetmetal shell attached with 1/4" steel threaded fasteners.

## RECOMMENDED EQUIPMENT AND PROCESSES

### MULTI-SYSTEM POWER SOURCE

The Multi-Source 40KW 80VDC buss power source (K1752-1) is recommended for use in the Multi-Weld system. However, other DC power sources capable of supplying the required system buss current, at above 60 volts, may be used. It is recommended that this power source have lower output inductance (choke) such as the Lincoln Electric DC-1000, DC-655 or DC-600 set for max. output in CC mode. The power source output VA capacity should be 10% greater than the sum of the max. VA of the converter arcs which may all be simultaneously welding or gouging:

Power Source (Volts x Amps) capacity > 1.1 x Sum of Converters' (Volts x Amps) arcs

### DISTRIBUTION BOX

The Multi-Weld Distribution Box (K1736-1) is available for interconnection of the Multi-System using the same "pig-tail" connection method provided with the Multi-Weld 350 converter. Six cable strain-relief ports are provided for connection of up to (12) cables for distribution or "daisy-chain" inter-connection to other boxes. Four "pig-tail" leads (see below) are included with the Box.

### "PIG-TAIL" LEADS AND CONNECTORS

Accessory "pig-tail" leads and Twist-Mate connectors are available from Lincoln for extra connections to the Multi-Weld 350 or the Distribution Box:

Order No.	Description:
CL012705	22in.(56cm) long 2/0 (70mm <sup>2</sup> ) cable with 0.5in.(13mm) hole lug and cut-off ends.
K852-70	Twist-Mate male insulated plug for 1/0-2/0 (50-70mm <sup>2</sup> ) cable.
K852-95	Twist-Mate male insulated plug for 2/0-3/0 (70-95mm <sup>2</sup> ) cable.
K1759-70	Twist-Mate female insulated receptacle for 1/0-2/0 (50-70mm <sup>2</sup> ) cable.
K1759-95	Twist-Mate female insulated receptacle for 2/0-3/0 (70-95mm <sup>2</sup> ) cable.

## REMOTE OUTPUT CONTROL OPTIONS

The Multi-Weld 350 is provided with a 6-pin remote receptacle to permit use with the 25ft.(7.6 m) K857 or 100ft.(30.4 m) K857-1 Remote Output Control options, or with the LN-25 equipped with the K444-1 Remote Control option. These Remotes have single-turn resolution on a Min to Max numbered dialplate.

## CV MODE WIRE WELDING

The Converter in CV mode was designed for use with an arc-powered wire feeder like the LN-25. The Converter output is always "hot" when the mode switch is not OFF, so it is recommended that the LN-25 model be equipped with the internal contactor in order to have a "cold" electrode when the gun trigger is released.

The CV mode recommended processes are positive (+) polarity wire welding within the output capacity of the Converter, including:

## CC MODE STICK WELDING AND GOUGING

The CC mode recommended processes are positive (+) polarity stick and arc gouging within the output capacity of single, or paralleled, Converters; including:

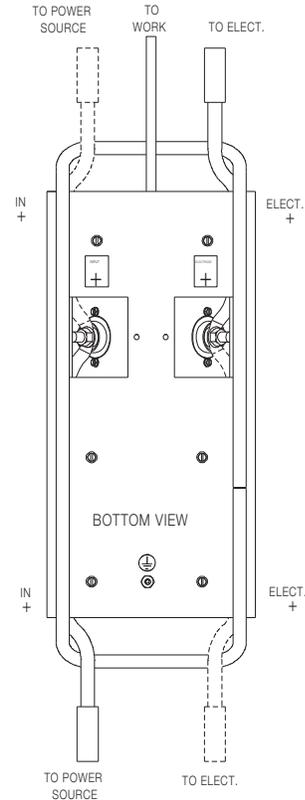
## QUICK-CONNECT "PIG-TAILS"

The Multi-Weld 350 is factory provided with two 21 in.(53 cm) long 2/0 AWG (70mm<sup>2</sup>) "pig-tail" cables with their 0.5"(13mm) hole lug ends routed through the "INPUT +" (on back) and "ELECTRODE +" (on front) cable channels of the Converter and attached to the bottom-accessed covered cable connection studs.

Attach the preferred standard user-provided Quick-connect terminal (such as Lincoln Twist-Mate or Tweco 2-MPC type) to the cut-off end of these cables. Use the female connector on the "ELECTRODE +" cable and the male connector on the "INPUT +" cable.

## ATTACHMENT AND ARRANGEMENT OF "PIG-TAILS"

To best suit the desired inter-connection of the Converters the "pig-tail" cables may be routed into the front cable channels, and/or into the back for single or double "pig-tail" cables to the bottom-accessed covered cable connection studs. (See below and refer to Figures 1 and 2.):



### To connect the "pig-tail" cables to the Converter:

1. Stand the Converter vertically on its rear handle and skid to gain access to the bottom stud covers, then remove the two 0.25"(6.3mm) screws securing each cover and fold out the cover insulation.
2. Route the appropriate "pig-tail" cable lug ends under the skid rail (for strain-relief) through the desired front and/or rear corner channels to the exposed 0.5"(13mm) stud, and remove the flange nut with a .75"(19mm) wrench. Note: Input supply cable(s) must connect through "INPUT +" labeled channels, and output weld cable(s) must connect through "ELECTRODE +" labeled channels.
3. Slip the "pig-tail" cable lug(s) over the stud and re-secure the flange nut, making sure that lug(s) nowhere touch any sheet metal of the stud housing, then fold back the cover insulation and replace the stud cover.

**⚠ WARNING****ELECTRIC SHOCK can kill.**

Be sure to follow the safety practice to use the female connector on the cable which would normally be electrically "hot" (supply lead) if disconnected when the system is energized, and the male on the normally "cold" (load lead) side. If practical, shut off power before connecting or disconnecting terminals.

**WORK CONNECTION**

Each Converter in the Multi-Weld System must have its individual "Work" lead connected (clipped) to work. The #3 AWG (27mm<sup>2</sup>) Work clip lead must have clean metal connection to the work to complete the DC input supply and output power circuits of the Multi-Weld 350.

**⚠ WARNING****ELECTRIC SHOCK can kill.**

Do not disconnect the Work clip lead without first switching OFF the Converter panel switch. Failure to do so will allow the work lead clip to be electrically "hot" to work, and "hot" to the electrode, through the circuit of the Converter for about 5 seconds until the input contactor opens.

**CASE GROUNDING**

As shipped, the case of the Multi-Weld 350 is isolated from all of the DC input and output welding terminals, and is equipped with a grounding terminal screw (.31" / 7.9mm) marked with the symbol  located on the bottom rear of the Base assembly. ( Refer to the bottom view figure.) In order to comply with CSA and UL case grounding specifications, this terminal is provided for connection to weldment work which must be properly grounded per methods meeting local and national electrical codes. Refer to "Safety in Welding, Cutting and Allied Processes", ANSI Z49.1 (US) and W117.2 (Canada).

Since any case fault would only involve the DC welding circuit, the size of the grounding lead should have the capacity to ground the potential fault current without burning open. Use at least #6AWG (13mm<sup>2</sup>), but do not exceed the size of the input cable supplied with the Multi-Weld 350.

Connect the Multi-Weld grounding lead to the work piece separately from the Work clip. If the same clip is used for both ground and work connection, the Multi-Weld case will be electrically "hot" to the work if the clip is removed without first switching OFF the panel switch. ( Refer to the Work clip WARNING above).

