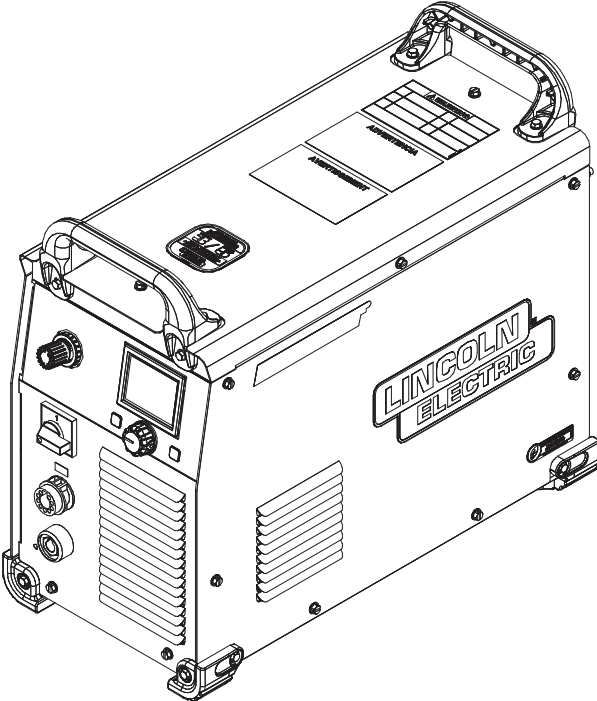




# Operator's Manual

# FlexCut™ 125



For use with machines having Code Numbers:  
**12478, 12917**



**Register your machine:**  
[www.lincolnelectric.com/register](http://www.lincolnelectric.com/register)  
**Authorized Service and Distributor Locator:**  
[www.lincolnelectric.com/locator](http://www.lincolnelectric.com/locator)

**Save for future reference**

Date Purchased

Code: (ex: 10859)

Serial: (ex: U1060512345)

# THANK YOU FOR SELECTING A QUALITY PRODUCT BY LINCOLN ELECTRIC.

## 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.

## 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.

### **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.



## KEEP YOUR HEAD OUT OF THE FUMES.

**DON'T** get too close to the arc. Use corrective lenses if necessary to stay a reasonable distance away from the arc.

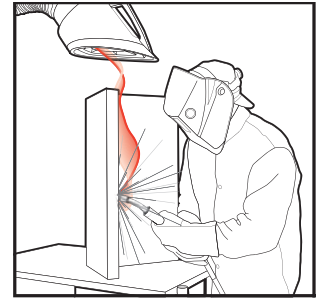
**READ** and obey the Safety Data Sheet (SDS) and the warning label that appears on all containers of welding materials.

**USE ENOUGH VENTILATION** or exhaust at the arc, or both, to keep the fumes and gases from your breathing zone and the general area.

**IN A LARGE ROOM OR OUTDOORS**, natural ventilation may be adequate if you keep your head out of the fumes (See below).

**USE NATURAL DRAFTS** or fans to keep the fumes away from your face.

If you develop unusual symptoms, see your supervisor. Perhaps the welding atmosphere and ventilation system should be checked.



## WEAR CORRECT EYE, EAR & BODY PROTECTION

**PROTECT** your eyes and face with welding helmet properly fitted and with proper grade of filter plate (See ANSI Z49.1).

**PROTECT** your body from welding spatter and arc flash with protective clothing including woolen clothing, flame-proof apron and gloves, leather leggings, and high boots.

**PROTECT** others from splatter, flash, and glare with protective screens or barriers.

**IN SOME AREAS**, protection from noise may be appropriate.

**BE SURE** protective equipment is in good condition.

Also, wear safety glasses in work area **AT ALL TIMES.**



## SPECIAL SITUATIONS

**DO NOT WELD OR CUT** containers or materials which previously had been in contact with hazardous substances unless they are properly cleaned. This is extremely dangerous.

**DO NOT WELD OR CUT** painted or plated parts unless special precautions with ventilation have been taken. They can release highly toxic fumes or gases.

## Additional precautionary measures

**PROTECT** compressed gas cylinders from excessive heat, mechanical shocks, and arcs; fasten cylinders so they cannot fall.

**BE SURE** cylinders are never grounded or part of an electrical circuit.

**REMOVE** all potential fire hazards from welding area.

**ALWAYS HAVE FIRE FIGHTING EQUIPMENT READY FOR IMMEDIATE USE AND KNOW HOW TO USE IT.**



## SECTION A: WARNINGS



### CALIFORNIA PROPOSITION 65 WARNINGS



**WARNING:** Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects, or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an exposed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to [www.P65warnings.ca.gov/diesel](http://www.P65warnings.ca.gov/diesel)

**WARNING:** This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code § 25249.5 *et seq.*)



**WARNING:** Cancer and Reproductive Harm  
[www.P65warnings.ca.gov](http://www.P65warnings.ca.gov)

**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. 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.

- Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.
- Operate engines in open, well-ventilated areas or vent the engine exhaust fumes outdoors.
- 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.

- 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.
- 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.
- 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.
- 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.
- To avoid scalding, do not remove the radiator pressure cap when the engine is hot.
- Using a generator indoors CAN KILL YOU IN MINUTES.
- Generator exhaust contains carbon monoxide. This is a poison you cannot see or smell.
- NEVER use inside a home or garage, EVEN IF doors and windows are open.
- Only use OUTSIDE and far away from windows, doors and vents.
- Avoid other generator hazards. READ MANUAL BEFORE USE.



### ELECTRIC AND MAGNETIC FIELDS MAY BE DANGEROUS



- Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding current creates EMF fields around welding cables and welding machines
- EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.
- Exposure to EMF fields in welding may have other health effects which are now not known.
- All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:
  - Route the electrode and work cables together - Secure them with tape when possible.
  - Never coil the electrode lead around your body.
  - 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.
  - Connect the work cable to the workpiece as close as possible to the area being welded.
  - Do not work next to welding power source.



## 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.



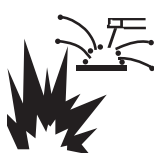
## FUMES AND GASES CAN BE DANGEROUS.



- 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 hardfacing (see instructions on container or SDS) or on lead or cadmium plated steel and other metals or coatings which produce highly toxic fumes, keep exposure as low as possible and within applicable OSHA PEL and ACGIH TLV limits using local exhaust or mechanical ventilation unless exposure assessments indicate otherwise. In confined spaces or in some circumstances, outdoors, a respirator may also be required. Additional precautions are also required when welding on galvanized steel.**
- 5.b. The operation of welding fume control equipment is affected by various factors including proper use and positioning of the equipment, maintenance of the equipment and the specific welding procedure and application involved. Worker exposure level should be checked upon installation and periodically thereafter to be certain it is within applicable OSHA PEL and ACGIH TLV limits.
- 5.c. 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.d. 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.e. Read and understand the manufacturer’s instructions for this equipment and the consumables to be used, including the Safety Data Sheet (SDS) and follow your employer’s safety practices. SDS forms are available from your welding distributor or from the manufacturer.
- 5.f. Also see item 1.b.




## WELDING AND CUTTING 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.
- 6.i. Read and follow NFPA 51B "Standard for Fire Prevention During Welding, Cutting and Other Hot Work", available from NFPA, 1 Batterymarch Park, PO box 9101, Quincy, MA 022690-9101.
- 6.j. Do not use a welding power source for pipe thawing.



## 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, 14501 George Carter Way Chantilly, VA 20151.



## 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.

**Refer to**  
**<http://www.lincolnelectric.com/safety>**  
**for additional safety information.**

# SAFETY

## General Precautions

Whereas plasma cutting has been used safely for years, it does require certain precautions to ensure the safety of the operator and other people around the equipment. The following safety information must be provided to each person who will operate, observe, perform maintenance, or work in close proximity to this piece of equipment.

Installation, operation, and repairs made to the system should only be performed by qualified personnel. The system makes use of both A.C. and D.C. circuitry for operation. Fatal shock hazard does exist. Exercise extreme caution while working on the system. Safety decals on the power supply should not be removed.



## ULTRAVIOLET RADIATION PROTECTION

Plasma cutting produces ultraviolet radiation similar to a welding arc. This ultraviolet radiation can cause skin and eye burns. For this reason, it is essential that proper protection be worn. The eyes are best protected by using safety glasses or a welding helmet with an AWS No. 12 shade or ISO 4850 No. 13 shade, which provides protection up to 400 amperes. All exposed skin areas should be covered with flame-retardant clothing. The cutting area should also be prepared in such a way that ultraviolet light does not reflect. Walls and other surfaces should be painted with dark colors to reduce reflected light. Protective screens or curtains should be installed to protect additional workers in the area from ultraviolet radiation.



## NOISE PROTECTION

The system generates high noise levels while cutting. Depending on the size of the cutting area, distance from the cutting torch, and arc current cutting level, acceptable noise levels may be exceeded. Proper ear protection should be used as defined by local or national codes.



## TOXIC FUME PREVENTION

Care should be taken to ensure adequate ventilation in the cutting area. Some materials give off toxic fumes that can be harmful or fatal to people in the vicinity of the cutting area. Also, some solvents decompose and form harmful gases when exposed to ultraviolet radiation. These solvents should be removed from the area prior to cutting. Galvanized metal can produce harmful gases during the cutting process. Ensure proper ventilation and use breathing equipment when cutting these materials.

Certain metals coated with or containing lead, cadmium, zinc, beryllium, and mercury produce harmful toxins. Do not cut these metals unless all people subjected to the fumes wear proper air breathing equipment.



## ELECTRIC SHOCK PREVENTION

The system uses high open circuit voltages that can be fatal. Extreme care should be used when operating or performing maintenance on the system. Only qualified personnel should service the system. Observe the following guidelines to protect against electric shock:

- A wall-mounted disconnect switch should be installed and fused according to local and national electrical codes. The disconnect switch should be located as close as possible to the power supply so it can be turned off in case of an emergency.
- The primary power cord should have a 600 volt minimum rating in order to protect the operator. In addition, it should be sized according to local and national electrical codes. Inspect the primary power cord frequently. Never operate the system if the power cord is damaged in any way.
- Make sure the primary power ground wire is connected at the input power ground location on the power supply. Make sure the connection is securely tightened.
- Make sure the positive output (work ground) of the power supply is connected to a bare metal area on the cutting table. A driven ground rod should be placed no further than five feet from this connection. Make sure this ground point on the cutting table is used as the star ground point for all other ground connections.
- Inspect the torch leads frequently. Never use the system if the leads are damaged in any way.
- Do not stand in wet, damp areas when operating or performing maintenance on the system.
- Wear insulated gloves and shoes while operating or performing maintenance on the system.
- Make sure the system is switched off at the wall disconnect before servicing the power supply or torch.
- Never change torch consumable parts unless main power to the system is switched off at the power supply or wall disconnect.
- Do not attempt to remove any parts from beneath the torch when cutting. Remember that the workpiece forms the current path back to the power supply.
- Never bypass the safety interlock devices.
- Before removing any of the covers, switch the system off at the wall disconnect. Wait at least five (5) minutes before removing any cover. This will give the capacitors inside the unit time to discharge. See Section 5 for additional safety precautions.
- Never operate the system without all of the covers in place. See Section 5 for additional safety precautions.
- Preventive maintenance should be performed daily to avoid possible safety hazards.



## FIRE PREVENTION

When using the system, it is necessary to exercise good judgment. While cutting, the arc produces sparks that could cause a fire if they fall on flammable materials. Make sure that all flammable materials are a suitable distance away from the cutting area. All flammable liquids should be at least 40 feet away from the cutting area, preferably stored in a metal cabinet. Plasma cutting should never be attempted on containers that contain flammable materials. Make sure that fire extinguishers are readily accessible in the cutting area.



## EXPLOSION PREVENTION

The system uses compressed gases. Use proper techniques when handling compressed gas cylinders and other compressed gas equipment. Observe the following guidelines to protect against explosion:

- Never operate the system in the presence of explosive gases or other explosive materials.
- Never cut pressurized cylinders or any closed container.
- When using a water table and cutting aluminum under water or with water touching the underside at the aluminum plate, hydrogen gas is produced. This hydrogen gas may collect under the plate and explode during the cutting process. Make sure the water table is properly aerated to help prevent the accumulation of hydrogen gas.
- Handle all gas cylinders in accordance with safety standards published by the U.S. Compressed Gas Association (CGA), American Welding Society (AWS), Canadian Standards Association (CSA), or other local or national codes.
- Compressed gas cylinders should be maintained properly. Never attempt to use a cylinder that is leaking, cracked, or has other signs of physical damage.
- All gas cylinders should be secured to a wall or rack to prevent accidental knock over.
- If a compressed gas cylinder is not being used, replace the protective valve cover.
- Never attempt to repair compressed gas cylinders.
- Keep compressed gas cylinders away from intense heat, sparks, or flames.
- Clear the compressed gas cylinder connection point by opening the valve momentarily prior to installing a regulator.
- Never lubricate compressed gas cylinder valves or pressure regulators with any type of oil or grease.
- Never use a compressed gas cylinder or pressure regulator for any purpose other than which it is intended.
- Never use a pressure regulator for any gas other than which it is intended.
- Never use a pressure regulator that is leaking or has other signs of physical damage.
- Never use any gas hose that is leaking or has other signs of physical damage.



## HEALTH SUPPORT EQUIPMENT

The system creates electric and magnetic fields that may interfere with certain types of health support equipment, such as pacemakers. Any person who uses a pacemaker or similar item should consult a doctor before operating, observing, maintaining, or servicing the system. Observe the following guidelines to minimize exposure to these electric and magnetic fields:

- Stay as far away from the ~power supply, torch, and torch leads as possible.
- Route the torch leads as close as possible to the work ground cable.
- Never place your body between the torch leads and work ground cable. Keep the work ground cable and the torch leads on the same side of your body.
- Never stand in the center of a coiled up set of torch leads or work ground cable.

## Safety Standards Booklet Index

For further information concerning safety practices to be exercised with plasma arc cutting equipment, please refer to the following publications:

1. AWS Standard AWN, Arc Welding and Cutting Noise, obtainable from the American Welding Society, 550 NW LeJeune Road, Miami, FL 33126.
2. AWS Standard C5.2, Recommended Practices for Plasma Arc Cutting, obtainable from the American Welding Society, 550 NW LeJeune Road, Miami, FL 33126.
3. AWS Standard FSW, Fire Safety in Welding and Cutting, obtainable from the American Welding Society, 550 NW LeJeune Road, Miami, FL 33126.
4. AWS Standard F4.1, Recommended Safe Practices for Preparation for Welding and Cutting of Containers and Piping, obtainable from the American Welding Society, 550 NW LeJeune Road, Miami, FL 33126.
5. AWS Standard ULR, Ultraviolet Reflectance of Paint, obtainable from the American Welding Society, 550 NW LeJeune Road, Miami, FL 33126.
6. AWS I ANSI Standard Z49.1, Safety in Welding, Cutting, and Allied Processes, obtainable from the American Welding Society, 550 NW LeJeune Road, Miami, FL 33126.
7. ANSI Standard Z41.1 , Standard For Men's Safety-Toe Footwear, obtainable from the American National Standards Institute, 11 West 42nd Street, New York, NY 10036.
8. ANSI Standard Z49.2, Fire Prevention in the Use of Cutting and Welding Processes, obtainable from the American National Standards Institute, 11 West 42nd Street, New York, NY 10036.
9. ANSI Standard Z87.1, Safe Practices For Occupation and Educational Eye and Face Protection, obtainable from the American National Standards Institute, 11 West 42nd Street, New York, NY 10036.
10. ANSI Standard Z88.2, Respiratory Protection, obtainable from the American National Standards Institute, 11 West 42nd Street, New York, NY 10036.
11. OSHA Standard 29CFR 1910.252, Safety and Health Standards, obtainable from the U.S. Government Printing Office, Washington, D.C. 20402.
12. NFPA Standard 51 , Oxygen - Fuel Gas Systems for Welding, Cutting, and Allied Processes, obtainable from the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269.
13. NFPA Standard 51 B, Cutting and Welding Processes, obtainable from the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269.
14. NFPA Standard 70, National Electrical Code, obtainable from the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269.
15. CGA booklet P-1 , Safe Handling of Compressed Gases in Containers, obtainable from the Compressed Gas Association, 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202.
16. CGA booklet P-14, Accident Prevention in Oxygen-Rich and Oxygen-Deficient Atmospheres, obtainable from the Compressed Gas Association, 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202.
17. CGA booklet TB-3, Hose Line Flashback Arrestors, obtainable from the Compressed Gas Association, 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202.
18. CSA Standard W117 .2, Safety in Welding, Cutting, and Allied Processes, obtainable from Canadian Standards Association, 178 Rexdale Boulevard, Toronto, Ontario M9W IR3, Canada.
19. Canadian Electrical Code Part 1, Safety Standard for Electrical Installations, obtainable from the Canadian Standards Association, 178 Rexdale Boulevard, Toronto, Ontario M9W 1 R3, Canada.



