# PRO 100

April, 2004

IM784

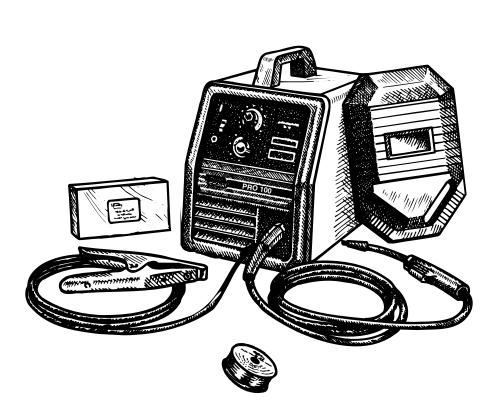
#### For use with machine Code Number 10970



This manual covers equipment which is no longer in production by The Lincoln Electric Co. Specifications and availability of optional features may have changed.

#### 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**



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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

## SAFETY

## 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 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 Diesel Engines

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.

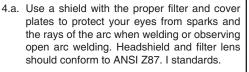


## ELECTRIC AND MAGNETIC FIELDS may be dangerous

- 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.







- 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.



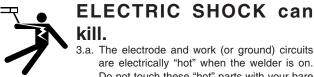
## FUMES AND GASES can be dangerous.

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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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.



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-I, "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.



#### • 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.



## **PRÉCAUTIONS DE SÛRETÉ**

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

#### Sûreté Pour Soudage A L'Arc

- 1. Protegez-vous contre la secousse électrique:
  - a. Les circuits à l'électrode et à la piéce 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 vétements mouillés. Porter des gants secs et sans trous pour isoler les mains.
  - b. Faire trés attention de bien s'isoler de la masse quand on soude dans des endroits humides, ou sur un plancher metallique ou des grilles metalliques, 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 defonctionnement.
  - 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 precautions pour le porte-électrode s'applicuent aussi au pistolet de soudage.
- Dans le cas de travail au dessus du niveau du sol, se protéger contre les chutes dans le cas ou on recoit un choc. Ne jamais enrouler le câble-électrode autour de n'importe quelle partie du corps.
- Un coup d'arc peut être plus sévère qu'un coup de soliel, 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 lateraux 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.
- Quand on ne soude pas, poser la pince à une endroit isolé de la masse. Un court-circuit accidental peut provoquer un échauffement et un risque d'incendie.
- 8. S'assurer que la masse est connectée le plus prés 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 chaines de levage, câbles de grue, ou autres circuits. Cela peut provoquer des risques d'incendie ou d'echauffement des chaines et des câbles jusqu'à ce qu'ils se rompent.
- Assurer une ventilation suffisante dans la zone de soudage. Ceci est particuliérement important pour le soudage de tôles galvanisées plombées, ou cadmiées ou tout autre métal qui produit des fumeés toxiques.
- 10. Ne pas souder en présence de vapeurs de chlore provenant d'opérations de dégraissage, nettoyage ou pistolage. La chaleur ou les rayons de l'arc peuvent réagir avec les vapeurs du solvant pour produire du phosgéne (gas fortement toxique) ou autres produits irritants.
- 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

- Relier à la terre le chassis du poste conformement au code de l'électricité et aux recommendations du fabricant. Le dispositif de montage ou la piece 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 faires des travaux à l'interieur de poste, la debrancher à l'interrupteur à la boite 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. 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:

### 

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

## 

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 – PRO 100

INPUT – SINGLE PHASE ONLY					
<u>Standard</u> <u>Voltage/Frequency</u> 115V/60Hz 115V/60Hz	Input Current 20 Amps - Rated Output 15 Amps - CSA Rated output				
	RATED OUTPUT				
<u>Duty Cycle</u> 20% Duty Cycle 20% Duty Cycle – CSA Rated Output	<u>Current</u> 88Amps 62Amps	<u>Voltage</u> 18V 20V			
OUTPUT					
Welding Current Range Rated DC Output: 30 - 100 amps	Maximum Open Circuit Voltage 32V	<u>Wire Speed Range</u> 50 - 300 IPM (1.3 - 7.6 m/min)			

	RECOMMENDED INPUT CABLE AND FUSE SIZES								
Output Mode	Input Voltage	Fuse or Breaker Size	Input Amps	Power Cord	Extension Cord				
RATED	115V/60Hz	20 Amp	20	15 Amp, 125V, Three Prong Plug (NEMA Type 5-15P)	Three Conductor #14 AWG (2.1 mm <sup>2</sup> ) or Larger Up to 25 Ft. (7.6 mm)				
CSA	115V/60Hz	15 Amp	12	15 Amp, 125V, Three Prong Plug (NEMA Type 5-15P)	Three Conductor #12 AWG (3.3 mm²) or Larger Up to 50 Ft. (15.2 mm)				

PHYSICAL DIMENSIONS						
Height <u>Width</u> <u>Depth</u> <u>Weight</u>						
12.0 in	9.75 in	16.5 in	47 lbs			
305 mm	248 mm	419 mm	21.4 kg			



Read entire installation section before starting installation.

## SAFETY PRECAUTIONS

## 



- ELECTRIC SHOCK can kill.
- Only qualified personnel should perform this installation.
- Only personnel that have read and understood the PRO 100 Operating Manual should install and operate this equipment.
- Machine must be plugged into a receptacle which is grounded per any national, local or other applicable electrical codes.
- The PRO 100 power switch is to be in the OFF ("O") position when installing work cable and gun and when connecting power cord to input power.

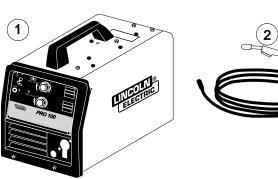
# IDENTIFY AND LOCATE COMPONENTS

If you have not already done so, unpack the PRO 100 from its carton and remove all packing material around the PRO 100. Remove the following loose items from the carton (see Figure A.1):

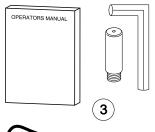
- 1. PRO 100
- 2. Gun and cable assembly<sup>(1)</sup>
- 3. Literature and miscellaneous including:
  - a) This operating manual
  - b) Extra .035" contact tip
  - c) Hex key wrench for removal of drive roll.
- 4. 10 ft (3,0 m) work cable.
- 5. Work clamp.
- 6. Sample spool of Innershield .035" (0,9 mm) NR-211-MP electrode.
- 7. Handshield with filter plate and lens.
- 8. Instructional video.

For available options and accessories refer to the Accessories Section of this manual.

<sup>(1)</sup> The gun is ready to feed 0.035" (0,9 mm) Innershield wire.



**FIGURE A.1** 

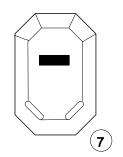


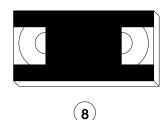




5









**PRO 100** 

## INSTALLATION

## SELECT SUITABLE LOCATION

Locate the welder in a dry location where there is free circulation of clean air into the louvers in the back and out the front of the unit. A location that minimizes the amount of smoke and dirt drawn into the rear louvers reduces the chance of dirt accumulation that can block air passages and cause overheating.

#### STACKING

PRO 100's cannot be stacked.

#### TILTING

Each machine must be placed on a secure, level surface, either directly or on a recommended undercarriage. The machine may topple over if this procedure is not followed.

## **OUTPUT CONNECTIONS**

Refer to Figure A.2.