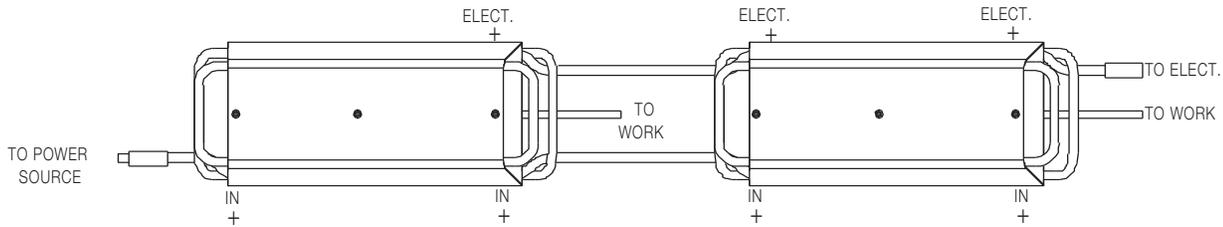
## INTER-CONNECTION OF CONVERTERS

Power Source (Volts x Amp) capacity > 1.1 x Sum of Converters' (Volts x Amps) arcs

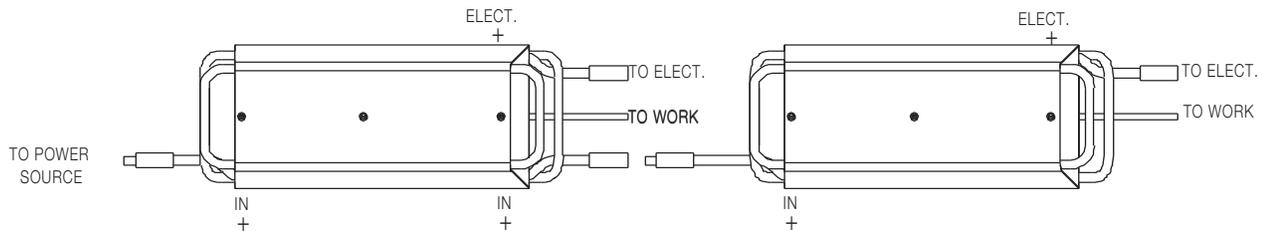
The input and electrode cables of the Multi-Weld 350 Converters may be inter-connected in a Multi-Weld System using any combination of Distribution Box(es) (see Figure 1), paralleling (CC mode only) and "daisy-chaining" (see Figure 2) which best fits the field application setup within the capacity of the power source supplying the system:

For Converters (operating at rated output) less than 200ft. (61m) from the power source, the following minimum cable sizes are recommended for the indicated quantity of Converters supplied by the input cable run to keep cable temperature and voltage drop within acceptable limits: (See Table.1)

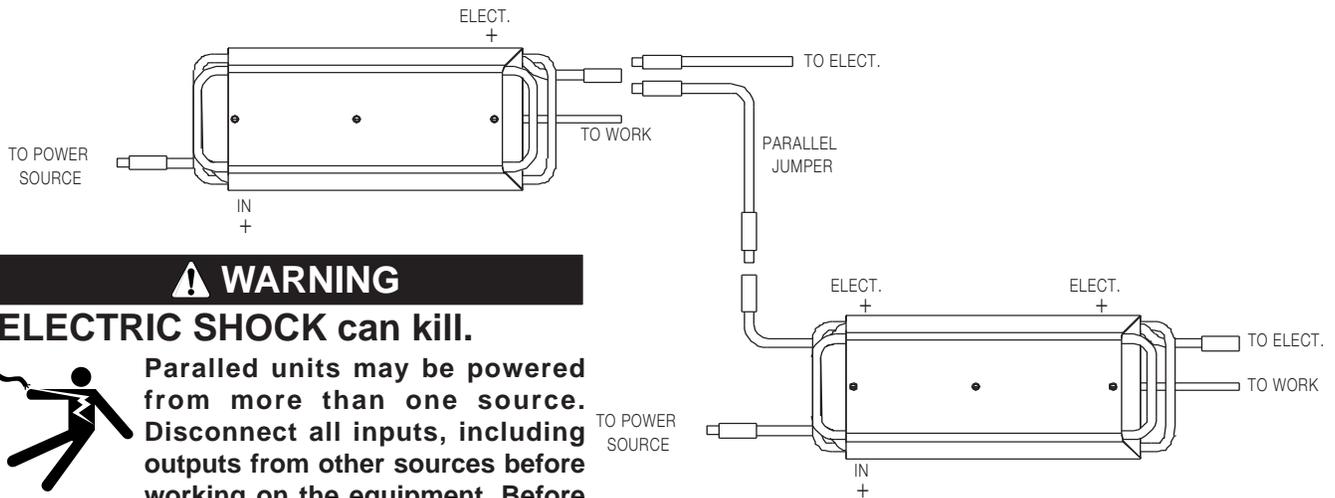
### FIXED PARALLEL OPERATION



### DAISY CHAIN OPERATION



### SEPARABLE PARALLEL OPERATION



#### ⚠ WARNING

#### ELECTRIC SHOCK can kill.



Paralled units may be powered from more than one source. Disconnect all inputs, including outputs from other sources before working on the equipment. Before removing the parallel jumper be sure both Converters are switched OFF. If not, the male side of the first disconnection will be electrically "hot" to work.

Figure 2

MULTI-WELD 350



Table .1

Converters on Cable	Cable Size AWG (mm <sup>2</sup> )
1	1/0 (50)
2	2/0 (70)
3	3/0 (95)
4	4/0 (120)
5	2x3/0 (2x95)

The output "Electrode" cable should be 2/0 AWG (70mm<sup>2</sup>) if sized for rated output up to 200 ft.(61m) from the Converter. If paralleled, the output cable to the arc should be 4/0(120mm<sup>2</sup>).

## ⚠ WARNING

### ELECTRIC SHOCK can kill.



Do not disconnect the Work clip lead without first switching OFF the Converter panel switch. Failure to do so will allow the work lead clip to be electrically "hot" to work, and "hot" to the electrode, through the circuit of

the Converter for about 5 seconds until the input contactor opens.

### CONNECTION FOR NEGATIVE POLARITY WELDING (See Figure 2A)

A Multi-Weld 350 may be used for Negative (straight) polarity CV (Innershield) or CC processes if connected per the diagram shown below:

## ⚠ CAUTION

No more than one Multi-Weld 350 may be connected to a power source for Negative Polarity welding. Multiple units connected to the same power source may cause damage to the Multi-Weld 350.

This connection method will only permit using one Multi-Weld arc on one power source, and cables have to be run to the Multi-Weld from both (+) and (-) output studs of the power source. This is required so that the (-) electrode has a return path to both the Multi-Weld and the Power Source, just like the normal (+) polarity connection has a (-) return path to both the Multi-Weld (through the Work Clamp) and to the Power Source (through work connections). Both cable sizes are the same, with capacity as recommended for normal (+) connection.