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Content/details may be changed or updated without notice. For most current Instruction Manuals, go to [parts.lincolnelectric.com](http://parts.lincolnelectric.com).

**GENERAL DESCRIPTION**

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The FLEXCUT™ 125 is a constant current, continuous control plasma cutting power source. It provides superior and reliable starting characteristics, cutting visibility and arc stability. The control system has a safety mechanism to ensure that the nozzle and electrode are in place before cutting or gouging. This is extremely important due to the high voltages involved.

The FLEXCUT™ 125 comes standard with an air regulator and digital pressure display.

The FLEXCUT™ 125 initiates the plasma arc with a simple, yet reliable, contact start mechanism. This system eliminates many of the failure problems associated with hi-frequency start systems.

**PREHEAT TEMPERATURE FOR PLASMA CUTTING**

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Preheat temperature control is not necessary in most applications when plasma arc cutting or gouging. Preheat temperature control may be necessary on high carbon alloy steels and heat treated aluminum for crack resistance and hardness control. Job conditions, prevailing codes, alloy level, and other considerations may also require preheat temperature control. The following minimum preheat temperature is recommended as a starting point. Higher temperatures may be used as required by the job conditions and/or prevailing codes. If cracking or excessive hardness occurs on the cut face, higher preheat temperature may be required. The recommended minimum preheat temperature for plate thickness up to 1/2" (12.7mm) is 70°F (21.1°C).

**DUTY CYCLE**

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The duty cycle of a plasma machine is the percentage of time in a 10 minute cycle at which the operator can operate the machine at rated cutting current.

Example: 60% duty cycle means that it is possible to cut for 6 minutes, then the machine stops for 4 minutes.

Refer to the Technical Specification section for more information about the machine rated duty cycles.

**USER RESPONSIBILITY**

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Because design, fabrication, erection and cutting variables affect the results obtained in applying this type of information, the serviceability of a product or structure is the responsibility of the user. Variation such as plate chemistry, plate surface condition (oil, scale), plate thickness, preheat, quench, gas type, gas flow rate and equipment may produce results different than those expected. Some adjustments to procedures may be necessary to compensate for unique individual conditions. Test all procedures duplicating actual field conditions.

**DESIGN FEATURES AND ADVANTAGES**

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The FLEXCUT™ 125 design makes plasma cutting uncomplicated. This list of design features and advantages will help you understand the machine's total capabilities so that you can get maximum use from your machine.

- Light weight and portable design for industrial use.
- Continuous control, 20 - 125 amps.
- Reliable touch start mechanism for plasma arc initiation.
- Rapid arc restrike for fast cutting of expanded metal.
- Input over voltage protection.
- Bright 5.0 second timed pilot arc.
- Gas purge selection.
- Air regulator and pressure gage included.
- Internal water separator included.
- Parts-in-Place mechanism to detect proper installation of consumables and torch.
- Preflow/Postflow timing. Preflow is eliminated if arc is re-initiated in Postflow.
- Thermostatic Protection.
- Solid state over-current protection.
- Patented electrode, nozzle and shield cap for optimum cooling, cut quality and long life.

**TECHNICAL SPECIFICATIONS -  
K4160-1 FLEXCUT™ 125**

<b>INPUT - THREE PHASE/ 50 / 60 HERTZ</b>			
<b>Input Voltage +/- 10%</b>	<b>Input Amperes @ Rated Output</b>		<b>Circuit Breaker (Delay Type)</b>
380/400/415V/3/50/60	40	100% Duty Cycle	50 Amps
460V/3/50/60	33	100% Duty Cycle	40 Amps
575V/3/50/60	28	100% Duty Cycle	30 Amps

<b>RATED OUTPUT AT 40° C</b>		
<b>Duty Cycle</b>	<b>CURRENT</b>	<b>VOLTAGE</b>
100%	125A	175 VDC

<b>OUTPUT</b>		
<b>Current Range</b>	<b>Open Circuit Voltage</b>	<b>Pilot Current</b>
20 - 125 Amps	300 VDC	30 Amps

\*In some countries U<sub>o</sub> is also known as OCV (see CAN/CSA - W117.2)

<b>GAS</b>	
<b>REQUIRED GAS FLOW RATE</b>	<b>REQUIRED GAS INLET PRESSURE</b>
550 SCFH min @ 90 PSI (260 SLPM min @ 6.21 bar)	90 to 120 PSI (6.21 to 8.27 Bar.)

<b>PHYSICAL DIMENSIONS</b>			
<b>Height</b>	<b>Width</b>	<b>Depth</b>	<b>Weight</b>
20.72 in. (526 mm)	12.25 in. (311 mm)	25.53 in. (648 mm)	118 lbs. (53.5 kgs)

<b>TEMPERATURE RANGES</b>	
<b>OPERATING TEMPERATURE RANGE</b>	<b>STORAGE TEMPERATURE RANGE</b>
-10°C to +40°C	-25°C to +55°C

<b>RECOMMENDED INPUT WIRE</b>	
For all plasma cutting applications Based on U.S. National Electrical Code Ambient Temperature 30°C or Less	
Input Cord Supplied with Machine	STO, 600V
	Type S, SO, ST, STO or Extra Hard Usage Cord AWG (IEC) Sizes
	Input Supply Wires #8 (8.4 mm <sup>2</sup> )
	1 Ground Wire #8 (8.4 mm <sup>2</sup> )

\*Ground wire should be longer than the three current carrying conductors inside the machine.

Read entire Installation Section before installing the FLEXCUT™ 125 .

# INSTALLATION

## WARNING

### ELECTRIC SHOCK CAN KILL.

- Only qualified personnel should install this machine.
- Turn the input power OFF at the disconnect switch or fuse box and discharge input capacitors before working inside the equipment.
- Do not touch electrically hot parts.
- Turn the FLEXCUT™ 125 Power Switch OFF when connecting power cord to input power.



### SELECT SUITABLE LOCATION

Place the FLEXCUT™ 125 where clean cool air can freely circulate in through the rear of the machine and out through the front and side louvers. Maintain at least 10 inches of space on all sides of the unit. Dirt, dust, or any foreign material that can be drawn into the machine should be kept to a minimum. A properly installed machine will allow for dependable service and reduce periodic maintenance time. Failure to observe these precautions may result in excessive operating temperatures and nuisance shutdowns of the machine.

## CAUTION

### Keep machine dry.

Shelter from rain and snow. Do not place on wet ground or in puddles.

### LIFTING

The FLEXCUT™ 125 power supply should be lifted by two people or a hoist. In order to prevent damage, the power supply should be lifted by both handles while keeping the unit as horizontal as possible. Only hoisting straps approved for the weight of the machine should be used.

### STACKING

The FLEXCUT™ 125 **cannot** be stacked.

### TILTING

The FLEXCUT™ 125 must be placed on a stable, level surface so it will not topple over.

## HIGH FREQUENCY INTERFERENCE PROTECTION

The FLEXCUT™ 125 employs a touch start mechanism for arc initiation which eliminates high frequency emissions from the machine as compared with spark gap and solid state type high frequency generators. Keep in mind though, that these machines may be used in an environment where other high frequency generating machines are operating. By taking the following steps, high frequency interference into the FLEXCUT™ 125 can be minimized:

- (1) Make sure the power supply chassis is connected to a good earth ground. The work terminal ground does NOT ground the machine frame.
- (2) Keep the work clamp isolated from other work clamps that have high frequency.
- (3) If the work clamp cannot be isolated, then keep the clamp as far as possible from other work clamp connections.
- (4) When the machine is enclosed in a metal building, several good earth driven grounds around the periphery of the building are recommended.

## INPUT CONNECTION

## WARNING

Only a qualified electrician should connect the input leads to the FLEXCUT 125. Connections should be made in accordance with all local and national electrical codes and the connection diagrams. Failure to do so may result in bodily injury or death.



The FLEXCUT™ 125 is rated for 380 VAC through 575 VAC input voltages, three phase and 50 or 60 Hertz. Before connecting the machine to power, be sure the input supply voltage, phase and frequency all match those listed on the machine's rating plate.

## MACHINE GROUNDING

The frame of the welder must be grounded. A ground terminal marked with a ground symbol is located next to the input power connection block.

See your local and national electrical codes for proper grounding methods.



## WARNING

The FLEXCUT 125 ON/OFF switch is not intended as a service disconnect for this equipment. Only a qualified electrician should connect the input leads to the FLEXCUT 125. Connections should be made in accordance with all local and national electrical codes. Failure to do so may result in bodily injury or death.

**INPUT PLUG INSTALLATION**

A 10 ft.(3m) power cord is provided with the FLEXCUT 125.

**Three Phase Input Only**

Connect green lead to ground per National Electric Code.

Connect black, red and white leads to power.

In all cases, the green or green/yellow grounding wire must be connected to the grounding pin of the plug, usually identified by a green screw.

Attachment plugs must comply with the Standard for Attachment Plugs and Receptacles, UL498.

The product is considered acceptable for use only when an attachment plug as specified is properly attached to the supply cord.

**⚠ WARNING**

**Only a qualified electrician should connect the input leads to the FLEXCUT 125. Connections should be made in accordance with all local and national electrical codes and the connection diagrams. Failure to do so may result in bodily injure or death.**

**⚠ WARNING**

The FLEXCUT 125 ON/OFF switch is not intended as a service disconnect for this equipment. Only a qualified electrician should connect the input leads to the FLEXCUT 125.



Connections should be made in accordance with all local and national electrical codes and the connection diagram located on the inside of the reconnect access door of the machine. Failure to do so may result in bodily injury or death.

**POWER CORD REPLACEMENT**

If the input cord is damaged or needs to be replaced, the new cord should be routed through the strain relief and into the connection block.

(See Figure A.1)

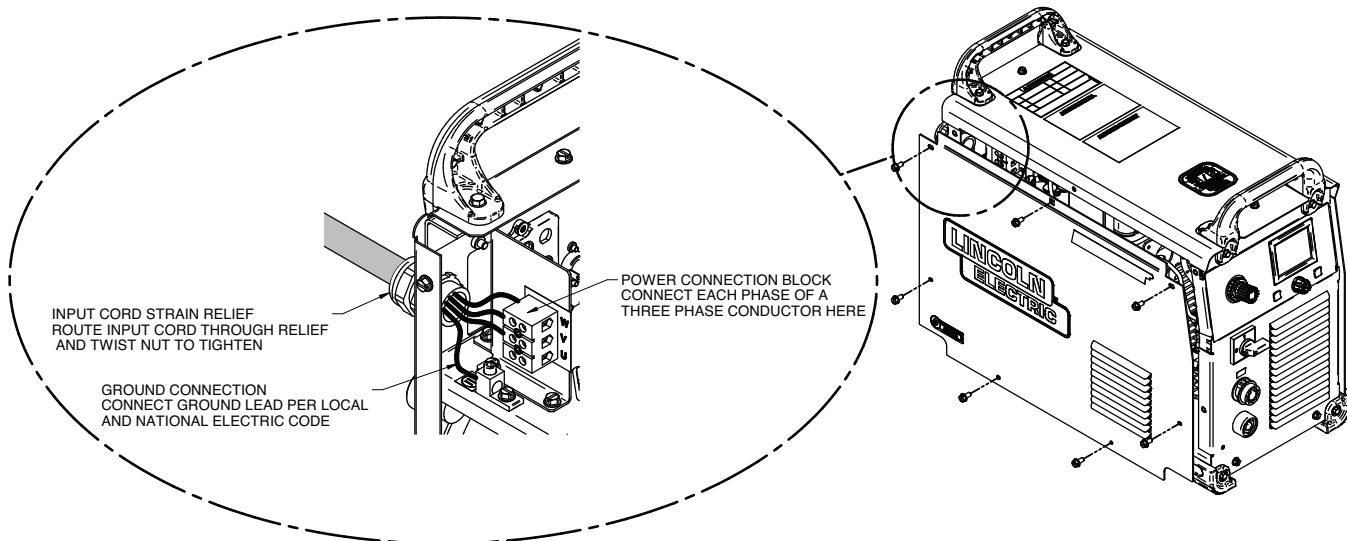
Use a three-phase supply line. A 1.40 inch diameter access hole with strain relief is located on the case back. Route input power cable through this hole and connect L1, L2, L3, and ground per connection diagrams and National Electric Code. To access the input power connection block, remove the seven screws and the left case side of the machine as shown.

**ALWAYS CONNECT THE GROUNDING LUG (LOCATED AS SHOWN IN FIGURE A.1) TO A PROPER SAFETY (EARTH) GROUND.**

**INPUT FUSE AND SUPPLY WIRE CONSIDERATIONS**

Refer to the Specification Section for recommended fuse, wire sizes, and type of copper wires. Fuse the input circuit with the recommended super lag fuses or delay type breakers (also called “inverse time” or “thermal/magnetic” circuit breakers). Choose input and grounding wire size according to local or national electric codes. Using input wire sizes, fuses, or circuit breakers smaller than recommended may result in “nuisance” shut-offs from high inrush currents, even if the machine is not being used at high currents.

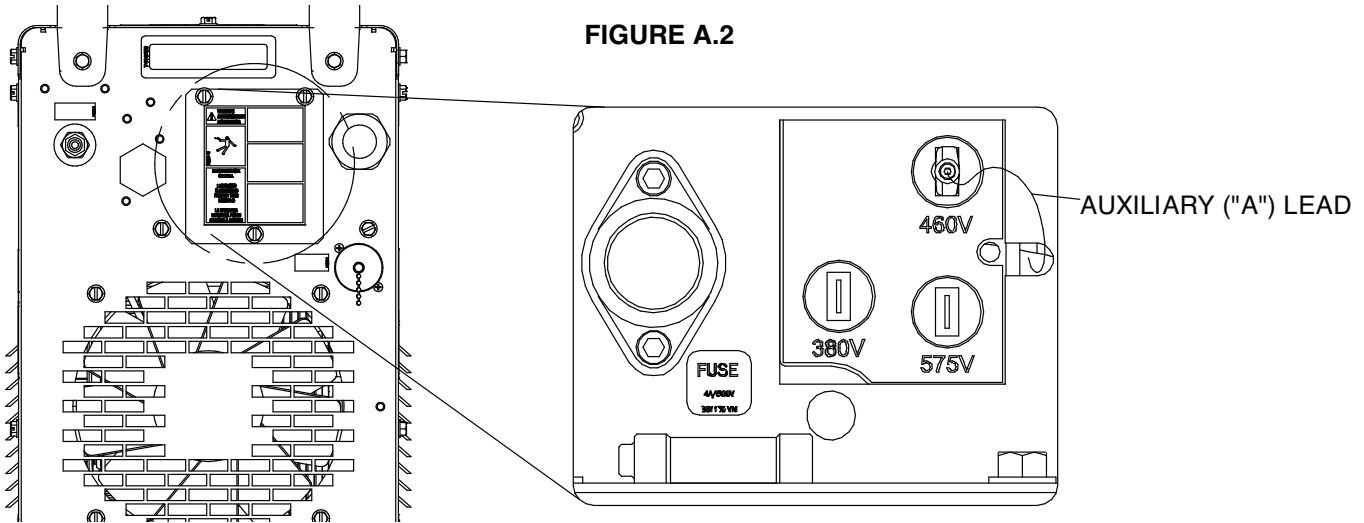
**FIGURE A.1**



**INPUT VOLTAGE SELECTION**

The Flexcut™ 125 is shipped connected for 460 VAC input. To reconfigure the machine for a different input voltage see the panel on the rear of the unit (Figure A.2). With input power removed from the machine, move the Auxiliary (“A”) lead from the 460V tap to the desired input voltage. Always replace the cover when finished.

If the “A” lead is not connected to the proper voltage tap, the machine may not power on, it may throw an error, or the fuse may open. Should the fuse open, replace the fuse, reconnect the “A” lead to the correct voltage and re-apply power.



**GAS SUPPLY REQUIREMENTS**

Supply the FLEXCUT™ 125 with clean, dry, oil-free compressed air or nitrogen. A high pressure regulator **MUST** be used with a compressor or a high pressure cylinder.

Supply pressure must be between 90-120 psi (6.21 - 8.27 bar) with flow rates of at least 550 SCFH or 260 SLPM.