- 1. Work Cable Access Hole.
- 2. Gun Cable and Control Lead Access Hole.
- 3. Connector Block.
- Gun Trigger Lead Connectors.
- 5. Positive (+) and negative (-) output terminals.
  - 00 PRO 100 0 0

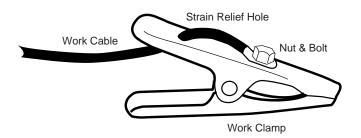
- 6. Wire Feed Gearbox.
- 7. Cable Hanger.
- 8. Thumbscrew.

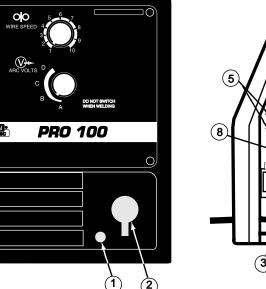
#### Work Clamp Installation

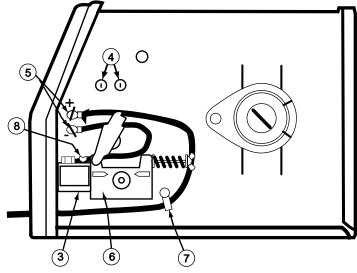
Attach the work clamp per the following:

- 1. Unplug the machine or turn the power switch to the "OFF" position.
- 2. Insert the work cable terminal lug with the larger hole through the strain relief hole in the work clamp as shown in Figure A-3.
- 3. Fasten securely with the bolt and nut provided.

#### **FIGURE A.3**







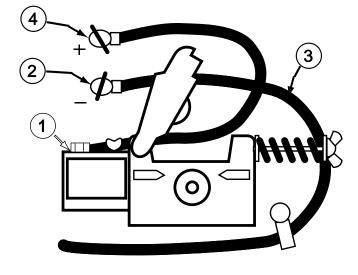


**FIGURE A.2** 

### Work Cable Installation

Refer to Figure A.2.

- 1. Open the wire feed section door on the right side of the PRO 100.
- 2. Pass the end of the work cable that has the terminal lug with the smaller hole through the Work Cable Access Hole (1) in the case front.
- 3. Route the cable under and around the back of the Wire Feed Gearbox (6).
- 4. For Innershield Only: Refer to Figure A.2. As delivered, the PRO 100 is connected for negative electrode polarity. This is the appropriate configuration for the Innershield process. To complete installation, use the provided wing nut to connect the work cable's terminal lug to the positive (+) output terminal (5) located above the Wire Feed Gearbox (6). Make sure that both wing nuts are tight.
- 5. For GMAW Only: Refer to Figure A.4. To wire for positive polarity (required for the MIG process), connect the short cable attached to the connector block (1) to the positive (+) output terminal (4) and the work cable (3) to the negative (-) terminal (2).



#### **FIGURE A.4**

## GUN INSTALLATION

As shipped from the factory, the PRO 100 gun is ready to feed 0.035" (0,9 mm) wire. If .023" – .025" (0,6 mm) or .030" (0.8 mm) wire is to be used for the GMAW (MIG) process, see the MAINTENANCE section for proper configuration of feeding components and installation details.

#### **Connecting Gun Cable to the PRO 100**

- 1. Refer to Figure A.2. Unplug the machine or turn power switch to the OFF "O" position.
- 2. Pass the insulated terminals of the gun trigger control leads, one at a time, through the Gun Cable and Control Lead Access Slot (2) in the case front. The leads are to be routed under the Wire Feed Gearbox (6) and through the Cable Hanger (7) on the inner panel.
- 3. Insert the connector on the gun conductor cable through the Gun Cable Access Hole (2) in the PRO 100 case front. Make sure the connector is all the way in the brass connector block. Unscrew thumbscrew on the connector block a few turns if gun connector will not insert fully. Rotate the connector so control leads are on the underside and tighten the Thumbscrew (8) in the connector block.
- 4. Connect the gun trigger control lead terminals to the two insulated 1/4" (6,4 mm) tab terminal connector bushings located above the "Gun Trigger Connection" decal in the wire feed section (4). Either lead can go to either connector. Form the leads so that they are as close as possible to the inside panel.

#### 

If the gun trigger switch being used is other than that supplied with the PRO 100, the switch must be a normally open, momentary switch. The terminals of the switch must be insulated from the welding circuit. Malfunction of the PRO 100 may result if this switch shorts to the PRO 100 welding output circuit or is common to any electrical circuit other than the PRO 100 trigger circuit.

## **GAS CONNECTION (OPTIONAL)**

When using the GMAW process, a K610-1 MIG conversion kit and a cylinder of carbon dioxide  $(CO_2)$  or argon-carbon dioxide mixed shielding gas must be obtained. For more information about the K610-1 MIG Conversion Kit for use with the PRO 100, refer to the ACCESSORIES section.



## A WARNING



A-5

#### CYLINDER may explode if damaged. Keep cylinder upright and chained to support

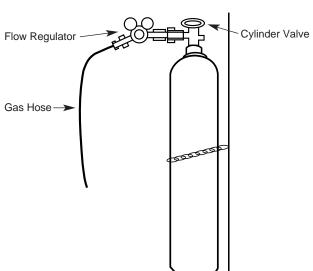
- Keep cylinder away from areas where it may be damaged.
- Never lift welder with cylinder attached.
- Never allow welding electrode to touch cylinder.
- Keep cylinder away from welding or other live electrical circuits.

## WARNING



BUILDUP OF SHIELDING GAS may harm health or kill.

- Shut off shielding gas supply when not in use.
- SEE AMERICAN NATIONAL STANDARD Z-49.1, "SAFETY IN WELDING AND CUTTING" PUB-LISHED BY THE AMERICAN WELDING SOCIETY.
- 1. Chain the cylinder to a wall or other stationary support to prevent the cylinder from falling over. Insulate the cylinder from the work circuit and earth ground. Refer to Figure A.5.



#### **FIGURE A.5**

2. With the cylinder securely installed, remove the cylinder cap. Stand to one side away from the outlet and open the cylinder valve very slightly for an instant. This blows away any dust or dirt which may have accumulated in the valve outlet.

## WARNING

BE SURE TO KEEP YOUR FACE AWAY FROM THE VALVE OUTLET WHEN "CRACKING" THE VALVE. Never stand directly in front of or behind the flow regulator when opening the cylinder valve. Always stand to one side.

3. Attach the flow regulator to the cylinder valve and tighten the union nut securely with a wrench..

**NOTE:** If connecting to 100%  $CO_2$  cylinder, insert regulator adapter (provided with MIG Conversion Kit for the PRO 100) between regulator and cylinder valve. If adapter is equipped with a plastic washer, be sure it is seated for connection to the  $CO_2$  cylinder.

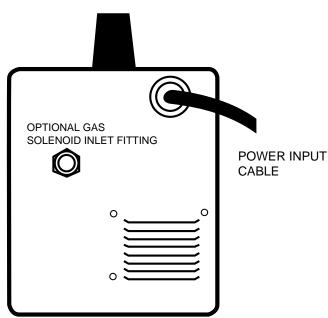
4. Refer to Figure A.6. Attach one end of inlet gas hose to the outlet fitting of the flow regulator and tighten the union nut securely with a wrench. Connect the other end to the PRO 100 Gas Solenoid Inlet Fitting (5/8-18 female threads — for CGA — 032 fitting). Make certain the gas hose is not kinked or twisted.





## **INPUT CONNECTIONS**

FIGURE A.6



Refer to Figure A.6.

The PRO 100 has a power input cable located on the rear of the machine.