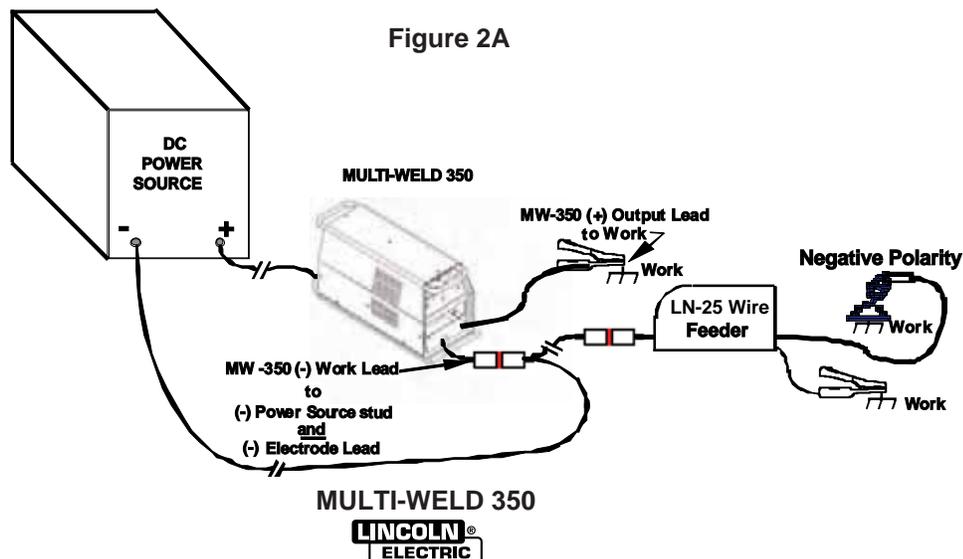
If the power source itself can not perform the CV negative welding process, the Multi-Weld is basically serving very well as a process converter (ei; CV from a CC power source), as well as a remote output control. The advantage is that the same equipment (Multi-Welds and CC Power Sources) is used for all weld process applications.

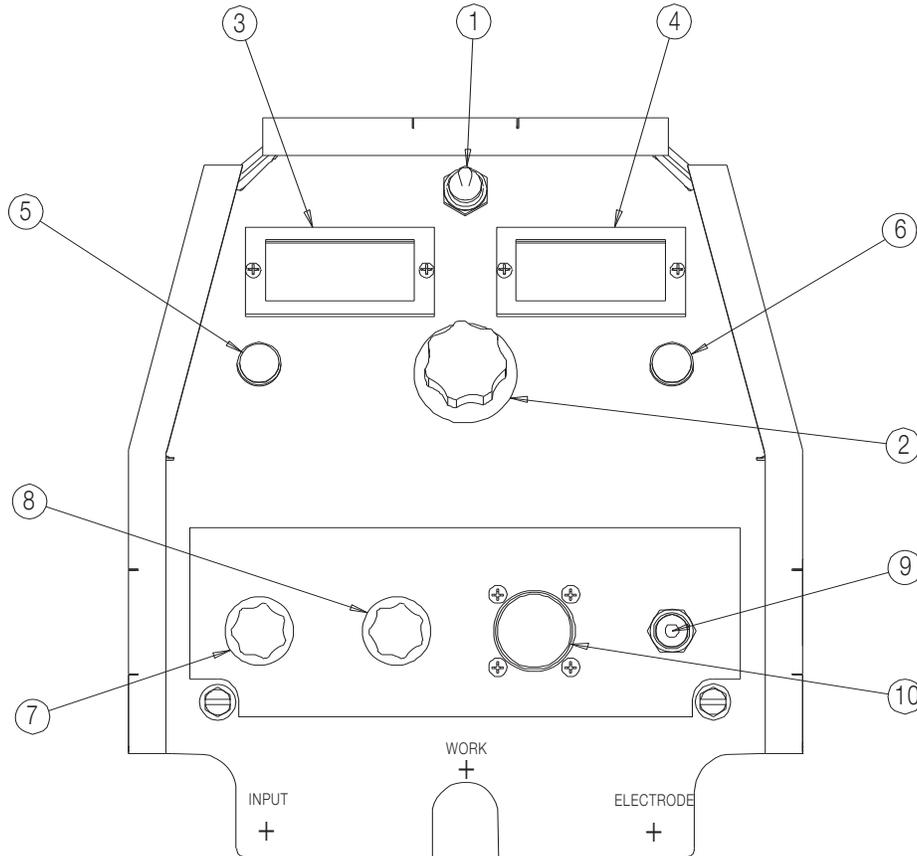
### POWER SOURCE SETUP

Refer to the Instruction Manual provided with the Multi-Source power source, or other DC power source being used, for input power supply connections, output connections and controls setup.

In general:

1. Connect the positive (+) output connection terminal to the input supplying the Multi-Weld system, and the negative (-) output connection terminal to the work. (see Figure 1).
2. If not using a Multi-Source power source;
  - a. If an inductance control, or tap, is selectable, use lowest inductance.
  - b. Use CC (Constant Current) mode, for maximum supply voltage.
  - c. Set panel output control to maximum, for maximum current capacity.
  - d. Activate output with the "output terminals on" switch, or jumper (2-4 on LE Co terminal strips).





**Figure 3**

The numbered items of Figure 3, above, match the numbered items described below:

## FRONT PANEL CONTROLS

These few instruments are basic to the operation and monitoring of the Converter. They are intuitively laid out so that the panel's left side is weld current related, and the right side is weld voltage related:

**(1) Input Power/ Mode Switch** has three positions:

Center is OFF which shuts off input power to the Converter.

- Neither displays nor output is on if in OFF position.

Left is on for CC (constant current) welding mode.

- Only AMPS digital meter is lit displaying the preset current setting
- Output will be on at o.c.v. (open circuit voltage).

Right is on for CV (constant voltage) welding mode.

- Only VOLTS digital meter is lit displaying the preset voltage setting

- Output will be on at the output voltage setting.

**(2) Output Control** has 3-3/4 turn resolution with slip-clutch to prevent control pot damage.

In CC mode it presets AMPS (30-350A range) when not welding, and adjusts actual arc current while welding.

In CV mode it presets VOLTS (15-40v range) when not welding, and adjusts actual arc voltage while welding.

**(3) AMPS Digital Meter** is a 3-1/2 digit LED meter which displays:

Preset Amps in CC mode when not welding.

"Blank" in CV mode when not welding.

Actual Amps while welding in both CC and CV modes.

Average Amps for about 7 seconds after welding stops in CC and CV modes .

- The 7 second memory display is indicated by the display's left-most decimal point blinking, and is interrupted if arc is restarted.

Accuracy of Actual Amps is within 3%, and typically within 10 amps of Preset.

- An Actual Amps meter calibration adjustment trimmer is provided. (See MAINTENANCE section).

Two front screws secure the meter bezel which holds a replaceable spatter shield lens (Lincoln part no. T14807-9).

- (4) VOLTS Digital Meter** is a 3-1/2 digit LED meter which displays:

Preset Volts in CV mode when not welding.

"Blank" in CC mode when not welding.

Actual Volts while welding in both CV and CC modes.

Average Volts for about 7 seconds after welding stops in CV and CC modes .

- The 7 second memory display is indicated by the display's left-most decimal point blinking, and is interrupted if arc is restarted.

Accuracy of Actual Volts is within 3%, and typically within 1 volt of Preset.

- An Actual Amps meter calibration adjustment trimmer is provided. (See MAINTENANCE section).

Two front screws secure the meter bezel which holds a replaceable spatter shield lens.

- (5) Thermal Shutdown (yellow) Light** turns on if output is shutdown because internal overheating has occurred. (See OVER TEMPERATURE SHUTDOWN in this section).

- (6) Input Voltage (green) Light** indicates appropriate level of input supply voltage:

"On" for adequate input voltage over 50v for CC or CV mode.

"Off" for inadequate input voltage under 50V, no input or Power Switch OFF.

**Note:** If green light is "blinking" the input voltage may be drifting above and below the 50V level due to loads on supply and cables.