**⚠ WARNING**

**Air supply pressure should never exceed 130 psi or damage to the machine may occur!**

The FLEXCUT™ 125 contains a built-in filter but depending on the quality of the supply, additional filtration may be required. Be aware that shop air systems are prone to oil and moisture contamination. If shop air is used, it must be cleaned to ISO 8573-1:2010, Class 1.4.1. See the Maintenance Gas Supply Section for information on changing the internal filter element.

Specify dry air when using compressed cylinders. Breathing quality air contains moisture and should not be used.

A standard nominal 5 micron inline filter is recommended, but for optimal performance, select a pre-filter with a 3 micron absolute rating.

**⚠ WARNING**

**CYLINDER could explode if damaged.**

- Keep cylinder upright and chained to a fixed support.
- Keep cylinder away from areas where it could be damaged.
- Never lift machine with cylinder attached.
- Never allow the cutting torch to touch the cylinder.
- Keep cylinder away from live electrical parts.
- Maximum inlet pressure 130 psi.



**CONNECTING THE GAS SUPPLY**

Air or gas must be supplied to the FLEXCUT™ 125 with 3/8” inside diameter tubing and a 1/4” NPT quick disconnect coupler.

**OUTPUT CONNECTIONS**

The FLEXCUT™ 125 is sent from the factory with a work clamp included. The work clamp must be securely connected to the work piece. If the work piece is painted or extremely dirty it may be necessary to expose the bare metal in order to make a good electrical connection.

# OPERATION

## GRAPHIC SYMBOLS THAT APPEAR ON THIS MACHINE OR IN THIS MANUAL

### SAFETY PRECAUTIONS

#### **WARNING**

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

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



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

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



#### **WELDING, CUTTING and GOUGING SPARKS can cause fire or explosion**

- Keep flammable material away.
- Do not weld, cut or gouge on containers that have held combustibles.



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

- Wear eye, ear and body protection.



#### **PLASMA ARC can injure**

- Keep your body away from nozzle and plasma arc.
- Operate the pilot arc with caution. The pilot arc is capable of burning the operator, others or even piercing safety clothing.



Observe additional Safety Guidelines detailed in the beginning of this manual.



**WARNING OR CAUTION**



**GAS PURGE**



**READ INSTRUCTION MANUAL**



**PROTECTIVE GROUND**



**GAS INPUT**



**CUT**



**GRID or EXPANDED METAL**



**GOUGE**



**MARKING**



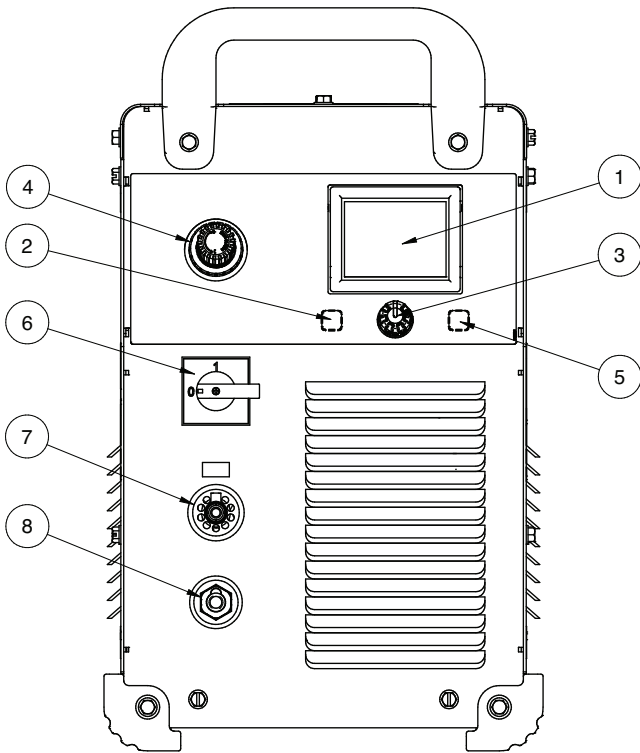
**POWER ON**



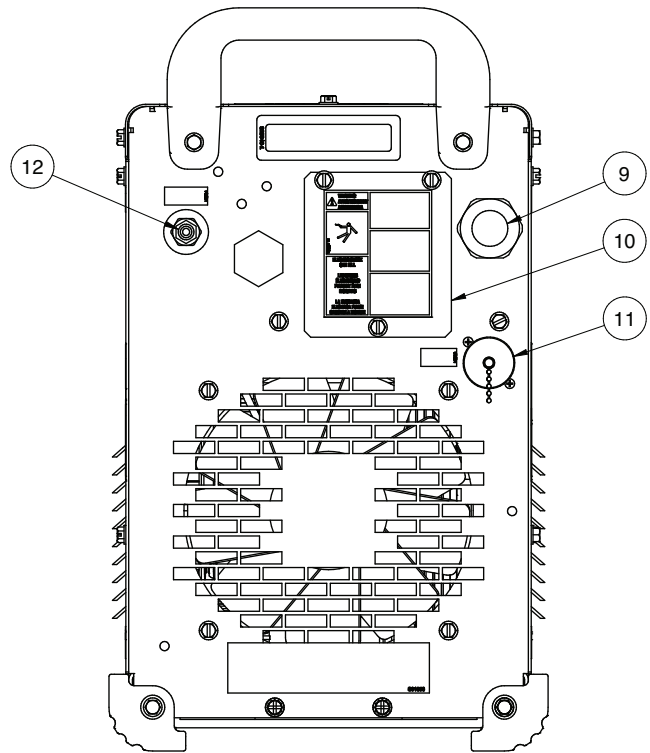
**POWER OFF**

**CONTROLS AND SETTINGS**

**FIGURE B.2 - Front Panel**



**FIGURE B.3 - Back Panel**



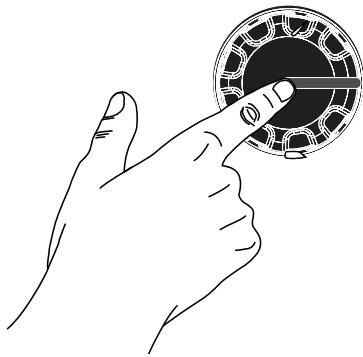
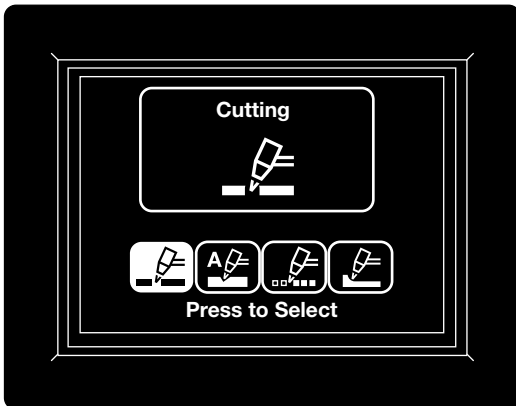
- 1. **LCD Display:** Shows available modes and real time parameters.
- 2. **Home Button:** Allows the user to return to the Home Screen.
- 3. **Menu Control Knob/Button:** Used to navigate and select items on the display.
- 4. **Pressure Regulator:** Allows the regulation of the primary air/gas pressure.
- 5. **Purge:** Allows the user to enable air flow from the machine.
- 6. **On/Off Switch:** Turns the input power to the machine ON/OFF.
- 7. **Torch Connection:** Connect the torch.
- 8. **Work Lead Connection:** Connect cable with work clamp.

- 9. **Input Cord Strain Relief:** Used to connect the unit to input power.
- 10. **Reconnect Panel Access:** Allows the unit to be configured for 380, 460, or 575 VAC input.
- 11. **14-pin CNC Interface:** Allows access to Arc Start Trigger, Arc Initiated contact, raw or divided Arc Voltage, and Forced Mark.
- 12. **Air or Gas Inlet (1/4" NPT Quick Connect):** Compressed air or gas connection.



USER INTERFACE

Mode Select Screen



Choose between four available modes:



**Cut** – For cutting operations on a solid workpiece.



**Mark** – For discoloring or slight removal of material. Can be used to add part numbers, bend lines, drill marks, or many other surface modifications.



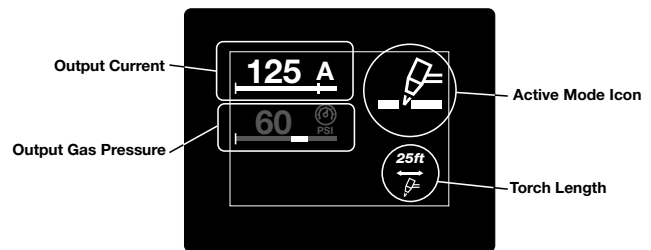
**Grid** – For cutting operations on a non-continuous workpiece.



**Gouge** – For removing material from a workpiece (removing a weld).

Active Mode Screen - See Figure B.4

FIGURE B.4



**Active Mode Icon** – The currently selected mode icon will be displayed here. Return to the mode select screen to choose a new mode.

**Output Current** – Turn the control knob to adjust the desired output current. While cutting, the screen will display the actual cutting current in Amps. Output current range is dependent on Mode selected.

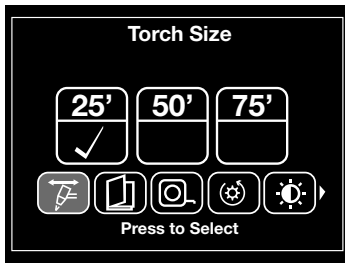
**Output Gas Pressure** – The output gas pressure is displayed on a linear scale, with the center of the green range as the recommended output gas pressure based on selected mode and torch length. Use the regulator knob on the front of the machine to adjust the output gas pressure, but do so only while gas is flowing. Hold the purge button while pulling and turning the regulator knob to adjust the pressure as desired.

**Torch Length** – The selected torch length will be displayed here. Be sure the torch length matches the torch that is being used with the machine. The torch length can be modified in the settings menu.

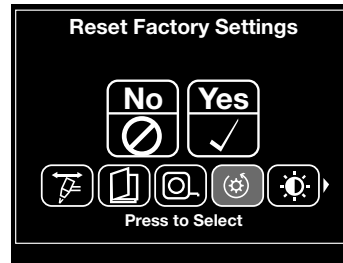
**Settings**

Press both the home and purge buttons at the same time to enter or exit the settings menu.

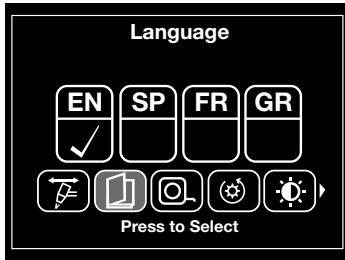
**Options (turn the knob to scroll and press the knob to select):**



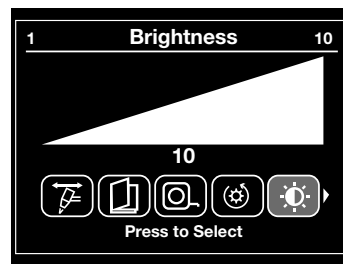
**Torch Size** – Choose between 25 ft. (7.6m), 50 ft. (15.2m), or 75 ft. (22.9m) torch lengths. This will change the recommended output gas pressure.



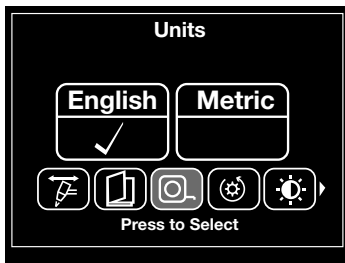
**Reset Factory Settings** – Use to restore the machine back to the factory settings



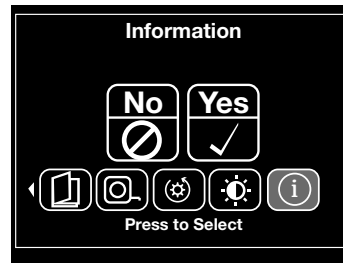
**Language** – Choose between English, Spanish, French, or German



**Brightness** – Used to dim or brighten the LCD display



**Units** – Choose between English or Metric units



**Advanced** – Used for diagnostic purposes

**MECHANIZED CUTTING**

**Mechanized Torch Installation**

It is recommended that the FLEXCUT™ 125 mechanized torch be installed on a positioner with an arc voltage control capable of maintaining the cutting arc voltage within 1 volt. The positioner must be rigid to ensure cut quality and a torch collision sensor is highly recommended.

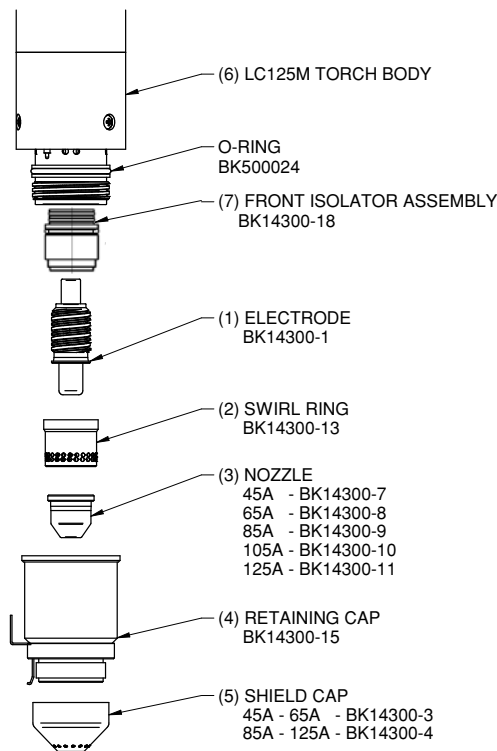
**Installing the Mechanized Torch Consumables**

To install the torch parts, perform the following steps (See Figure B.5):

**Note: Do not over tighten the consumables! Only tighten until the parts are seated properly.**

1. Inspect the threads on the torch body and retaining cap and clean as necessary. Apply lubricant to the torch o-ring as necessary. Lubricant should be oxygen safe and inert in a flammable environment.
2. Install the electrode (1) into the torch body and press into place.
3. Thread the shield cap (5) onto the retaining cap assembly. (4)
4. Insert the nozzle (3) into the swirl ring. (2)
5. Place the swirl ring / nozzle assembly into the retaining cap.
6. Thread and tighten the retaining cap assembly onto the torch body. (6)

**FIGURE B.5**



**Removing the Torch Consumables**

**WARNING**

**Turn off the machine prior to removing consumables.**

To remove the torch consumables, perform the following steps:

1. Remove the retaining cap from the torch.
2. Remove the swirl ring and nozzle from the retaining cap.
3. Separate the shield cap from retaining cap.
4. Remove the electrode from the torch body.
5. Remove the swirl ring from the nozzle.

**WARNING**

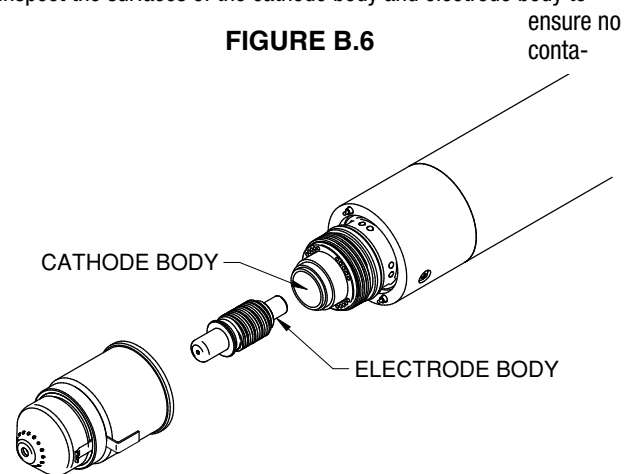
**Contaminants such as dirt, metallic dust, oil and moisture present on the surface of the electrode and/or torch body can cause electrical arcing between these components and ultimately result in failure of the torch and consumables.**

**Do not continue to try and cut excessively worn consumables as this can cause damage to the Torch Head.**

In order to avoid damaging the torch and/or consumables, adhere to the following guidelines:

1. Ensure that the air supplied to the torch does not contain contaminants such as debris, moisture and oil.
2. Ensure that the torch cathode body and electrode body are clean prior to assembling the consumables into the torch. Wipe away any contaminants with a dry, lint free cloth.
3. Be sure that the consumables are properly tightened and fully inserted when installing them into the torch. Check the installation of the consumables before the start of each work shift and frequently to ensure that the parts have not become loose as a result of normal operation.
4. Inspect the surfaces of the cathode body and electrode body to

**FIGURE B.6**



## Making a Cut

### Setting up a Cut

Use the following procedure to make a cut with the FLEXCUT™ 125.