### CODE REQUIREMENTS FOR INPUT CONNECTIONS

## A WARNING

This welding machine must be connected to power source in accordance with applicable electrical codes.

The National Electrical Code provides standards for amperage handling capability of supply conductors based on duty cycle of the welding source.

If there is any question about the installation meeting applicable electrical code requirements, consult a qualified electrician.

#### **Requirements For Rated Output**

A power cord with a 15 amp, 125 volt, three prong plug (NEMA Type 5-15P) is factory installed on the PRO 100. Connect this plug to a mating grounded receptacle which is connected to a 20 amp branch circuit with a nominal voltage rating of 115 to 125 volts, 60 Hertz, AC only.

The rated output with this installation is 88 amps, 18 Volts, 20% duty cycle (2 minutes of every 10 minutes used for welding).

#### 

Do not connect the PRO 100 to an input power supply with a rated voltage that is greater than 125 volts.

Do not remove the power cord ground prong.

## **Requirements For CSA Rated Output**

A line cord with a 15 amp, 125 volt, three-prong plug (NEMA Type 5-15P) is factory installed. Connect this plug to a mating grounded receptacle which is connected to a 15 amp branch circuit with a nominal voltage rating of 115 volts to 125 volts, 60 hertz, AC only. With this installation, the PRO 100 can be used at an output of 62 amps, 20 volts, 20% duty cycle.



## **OPERATION**

Read entire operation section before operating the PRO 100.

## WARNING

A



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### 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 closed containers.



# ARC RAYS can burn eyes and skin.

\_\_\_\_\_

• Wear eye, ear and body protection.

# Observe all safety information throughout this manual.

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## **GENERAL DESCRIPTION**

The PRO 100 is a compact lightweight DC wire feeder/power source. It has been designed for workshop, hobby, and light maintenance. It is capable of general purpose welding with self-shielded flux-cored (Innershield<sup>®</sup>) wire. When combined with the optional K610-1 MIG Conversion Kit, the PRO 100 is suitable for GMAW (MIG) welding applications.

The PRO 100 is ideally suited for individuals having access to 115 volt AC input power, and wanting the ease of use, quality and dependability of both the Innershield electrode process (self-shielded flux-cored or FCAW) and gas metal arc welding or GMAW (also known as MIG welding). The PRO 100 is a rugged and reliable machine that has been designed for dependable service and long life.

### **RECOMMENDED PROCESSES**

The PRO 100 can be used for welding mild steel using the self shielded, Innershield electrode process (FCAW) or it can be used for the GMAW, single pass, process which requires a supply of shielding gas and the K610-1 MIG Conversion Kit. The PRO 100 is configured for use with the FCAW process as delivered from the factory.

# OPERATIONAL FEATURES AND CONTROLS

The PRO 100 has the following controls as standard: Power ON/OFF Switch, Voltage Control, Wire Speed Control, Trigger Switch, and a Circuit Breaker.

### DESIGN FEATURES AND ADVANTAGES

- Operates on 115 volt input .
- "Cold electrode" until gun trigger is pressed for an added measure of safety.
- Overload protection incorporates both a thermostat and a circuit breaker.
- Quality wire drive with electronic overload protection.
- "Quick Release" idle roll pressure arm is easily adjusted.
- Reversible, dual groove drive roll. Drive roll will feed .023 – .025" (0.6 mm) and .030" and .035" (0.8 mm and 0.9 mm) diameter wire.

- No external shielding gas is required when used with Lincoln Innershield .035" (0,9 mm) NR<sup>®</sup>-211-MP electrode.
- Accommodates 4" (100 mm) diameter spool of wire. Will accommodate 8" (200 mm) diameter with optional spindle.

## WELDING CAPABILITY

The PRO 100 is rated at 88 amps, 18 volts, at 20% duty cycle on a ten minute basis. CSA rated output at 62 amps at 20 volts at 20% duty cycle. It is capable of higher output currents at lower duty cycles.

## LIMITATIONS

Arc Gouging cannot be performed with the PRO 100. The PRO 100 is not recommended for pipe thawing or TIG welding.

## **CONTROLS AND SETTINGS**

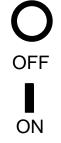
Refer to Figure B.1a.

- Power ON/OFF Switch When the power is on the fan motor will run and air will be exhausted out the louvers in the front of the machine. The welding output and wire feeder remain off until the gun trigger is pressed.
- Wire Speed Control Controls the wire feed speed from 50 300 in /min (1.3 7.6 m/min). The control can be preset on the dial to the setting specified on the PRO 100 Application Chart located on the inside of the wire feed section door.
- Voltage Control A 4-position tap selector switch gives full range adjustment of power source output voltage. Do not switch while welding.

Refer to Figure B.1b.

 Circuit Breaker – Protects machine from damage if maximum output is exceeded. Button will extend out when tripped (Manual reset).

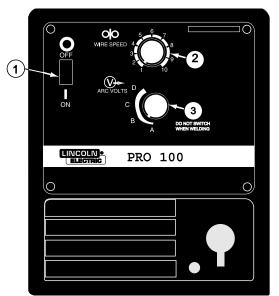


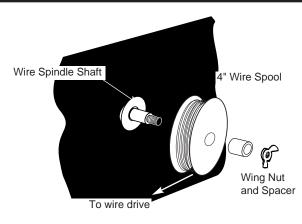






**FIGURE B.1a** 



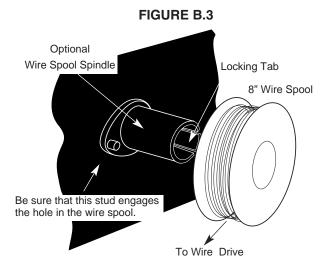


#### **FIGURE B.2**

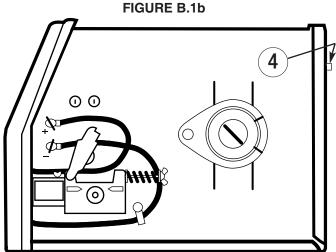
To use 8" (200 mm) diameter spools, the 2" (51 mm) diameter M15445 spindle must be used. Remove the spacer and wing nut at the end of the shaft. Insert spindle as shown in figure B.3. Reattach spacer and wing nut.

**Note:** <u>When loading and removing the 8" Spools</u> make sure that the wing nut (inside the wire spool spindle hub) is turned 90° from the wire spool spindle locking tab. If the wing nut is positioned in line with the locking tab, the tab cannot be depressed to load or unload the wire spool.

Make certain the start end of the wire, which may protrude through the side of the spool, does not contact any metallic case parts.



Wire Spool must be pushed all the way on the spindle so that the spindle's tab will hold it in place. The Wire Spool will rotate clock-wise when wire is dereeled.



## WELDING OPERATIONS

#### **SEQUENCE OF OPERATION**

#### Wire Loading

Refer to Figure B.2 AND B3.

The machine power switch should be turned to the OFF ("O") position before working inside the wire feed enclosure.

The machine is shipped from the factory ready to feed 4" (100 mm) diameter spools. A 4" (100 mm) diameter spool is mounted directly on the 5/8" (16 mm) diameter spindle that has a built-in adjustable friction brake to prevent overrun of the spool and excess slack in the wire. The wing nut at the end of the shaft is used to adjust the tension on the wire spool.



**PRO 100** 

**Note:** The brake should be adjusted with a spool of wire installed. When properly adjusted it should move freely but not coast.