## RECESSED PANEL CONTROLS

These instruments are recessed behind a screw secured hinged cover panel, and are not typically required for normal operator access. They may be left covered, as factory set, or setup as desired with or without the hinged cover secured:

- (7) Hot Start Control** is provided to enhance arc starting in both CC and CV modes with an extra output "boost" at the arc strike that returns to the setting level in less than a second (about 0.30 sec. in CC mode, and 0.045 sec. in CV mode). This extra Hot Start amplitude is adjustable from "0" (no extra) to "10" (100% of setting extra), with the factory set "5" (center) position typically good for most weld starting.

- (8) Arc Force Control** in the CC mode with Stick/Gouge slope.(See below). Arc Force prevents "stubby" of the electrode by providing extra weld current if the arc voltage drops below about 14V. This extra weld current is adjustable from "-10" (no extra) to "+10" (60% of setting extra), with the factory set "0" (center) position typically good for most welding.

In **CV** mode this control functions like an inductance (or "pinch") control to provide a "softer" less penetrating arc when set toward "+10", or a "harsher" more penetrating arc when set toward "-10".

- (9) CC Slope Switch** is provided to enhance stick welding on "fast-freeze" type electrodes (such as E6010 and E7010) typically used on pipe welding applications for fast root pass vertical down "drag" technique (not "whipping"). If using this type of application improved operating appeal may be obtained if the CC Slope is switched from the factory set STICK / GOUGE position to the PIPE position.

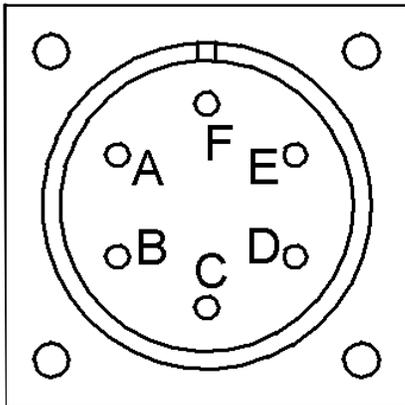
**Note:** The PIPE position uses a "drooping" type slope (~22v/100A), so preset current (not actual current) accuracy may be affected if arc length voltage is not maintained at the typical 28V used for these electrodes. Typically this error should not be more than about 10 A.

- (10) Remote Control Receptacle** is provided to permit the use of an optional Remote output control to provide operator control even closer to the arc. Connecting the Remote's plug to this receptacle automatically transfers output control from the panel Output Control (item (2) above) to the Remote pot control, which will function the same, but with only single-turn resolution.

Disconnecting the Remote's plug from this receptacle automatically transfers output control back to the panel Output Control (item (2) above).

Remote output On/Off switching can also be done thru this Remote Control receptacle. by performing the following wiring changes:

1. Making sure the input to the Converter is removed, remove the case wraparound.
2. Locate the 4-pin plug (P21) on the back panel of the control box module, and cut the jumper lead looping from the back of the plug. (Refer to the Wiring Diagram in this manual.) Insulate the cut lead ends and leave long enough to possibly splice back together again at some future time.
3. Replace the case wraparound.
4. Connect a user-provided remote switch between pins D and E of an MS3106A-18-12P plug (Lincoln part no. S12020-27 with S12024-1 cable clamp). See diagram below:



Pin:	Remote Function:
A	Max. of 10K pot
B	Wiper of 10K pot
C	Min. of 10K pot
D	Output Switch
E	Output Switch
F	No connection

5. Connect this switch plug to the Multi-Weld 350 Remote Control Receptacle (10) with switch opened. Closing the switch activates the Converter output.

## PARALLELED CONVERTERS

Multi-Weld 350 converters that are paralleled (see INTER-CONNECTION OF CONVERTERS in the INSTALLATION section) must each be set up in the same manner in order to manage the arc current drawn from each:

- 1) Set to CC mode with CC SLOPE switch set to STICK/GOUGE.
- 2) Preset Output Controls of both paralleled Converters to ~1/2 desired total Amps.

If arc current from each Converter gets too out of balance (primarily a problem if trying to use CV mode) the hotter running Converter could go into current-limiting and/or Thermal shutdown (See OVER-TEMPERATURE SHUTDOWN in the INSTALLATION section), which might then overload the other, or at least interrupt the operator's process. However, no damage will occur to the Converters.

## REMOTE CONTROL OF PARALLELED CONVERTERS

### (FOR CC STICK/GOUGE MODE ONLY)

Full Range remote control can be accomplished with a separate optional Remote output control (see INSTALLATION section) connected to each Converter. The current contribution of each Converter will depend on its remote output setting.

Partial Range remote control can be accomplished with a single Remote Control connected to the output Converter with the input Converter preset with its panel Output Control to below the minimum desired output range. The Remote Control, connected to the output Converter, will control its output to add to the preset level.

Remote Output On/Off switching maybe setup for each of the paralleled Converters, but isolated, or double-pole, switches must be used to activate each separately but simultaneously.

## TRANSPORTING AND STORAGE OF THE MULTI-WELD 350

### CABLE HANDLING

The input and electrode cables are easily disconnected from the quick-connect "pig-tails", and the Work lead can be reeled around the Multi-Weld 350 case cradled by the base skid handles, to which the clip can be secured.

### TRANSPORTING

The Converter may be carried by one or two persons using the front and rear top and bottom handles. It can also be set vertically on a two wheel cart, or horizontally on a wagon, to convey it longer distances.

### STORAGE

The Multi-Weld 350 may be set on a floor, or shelf, horizontally on its skid, or vertically standing on its rear top and bottom handles.

## PROTECTION FEATURES

The Multi-Weld 350 design features electronic protection systems to help assure reliable operation even under adverse conditions. These systems include:

### FAN AS NEEDED (F.A.N.)

The cooling fan will turn on when the arc starts and remain on for about a minute after the arc is out to cool down the power components.

This feature electronically controls the fan so it does not run continuously when the power switch is turned on. This will minimize the amount of contaminate and clogging debris which may be drawn into the Converter, in addition to the "Central-Air" system design which intakes lower velocity air through the higher side louvers and blows out through the lower back louvers with higher velocity.

## OVER-VOLTAGE PROTECTION

### Average Input Voltage Protection

The Multi-Weld 350 input contactor will open if the average input supply voltage is above 113VDC, and will automatically reclose if the voltage drops back below. During Over-Voltage Shutdown the panel displays will be as appropriate for the non-welding mode. (See FRONT PANEL CONTROLS in this section).

## CAUTION

**When the contactor recloses the output of the Converter will reactivate. Switching OFF input power prevents unexpected reactivation.**

-----

### Peak Input Voltage Protection

The Chopper PC Board will stop switching and interrupt the machine output whenever the input voltage across the input capacitors exceeds their 150 volt rating. The Thermal Shutdown (yellow) panel light will be lit when this protection is activated (Refer to OVER-TEMPERATURE SHUTDOWN Section), and resets when the voltage level drops below the protection level. The input contactor also opens during this shutdown, until reset.

These features protects internal components of the Converter from excessive voltage levels.

## OVER-CURRENT PROTECTION

The max. output current of the Multi-Weld 350 is electronically limited, to protect internal power components, so as not to exceed about 375 amps average and 500 amps peak. When the current load starts to exceed these limits the output is reduced (lower voltage) to sustain these max. levels, until the current is reduced. even to a shorted output.

Prolonged output at this max. current limit level may eventually overheat the Converter's internal power components causing over-temperature shutdown. (See following section).

Short circuit protection is also provided to reduce max. output current to about 200 amps if the output voltage is reduced, by loading or current limiting (see above), to below 14 volts for over 7 seconds (indicating a shorted output). The output current must be interrupted to reset this reduced protective level.