1. Using the charts, determine the proper torch parts and cutting conditions for the material being cut.
2. Install the proper consumables into the torch.
3. Turn the power switch to the ON position to apply power to the FLEXCUT™ 125. The LCD will turn on and display the FLEXCUT™ initialization screen.
4. Press the home button and choose the desired operating mode.
5. Turn the control knob to set the desired output current.
6. Press and hold the gas purge button while adjusting the regulator to recommended output pressure (center of green range).
7. The cutting operation is initiated after a start signal is received. The arc should establish approximately 2 seconds after application of the start command. The cutting operation is terminated when the start signal is removed. At the completion of a cut, gas flow through the torch will continue for approximately 20 seconds. The LCD will display the actual output current and gas pressure while the cut is active.

## Machine Interface

The FLEXCUT™ 125 comes standard with a machine interface. Interface signals provided include: Arc Start, Arc Initiated, Arc Voltage (raw or divided) and Force Mark. These signals are accessible through the 14 pin connector on the case back. (See Figure B.7

### Arc Start:

The Arc Start circuit allows for triggering of the power source to commence cutting. This circuit can be accessed through pins K and M of the 14 pin connector. The circuit has a 15 VDC nominal open circuit voltage and requires a dry contact closure to activate.

### Arc Initiated:

The Arc Initiated circuit provides information as to when a cutting arc has transferred to the work piece. This circuit can be accessed through pins I and J of the 14 pin connector. The circuit provides a dry contact closure when the arc has transferred. Input to this circuit should be limited to 0.3 A for either 120VAC or 30VDC.

### Arc Voltage:

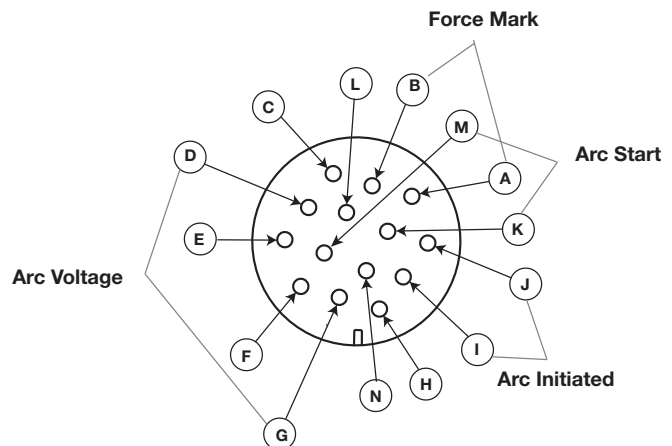
The Arc Voltage circuit can be used for activating a torch height control. This circuit can be accessed through pins D and G of the 14 pin connector. The circuit provides full electrode to work arc voltage (300VDC maximum). A divided arc voltage of 20:1, 30:1, 40:1 or 50:1 is available. See “Accessing Divided Arc Voltage.”

### Force Mark:

The Force Mark circuit can be used to change between a cut or grid operating mode and a marking mode quickly and while output is on. This circuit can be accessed through pins A and B of the 14-pin connector. This circuit requires a dry contact closure to operate and both modes should be configured prior to cutting.

Users wishing to utilize the Machine Interface can order a K867 Universal Adapter (please adhere to the pin locations stated above) or manufacture a 14 pin connector cable assembly.

FIGURE B.7



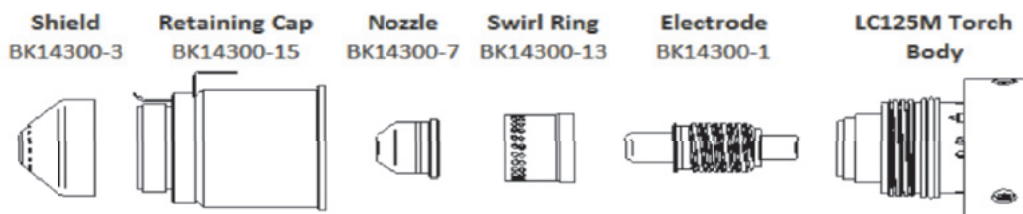
14-PIN BOX RECEPTACLE, FRONT VIEW

**CUTTING CHARTS**

The cutting charts shown on the following pages are intended to give the operator the best starting point to use when making a cut on a particular material type and thickness. Small adjustments may have to be made to achieve the best cut. Also, remember that the arc voltage must be increased as the electrode wears in order to maintain the correct cutting height.

<b>MATERIAL</b>	<b>CURRENT</b>	<b>PAGE</b>
MILD STEEL	45 AMPS	B-8
MILD STEEL	65 AMPS	B-9
MILD STEEL	85 AMPS	B-10
MILD STEEL	105 AMPS	B-11
MILD STEEL	125 AMPS	B-12
STAINLESS STEEL	45 AMPS	B-13
STAINLESS STEEL	65 AMPS	B-14
STAINLESS STEEL	85 AMPS	B-15
STAINLESS STEEL	105 AMPS	B-16
STAINLESS STEEL	125 AMPS	B-17
ALUMINUM	45 AMPS	B-18
ALUMINUM	65 AMPS	B-19
ALUMINUM	85 AMPS	B-20
ALUMINUM	105 AMPS	B-21
ALUMINUM	125 AMPS	B-22

45 Amps - Mild Steel



Imperial

Material Thickness		Pressure	Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(in)	(psi)	(volts)	(ipm)	(volts)	(ipm)	(in)	(in)	(msec)	(in)	
26	0.0179	60*	135	350	134	500	0.040	0.100	0	0.045	
22	0.0299		135	360	134	460	0.040	0.100	0	0.045	
18	0.048		135	350	134	410	0.040	0.100	100	0.050	
16	0.060		135	325	134	400	0.040	0.100	100	0.050	
14	0.075		140	290	139	325	0.080	0.160	300	0.060	
12	0.105		142	200	139	220	0.080	0.160	400	0.065	
10	0.135		144	110	142	167	0.080	0.160	400	0.065	
	3/16		146	80	143	110	0.080	0.160	500	0.065	
	1/4		152	45	150	73	0.120	0.160	600	0.080	

Metric

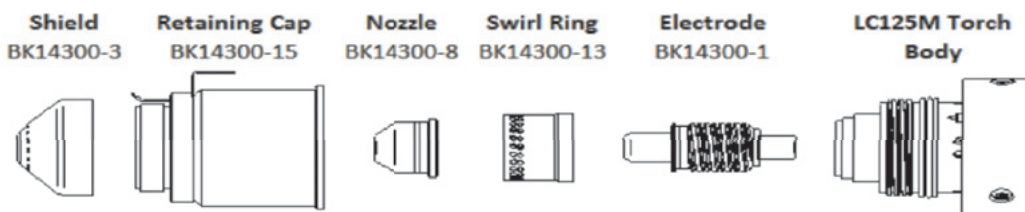
Material Thickness		Pressure	Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(mm)	(Bar)	(volts)	(mm/min)	(volts)	(mm/min)	(mm)	(mm)	(msec)	(mm)	
	0.5	4.13	135	8925	134	12550	1.0	2.5	0	1.1	
	0.8		135	9125	134	11575	1.0	2.5	0	1.2	
	1		135	9000	134	11025	1.0	2.5	100	1.2	
	1.2		135	8900	134	10475	1.0	2.5	100	1.3	
	1.5		135	8300	134	10175	1.0	2.5	100	1.3	
	2		140	7075	139	7925	2.0	4.1	300	1.5	
	2.5		142	5575	139	6175	2.0	4.1	400	1.6	
	3		143	4075	140	5000	2.0	4.1	400	1.7	
	4		145	2475	142	3625	2.0	4.1	400	1.7	
	6		151	1350	148	2075	2.8	4.1	600	1.9	

Marking

Material Thickness		Current	Pressure	Arc Voltage	Travel Speed	Marking Height	Transfer Height	Pierce Time
(ga)	(in)	(amps)	(psi/Bar)	(volts)	(ipm)	(in)	(in)	(msec)
All Thicknesses		12	37 / 2.55	177	250	0.100	0.100	0

\* Required for 25' (7.5m) Torch Leads - Increase outlet pressure by 5psi (.35 Bar) for every 25' (7.5m) increment in torch

65 Amps - Mild Steel



Imperial

Material Thickness		Pressure	Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(in)	(psi)	(volts)	(ipm)	(volts)	(ipm)	(in)	(in)	(msec)	(in)	
16	0.0598	60*	143	250	141	295	0.120	0.160	100	0.060	
10	0.1345		145	195	143	226	0.120	0.160	300	0.070	
	3/16		145	140	143	170	0.120	0.160	500	0.070	
	1/4		145	95	143	115	0.120	0.160	800	0.070	
	3/8		152	50	148	63	0.120	0.160	1200	0.075	
	1/2		153	35	150	40	0.120	0.200	2000	0.085	
	5/8		156	20	155	24	0.120	0.300	2000	0.085	
***	3/4		162	15	160	19	0.120	0.200	2000	0.090	YES
***	7/8		165	10	164	14	0.120	0.200	2000	0.090	YES
***	1		170	7	166	10	0.120	0.200	2000	0.092	YES

Metric

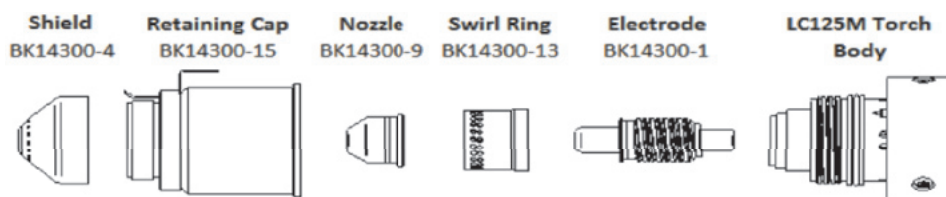
Material Thickness		Pressure	Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(mm)	(Bar)	(volts)	(mm/min)	(volts)	(mm/min)	(mm)	(mm)	(msec)	(mm)	
	1.5	4.13	143	6375	141	7525	3.0	4.1	100	1.5	
	2		143	6000	141	7050	3.0	4.1	100	1.6	
	2.5		144	5625	142	6600	3.0	4.1	200	1.7	
	3		145	5275	143	6125	3.0	4.1	300	1.7	
	4		145	4350	143	5125	3.0	4.1	400	1.8	
	6		145	2675	143	3225	3.0	4.1	700	1.8	
	10		152	1225	148	1525	3.0	4.2	1300	1.9	
	12		153	975	150	1150	3.0	4.9	1800	2.1	
	16		156	500	155	600	3.0	7.5	2000	2.2	YES
	20		163	350	161	450	3.0	5.1	2000	2.3	YES
	25		169	175	166	275	3.0	5.1	2000	2.3	YES

Marking

Material Thickness		Current	Pressure	Arc Voltage	Travel Speed	Marking Height	Transfer Height	Pierce Time
(ga)	(in)	(amps)	(psi/Bar)	(volts)	(ipm)	(in)	(in)	(msec)
All Thicknesses		14	37 / 2.55	178	250	0.100	0.100	0

\* Required for 25' (7.5m) Torch Leads - Increase outlet pressure by 5psi (.35 Bar) for every 25' (7.5m) increment in torch length

85 Amps - Mild Steel



Imperial

Material Thickness		Pressure	Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(in)	(psi)	(volts)	(ipm)	(volts)	(ipm)	(in)	(in)	(msec)	(in)	
10	0.1345	60*	138	260	137	315	0.120	0.250	0	0.050	
3/16	0.1875		140	190	139	220	0.120	0.250	200	0.058	
1/4	0.2500		141	120	140	155	0.120	0.250	500	0.060	
3/8	0.3750		144	75	143	88	0.120	0.250	500	0.068	
1/2	0.5000		145	40	145	54	0.120	0.250	500	0.078	
5/8	0.6250		150	30	147	40	0.120	0.250	1000	0.085	
3/4	0.7500		153	24	150	30	0.120	0.300	1500	0.085	
7/8	0.8750		158	16	153	22	0.120	0.250	1250	0.090	YES
1	1.0000		160	13	156	16	0.120	0.250	1500	0.100	YES
1-1/4	1.2500		168	7	161	10	0.120	0.250	1500	0.110	YES

Metric

Material Thickness		Pressure	Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(mm)	(psi)	(volts)	(mm/min)	(volts)	(mm/min)	(mm)	(mm)	(msec)	(mm)	
	3	4.13	137	7175	136	8775	3.0	6.4	0	1.2	
	4		139	5850	138	6975	3.0	6.4	100	1.4	
	6		141	3450	140	4300	3.0	6.4	400	1.5	
	10		144	1775	143	2100	3.0	6.4	500	1.8	
	12		145	1200	145	1550	3.0	6.4	500	1.9	
	16		150	750	147	1000	3.0	6.4	1000	2.2	
	20		154	550	151	700	3.0	7.2	1400	2.2	
	25		160	350	156	425	3.0	6.4	1500	2.5	YES
	32		168	175	161	250	3.0	6.4	1500	2.8	YES

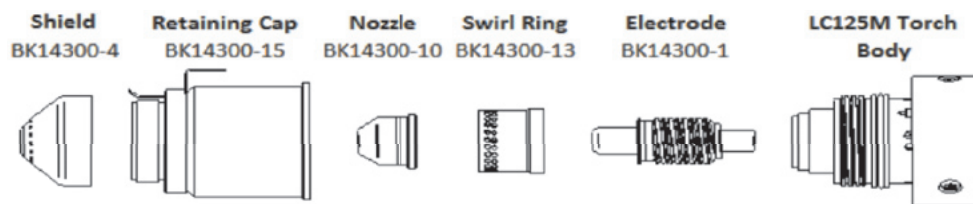
Marking

Material Thickness		Current	Pressure	Arc Voltage	Travel Speed	Marking Height	Transfer Height	Pierce Time
(ga)	(in)	(amps)	(psi/Bar)	(volts)	(ipm)	(in)	(in)	(msec)
All Thicknesses		13	37 / 2.55	188	250	0.100	0.100	0

\* Required for 25' (7.5m) Torch Leads - Increase outlet pressure by 5psi (.35 Bar) for every 25' (7.5m) increment in torch length



105 Amps - Mild Steel



Imperial

Material Thickness		Pressure	Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(in)	(psi)	(volts)	(ipm)	(volts)	(ipm)	(in)	(in)	(msec)	(in)	
	1/4	60*	145	150	145	180	0.160	0.280	400	0.100	
	3/8		147	105	146	114	0.160	0.280	500	0.100	
	1/2		150	60	150	73	0.160	0.280	600	0.105	
	5/8		153	42	150	50	0.160	0.375	1000	0.105	
	3/4		154	33	152	37	0.160	0.375	1000	0.105	
	7/8		156	25	155	31	0.160	0.375	2000	0.110	
***	1		160	19	159	23	0.160	0.300	1800	0.120	YES
***	1 1/4	165	14	164	16	0.160	0.300	2000	0.125	YES	

Metric

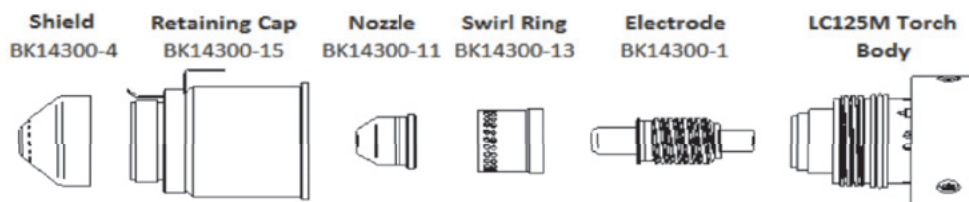
Material Thickness		Pressure	Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(mm)	(Bar)	(volts)	(mm/min)	(volts)	(mm/min)	(mm)	(mm)	(msec)	(mm)	
	6	4.13	145	3925	145	4750	4.1	7.1	400	2.5	
	10		147	2500	147	2750	4.1	7.1	500	2.6	
	12		149	1775	149	2075	4.1	7.1	600	2.6	
	16		153	1050	150	1250	4.1	9.5	1000	2.7	
	20		155	775	153	900	4.1	9.5	1300	2.7	
	25		159	500	158	600	4.1	7.1	1800	3.0	YES
***	32		165	350	164	400	4.1	7.1	2000	3.2	YES

Marking

Material Thickness		Current	Pressure	Arc Voltage	Travel Speed	Marking Height	Transfer Height	Pierce Time
(ga)	(in)	(amps)	(psi/Bar)	(volts)	(ipm)	(in)	(in)	(msec)
All Thicknesses		14	37 / 2.55	184	250	0.100	0.100	0

\* Required for 25' (7.5m) Torch Leads - Increase outlet pressure by 5psi (.35 Bar) for every 25' (7.5m) increment in torch length