Friction Brake Adjustments

- 1. With wire spool installed, check free movement and coast of the spool.
- 2. To tighten the brake turn the wing nut clockwise in 1/4 turn increments until coasting stops.
- 3. To loosen the brake turn the wing nut counterclockwise in 1/4 turn increments until the wire spool moves freely without coasting.

#### Wire Threading

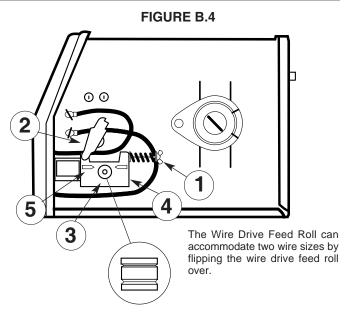
Refer to Figure B-4

- Release the Spring Loaded Pressure Arm (1) rotate the Idle Roll Arm (2) away from. the Wire Feed Drive Roll (3). Ensure that the groove size in the feeding position on the drive roll matches the wire size being used.
- 2. Carefully detach the end of the wire from the spool. To prevent the spool from unwinding, maintain tension on the wire until after step 5.
- 3. Cut the bent portion of wire off and straighten the first 4" (100 mm).
- Thread the wire through the In-going guide tube (4), over the drive roll (3), and into the out-going guide tube (5).
- 5. Close the idle roll arm and latch the spring loaded pressure arm (2) in place. Rotate the spool counterclockwise if required in order to take up extra slack in the wire.

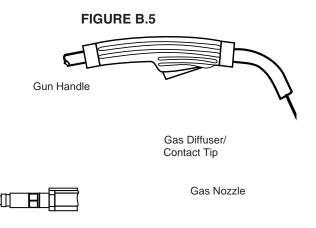
### WARNING

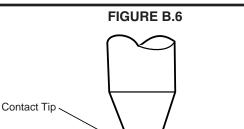
When inching the welding wire, the drive rolls, the gun connector block and the gun contact tip are electrically energized relative to work and ground and remain energized for several seconds after the gun trigger is released.

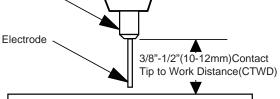
6. The idle roll pressure adjustment wing nut is normally set for mid-position on the pressure arm threads. If feeding problems occur because the wire is flattened excessively, turn the pressure adjustment counter-clockwise to reduce distortion of the wire. Slightly less pressure may be required when using 0.023 – 0.025" (0,6 mm) wire. If the drive roll slips while feeding wire, the pressure should be increaseduntil the wire feeds properly.



- Refer to Figure B.5. Remove gas nozzle and contact tip from end of gun.
- 8. Turn the PRO 100 ON ("I").
- 9. Straighten the gun cable assembly.
- Depress the gun trigger switch and feed welding wire through the gun and cable. (Point gun away from yourself and others while feeding wire.) Release gun trigger after wire appears at end of gun.
- 11. Turn the PRO 100 OFF ("O").
- 12. Replace contact tip and gas nozzle.
- 13. Refer to Figure B-6. Cut the wire off 3/8" 1/2" (10 13 mm) from the end of the tip. The PRO 100 is now ready to weld.

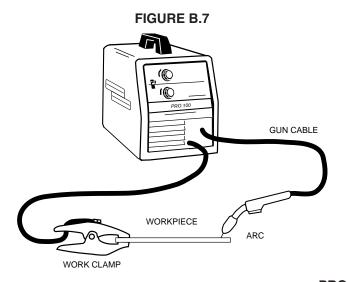






#### Making A Weld

- 1. See "Process Guidelines" in this section for selection of welding wire and shielding gas and for range of metal thicknesses that can be welded.
- 2. See the Application chart on the inside of the wire feed compartment door for information on setting the PRO 100 controls. Refer to Table B.1 for aluminum and stainless wire.
- Set the Voltage ("V") and Wire Speed ("olo") controls to the settings suggested for the welding wire and base metal thickness being used, refer to Applications chart on the inside of the wire drive compartment door.
- 4. Check that the polarity is correct for the welding wire being used and that the gas supply, if required, is turned on.
- 5. When using Innershield electrode, remove the gas nozzle and install the gasless nozzle. This will improve visibility of the arc and protect the gas diffuser from weld spatter. Refer to the MAINTE-NANCE section for details on nozzle replacement.



- Refer to Figure B.7. Connect work clamp to metal to be welded. Work clamp must make good electrical contact to the workpiece. The workpiece must also be grounded as stated in "Arc Welding Safety Precautions" in the beginning of this manual.
- 7. Position gun over joint. End of wire may be lightly touching the work.
- 8. Lower welding helmet, close gun trigger, and begin welding. Hold the gun so the contact tip to work distance is about 3/8 inch (10 mm).
- 9. To stop welding, release the gun trigger and then pull the gun away from the work after the arc goes out.
- 10. When no more welding is to be done, close valve on gas cylinder (if used), momentarily operate gun trigger to release gas pressure, and turn off the PRO 100.

#### **Cleaning Tip And Nozzle**

Clean the contact tip and nozzle to avoid arc bridging between the nozzle and contact tip which can result in a shorted nozzle, poor welds and an overheated gun. Hint: Anti-stick spray or gel, available from a welding supply distributor, may reduce buildup and aid in spatter removal.

#### PROCESS GUIDELINES

The PRO 100 as shipped, can be used for welding mild steel using the self shielded, Innershield electrode process or it can be used for the GMAW (MIG), single pass, process which requires a supply of shielding gas and the K610-1 MIG Conversion Kit.

The recommended electrode for the self-shielded process is 0.035" (0,9 mm) diameter Lincoln Innershield NR-211-MP. Requires optional spindle – refer to Accessories section. This electrode can be used for all position welding of 20 gauge through 5/16" (1,0 – 8,0 mm) thick steel [multiple passes are required for 1/4" and 5/16" (6,0 and 8,0 mm)].

The recommended gas and electrode for GMAW is welding grade  $CO_2$  gas and 0.025" (0 6 mm) diameter Lincoln Super Arc L-56 mild-steel welding wire [supplied on 12-1/2 lb (6 kg) spools]. For 14 gauge (2,0 mm) and thinner,  $CO_2$  gas is recommended because it gives equal or better performance than a blended gas at a lower cost. A mixed gas consisting of 75 to 80% Argon and 20 to 25%  $CO_2$  is recommended for welding on heavier gauge steel, 12 gauge (2,5 mm) for example.



The PRO 100 is suitable for .035" aluminum wire and .030" stainless wire. Refer to Table B.1 for recommended procedure settings. (Requires K610-1 MIG Conversion Kit and K664-2 Aluminum - Stainless Feeding Kit.)

### A CAUTION

It is important when changing between welding with steel wire and aluminum to exchange feeding components due to the lubricant applied to steel wire. Failure to do so may result in contaminated welds when welding aluminum.

#### TABLE B.1

		Shielding	Voltage/Wire Speed					
Process	Welding Wire	Gas	22 ga	16 ga	12 ga	1/8"	3/16"	1/4'
	.035 Dia(0.9mm 4043 Aluminum Wire	0	A-4.5	C-8.5	D-10	NR*	NR*	NR*
MIG DC+			16 ga	14 ga	12 ga	10 ga		
	.030 Dia 308L Stainless Steel Wire	98% Argon/ 2% Oxygen	A-3	C-6	D-7.5	D-7.5		

\*NR-Not Recommended

### CHANGING MACHINE OVER TO FEED OTHER WIRE SIZES

The PRO 100 is shipped from the factory ready to feed 0.035" (0,9 mm) diameter cored wire. To operate the PRO 100 with other sizes and types of wire, it maybe necessary to change the contact tip and drive roll orientation. Refer to the MAINTENANCE section, for component configuration and replacement procedures.