## OVER-TEMPERATURE SHUTDOWN

The Multi-Weld 350 has a temperature sensing thermostat on the input diode heatsink to protect the power components within the Converter from overheating. If this thermostat temperature exceeds about 95°C (203°F) the Converter will electronically shut off the output, and turn on the Thermal Shutdown (yellow) Light until the thermostat is cooled to reset.

A second over-load protection switch in the Imbalance Protector Module is added to Multi-Weld 350 models with codes 10736, and higher, but may be retrofitted to original code 10645 models with the parts order kit. This module senses for an imbalance of current between the paralleled Chopper boards by sensing the differential choke voltage. If this voltage exceeds 1V for a sustained time the Imbalance Protector will also activate over-temperature shut down to protect the higher current Chopper board from over heating.

Machines with code 11148, or higher, which use the G4662-[ ] Peripheral PC Board, also include Peak Input Voltage Protection that also lights the the Thermal Shutdown (yellow) panel light if the unit output is shutdown (See OVER-VOLTAGE PROTECTION Section.).

### CAUTION

**When the thermostat resets the output of the Converter will reactivate. Switching OFF input power prevents reactivation, but also shuts off the cooling fan which prolongs the reset time.**

-----  
During Over-Temperature Shutdown the panel displays will be as appropriate for the non-welding mode. (See FRONT PANEL CONTROLS in this section), except the fan will remain running and the Thermal Shutdown (yellow) Light will be lit until reset. Typically, If shutdown occurs repeatedly below 300 amps output with fan running, imbalance of the Chopper board current may likely be the cause.

## SAFETY PRECAUTIONS

### ⚠ WARNING

Have qualified personnel do the maintenance work.

Always use the greatest care when working near moving parts.

If a problem cannot be corrected by following the instructions, take the machine to the nearest Lincoln Field Service Shop.



**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.

## MAINTENANCE

The only maintenance which may be required for the Multi-Weld 350 is to clean out any accumulated dirt and debris which could contaminate internal components, or obstruct proper cooling of the power components resulting in premature over-temperature shut-down.

The recommended cleaning procedure is as follows:

1. Be sure to disconnect the Converter's input cable to remove its input power.
2. Remove the four screws securing the rear louver panel, and remove the panel to expose the cooling tunnel heatsinks. (See Figure 4 below):

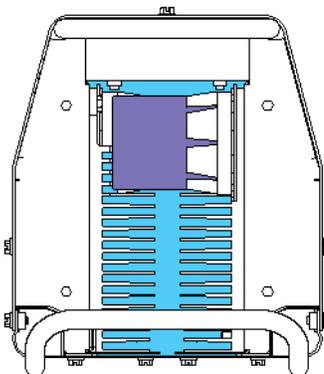


Figure 4

3. Holding the unit by the front handles, so the back is facing down, shake the loose debris out of the unit. Raking out the heatsink fins may be necessary for jammed debris.

4. If necessary, remove the case wraparound cover and using the skid handles to hold upside down carefully dump out any remaining loose debris, or carefully blow out using low pressure air.

5. Reassemble the cleaned out Converter by reversing the above steps.

## DIGITAL METER CALIBRATION

If calibration of either digital meter is ever necessary, meter calibration adjustment trimmers are provided on the Weld Control PC board inside the Control Module (see Figure 5). Calibration must be done with an Output current load, so meters are displaying Actual (not Preset) values. It is recommended that the calibration levels be near the rating plate values, for best accuracy, and compared to "master" meters with better than 2% accuracy.

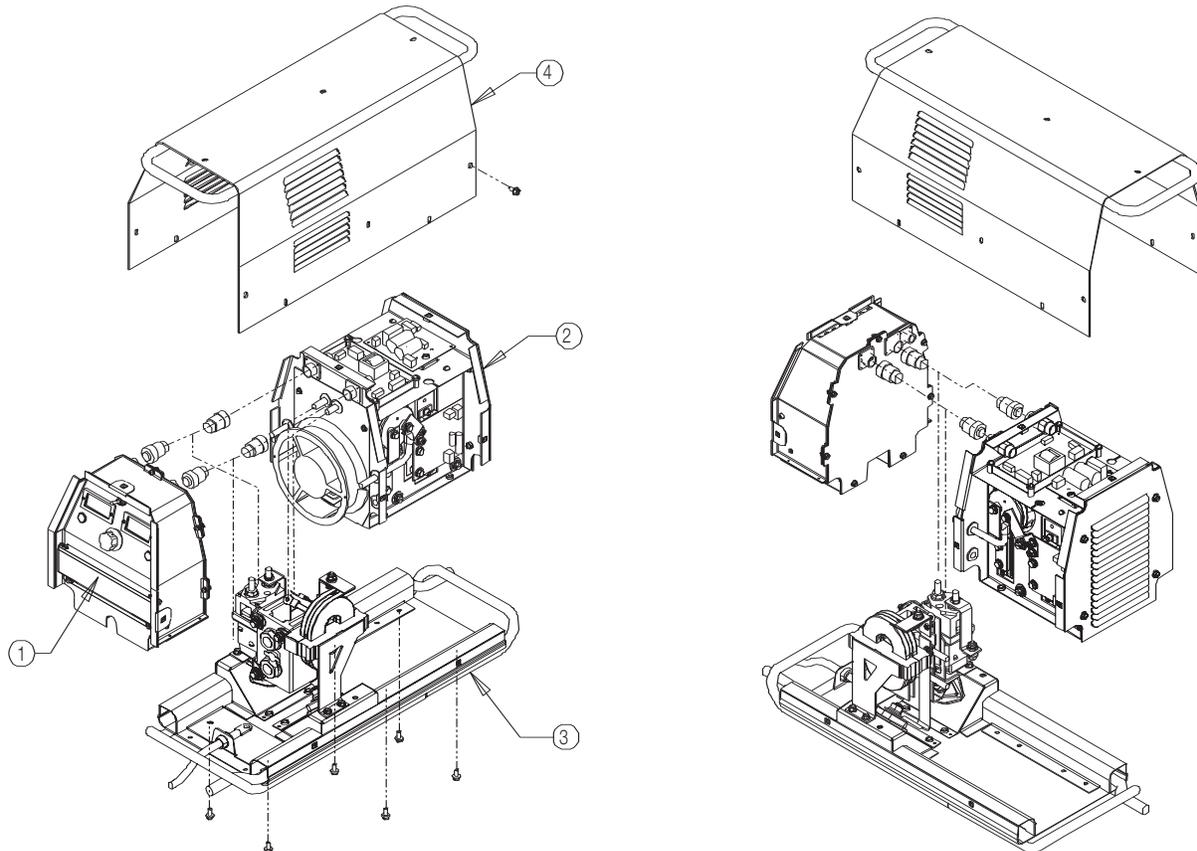
The accuracy of Actual **AMPS** meter should be within 3% of the welding amps monitored. The **AMPS** meter trimmer (R561) is located near the center of the Weld Control PC board just below the **VOLTS** meter trimmer (R562). Clockwise rotation of the trimmer adjustment screw will decrease the meter reading.

The accuracy of Actual **VOLTS** meter should be within 3% of the welding volts monitored. The **VOLTS** meter trimmer (R562) is located near the center of the Weld Control PC board just above the **AMPS** meter trimmer (R561). Clockwise rotation of the trimmer adjustment screw will decrease the meter reading. The "master" voltmeter should be connected as close as possible to the "**ELECTRODE +**" stud and "**WORK-**" lead bolt, for best accuracy.