125 Amps - Mild Steel



Imperial

Material Thickness		Pressure	Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(in)	(psi)	(volts)	(ipm)	(volts)	(ipm)	(in)	(in)	(msec)	(in)	
	1/4	60*	145	180	144	210	0.160	0.300	300	0.100	
	3/8		147	110	146	128	0.160	0.300	500	0.105	
	1/2		149	72	147	88	0.160	0.300	700	0.105	
	5/8		151	50	150	63	0.160	0.300	1000	0.110	
	3/4		153	40	152	52	0.160	0.325	1200	0.110	
	7/8		156	31	155	40	0.160	0.350	1800	0.115	
	1		160	23	157	32	0.160	0.375	2500	0.120	
***	1 1/4		163	16	162	21	0.160	0.300	2200	0.125	YES
***	1 1/2		168	11	168	14	0.160	0.300	2200	0.125	YES

Metric

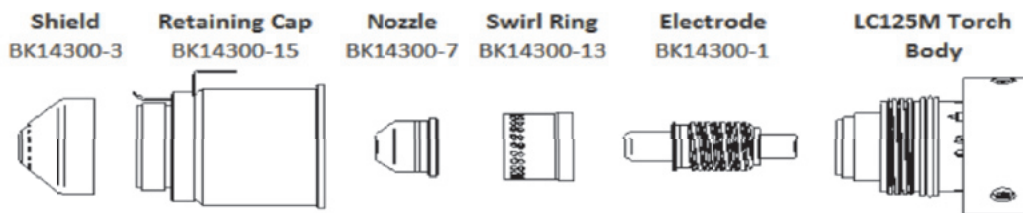
Material Thickness		Pressure	Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(mm)	(Bar)	(volts)	(mm/min)	(volts)	(mm/min)	(mm)	(mm)	(msec)	(mm)	
	6	4.13	145	4775	144	5575	4.1	7.6	300	2.5	
	10		147	2650	146	3100	4.1	7.6	500	2.7	
	12		149	2050	147	2450	4.1	7.6	700	2.7	
	16		151	1250	150	1600	4.1	7.6	1000	2.8	
	20		154	950	153	1225	4.1	8.4	1400	2.8	
	25		159	600	157	850	4.1	9.4	2400	3.0	
	32		163	400	162	525	4.1	7.6	2200	3.2	YES
***	38		168	275	168	350	4.1	7.6	2200	3.2	YES

Marking

Material Thickness		Current	Pressure	Arc Voltage	Travel Speed	Marking Height	Transfer Height	Pierce Time
(ga)	(in)	(amps)	(psi/Bar)	(volts)	(ipm)	(in)	(in)	(msec)
All Thicknesses		15	37 / 2.55	177	250	0.100	0.100	0

\* Required for 25' (7.5m) Torch Leads - Increase outlet pressure by 5psi (.35 Bar) for every 25' (7.5m) increment in torch length

45 Amps - Stainless Steel



Imperial

Material Thickness		Pressure	Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(in)	(psi)	(volts)	(ipm)	(volts)	(ipm)	(in)	(in)	(msec)	(in)	
26	0.0179	70*	150	400	150	510	0.100	0.200	0	0.040	
22	0.0299		150	375	150	475	0.100	0.200	0	0.030	
18	0.0478		150	350	152	400	0.100	0.200	100	0.035	
16	0.0598		152	315	152	400	0.100	0.200	100	0.040	
14	0.0747		154	240	154	250	0.100	0.200	200	0.045	
12	0.1046		156	175	154	185	0.100	0.200	300	0.050	
10	0.1345		156	100	154	140	0.100	0.200	400	0.055	
	3/16		158	70	156	85	0.100	0.200	500	0.060	
	1/4		159	30	157	40	0.100	0.200	600	0.060	

Metric

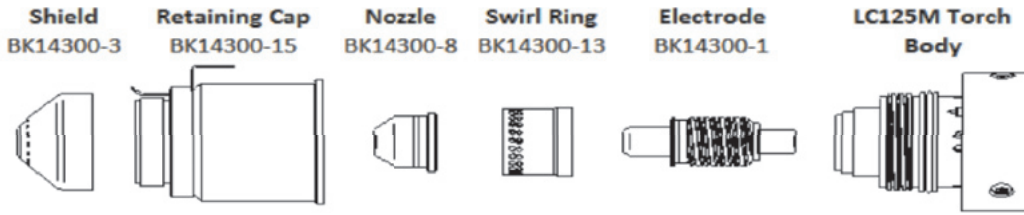
Material Thickness		Pressure	Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(mm)	(Bar)	(volts)	(mm/min)	(volts)	(mm/min)	(mm)	(mm)	(msec)	(mm)	
	0.5	4.83 Bar	150	10075	150	12825	2.5	5.1	0	1.0	
	0.8		150	9475	150	11900	2.5	5.1	0	0.8	
	1		150	9200	151	11075	2.5	5.1	100	0.8	
	1.2		150	8925	152	10250	2.5	5.1	100	0.9	
	1.5		152	8075	152	10150	2.5	5.1	100	1.0	
	2		154	5900	154	6150	2.5	5.1	200	1.2	
	2.5		156	4800	154	5050	2.5	5.1	300	1.2	
	3		156	3600	154	4200	2.5	5.1	300	1.3	
	4		157	2225	155	2975	2.5	5.1	400	1.5	
	6		159	1000	157	1275	2.5	5.1	600	1.5	

Marking

Material Thickness		Current	Pressure	Arc Voltage	Travel Speed	Marking Height	Transfer Height	Pierce Time
(ga)	(in)	(amps)	(psi/Bar)	(volts)	(ipm)	(in)	(in)	(msec)
All Thicknesses		12	37 / 2.55	177	250	0.100	0.100	0

\* Required for 25' (7.5m) Torch Leads - Increase outlet pressure by 5psi (.35 Bar) for every 25' (7.5m) increment in torch length

65 Amps - Stainless Steel



Imperial

Material Thickness		Pressure	Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(in)	(psi)	(volts)	(ipm)	(volts)	(ipm)	(in)	(in)	(msec)	(in)	
16	0.060	60*	149	325	149	425	0.200	0.325	100	0.050	
10	0.135		151	210	149	264	0.200	0.325	100	0.060	
	3/16		153	147	151	168	0.200	0.325	200	0.070	
	1/4		155	70	153	90	0.200	0.325	400	0.080	
	3/8		158	43	157	50	0.200	0.325	800	0.090	
	1/2		167	20	159	32	0.200	0.325	1200	0.100	
	5/8		165	19	163	22	0.200	0.325	600	0.105	*
	3/4		168	14	166	18	0.200	0.325	600	0.110	*

Metric

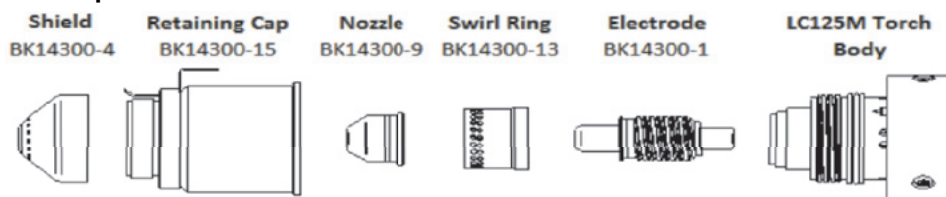
Material Thickness		Pressure	Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(mm)	(Bar)	(volts)	(mm/min)	(volts)	(mm/min)	(mm)	(mm)	(msec)	(mm)	
	1.5	4.13	149	8300	149	10850	5.1	8.3	100	1.3	
	2		149	7525	149	9775	5.1	8.3	100	1.3	
	2.5		150	6750	149	8700	5.1	8.3	100	1.4	
	3		151	6000	149	7625	5.1	8.3	100	1.5	
	4		152	4650	150	5675	5.1	8.3	100	1.6	
	6		155	2225	153	2725	5.1	8.3	400	2.0	
	10		159	1000	157	1200	5.1	8.3	900	2.3	
	12		165	625	159	925	5.1	8.3	1100	2.5	
	16		165	475	163	550	5.1	8.3	600	2.7	*
	20		169	325	167	425	5.1	8.3	600	2.8	*

Marking

Material Thickness		Current	Pressure	Arc Voltage	Travel Speed	Marking Height	Transfer Height	Pierce Time
(ga)	(in)	(amps)	(psi/Bar)	(volts)	(ipm)	(in)	(in)	(msec)
All Thicknesses		14	37 / 2.55	178	250	0.100	0.100	0

\* Required for 25' (7.5m) Torch Leads - Increase outlet pressure by 5psi (.35 Bar) for every 25' (7.5m) increment in torch length

**85 Amps - Stainless Steel**



**Imperial**

Material Thickness		Pressure	Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(in)	(psi)	(volts)	(ipm)	(volts)	(ipm)	(in)	(in)	(msec)	(in)	
10	0.1345	60*	139	285	138	345	0.120	0.240	200	0.075	
	3/16		139	210	138	250	0.120	0.240	300	0.075	
	1/4		139	135	138	170	0.120	0.240	400	0.080	
	3/8		143	60	142	80	0.120	0.240	500	0.080	
	1/2		148	36	146	46	0.120	0.240	700	0.084	
	5/8		150	26	149	33	0.120	0.240	800	0.093	
	3/4		154	18	153	24	0.120	0.240	800	0.105	*
	7/8		155	16	154	19	0.120	0.240	800	0.105	*
	1		159	11	158	14	0.120	0.240	800	0.105	*

**Metric**

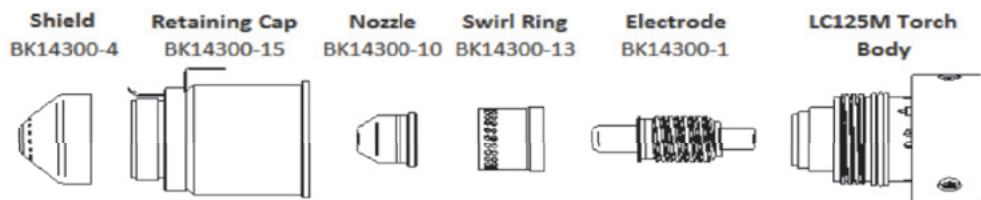
Material Thickness		Pressure	Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(mm)	(Bar)	(volts)	(mm/min)	(volts)	(mm/min)	(mm)	(mm)	(msec)	(mm)	
	3	4.13	139	7850	138	9525	3.0	6.1	200	1.9	
	4		139	6425	138	7750	3.0	6.1	200	1.9	
	6		139	3850	138	4775	3.0	6.1	400	2.0	
	10		144	1425	143	1900	3.0	6.1	500	2.0	
	12		147	1050	145	1350	3.0	6.1	700	2.1	
	16		150	650	149	825	3.0	6.1	800	2.4	
	20		154	450	153	575	3.0	6.1	800	2.7	*
	25		158	300	157	375	3.0	6.1	800	2.7	*

**Marking**

Material Thickness		Current	Pressure	Arc Voltage	Travel Speed	Marking Height	Transfer Height	Pierce Time
(ga)	(in)	(amps)	(psi/Bar)	(volts)	(ipm)	(in)	(in)	(msec)
All Thicknesses		14	37 / 2.55	188	250	0.100	0.100	0

\* Required for 25' (7.5m) Torch Leads - Increase outlet pressure by 5psi (.35 Bar) for every 25' (7.5m) increment in torch length

105 Amps - Stainless Steel



Imperial

Material Thickness		Pressure	Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(in)	(psi)	(volts)	(ipm)	(volts)	(ipm)	(in)	(in)	(msec)	(in)	
	1/4	60*	158	198	145	215	0.180	0.300	600	0.100	
	3/8		150	90	148	102	0.180	0.350	600	0.105	
	1/2		153	55	149	69	0.180	0.350	600	0.105	
	5/8		166	38	156	42	0.180	0.400	1200	0.115	
	3/4		160	26	158	30	0.180	0.425	2000	0.120	
	7/8		165	21	159	25	0.180	0.350	2000	0.122	*
	1		174	17	163	20	0.180	0.350	2000	0.130	*
	1 1/4		168	11	166	14	0.180	0.350	2500	0.130	*

Metric

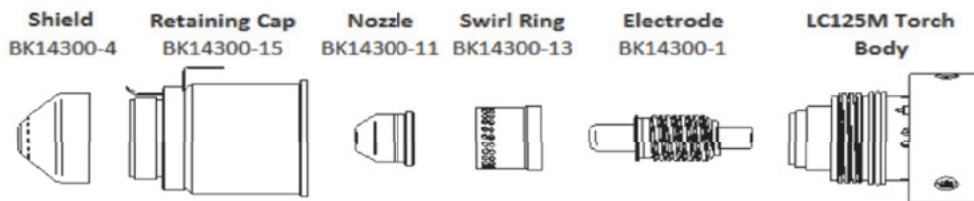
Material Thickness		Pressure	Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(mm)	(Bar)	(volts)	(mm/min)	(volts)	(mm/min)	(mm)	(mm)	(msec)	(mm)	
	6	4.13	159	5325	145	5775	4.6	7.5	600	2.5	
	10		150	2150	148	2475	4.6	8.9	600	2.7	
	12		152	1600	149	1925	4.6	8.9	600	2.7	
	16		166	950	156	1050	4.6	10.2	1200	2.9	
	20		161	625	158	725	4.6	10.2	2000	3.1	
	25		173	450	162	525	4.6	8.9	2000	3.3	*
	32		168	275	166	350	4.6	8.9	2500	3.3	*

Marking

Material Thickness		Current	Pressure	Arc Voltage	Travel Speed	Marking Height	Transfer Height	Pierce Time
(ga)	(in)	(amps)	(psi/Bar)	(volts)	(ipm)	(in)	(in)	(msec)
All Thicknesses		15	37 / 2.55	180	250	0.100	0.100	0

\* Required for 25' (7.5m) Torch Leads - Increase outlet pressure by 5psi (.35 Bar) for every 25' (7.5m) increment in torch length

125 Amps - Stainless Steel



Material Thickness		Pressure	Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(in)	(psi)	(volts)	(ipm)	(volts)	(ipm)	(in)	(in)	(msec)	(in)	
	1/4	60*	146	225	148	260	0.200	0.300	500	0.100	
	3/8		148	107	148	152	0.200	0.300	500	0.110	
	1/2		153	78	150	94	0.200	0.300	600	0.110	
	5/8		155	47	153	60	0.200	0.400	700	0.115	
	3/4		157	40	156	45	0.200	0.400	1200	0.115	
	7/8		161	26	159	32	0.200	0.300	1500	0.117	*
	1		166	19	163	25	0.200	0.300	1800	0.120	*
	1 1/4		168	14	165	18	0.200	0.300	2000	0.125	*
	1 1/2		175	9	172	11	0.200	0.300	2200	0.125	*

Metric

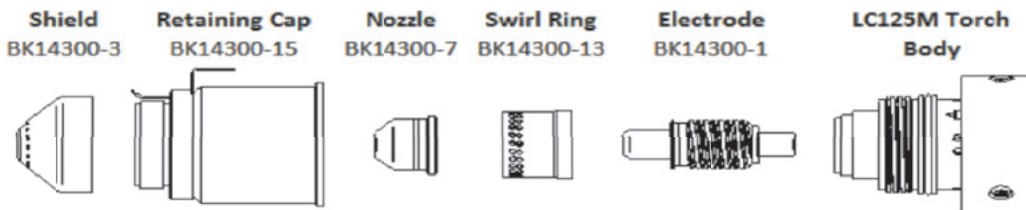
Material Thickness		Pressure	Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(mm)	(Bar)	(volts)	(mm/min)	(volts)	(mm/min)	(mm)	(mm)	(msec)	(mm)	
	6	4.13	146	6050	148	6900	5.1	7.6	500	2.5	
	10		149	2600	148	3650	5.1	7.6	500	2.8	
	12		152	2150	150	2700	5.1	7.6	600	2.8	
	16		155	1175	153	1500	5.1	10.2	700	2.9	
	20		158	900	157	1050	5.1	10.2	1300	2.9	
	25		165	500	162	650	5.1	7.6	1800	3.0	*
	32		168	350	165	450	5.1	7.6	2000	3.2	*
	38		175	225	172	275	5.1	7.6	2200	3.2	*

Marking

Material Thickness		Current	Pressure	Arc Voltage	Travel Speed	Marking Height	Transfer Height	Pierce Time
(ga)	(in)	(amps)	(psi/Bar)	(volts)	(ipm)	(in)	(in)	(msec)
All Thicknesses		15	37 / 2.55	184	250	0.100	0.100	0

\* Required for 25' (7.5m) Torch Leads - Increase outlet pressure by 5psi (.35 Bar) for every 25' (7.5m) increment in torch length