## WELDING WITH GMAW (MIG)

#### **Shielding Gas**

When using the GMAW process, obtain and install the K610-1 MIG Conversion Kit and a cylinder of carbon dioxide ( $CO_2$ ) or argon-carbon dioxide mixed shielding gas. Refer to the ACCESSORIES section for more information about installing the K610-1 Kit for use with the PRO 100. Also see the MAINTENANCE section for proper contact tip, nozzle liner and drive roll configuration.

- For CO<sub>2</sub>, open the cylinder very slowly. For argonmixed gas, open cylinder valve slowly a fraction of a turn. When the cylinder pressure gauge pointer stops moving, open the valve fully.
- 2. If using a regulator with an adjustable flow meter, close the gun trigger and adjust the flow to give 15 20 cubic ft per hour (CFH) (7 10 l/min) [use 20 25 CFH (10 12 l/min) when welding out of position or in a drafty location for  $CO_2$ ]. For argon mixed gas, trigger to release gas pressure, and turn off the adjust the flow to give 25 30 CFH (12 14 l/min).
- 3. Keep the cylinder valve closed, except when using the PRO 100. When finished welding:
  - a) Close the cylinder valve to stop gas flow.
  - b) Depress the gun trigger briefly to release the pressure in the gas hose.
  - c) Turn off the PRO 100.

## **OVERLOAD PROTECTION**

#### **Output Overload**

The PRO 100 is equipped with a circuit breaker and a thermostat which protects the machine from damage if maximum output is exceeded. The circuit breaker button will extend out when tripped. The circuit breaker must be manually reset.

#### **Thermal Protection**

The PRO 100 has a rated output duty cycle of 20%. If the duty cycle is exceeded, a thermal protector will shut off the output until the machine cools to a reasonable operating temperature. This is an automatic function of the PRO 100 and does not require user intervention. The fan continues to run during cooling.

#### **Electronic Wire Drive Motor Protection**

The PRO 100 has built-in protection for wire drive motor overload.



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		1/4 in. 6.0 mm	D-2*					Multiple passes req'd.	IN FLAT	IA.	¥ [			the Operating serviceability	DETENTE T, sl	Nire 94-R ed Wire 8-R											
LINCOLN		3/16 in. 5.0 mm	D-2*					• Multiple	(0.8 mm) DI		•Multiple F •Multiple F •Multiple F •Multiple F •Multiple F •Multiple F •Multiple F	NTERED C (0.8 mm) D STEEL W	(0.8 mm) D 0 STEEL W	NTERED C 0 STEEL W 0 STEEL W 0 STEEL W 1 CARGE GROOVE AUTIONS in the	(0.8 mm) DI DI STEEL W		030 (0.8 mm) DIA. SOLID STEEL WIRE		(0.8 mm) DI		(0.8 mm) DI	(0.8 mm) DI D STEEL W	(0.8 mm) DI	(0.8 mm) D D STEEL W	(0.8 mm) D STEEL W	HE ET QUE LA D D'ENTRAINMEN' 5 TENSION.	Nozzle-MIG Wire Part No. M16294-R Nozzle-Flux-Cored Wire Part No. M16418-R
		10 ga .135 in. 3.5 mm	D-2*					NO	T SCREW C	_			7	sions. SAFETY PRE g this type of in	GE EST BRANCH LES ROULEAUX SONT MIS SOUS												
DING		12 ga .105 in. 2.5 mm	D-2					NTATION	LL WITH SE	A. MIG UC (+)	¥ M			ad MIG conver ARC WELDING ined in applying	OSTE DE SOUDA ST ENFONCEE, I L'ELECTRODE	ser/ ③ der ④											
TED SETTINGS FOR WELDING SS STEEL AND ALUMINUM SETTINGS-SEE MANUAL	STEEL THICKNESS	14 ga .075 in. 2.0 mm	C-2	D-5	D-7	D-3.5	D-4.5	- ORIENT	ALIGN GROOVE WITH CENTER OF GUIDE TUBES, SECURE DRIVE ROLL WITH SET SCREW CENTERED ON FLAT	.025 (0.6 mm) DIA.				See manual for other required MIG conversions. Be sure to read and understand the warnings on this welding machine and the section on ARC WELDING SAFETY PRECAUTIONS in the Operating Manual. Because design, fabrication, assembly and welding variables affect the results obtained in applying this type of information, the serviceability of a product or assembly is the responsibility of the builder/user.	AVERTISSEMENT: LOPROUE LE POSTE DE SOUDAGE EST BRANCHE ET QUE LA DETENTE DU PISTOLET EST ENFONCEE, LES ROULEAUX D'ENTRAINMENT, LE DEVIDOIR ET L'ELECTRODE SONT MIS SOUS TENSION.	) Gas Diffuser/ Tip Holder Part No. S19728-R											
	STEEL T	16 ga .060 in. 1.6 mm	B-1.5	C-4	C-5	D-3	မို င	ROLL	BES, SECUF	8.8			7	See manual ng machine an variables affect der/user.	◀	Cored Wire Dia.											
SS FUN SET		18 ga .048 in. 1.2mm	B-1.5	B-3	B-3.5	C-2.5	B-2.5	DRIVE	of guide tu	-				gs on this weldli bly and welding ility of the build	E IS ON AND THE MLLS, WIRE REEL Y HOT.	For Flux-Cored Part No. Wire D S19726-3R .035 i											
TINC		20 ga .036 in. 1.0 mm	B-1.5	B-3	A-2.5	B-2	B-2.5		H CENTER (				ъш	and the warning orication, assem s the responsib	ARNING: WHEN THE WELDING POWER SOURCE IS ON AND THE GUN TRIGGER DEPRESSED, FEED ROLLS, WIRE REEL AND ELECTRODE ARE ELECTRICALLY HOT.	Fr Wire Dia. 023 - 025 in 030 in.											
		22 ga .030 in. 0.80 mm		B-2.5	A-2.5				SROOVE WIT	.035 (0.9 I			ad and underst ause design, fat or assembly is	WARNING: WHEN THE WELDIN GUN TRIGGER DEPR AND ELECTRODE A	For MIG Part No. W S19726-1R 022 S19726-2R 0.2												
SS STEE		24 ga .024 in. 0.60 mm		B-2.5	A-2				ALIGN C	- 10	-					Be sure to r	Be sure to r Manual. Bec of a produc W		(1) FG Contact Star								
SUGGESTED SETTINGS FOR WELDIN FOR STAINLESS STEEL AND ALUMINUM SETTINGS-SEE MANUAL		SHIELDING GAS	NONE	co2	C20 or C25 (75-80% Argon, 25-20% C0 <sub>2</sub> )	co2	C20 or C25 (75-80% Argon, 25-20% C0 <sub>2</sub> )									©0∂											
S S		WELDING WIRE	.035 in. (0.9 mm) DIA. INNERSHIELD NR®-211-MP	5 in. (0.6 mm) DIA.	Solid Steel wike Lincoln Weld® L-56	.030 in. (0.8mm) DIA.	SUCID VIELD® L-56	<b>OUTPUT POLARITY</b>																			
LINCOLN		PROCESS	GASLESS .03 FLUX-CORED DC()	.02		DC(+)	⊼⊐ 	OUTPU	GASLESS	DC(-)	(		MIG			MAGNUM <sup>™</sup> 100L gun and cable Consumable Parts											

PRO 100

**APPLICATION CHART** 

**B-7** 

B-7

## **OPTIONAL ACCESSORIES**

- K520 Utility Cart Designed to transport the Lincoln family of small welders. Has provisions for mounting a single gas cylinder. Has front casters and large rear wheels. Handle height is easily adjustable. Bottom tray provided for tools and accessories. Easy assembly required; takes less than 15 minutes.
- M15445 Spindle Mounts onto standard spool shaft for 4" (100 mm) spools to provide for mounting 8" (200 mm) diameter spools with 2" (51 mm) I.D. and up to 2.2" (56 mm) wide.
- 3. K664-2 Aluminum Feeding Kit This kit recommended for welding with .035 Aluminum wire. This kit may also be used for feeding .030 stainless wire. Included with this kit are a drive roll, gun liner and contact tip. It is important when changing between welding with steel wire and aluminum to exchange these components due to the lubricant applied to steel wire. Failure to do so may result in contaminated welds when welding aluminum.