## SERVICE

The Multi-Weld 350 was designed for easy service using quick to replace components, and assembly

modules which could be simply swapped out at the job site to minimize down time, and so more prolonged troubleshooting and repair of the module may be done later on the service bench.



**Figure 5**

The above, Figure 5, shows the three assembly modules of the Converter which are covered with the Case Wraparound (item (4)):

**Control Module (item (1))** is removed from the Base Module assembly by removing the two bottom accessed screws and disconnecting the three sealed harness plugs from the receptacles on the back of the Control box.

This module is a sealed enclosure containing replaceable electronic components:

- Sealed back cover which mounts the internal "potted" Control and Peripheral PCB's.
- Front panel with "plug-n-play" instruments which individually plug to the Control PCB.
- Interchangeable "potted" digital meters with front replaceable spatter shield lenses.
- Harness lead receptacles that connect to Base Module harness lead plugs.

**Tunnel Module (item (2))** is removed from the Base Module assembly by removing the four bottom accessed screws and disconnecting the two sealed harness plugs and power leads.

**Note:** Removal of Control Module improves access to disconnect Tunnel Module power leads.

This module assembly includes:

- Heatsinked power switching (IGBT) boards and isolated diodes.
- Capacitors and potted power supply boards.
- Fan and sheetmetal bulkhead tunnel and component enclosure.
- Harness lead receptacles and power leads that connect to Base Module.

**Base Module (item (3))** is the mounting and connection platform for the other modules.

This module assembly includes:

- Base sheetmetal with input / output connection chambers with "pigtail" leads.
- Input contactor, input diodes heat sink assembly and work clip lead.
- Output chokes and current shunt.
- Lead harness sealed plugs connect to Tunnel and Control Module receptacles.

## HOW TO USE TROUBLESHOOTING GUIDE

### 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 repair possible machine malfunctions. 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. POSSIBLE CAUSE.**

The second column labeled “POSSIBLE CAUSE” lists the obvious external possibilities that may contribute to the machine symptom.

#### **Step 3. RECOMMENDED COURSE OF ACTION**

This column provides a course of action for the Possible Cause, generally it states to contact your local Lincoln Authorized Field Service Facility.

If you do not understand or are unable to perform the Recommended Course of Action safely, contact your local Lincoln 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 Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
Machine completely dead: Input contactor does not pull in, meters are off.	<ol style="list-style-type: none"> <li>1. Check Input cable connections for loose or faulty connection.</li> <li>2. Input voltage may be too low.</li> <li>3. The power switch may be faulty.</li> <li>4. The DC Buss Power Supply PCB or its connections may be faulty.</li> <li>5. The Analog Control Power Supply PCB may be faulty.</li> <li>6. The Weld Control PCB may be faulty.</li> </ol>	<p>If all recommended possible areas of misadjustment have been checked and the problem persists, <b>Contact your local Lincoln Authorized Field Service Facility.</b></p>
Meter turns on but input contactor does not pull in.	<ol style="list-style-type: none"> <li>1. Input too high</li> <li>2. Remote receptacle output switching enabled.</li> <li>3. The contactor or supply voltage to contactor coil may be faulty.</li> <li>4. The connections at PCB connectors inside the control box may be faulty.</li> <li>5. The Peripheral PCB may be faulty.</li> <li>6. The Weld Control PCB may be faulty.</li> </ol>	
Thermal light comes on.	<ol style="list-style-type: none"> <li>1. Over- Temperature shut down.</li> <li>2. The thermostat or imbalance protector or Peak Input Voltage Protection (if present) or their connections may be faulty.</li> <li>3. Bad analog control Supply PCB.</li> <li>4. Bad weld control PCB.</li> </ol>	

 **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.

MULTI-WELD 350



Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
Meter turns on, input contactor pulls in, thermal light is off.	<ol style="list-style-type: none"> <li>1. The output cable connections may be faulty.</li> <li>2. The connections at control box plugs, chopper boards plugs, or Analog Control Power Supply PCB may be faulty.</li> <li>3. Inputs to Chopper PCB or Chopper PCB may be faulty.</li> <li>4. The Analog Control Supply PCB may be faulty.</li> <li>5. The connection at PCB connectors inside the control box may be faulty.</li> <li>6. The Weld Control PCB may be faulty.</li> </ol>	<p>If all recommended possible areas of misadjustment have been checked and the problem persists, <b>Contact your local Lincoln Authorized Field Service Facility.</b></p>
<b>Preset is not adjustable:</b> <b>Note: Panel control is disabled if Remote is plugged in.</b>	<ol style="list-style-type: none"> <li>1. The output control potentiometer or its connections may be faulty.</li> <li>2. The Weld Control board or its connections may be faulty.</li> </ol>	
<b>Preset range is not right:</b>	<ol style="list-style-type: none"> <li>1. A faulty or missing plug P3 at connector J3 of Weld Control PCB.</li> <li>2. The Weld Control board or its connections may be faulty.</li> </ol>	
<b>None of the meters comes on in CC or CV settings:</b>	<ol style="list-style-type: none"> <li>1. The Analog Control Power Supply PCB or its connections may be faulty.</li> <li>2. The Weld Control PCB or connections to meters may be faulty.</li> <li>3. Faulty meters.</li> </ol>	
<b>Meter comes on in only one of the CC or CV settings:</b>	<ol style="list-style-type: none"> <li>1. The Weld Control PCB or connections to meters may be faulty.</li> <li>2. Faulty meters.</li> </ol>	

 **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.

MULTI-WELD 350



Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
The meter is not accurate:	<ol style="list-style-type: none"> <li>1. The Analog Control Power Supply PCB or its connections may be faulty.</li> <li>2. The Weld Control PCB may be faulty.</li> </ol>	<p>If all recommended possible areas of misadjustment have been checked and the problem persists, <b>Contact your local Lincoln Authorized Field Service Facility.</b></p>
Fan does not run when turning machine on:	<ol style="list-style-type: none"> <li>1. Fan does not normally run until machine is welding. See Instruction Manual.</li> </ol>	
Fan does not run when welding:	<ol style="list-style-type: none"> <li>1. Faulty Supply voltage to fan.</li> <li>2. Faulty fan</li> <li>3. The Weld Control PCB may be faulty.</li> </ol>	
No control, very high output current:	<ol style="list-style-type: none"> <li>1. Input shorts to output.</li> <li>2. Faulty shunt lead connection.</li> <li>3. Faulty output control potentiometer or its connections.</li> <li>4. Faulty Weld Control PCB.</li> </ol>	
No control, maximum output current stays around 200A:	<ol style="list-style-type: none"> <li>1. Output shorted</li> <li>2. Faulty voltage feedback connection.</li> <li>3. Faulty Weld Control PCB.</li> </ol>	
No control :	<ol style="list-style-type: none"> <li>1. Faulty output control potentiometer or its connections.</li> <li>2. Faulty connections at Weld Control PCB connectors.</li> <li>3. Faulty Weld Control PCB.</li> </ol>	