45 Amps - Aluminum



Imperial

Material Thickness		Pressure	Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(in)	(psi)	(volts)	(ipm)	(volts)	(ipm)	(in)	(in)	(msec)	(in)	
	1/32	60*	152	360	152	450	0.100	0.200	0	0.055	
	1/16		154	360	154	390	0.100	0.200	100	0.060	
	3/32		156	235	152	300	0.100	0.200	200	0.060	
	1/8		160	180	158	205	0.100	0.250	400	0.065	
	1/4		162	55	160	75	0.160	0.250	500	0.065	

Metric

Material Thickness		Pressure	Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(mm)	(Bar)	(volts)	(mm/min)	(volts)	(mm/min)	(mm)	(mm)	(msec)	(mm)	
	0.8	4.13	152	9150	152	11400	2.5	5.1	0	1.4	
	1		153	9150	153	11025	2.5	5.1	0	1.4	
	1.2		153	9150	153	10650	2.5	5.1	100	1.5	
	1.5		154	9150	154	10100	2.5	5.1	100	1.5	
	2		155	7525	153	8750	2.5	5.1	200	1.5	
	2.5		157	5775	153	7275	2.5	5.3	200	1.5	
	3		159	4875	157	5750	2.5	6.1	400	1.6	
	4		161	3750	159	4350	2.9	6.4	400	1.7	
	6		162	1750	160	2275	3.9	6.4	500	1.7	

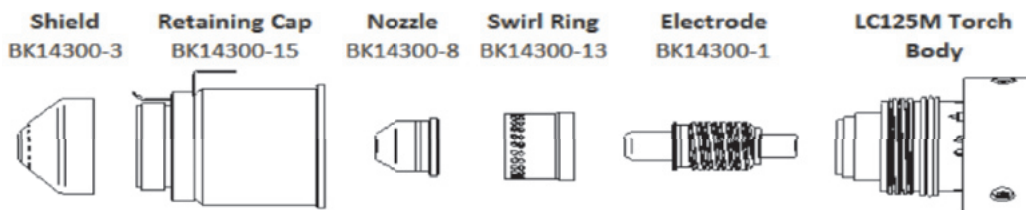
Marking

Material Thickness		Current	Pressure	Arc Voltage	Travel Speed	Marking Height	Transfer Height	Pierce Time
(ga)	(in)	(amps)	(psi/Bar)	(volts)	(ipm)	(in)	(in)	(msec)
All Thicknesses		12	37 / 2.55	177	250	0.100	0.100	0

\* Required for 25' (7.5m) Torch Leads - Increase outlet pressure by 5psi (.35 Bar) for every 25' (7.5m) increment in torch length



**65 Amps - Aluminum**



**Imperial**

			Optimum		Production						
Material Thickness		Pressure	Arc Voltage	Travel Speed	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(ga)	(in)	(psi)	(volts)	(ipm)	(volts)	(ipm)	(in)	(in)	(msec)	(in)	
	1/16	60*	160	345	160	428	0.200	0.300	100	0.070	
	1/8		150	255	150	325	0.200	0.300	200	0.060	
	1/4		160	100	159	147	0.200	0.300	400	0.075	
	3/8		165	55	163	70	0.200	0.300	600	0.085	
	1/2		168	35	168	45	0.200	0.300	1000	0.090	
	5/8		170	22	168	30	0.200	0.250	500	0.100	YES
	3/4		174	14	172	22	0.200	0.250	500	0.105	YES

**Metric**

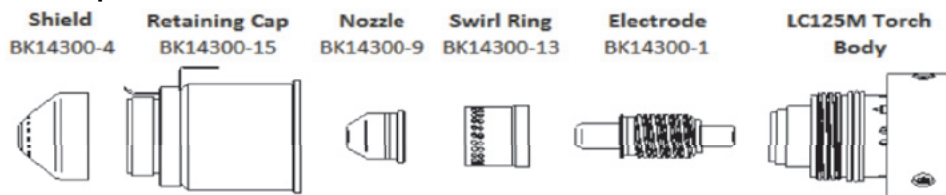
			Optimum		Production						
Material Thickness		Pressure	Arc Voltage	Travel Speed	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(ga)	(mm)	(Bar)	(volts)	(mm/min)	(volts)	(mm/min)	(mm)	(mm)	(msec)	(mm)	
	1.5	4.13	161	8900	161	11050	5.1	7.6	100	1.8	
	2		157	8175	157	10200	5.1	7.6	100	1.7	
	2.5		154	7450	154	9375	5.1	7.6	200	1.6	
	3		151	6725	151	8550	5.1	7.6	200	1.6	
	4		153	5450	152	7075	5.1	7.6	300	1.6	
	6		159	2975	158	4225	5.1	7.6	400	1.9	
	10		165	1325	164	1675	5.1	7.6	700	2.2	
	12		167	1000	167	1275	5.1	7.6	1000	2.3	
	16		170	550	168	750	5.1	6.4	500	2.5	YES
	20		175	300	173	500	5.1	6.4	500	2.7	YES

**Marking**

Material Thickness		Current	Pressure	Arc Voltage	Travel Speed	Marking Height	Transfer Height	Pierce Time
(ga)	(in)	(amps)	(psi/Bar)	(volts)	(ipm)	(in)	(in)	(msec)
All Thicknesses		14	37 / 2.55	178	250	0.100	0.100	0

\* Required for 25' (7.5m) Torch Leads - Increase outlet pressure by 5psi (.35 Bar) for every 25' (7.5m) increment in torch length

**85 Amps - Aluminum**



**Imperial**

Material Thickness			Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(in)	Pressure (psi)	(volts)	(ipm)	(volts)	(ipm)	(in)	(in)	(msec)	(in)	
	1/8	60*	154	310	154	360	0.210	0.325	200	0.085	
	1/4		158	140	158	167	0.210	0.325	400	0.090	
	3/8		160	75	158	104	0.210	0.325	600	0.095	
	1/2		162	55	162	73	0.210	0.325	800	0.100	
	5/8		167	38	167	48	0.210	0.325	1000	0.105	
	3/4		169	28	167	40	0.210	0.250	500	0.105	YES
	7/8		172	22	171	30	0.210	0.250	500	0.105	YES
	1		175	15	175	20	0.210	0.250	500	0.105	YES

**Metric**

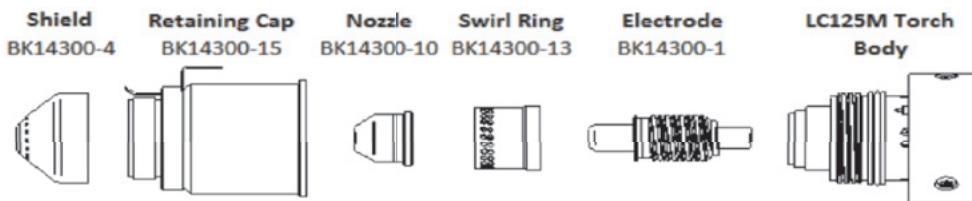
Material Thickness			Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(mm)	Pressure (Bar)	(volts)	(mm/min)	(volts)	(mm/min)	(mm)	(mm)	(msec)	(mm)	
	3	4.13	154	8100	154	9425	5.3	8.3	200	2.2	
	4		155	6750	155	7875	5.3	8.3	300	2.2	
	6		158	4025	158	4775	5.3	8.3	400	2.3	
	10		160	1825	159	2525	5.3	8.3	600	2.4	
	12		162	1500	161	2025	5.3	8.3	800	2.5	
	16		167	950	167	1200	5.3	8.3	1000	2.7	
	20		170	675	168	950	5.3	6.4	500	2.7	YES
	25		175	400	174	550	5.3	6.4	500	2.7	YES

**Marking**

Material Thickness		Current	Pressure	Arc Voltage	Travel Speed	Marking Height	Transfer Height	Pierce Time
(ga)	(in)	(amps)	(psi/Bar)	(volts)	(ipm)	(in)	(in)	(msec)
All Thicknesses		14	37 / 2.55	188	250	0.100	0.100	0

\* Required for 25' (7.5m) Torch Leads - Increase outlet pressure by 5psi (.35 Bar) for every 25' (7.5m) increment in torch length

**105 Amps - Aluminum**



**Imperial**

Material Thickness		Pressure	Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(in)	(psi)	(volts)	(ipm)	(volts)	(ipm)	(in)	(in)	(msec)	(in)	
	1/4	60*	150	210	149	225	0.180	0.325	500	0.100	
	3/8		155	105	154	130	0.180	0.325	600	0.105	
	1/2		158	77	156	93	0.180	0.325	800	0.110	
	5/8		163	54	162	62	0.180	0.375	1000	0.110	
	3/4		167	38	166	41	0.180	0.400	1200	0.115	
	7/8		169	29	168	34	0.180	0.400	1350	0.115	
	1		172	23	170	29	0.180	0.350	1800	0.120	YES
	1 1/4		179	15	177	18	0.180	0.350	1800	0.120	YES

**Metric**

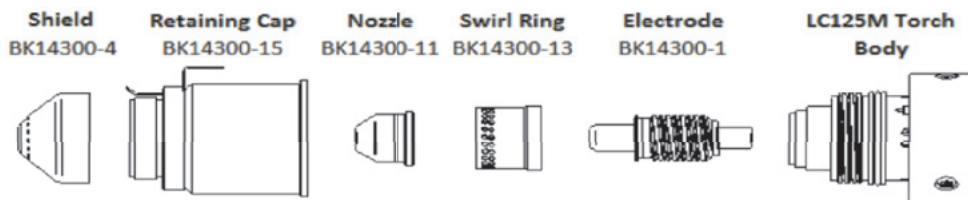
Material Thickness		Pressure	Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(mm)	(Bar)	(volts)	(mm/min)	(volts)	(mm/min)	(mm)	(mm)	(msec)	(mm)	
	6	4.13	149	5625	148	5975	4.6	8.3	500	2.5	
	10		155	2550	154	3150	4.6	8.3	600	2.7	
	12		157	2125	156	2575	4.6	8.3	800	2.8	
	16		163	1350	162	1550	4.6	9.5	1000	2.8	
	20		168	900	167	1000	4.6	10.2	1200	2.9	
	25		172	600	170	750	4.6	8.9	1800	3.0	YES
	32		179	375	177	450	4.6	8.9	1800	3.0	YES

**Marking**

Material Thickness		Current	Pressure	Arc Voltage	Travel Speed	Marking Height	Transfer Height	Pierce Time
(ga)	(in)	(amps)	(psi/Bar)	(volts)	(ipm)	(in)	(in)	(msec)
All Thicknesses		15	37 / 2.55	184	250	0.100	0.100	0

\* Required for 25' (7.5m) Torch Leads - Increase outlet pressure by 5psi (.35 Bar) for every 25' (7.5m) increment in torch length

125 Amps - Aluminum



Imperial

Material Thickness		Pressure	Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(in)	(psi)	(volts)	(ipm)	(volts)	(ipm)	(in)	(in)	(msec)	(in)	
	1/4	60*	150	250	149	275	0.200	0.300	200	0.115	
	3/8		154	128	152	158	0.200	0.300	400	0.120	
	1/2		157	83	154	112	0.200	0.300	500	0.120	
	5/8		161	63	159	83	0.200	0.325	700	0.120	
	3/4		164	52	162	62	0.200	0.350	1000	0.125	
	7/8		167	34	164	46	0.200	0.400	1600	0.127	
	1		170	32	167	40	0.200	0.425	2200	0.130	
	1 1/4		178	17	173	30	0.200	0.350	2500	0.130	YES
	1 1/2		183	12	180	16	0.200	0.350	2500	0.140	YES

Metric

Material Thickness		Pressure	Optimum		Production		Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
			Arc Voltage	Travel Speed	Arc Voltage	Travel Speed					
(ga)	(mm)	(Bar)	(volts)	(mm/min)	(volts)	(mm/min)	(mm)	(mm)	(msec)	(mm)	
	6	4.13	150	6700	149	7325	5.1	7.6	200	2.9	
	10		154	3075	152	3850	5.1	7.6	400	3.0	
	12		156	2350	154	3100	5.1	7.6	500	3.0	
	16		161	1600	159	2075	5.1	8.3	700	3.1	
	20		165	1175	163	1450	5.1	9.3	1200	3.2	
	25		170	825	167	1025	5.1	10.7	2100	3.3	
	32		178	425	173	750	5.1	8.9	2500	3.3	YES
	38		183	300	180	400	5.1	8.9	2500	3.6	YES

Marking

Material Thickness	Current	Pressure	Arc Voltage	Travel Speed	Marking Height	Transfer Height	Pierce Time
(ga)	(in)	(amps)	(psi/Bar)	(ipm)	(in)	(in)	(msec)
All Thicknesses	16	37 / 2.55	179	250	0.100	0.100	0

\* Required for 25' (7.5m) Torch Leads - Increase outlet pressure by 5psi (.35 Bar) for every 25' (7.5m) increment in torch length

## CONSUMABLE LIFE

### Use the following guidelines to maximize consumable parts life:

1. The FLEXCUT™ 125 utilizes the latest advancement in technology for extending the life of the torch consumable parts. To maximize the life of the consumable parts, it is imperative that the shutdown procedure of the arc is carried out properly. The arc must be extinguished while it is still attached to the workpiece. A popping noise may be heard if the arc extinguishes abnormally. Note that holes are usually programmed without lead-outs to prevent loss of the arc during shutdown.
2. Use the recommended pierce height given in the cutting charts. A pierce height that is too low will allow molten metal that is ejected during the piercing process to damage the shield cap and nozzle. A pierce height that is too high will cause the pilot arc time to be excessively long and will cause nozzle damage.
3. Minimize firing the torch in the air. Nozzle damage will occur.
4. Make sure the torch does not touch the plate while cutting. Shield cap and nozzle damage will result.
5. Use a chain cut when possible. Starting and stopping the torch is more detrimental to the consumables than making a continuous cut.

## CUT QUALITY


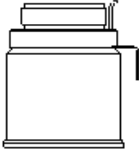



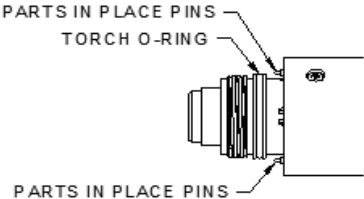
Before the optimum cutting condition can be achieved on a particular material type and thickness, the machine operator must have a thorough understanding of the cutting characteristics of the FLEXCUT™ 125. When the cut quality is not satisfactory, the cutting speed, torch height, or gas pressures may need to be adjusted in small increments until the proper cutting condition is obtained. The following guidelines should be useful in determining which cutting parameter to adjust.

**Before making any parameter changes, verify that the torch is square to the work piece. Also, it is essential to have the correct torch parts in place and to ensure that they are in good condition. Check the electrode for excessive wear and the nozzle and shield cap orifices for roundness. Also, check the parts for any dents or distortions. Irregularities in the torch parts can cause cut quality problems.**

1. A positive cut angle (top dimension of piece smaller than the bottom dimension) usually occurs when the torch standoff distance is too high, when cutting too fast, or when excessive power is used to cut a given plate thickness.
2. A negative cut angle (top dimension of piece larger than the bottom dimension) usually occurs when the torch standoff distance is too low or when the cutting speed is too slow.
3. Top dross usually occurs when the torch standoff distance is too high.
4. Bottom dross usually occurs when the cutting speed is either too slow (slowspeed dross) or too fast (high-speed dross). Low-speed dross is easily removed, while high-speed dross usually requires grinding or chipping off. Bottom dross also occurs more frequently as the metal heats up. As more pieces are cut out of a particular plate, the more likely they are to form dross.
5. Note that different material compositions have an effect on dross formation.
6. If the material is not being completely severed, the likely causes are that the cutting current is too low, the travel speed is too high, the gas pressure is incorrect, the incorrect consumables are installed in the torch, or the consumables are worn.

**INSPECTION OF CONSUMABLE PARTS**

When the cut quality is not satisfactory, use the following guidelines for determining which consumable parts need to be changed. Inspect all parts for dirt or debris and clean as necessary.