See Maintenance section for instructions on installing drive roll, cable liner, contact tip and their proper configuration.

4. K610-1 MIG Conversion Kit for the PRO 100 — Complete kit for use with .025" (0.6 mm) electrode wire and either CO<sub>2</sub> or Argon-mixed gas. Includes .025-.030" (0.6-0.8 mm) cable liner, two .025" (0.6 mm) contact tips, gas nozzle, 2 lb. spool of .025" (0.6 mm )Super Arc L-56 electrode, gas regulator, gas hose, regulator adapter for CO<sub>2</sub> cylinders and gas solenoid assembly, with all necessary hardware and easy instructions for installing gas solenoid. Use with .030" (0.8 mm) wire requires additional .030" (0.8 mm) contact tip and electrode wire.

See Maintenance section for instructions on flipping over the drive roll, changing the cable liner and contact tip, and their proper configuration.

### **MIG CONVERSION**

Several changes are needed to convert the unit for operation with the MIG (GMAW) process. The K610-1 MIG Conversion Kit for the PRO 100 includes all the necessary accessories for this conversion and is provided for this purpose. The following conversions should be made using the contents of this kit:

- 1. Install the gas solenoid. Complete instructions are included with the kit.
- 2. Change the output polarity to DC(+). See "Work Cable Installation" in Installation section for details.
- Change drive roll orientation (if required) for the wire size selected. See "Changing Drive Roll" in Maintenance section for details.
- 4. Install the proper gun liner (Note 1) and tip for the wire size selected. See "Component Replacement" in Maintenance section for details.
- 5. Remove gasless nozzle (if installed) and install gas nozzle. To remove, simply unscrew.
- 6. Load wire into machine and thread into gun and cable per "Welding Wire Loading" section.

(Note 1) The factory installed gun liner will feed .025 - .035 (0.6 - 0.9 mm) wire.

C-1



## MAINTENANCE

## SAFETY PRECAUTIONS

## A WARNING

ELECTRIC SHOCK can kill.



- Disconnect input power by removing plug from receptacle before working inside PRO 100. Use only grounded receptacle. Do not touch electrically "hot" parts inside PRO 100.
- Have qualified personnel do the maintenance and trouble shooting work.

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## **ROUTINE MAINTENANCE**

### **POWER SOURCE COMPARTMENT**

No user serviceable parts inside! Do not attempt to perform service in the power source (fixed) side of the PRO 100. Take the unit to an authorized Lincoln Service Center if you experience problems. NO maintenance is required.

## WIRE FEED COMPARTMENT

- 1. When necessary, vacuum accumulated dirt from gearbox and wire feed section.
- 2. Occasionally inspect the incoming guide tube and clean inside diameter is necessary.
- 3. Motor and gearbox have lifetime lubrication and require no maintenance.

## **FAN MOTOR**

Has lifetime lubrication — requires no maintenance.

## WIRE REEL SPINDLE

Requires no maintenance. Do not lubricate shaft.

## GUN AND CABLE MAINTENANCE

#### FOR MAGNUM<sup>™</sup> 100L GUN

#### **Gun Cable Cleaning**

Clean cable liner after using approximately 300 lbs (136 kg) of solid wire or 50 lbs (23 kg) of flux-cored wire. Remove the cable from the wire feeder and lay it out straight on the floor. Remove the contact tip from the gun. Using low pressure air, gently blow out the cable liner from the gas diffuser end.

## Excessive pressure at the start may cause the dirt to form a plug.

Flex the cable over its entire length and again blow out the cable. Repeat this procedure until no further dirt comes out.

#### Contact Tips, Nozzles, and Gun Tubes

 Dirt can accumulate in the contact tip hole and restrict wire feeding. After each spool of wire is used, remove the contact tip and clean it by pushing a short piece of wire through the tip repeatedly. Use the wire as a reamer to remove dirt that may be adhering to the wall of the hole through the tip.

- 2. Replace worn contact tips as required. A variable or "hunting" arc is a typical symptom of a worn contact tip. To install a new tip, choose the correct size contact tip for the electrode being used (wire size is stenciled on the side of the contact tip) and screw it snugly into the gas diffuser.
- 3. Remove spatter from inside of gas nozzle and from tip after each 10 minutes of arc time or as required.
- 4. Be sure the gas nozzle is fully screwed onto the diffuser for gas shielded processes. For the Innershield<sup>®</sup> process, the gasless nozzle should be screws onto the diffuser.
- 5. To remove gun tube from gun, remove gas nozzle or gasless nozzle and remove diffuser from gun tube. Remove both collars from each end of the gun handle and separate the handle halves. Loosen the locking nut holding the gun tube in place against the gun end cable connector. Unscrew gun tube from cable connector. To install gun tube, screw the locking nut on the gun tube as far as possible. Then screw the gun tube into the cable connector until it bottoms. Then unscrew (no more than one turn) the gun tube until its axis is perpendicular to the flat sides of the cable connector and pointed in the direction of the trigger. Tighten the locking nut so as to maintain the proper relationship between the gun tube and the cable connector. Replace the gun handle, trigger and diffuser. Replace the gas nozzle or gasless nozzle.

## **CONFIGURATION OF COMPONENTS IN WIRE FEEDING SYSTEM**

	Contact Tip	Cable Liner	Drive Roll
Components shipped with PRO 100	KP2039-3B1 .035" (0.9mm)	KP1937-3 .025035 (0.6 - 0.9mm)	M16190 Large Knurled, Small Smooth groove Small .023025 (0.6mm) Large .030/.035" (0.8/0.9mm)
K610-1 .023/.025" (0.6mm) MIG Conversion Kit∙	KP2039-1B1 .025" (0.6mm)	KP1937-2 .030 (0.8mm)	Use Standard Drive Roll Small Smooth Groove
K664-2 .035 (0.9mm) Aluminum or Stainless Kit*			M19631

• If .030 Solid wire feeding is desired obtain an KP2039-2B1 Contact Tip.

\* It is important when changing between welding with steel wire and aluminum to exchange feeding components due to the lubricant applied to steel wire. Failure to do so may result in contaminated welds when welding aluminum.



## COMPONENT REPLACEMENT PROCEDURES

#### CHANGING THE CONTACT TIP

- 1. Refer to Figure D.2. Remove the gas nozzle from the gun by unscrewing counter-clockwise.
- 2. Remove the existing contact tip from the gun by unscrewing counter-clockwise.
- 3. Insert and hand tighten desired contact tip.
- 4. Replace gas nozzle.