 **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.

MULTI-WELD 350



Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
Current changing with arc length in Stick welding:	<ol style="list-style-type: none"> <li>1. Check the CC Slope switch on the recessed panel, it should be set at Stick/Gauge position for Stick welding.</li> <li>2. Faulty CC Slope switch or connections.</li> <li>3. Faulty Weld Control PCB.</li> </ol>	<p>If all recommended possible areas of misadjustment have been checked and the problem persists, <b>Contact your local Lincoln Authorized Field Service Facility.</b></p>
Poor performance on "fast-freeze" type electrodes such as E6010, E7010:	<ol style="list-style-type: none"> <li>1. Check the CC Slope switch on the recessed panel, it should be set at Pipe position.</li> <li>2. Faulty CC Slope switch or connections.</li> <li>3. Faulty connections on Weld Control PCB connectors.</li> <li>4. Faulty Weld Control PCB.</li> </ol>	
Bad starting:	<ol style="list-style-type: none"> <li>1. Adjust Hot Start setting on the recessed panel.</li> <li>2. Check Hot Start potentiometer and connections. The Hot Start and Arc Force potentiometers are interchangeable, switch them to check out.</li> </ol>	
Electrode "stubbing":	<ol style="list-style-type: none"> <li>1. Adjust Arc Force setting on the recessed panel.</li> <li>2. Check Arc Force potentiometer and connections. The Hot Start and Arc Force potentiometers are interchangeable, switch them to check out.</li> </ol>	

 **CAUTION**

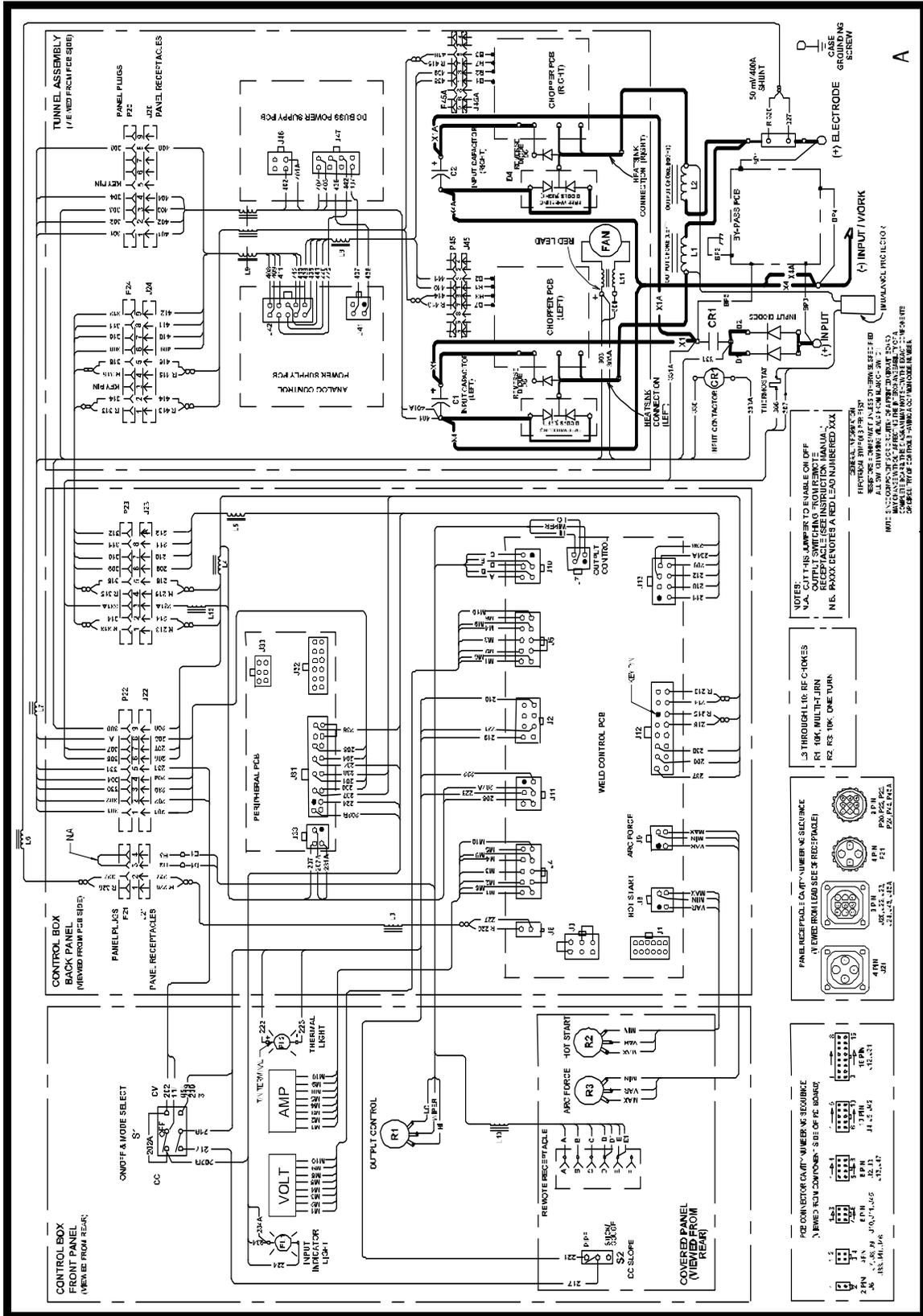
If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

MULTI-WELD 350





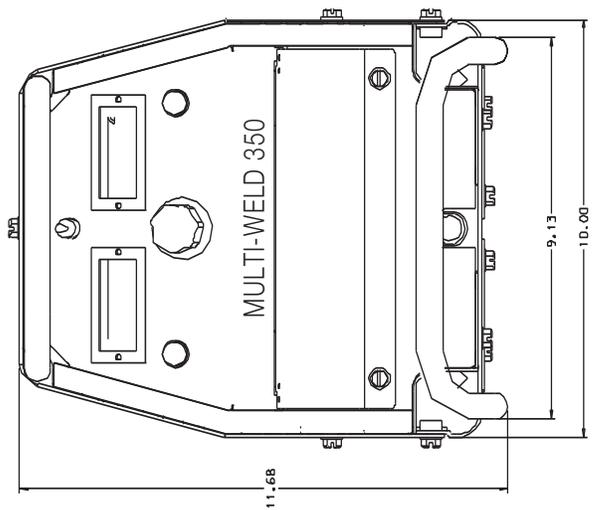
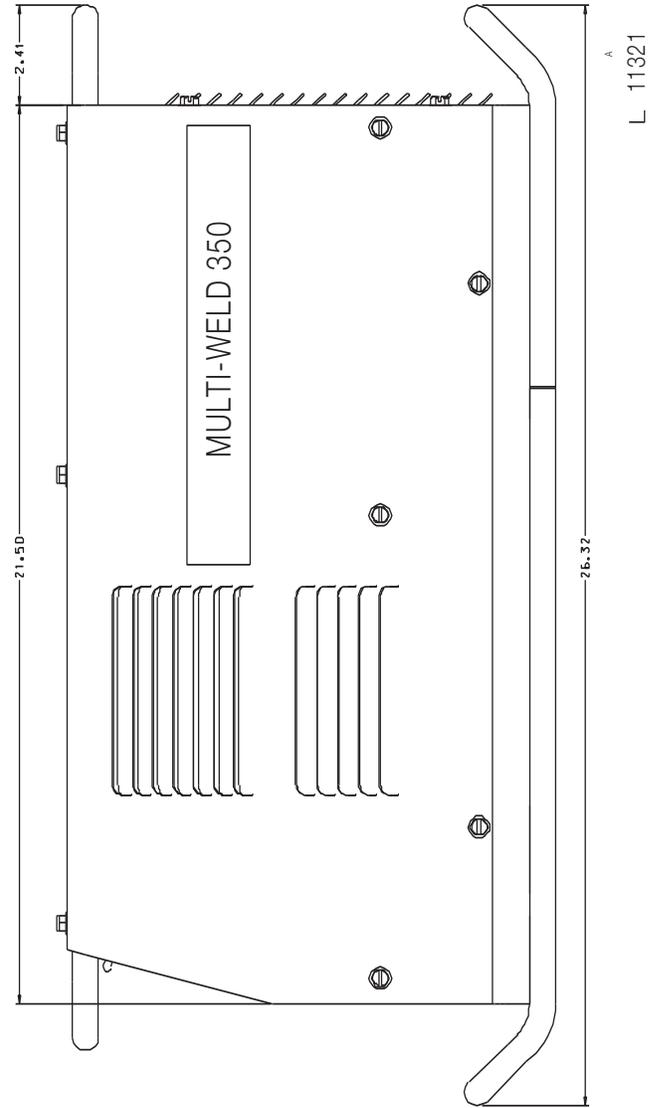
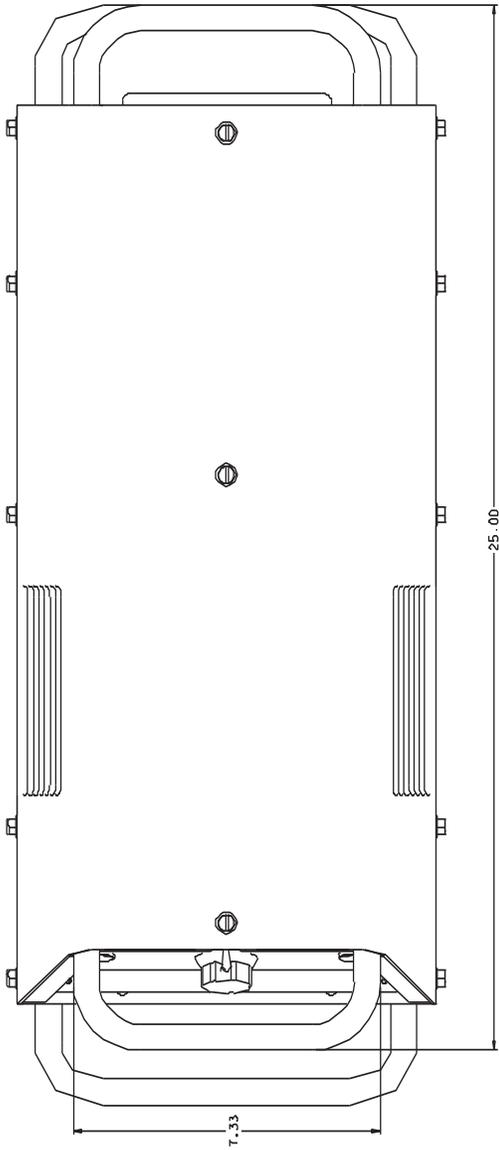
# MULTI-WELD 350 WIRING DIAGRAM FOR CODE 11148