PART	INSPECT FOR	CORRECTIVE ACTION
<p style="text-align: center;">SHIELD CAP</p> 	CENTER HOLE OUT OF ROUND	REPLACE SHIELD CAP
	DENTS, SCRATCHES, OR OTHER DAMAGE	REPLACE SHIELD CAP
<p style="text-align: center;">RETAINING CAP</p> 	GAS PASS HOLES CLOGGED	REPLACE RETAINING CAP
	DENTS, CRACKS, OR OTHER DAMAGE	REPLACE RETAINING CAP
	LOOSE OHMIC SENSE CONNECTOR	REPLACE RETAINING CAP
<p style="text-align: center;">NOZZLE</p> 	CENTER HOLE OUT OF ROUND	REPLACE NOZZLE
	EROSION OR ARCING	REPLACE NOZZLE
<p style="text-align: center;">SWIRL RING</p> 	DAMAGE	REPLACE SWIRL RING
	CLOGGED HOLES	BLOW OUT WITH COMPRESSED AIR. REPLACE PART IF HOLES CANNOT BE CLEARED.
<p style="text-align: center;">ELECTRODE</p> 	PIT DEPTH	REPLACE ELECTRODE IF CENTER PIT DEPTH IS GREATER THAN .060" (1.5 mm).
	SURFACE ARCING OR EROSION	REPLACE ELECTRODE IF SURFACE IS EXCESSIVELY CORRODED.
<p style="text-align: center;">TORCH</p> 	DAMAGED, WORN, OR DRY O-RING	IF THE O-RING IS DAMAGED OR CRACKED, REPLACE IT. APPLY A LUBRICANT WHICH IS COMPATIBLE IN OXYGEN OR REACTIVE ENVIRONMENT.
	PARTS IN PLACE PINS ARE CLEAN AND MOVE IN AND OUT EASILY	KEEP PINS AS CLEAN AS POSSIBLE. IF THEY NO LONGER MAKE GOOD CONTACT WITH RETAINING CAP THEY MUST BE REPLACED.

**SUGGESTIONS FOR EXTRA UTILITY FROM THE FLEXCUT™ 125 SYSTEM:****⚠ WARNING****ELECTRIC SHOCK CAN KILL.**

- Turn off machine at the disconnect switch on the rear of the machine before tightening, cleaning or replacing consumables.



1. Occasionally an oxide layer may form over the tip of the electrode, creating an insulating barrier between the electrode and nozzle. This will result in false starts. When this happens turn the power off, remove the shield cup and nozzle. Rub the inside surface of the nozzle, this will help remove any oxide buildup. Also, clean any oxide build up from the electrode. Replace the shield cup and nozzle, turn on the power and continue cutting. If false starts continue to occur after cleaning the consumables, then replace them with a new set. Do not continue to try and cut with excessively worn consumables as this can cause damage to the torch head and will degrade cut quality. Do not allow torch cable or body to contact hot surfaces.
2. To improve consumable life, here are some suggestions that may be useful:
  - Use only Lincoln consumable parts. These parts are patented and using any other replacement consumables may cause damage to the torch or reduce cut quality.
  - Make sure the air supply to the FLEXCUT™ 125 is clean and free of oil. Use several extra in line filters if necessary.
  - Minimize dross buildup on the nozzle tip by starting the cut from the edge of the plate when possible.
  - Pierce cutting should be done only when necessary. If piercing, angle torch about 30° from the plane perpendicular to the work piece, transfer the arc, then bring the torch perpendicular to the work and begin parallel movement.
  - Reduce the number of pilot arc starts without transferring to the work.
  - Reduce the pilot arc time before transferring to the work.
  - Set air pressure to recommended setting. A higher or lower pressure will cause turbulence in the plasma arc, eroding the orifice of the nozzle tip.

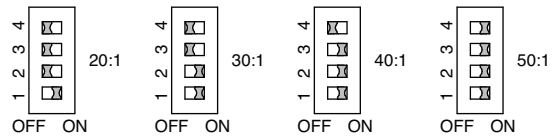
**ACCESSING DIVIDED ARC VOLTAGE**

The Flexcut™ 125 is factory set to provide raw arc voltage through the 14 pin CNC Connector (see arc voltage on page B-6).

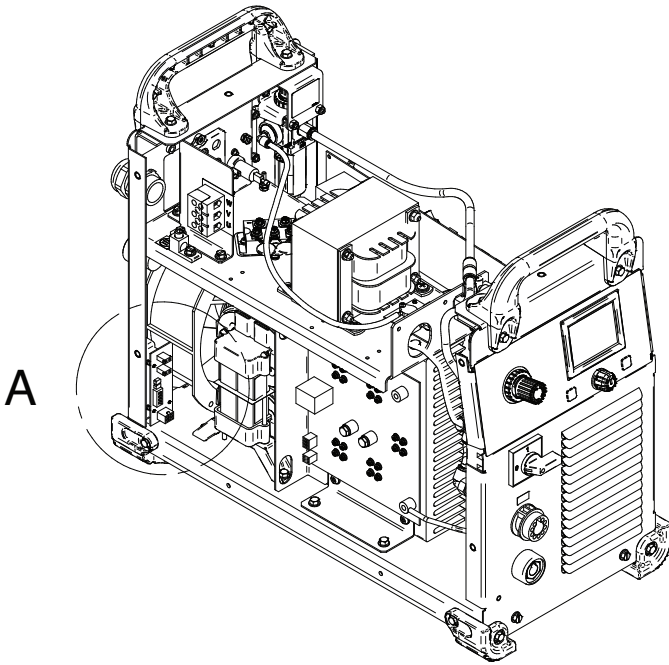
The machine is configurable to provide a divided voltage of 20:1, 30:1, 40:1, or 50:1 instead of raw arc voltage by following these steps:

1. Turn off and disconnect the Flexcut™ 125 from incoming power.
2. Remove the left case side (left side while viewing the front of the machine).
3. Located in the lower left rear corner is the voltage divider board.

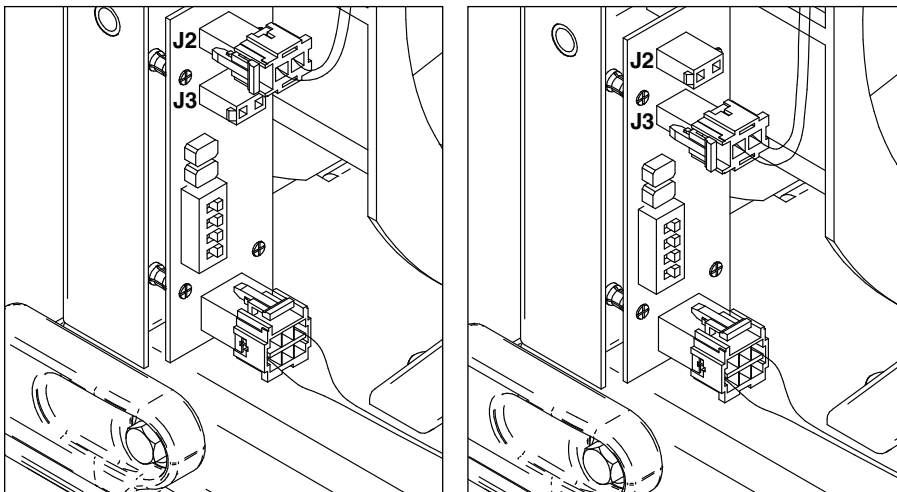
5. Set the switch as follows to get the desired divided voltage:



6. Reinstall the left case side.
7. Apply power to the machine and confirm output voltage during operation.



4. Remove the 2-pin connector from J2 and plug it into J3:





# OPTIONS/ACCESSORIES

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The following options/accessories are available for your FlexCut™ Plasma cutter from your local Lincoln Distributor.

## TORCHES

The following replacement or optional torches are available:

- K4300-4** LC125 Mechanized Torch 25' (7.5m)
- K4300-5** LC125 Mechanized Torch 50' (15m)
- K4300-6** LC125 Mechanized Torch 75' (22.5m)
- K4302-2** LC125 Mechanized Consumable Starter Kit\*

## EXPENDABLE PARTS

- BK14300-1** Electrode
- BK14300-3** Shield Cap (45A - 65A)
- BK14300-4** Shield Cap (85A - 125A)
- BK14300-7** Nozzle 45A
- BK14300-8** Nozzle 65A
- BK14300-9** Nozzle 85A
- BK14300-10** Nozzle 105A
- BK14300-11** Nozzle 125A
- BK14300-13** Swirl Ring
- BK14300-14** Retaining Cap
- BK14300-15** Retaining Cap, CTP
- BK14300-18** Front Isolator Assembly

# MAINTENANCE

## WARNING

### ELECTRIC SHOCK CAN KILL.

- Have an electrician install and service this equipment.
- Turn the input power off at the fuse box before working on equipment.
- Do not touch electrically hot parts.



## DAILY PROCEDURES

### POWER SUPPLY

1. Verify that the display light is illuminated when primary power is applied to the system.
2. Press the purge button and verify that air is flowing through the torch. While air is flowing, adjust the regulator to 60 psi for 25' torches and 65 psi for 50' torches and 70 psi for 75' torches.
3. Raise the torch a minimum of 2 inches above the workpiece. Apply a trigger signal through the 14-pin connector. The pilot arc should be established in approximately 2 seconds. The arc should extend approximately 1 inch from the nozzle.

### TORCH ASSEMBLY

1. Check the output cover of the torch lead for nicks or cuts. If the outer cover is damaged and the underlying wires are visible, the torch lead must be replaced. Check to make sure nothing is crushing the cable and blocking the flow of air through the torch. Also, check for and remove any kinks in the cable to maximize air flow to the torch.
2. Remove all consumables from the torch and verify that the anode-cathode insulator (brown plastic) is in good condition and has no signs or arcing.
3. Check all consumables and discard any damaged items.
4. Verify that the electrode seat is clean to ensure proper electrical contact.
5. Inspect the threads on the torch body for nicks or defects. Remove any debris and keep area clean.
6. Reassemble the torch consumables making sure that all parts are seated properly and that the retaining cap is hand tight.
7. Always make sure the electrode freely moves in the torch. If not check the electrode for structural damage. If electrode is fine, change the Front Isolator Assembly (BK14300-18).

## MONTHLY PROCEDURES

### POWER SUPPLY

1. Using clean, dry, compressed air, blow out all accumulated dust inside the machine. Be sure to clean all printed circuit boards, heatsinks, power switch, and fan. In excessively dirty environments, blow out the machine on a weekly basis. Keeping the machine clean will result in cooler operation and higher reliability.
2. Verify that all torch lead and ground connections are secure and free of corrosion.
3. Verify that the primary three phase AC connections are tight.
4. Verify that all printed circuit board connectors are installed properly.
5. Examine the sheet metal case for dents or other damage and repair as required. Keep case in good condition to ensure that high voltage parts are protected and correct spacings are maintained. All external sheet metal screws must be in place to ensure case strength and electrical ground continuity.

### TORCH ASSEMBLY

1. Verify that the torch lead connection at the power supply is tight and that there are no leaks. Only tighten enough to provide an air tight seal. The connections are subject to damage if over-tightened.
2. Inspect the torch leads for nicks or cuts and replace if necessary.

### Work Ground

1. Verify that work ground lead is securely fastened to the cutting table and that the connection point is free from corrosion. Use a wire brush to clean the connection point if necessary.

### Gas Supply

1. Check for signs of contamination in the gas supply lines.
2. Drain filter bowl as needed.
3. Listen for gas leaks in the supply lines and the internal plumbing system. Tighten any leaking connections. Leaks can cause poor cut quality as well as torch overheating.
4. Replace the filter element as necessary. If the pressure drop across the filter is more than 10 psi, the element needs to be replaced. To replace the element:
  - Remove the bowl from the filter body
  - Remove the element and holder from body
  - Separate the element from its holder
  - Discard the used element
  - Place the new element on its holder
  - Thread the element and holder onto the body
  - Tighten the bowl onto the body

# TROUBLESHOOTING

## 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 you local Lincoln Authorized Field Service Facility.

If you do not understand or are unable to perform the Recommended Course of Action safely, contact you local Lincoln Authorized Field Service Facility.

### WARNING



#### **ELECTRIC SHOCK CAN KILL.**

- Turn off machine at the disconnect switch on the rear of the machine and remove main power supply connections before doing any troubleshooting.

### 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.



**0298**

**DESCRIPTION:**  
*Low Gas Pressure*

<b>Possible Cause</b>
Gas input line is disconnected or input pressure is too low.
<b>Recommended Course of Action</b>
Check that the gas line feeding the machine is properly connected and that the pressure is above 90 psi for cutting or above 50 psi for marking or gouging.



**0728**

**DESCRIPTION:**  
*Check Retaining Cap*

<b>Possible Cause</b>
Torch is disconnected or the torch retaining cap is missing or loose.
<b>Recommended Course of Action</b>
Check that the consumables are properly installed. Tighten retaining cap (hand-tight only) and check that it touches the two pins extending down from the torch body. The pins on the torch should extend and retract freely.



**0021**

**DESCRIPTION:**  
*Work Transfer Failed*

<b>Possible Cause</b>
Pilot timeout error
<b>Recommended Course of Action</b>
In cut, mark, and grid modes, the pilot arc will only run for 5 seconds to prevent unnecessary consumable wear. Verify the correct torch to workpiece height and that the work lead is connected and making a good electrical connection. If error occurs immediately after triggering, verify correct three phase input.



**0729**

**DESCRIPTION:**  
*Release Trigger*

<b>Possible Cause</b>
Trigger locked
<b>Recommended Course of Action</b>
Release the trigger before continuing. The trigger must be disabled at machine startup or when changing modes.



**0021**

**DESCRIPTION:**  
*Open Pilot -  
Check Consumables*

<b>Possible Cause</b>
Pilot Stuck Open
<b>Recommended Course of Action</b>
Nozzle could be missing or debris could be stuck between the torch consumables. Remove and replace the consumables, checking for proper installation.



**0021**

**DESCRIPTION:**  
*Shorted Pilot -  
Check Consumables*

<b>Possible Cause</b>
Pilot Stuck Closed
<b>Recommended Course of Action</b>
Electrode is not retracting from the nozzle after trigger initiation. The parts could be stuck together or air is not properly flowing through the torch. Remove and replace the consumables, checking for proper installation. Check the electrode for structural damage. If electrode is fine, replace Front Isolator Assembly (BK14300-18).



**0036**

**DESCRIPTION:**  
*Thermal Trip*

<b>Possible Cause</b>
Machine has overheated and must be allowed to cool before continuing.
<b>Recommended Course of Action</b>
Check that the fan is spinning freely and that the rear brickwork and side/front louvers are not obstructed. If thermal faults continue, blow dust out from the rear of the machine.



**0006**

**DESCRIPTION:**  
*Control Board Offline*

<b>Possible Cause</b>
Communication error between power board and control board.
<b>Recommended Course of Action</b>
Cycle power to the machine to see if the error clears. Otherwise a qualified technician must check communication between the power and control boards.