#### **CHANGING DRIVE ROLL**

The drive roll has two grooves; one for .023" - .025" (0.6 mm) solid steel electrode and a larger knurled groove for .030" (0.8 mm) solid and .035" (0.9 mm) flux-cored steel electrode. As shipped, the drive roll is installed in the .030"/.035" (0.8/0.9 mm) position.

If .023" - .025" (0.6 mm) wire is to be used, the drive roll must be reversed as follows:

- 1. Connect the machine to its rated input power per instructions in Installation section.
- 2. Release the spring-loaded pressure arm and lift the idle roll arm away from the drive roll.
- 3. Turn the power switch to ON (marked "I").
- 4. Set the wire speed to minimum and jog the drive unit with the trigger switch until the drive roll set screw is facing up.

## **CAUTION**

When inching the welding wire, the drive rolls, gun connector block, and gun contact tip are energized relative to work and ground and remain energized for several seconds after the gun trigger is released.

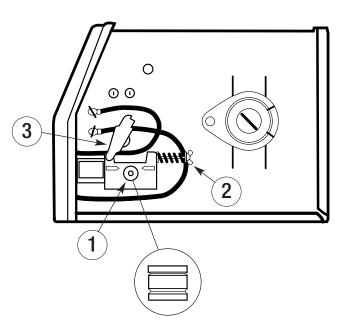
5. Turn the power switch to OFF (marked "O").

- 6. Loosen the drive roll set screw with the 5/64" (2.0 mm) hex wrench supplied.
- Remove the drive roll, flip over and reinstall with the .023 – .025" (0.6 mm) groove (the smaller groove) closest to the gearbox.

8. Push a length of straightened welding wire through the wire feeder guide tubes and adjust the position of the drive roll so that the groove is centered on the wire. Make certain the set screw is located on the flat portion of the shaft and tighten.

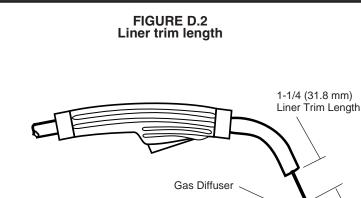
D-3

#### FIGURE D.1





PRO 100



Gas Nozzle or **Gasless Nozzle** 

Set Screw **Brass Cable** Connector Liner Assembly

(Liner bushing to be sealed tight against brass cable connector)

### CHANGING LINER

NOTICE: The variation in cable lengths prevents the interchangeability of liners. Once a liner has been cut for a particular gun, it should not be installed in another gun unless it can meet the liner cutoff length requirement. Refer to Figure D.2.

- 1. Remove the gas nozzle from the gun by unscrewing counter-clockwise.
- 2. Remove the existing contact tip from the gun by unscrewing counter-clockwise.
- 3. Remove the gas diffuser from the gun tube by unscrewing counter-clockwise.
- 4. Lay the gun and cable out straight on a flat surface. Loosen the set screw located in the brass connector at the wire feeder end of the cable. Pull the liner out of the cable.
- 5. Insert a new untrimmed liner into the connector end of the cable. Be sure the liner bushing is stenciled appropriately for the wire size being used.
- 6. Fully seat the liner bushing into the connector. Tighten the set screw on the brass cable connector. At this time, the gas diffuser should not be installed onto the end of the gun tube.
- 7. With the gas nozzle and diffuser removed from the gun tube, be sure the cable is straight, and then trim the liner to the length shown in the Figure D.2. Remove any burrs from the end of the liner.
- 8. Screw the gas diffuser onto the end of the gun tube and securely tighten.
- 9. Replace the contact tip and nozzle.

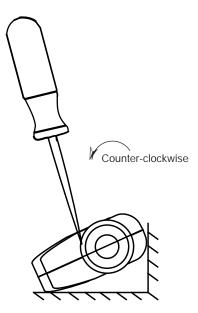




#### **GUN HANDLE PARTS**

The gun handle consists of two halves that are held together with a collar on each end. To open up the handle, turn the collars approximately 60 degrees counter-clockwise until the collar reaches a stop. Then pull the collar off the gun handle. If the collars are difficult to turn, position the gun handle against a corner, place a screwdriver against the tab on the collar and give the screwdriver a sharp blow to turn the collar past an internal locking rib. See Figure D-3.

#### **FIGURE D.3**





## 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 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.

Symptoms are grouped into three main categories: output problems, function problems, welding problems.

#### 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.

## 

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.

## TROUBLESHOOTING

## TROUBLESHOOTING GUIDE

Observe Safety Guidelines detailed in the beginning of this manual.

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
	OUTPUT PROBLEMS	
Major physical or electrical damage is evident.	None Contact your local Authorized Field Service Facility.	
No wire feed, weld output or gas flow when gun trigger is pulled. Fan does NOT operate.	1. Make sure correct voltage is applied to the machine (115vac).	
	2. Make certain that power switch is in the ON position.	
	<ol> <li>Make sure circuit breaker is reset.</li> </ol>	Contact your local Lincoln Authorized Field Service Facility.
No wire feed, weld output or gas flow when gun trigger is pulled. Fan operates normally.	<ol> <li>The thermostat may be tripped due to overheating. Let machine cool. Weld at lower duty cycle.</li> </ol>	
	2. Check for obstructions in air flow. Check Gun Trigger connec- tions. See Installation section.	
	3. Gun trigger may be faulty.	

## **A** 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 Safety Guidelines detailed in the beginning of this manual.

## **TROUBLESHOOTING GUIDE**

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
	FEEDING PROBLEMS	
No wire feed when gun trigger is pulled. Fan runs, gas flows and machine has correct open circuit voltage (32vcd maximum) – weld output.	<ol> <li>If the wire drive motor is running make sure that the correct drive rolls are installed in the machine.</li> <li>Check for clogged cable liner or contact tip.</li> <li>Check for proper size cable liner and contact tip.</li> </ol>	Contact your local Lincoln Authorized Field Service Facility.

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
	GAS FLOW PROBLEMS	
Low or no gas flow when gun trigger is pulled. Wire feed, weld output and fan operate normally. (Optional MIG Conversion Kit only.)	<ol> <li>Verify that gas solenoid is properly installed. Refer to instructions included with K610-1 MIG conversion kit.</li> <li>Check gas supply, flow regulator and gas hoses.</li> <li>Check gun connection to machine for obstruction or leaky seals.</li> </ol>	Contact your local Lincoln Authorized Field Service Facility.

## 

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.

## TROUBLESHOOTING

6. Check gun for damage or

tation and alignment.

8. Check liner for proper size.

7. Check for proper drive roll orien-

breaks.

Observe Safety Guidelines detailed in the beginning of this manual.