G4673

NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual. The specific diagram for a particular code is pasted inside the machine on one of the enclosure panels. If the diagram is illegible, write to the Service Department for a replacement. Give the equipment code number.

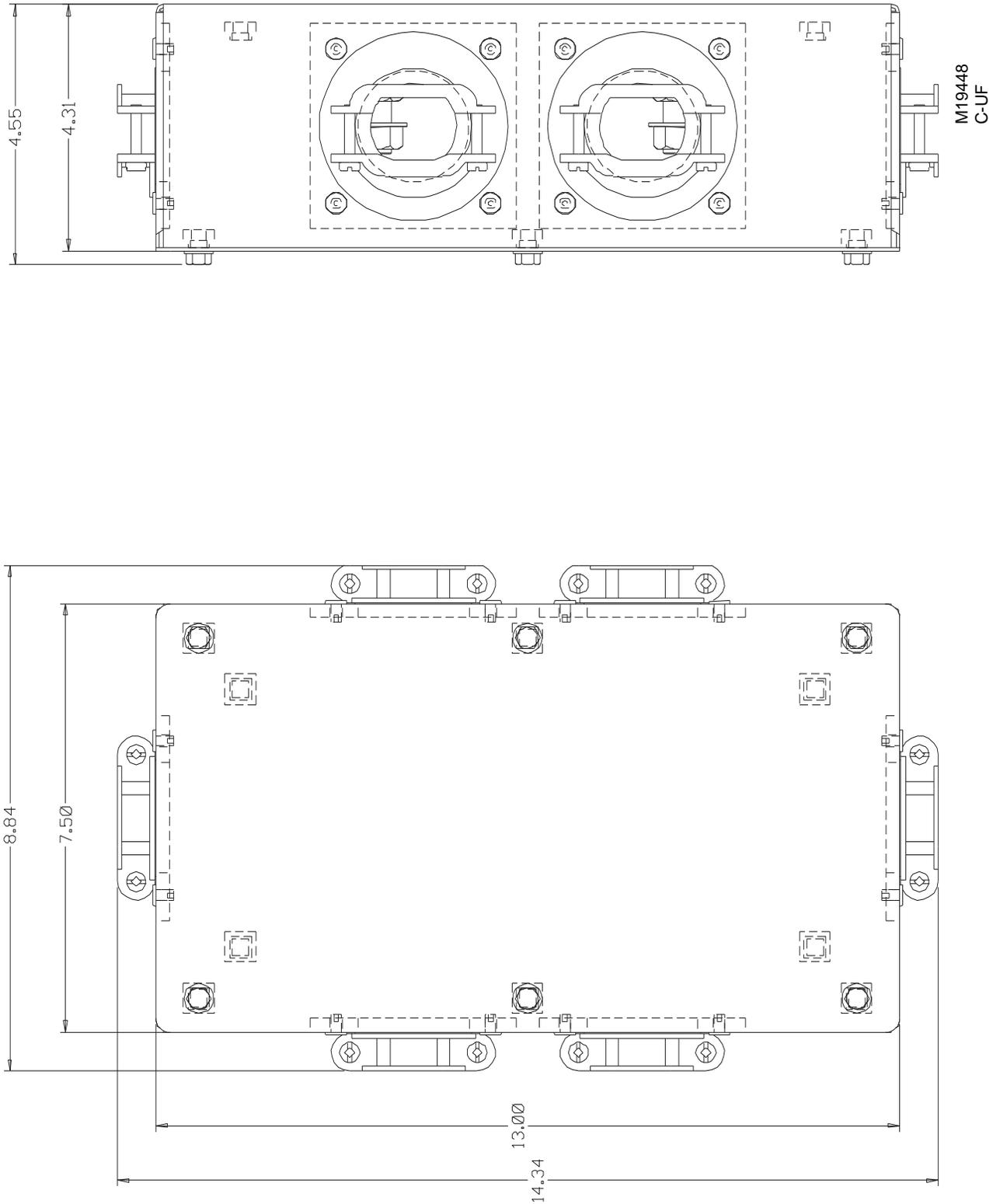
# DIMENSION PRINT - MULTI-WELD 350 CONVERTER



MULTI-WELD 350



**DIMENSION PRINT FOR DISTRIBUTION BOX**



MULTI-WELD 350



# NOTES

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MULTI-WELD 350



<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>● 皮肤或湿衣物切勿接触带电部件及焊条。</li> <li>● 使你自已与地面和工作件绝缘。</li> </ul>	<ul style="list-style-type: none"> <li>● 把一切易燃物品移离工作场所。</li> </ul>	<ul style="list-style-type: none"> <li>● 佩戴眼、耳及身体劳动保护用具。</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 بجسد 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>	WARNING
<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 AVISO DE PRECAUCION
<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 ATTENTION
<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 WARNUNG
<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 ATENÇÃO
<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ってください。</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 注意事項
<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 警告
<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 위험
<ul style="list-style-type: none"> <li>● ابعدها 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 تحذير

**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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