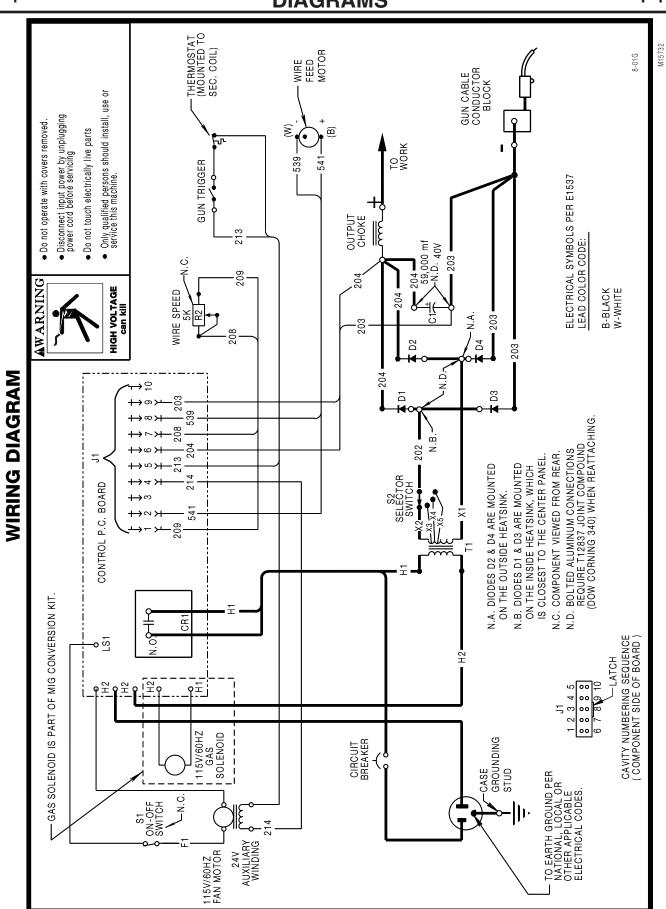
TROUBL	ESHOO	ring o	GUIDE
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		detailed in the beginning of this manual.
PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
	WELDING PROBLEMS	
Arc is unstable – Poor starting	<ol> <li>Check for correct input voltage to machine – 115vac.</li> </ol>	
	<ol> <li>Check for proper electrode polarity for process.</li> </ol>	
	<ol> <li>Check gun tip for wear or dam- age and proper size – Replace.</li> </ol>	Contact your local Lincoln
	4. Check for proper gas and flow rate for process. (For MIG only.)	Authorized Field Service Facility.
	<ol> <li>Check work cable for loose or faulty connections.</li> </ol>	

## 

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.





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.

PRO 100

F-1



WARNING	<ul> <li>Do not touch electrically live parts or electrode with skin or wet clothing.</li> <li>Insulate yourself from work and ground.</li> </ul>	● Keep flammable materials away.	<ul> <li>Wear eye, ear and body protection.</li> </ul>
AVISO DE PRECAUCION	<ul> <li>No toque las partes o los electrodos bajo carga con la piel o ropa moja- da.</li> <li>Aislese del trabajo y de la tierra.</li> </ul>	<ul> <li>Mantenga el material combustible fuera del área de trabajo.</li> </ul>	<ul> <li>Protéjase los ojos, los oídos y el cuerpo.</li> </ul>
French ATTENTION	<ul> <li>Ne laissez ni la peau ni des vête- ments mouillés entrer en contact avec des pièces sous tension.</li> <li>Isolez-vous du travail et de la terre.</li> </ul>	<ul> <li>Gardez à l'écart de tout matériel inflammable.</li> </ul>	<ul> <li>Protégez vos yeux, vos oreilles et votre corps.</li> </ul>
German WARNUNG	<ul> <li>Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung!</li> <li>Isolieren Sie sich von den Elektro- den und dem Erdboden!</li> </ul>	<ul> <li>Entfernen Sie brennbarres Material!</li> </ul>	<ul> <li>Tragen Sie Augen-, Ohren- und Kör- perschutz!</li> </ul>
ATENÇÃO	<ul> <li>Não toque partes elétricas e electrodos com a pele ou roupa molhada.</li> <li>Isole-se da peça e terra.</li> </ul>	<ul> <li>Mantenha inflamáveis bem guarda- dos.</li> </ul>	<ul> <li>Use proteção para a vista, ouvido e corpo.</li> </ul>
注意事項	<ul> <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>	● 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。	● 目、耳及び身体に保護具をして下 さい。
Chinese 聲告	<ul> <li>●皮肤或濕衣物切勿接觸帶電部件及 銲條。</li> <li>●使你自己與地面和工件絶縁。</li> </ul>	● 把一切易燃物品移離工作場所。 	●佩戴眼、耳及身體勞動保護用具。
Korean 위험	●전도체나 용접봉을 젖은 헝겁 또는 피부로 절대 접촉치 마십시요. ● 모재와 접지를 접촉치 마십시요.	●인화성 물질을 접근 시키지 마시요.	●눈, 귀와 몸에 보호장구를 착용하십시요.
Arabic	لا تلمس الاجزاء التي يسري فيها التبار الكهرياني أو الالكترود بجلد الجسم أو بالملابس المللة بالماء. ضع عاز لا على جسمك خلال العمل.	<ul> <li>ضع المواد القابلة للاشتعال في مكان بعيد.</li> </ul>	<ul> <li>ضع أدوات وملابس واقية على عينيك وأذنيك</li> <li>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 HER-Stellers. Die Unfallverhütungsvorschriften des Arbeitgebers sind ebenfalls zu beachten.

	بر ا		
<ul> <li>Keep your head out of fumes.</li> <li>Use ventilation or exhaust to remove fumes from breathing zone.</li> </ul>	<ul> <li>Turn power off before servicing.</li> </ul>	<ul> <li>Do not operate with panel open or guards off.</li> </ul>	WARNING
<ul> <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> <li>Desconectar el cable de ali- mentación de poder de la máquina antes de iniciar cualquier servicio.</li> </ul>	<ul> <li>No operar con panel abierto o guardas quitadas.</li> </ul>	AVISO DE PRECAUCION
<ul> <li>Gardez la tête à l'écart des fumées.</li> <li>Utilisez un ventilateur ou un aspira- teur pour ôter les fumées des zones de travail.</li> </ul>	<ul> <li>Débranchez le courant avant l'entre- tien.</li> </ul>	<ul> <li>N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés.</li> </ul>	French ATTENTION
<ul> <li>Vermeiden Sie das Einatmen von Schweibrauch!</li> <li>Sorgen Sie für gute Be- und Entlüf- tung des Arbeitsplatzes!</li> </ul>	<ul> <li>Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öff- nen; Maschine anhalten!)</li> </ul>	<ul> <li>Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen!</li> </ul>	German WARNUNG
<ul> <li>Mantenha seu rosto da fumaça.</li> <li>Use ventilação e exhaustão para remover fumo da zona respiratória.</li> </ul>	<ul> <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> <li>Mantenha-se afastado das partes moventes.</li> <li>Não opere com os paineis abertos ou guardas removidas.</li> </ul>	Portuguese ATENÇÃO
<ul> <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>	● 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 必ず切って下さい。	● パネルやカバーを取り外したまま で機械操作をしないで下さい。	注意事項
●頭部遠離煙霧。 ●在呼吸區使用通風或排風器除煙。	● 維修前切斷電源。	●儀表板打開或沒有安全罩時不準作 業。	Chinese 营告
<ul> <li>얼굴로부터 용접가스를 멀리하십시요.</li> <li>호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시요.</li> </ul>	● 보수전에 전원을 차단하십시요.	● 판넬이 열린 상태로 작동치 마십시요.	Korean 위 험
<ul> <li>ابعد رأسك بعيداً عن الدخان.</li> <li>استعمل التهوية أو جهاز ضغط الدخان للخارج</li> <li>لكي تبعد الدخان عن المنطقة التي تتنفس فيها.</li> </ul>	<ul> <li>اقطع التيار الكهرباني قبل القيام بأية صيانة.</li> </ul>	<ul> <li>لا تشغل هذا الجهاز اذا كانت الاغطية الحديدية الواقية ليست عليه.</li> </ul>	Arabic تحذیر

# 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説明以及應該使用的銀捍材料,並請遵守貴方的有関勞動保護規定。

이 제폼에 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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