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
Input circuit breaker trips repeatedly.	<ol style="list-style-type: none"> <li>1. Verify that the input circuit protection is properly sized per the voltage being supplied. See Technical Specification page.</li> <li>2. Install a larger input circuit or turn the output control to a lower amperage.</li> <li>3. Check the input power to be sure it is on.</li> </ol>	<p>If all recommended possible areas of mis-adjustment have been checked and the problem persists, <b>Contact your local Lincoln Authorized Field Service Facility.</b></p>
No display after the power switch is turned on.	<ol style="list-style-type: none"> <li>1. Check the power line fuses or breakers and machine connection.</li> <li>2. Disconnect input power at fuse/breaker panel and check line switch continuity. Replace line switch if bad.</li> <li>3. Possible faulty Display Board.</li> <li>4. Possible faulty Auxiliary Transformer. Check for status LED's on Display Board</li> </ol>	
CAN Error	<ol style="list-style-type: none"> <li>1. Possible faulty Switch board. Check for status LED's</li> </ol>	
The Thermal Error does not clear.	<ol style="list-style-type: none"> <li>1. Check that rear brickwork is not blocked.</li> <li>2. Check that fan rotates freely</li> <li>3. Check that heatsink fins are not clogged with dirt</li> </ol>	
Pilot Power Supply Fault	<ol style="list-style-type: none"> <li>1. Check connections between switchboard and output board.</li> <li>2. Possible faulty output board.</li> </ol>	



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

[WWW.LINCOLNELECTRIC.COM/LOCATOR](http://WWW.LINCOLNELECTRIC.COM/LOCATOR)

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
<p>The FLEXCUT™ 125 powers up properly but there is no response when output is triggered.</p>	<ol style="list-style-type: none"> <li>1. Press the purge button on the front of the FLEXCUT™ 125 . If air does not flow, then:                             <ul style="list-style-type: none"> <li>• The main gas solenoid assembly/ may be faulty. Check or replace.</li> <li>• Possible faulty Control board.</li> </ul> </li> <li>2. Remove the body of the torch and examine all the connections.</li> <li>3. Check for proper CNC trigger operation. Replace the trigger or cable if defective.</li> <li>4. Possible faulty Output board.</li> </ol>	<p>If all recommended possible areas of mis-adjustment have been checked and the problem persists, <b>Contact your local Lincoln Authorized Field Service Facility.</b></p>



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

**WWW.LINCOLNELECTRIC.COM/LOCATOR**

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
<p>When the trigger is pulled air begins to flow, but there is no pilot arc after at least 3 seconds.</p>	<ol style="list-style-type: none"> <li>1. Check the torch consumables to be sure they are not dirty or greasy, and are in good shape. Replace the consumables if necessary.</li> <li>2. Make sure the air pressure is set correctly.</li> <li>3. Make sure there are no kinks or restrictions for air flow in the torch cable. Replace cable as needed.</li> <li>4. If a slight thump cannot be felt in the torch when the trigger is pulled, check for loose connection in the torch head.</li> <li>5. Possible faulty Control board.</li> </ol>	<p>If all recommended possible areas of mis-adjustment have been checked and the problem persists, <b>Contact your local Lincoln Authorized Field Service Facility.</b></p>
<p>The air begins to flow and there is a very brief arc that snaps out consistently with repeated trigger pulls.</p>	<ol style="list-style-type: none"> <li>1. Check the torch consumables to be sure they are in tight, not dirty or greasy and in good shape. Replace if necessary.</li> <li>2. Make sure the air pressure is set correctly.</li> <li>3. Possible faulty Control board.</li> </ol>	
<p>The arc starts but sputters badly.</p>	<ol style="list-style-type: none"> <li>1. Check the torch consumables to be sure they are in tight, not dirty or greasy and in good shape. Replace if necessary.</li> <li>2. Check air supply for oil or a great deal of water. If there is oil or a great deal of water, the air must be filtered or the machine switched to nitrogen or bottled air.</li> <li>3. Make sure the air pressure is set correctly.</li> </ol>	



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

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Observe all Safety Guidelines detailed throughout this manual

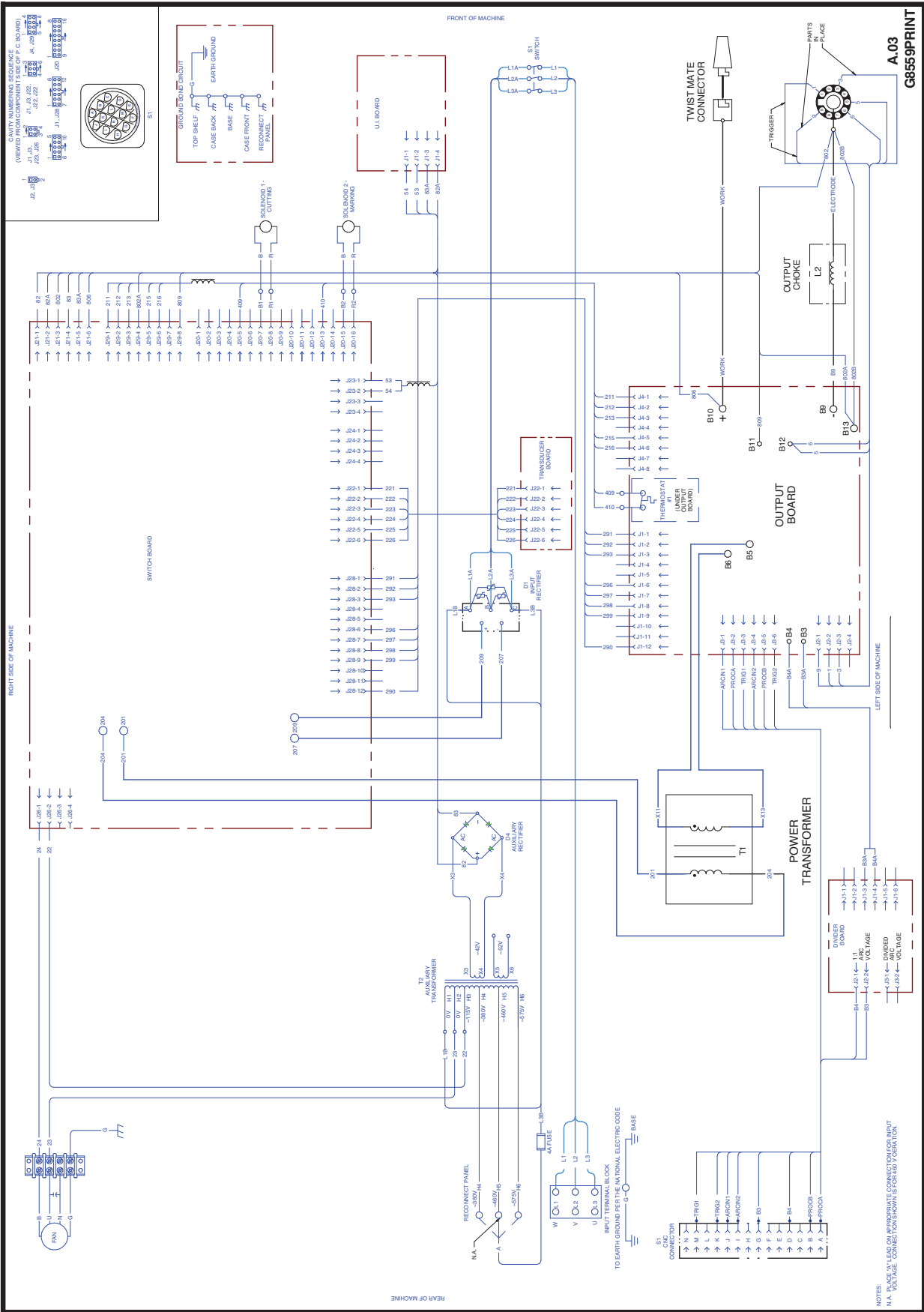
<p><b>PROBLEMS (SYMPTOMS)</b></p>	<p><b>POSSIBLE CAUSE</b></p>	<p><b>RECOMMENDED COURSE OF ACTION</b></p>
<p>Pilot arc starts but will not transfer when brought near work.</p>	<ol style="list-style-type: none"> <li>1. Check work lead connection for clean, secure connection.</li> <li>2. Plasma will only cut conductive material. Do not attempt to cut fiberglass, plastic, rubber, PVC or any other non-conductive material.</li> <li>3. Make sure work piece is clean and dry. Remove any scale, rust or dross.</li> <li>4. Check all connections to Output board.</li> <li>5. Possible faulty Output board.</li> </ol>	<p>If all recommended possible areas of mis-adjustment have been checked and the problem persists, <b>Contact your local Lincoln Authorized Field Service Facility.</b></p>



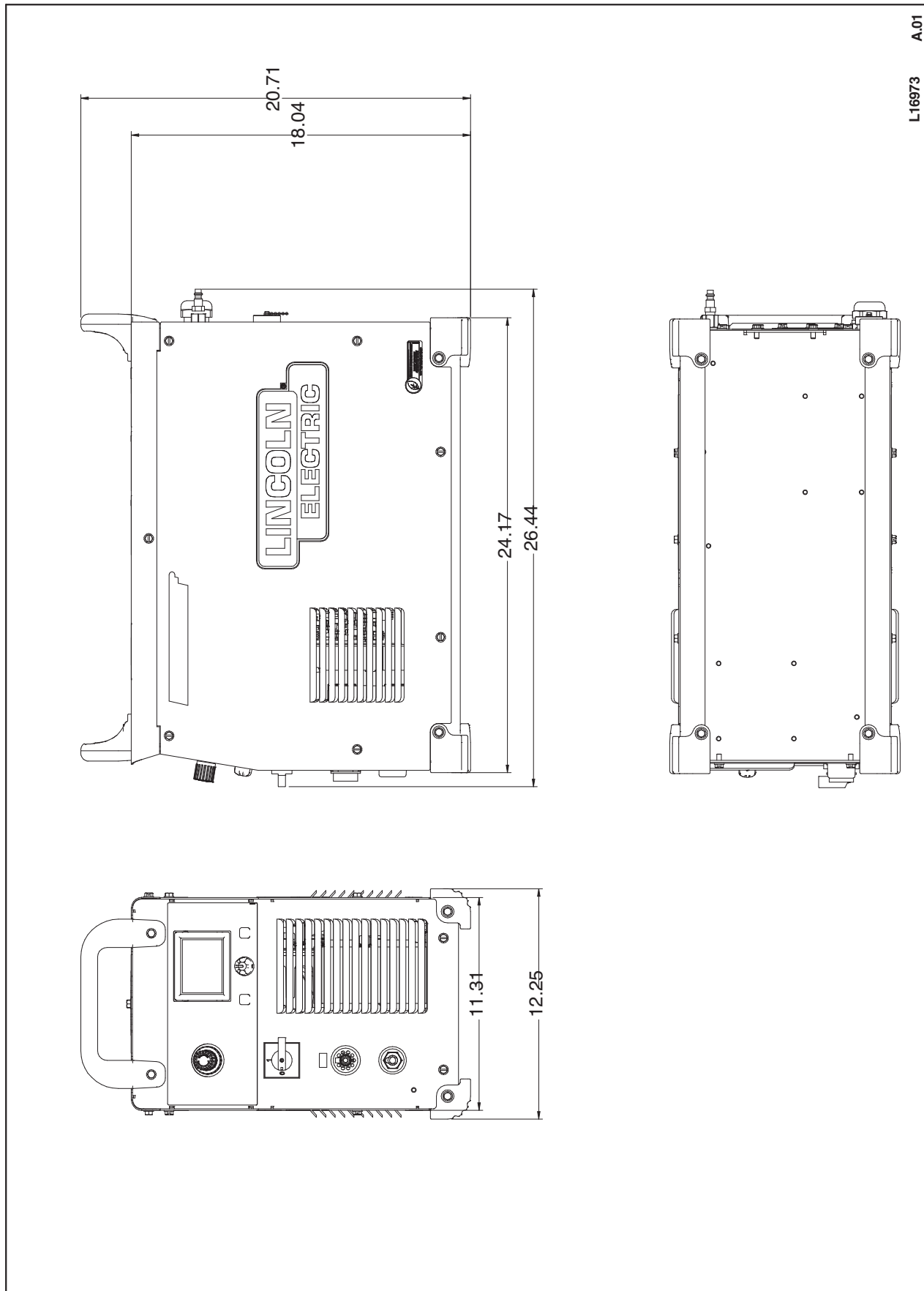
If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your Lincoln Authorized Service Facility for technical troubleshooting assistance before you proceed.

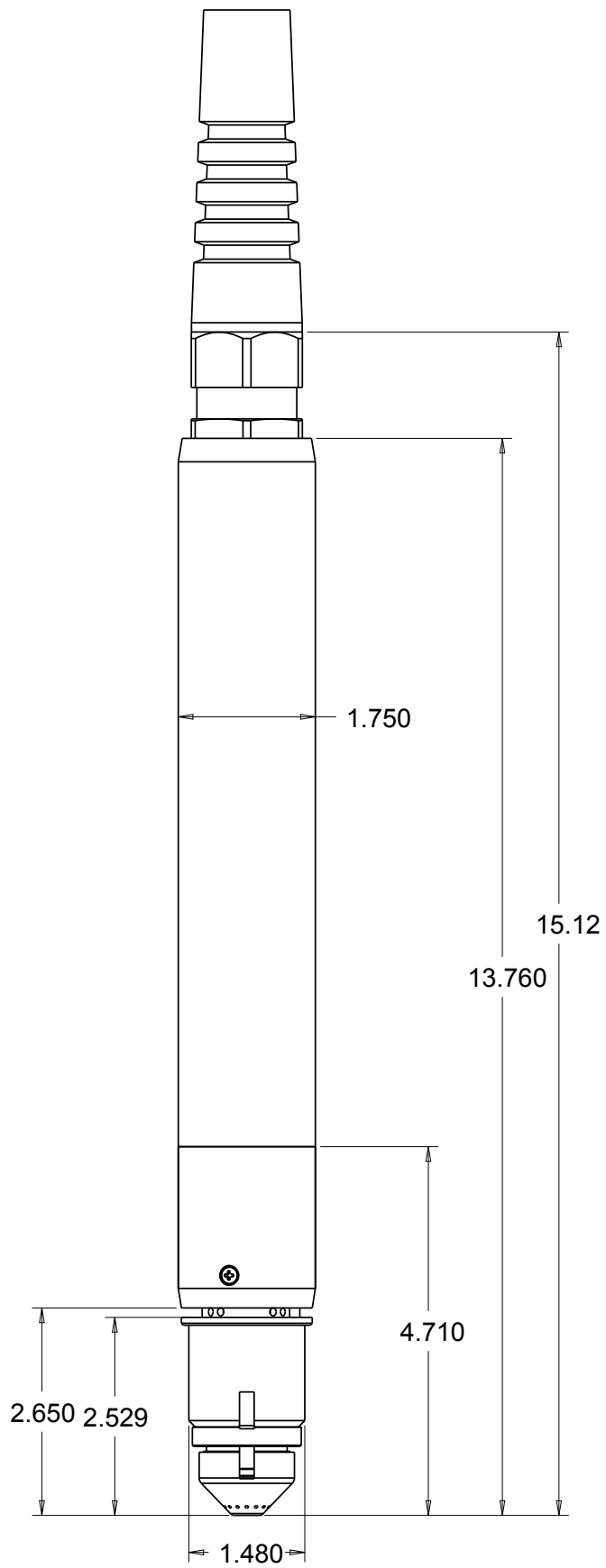
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FLEXCUT 125 WIRING DIAGRAM (CODE 12478)



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 posted 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.





ALL DIMENSIONS ARE IN INCHES

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<b>WARNING</b>	<ul style="list-style-type: none"> <li>Do not touch electrically live parts or electrode with skin or wet clothing.</li> <li>Insulate yourself from work and ground.</li> </ul>	<ul style="list-style-type: none"> <li>Keep flammable materials away.</li> </ul>	<ul style="list-style-type: none"> <li>Wear eye, ear and body protection.</li> </ul>
Spanish <b>AVISO DE PRECAUCION</b>	<ul style="list-style-type: none"> <li>No toque las partes o los electrodos bajo carga con la piel o ropa mojada.</li> <li>Aíslese del trabajo y de la tierra.</li> </ul>	<ul style="list-style-type: none"> <li>Mantenga el material combustible fuera del área de trabajo.</li> </ul>	<ul style="list-style-type: none"> <li>Protéjase los ojos, los oídos y el cuerpo.</li> </ul>
French <b>ATTENTION</b>	<ul style="list-style-type: none"> <li>Ne laissez ni la peau ni des vêtements mouillés entrer en contact avec des pièces sous tension.</li> <li>Isolez-vous du travail et de la terre.</li> </ul>	<ul style="list-style-type: none"> <li>Gardez à l'écart de tout matériel inflammable.</li> </ul>	<ul style="list-style-type: none"> <li>Protégez vos yeux, vos oreilles et votre corps.</li> </ul>
German <b>WARNUNG</b>	<ul style="list-style-type: none"> <li>Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung!</li> <li>Isolieren Sie sich von den Elektroden und dem Erdboden!</li> </ul>	<ul style="list-style-type: none"> <li>Entfernen Sie brennbares Material!</li> </ul>	<ul style="list-style-type: none"> <li>Tragen Sie Augen-, Ohren- und Körperschutz!</li> </ul>
Portuguese <b>ATENÇÃO</b>	<ul style="list-style-type: none"> <li>Não toque partes elétricas e electrodos com a pele ou roupa molhada.</li> <li>Isole-se da peça e terra.</li> </ul>	<ul style="list-style-type: none"> <li>Mantenha inflamáveis bem guardados.</li> </ul>	<ul style="list-style-type: none"> <li>Use proteção para a vista, ouvido e corpo.</li> </ul>
Japanese <b>注意事項</b>	<ul style="list-style-type: none"> <li>通電中の電気部品、又は溶材にヒフやぬれた布で触れないこと。</li> <li>施工物やアースから身体が絶縁されている様にして下さい。</li> </ul>	<ul style="list-style-type: none"> <li>燃えやすいものの側での溶接作業は絶対にしてはなりません。</li> </ul>	<ul style="list-style-type: none"> <li>目、耳及び身体に保護具をして下さい。</li> </ul>
Chinese <b>警告</b>	<ul style="list-style-type: none"> <li>皮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 بجسدك أو بالملابس المبللة بالماء.</li> <li>ضع عازلا على جسمك خلال العمل.</li> </ul>	<ul style="list-style-type: none"> <li>ضع المواد القابلة للاشتعال في مكان بعيد.</li> </ul>	<ul style="list-style-type: none"> <li>ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.</li> </ul>

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

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

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

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

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

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

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

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

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.

## **CUSTOMER ASSISTANCE POLICY**

The business of Lincoln Electric is manufacturing and selling high quality welding equipment, automated welding systems, consumables, and cutting equipment. Our challenge is to meet the needs of our customers, who are experts in their fields, and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for information or technical information about their use of our products. Our employees respond to inquiries to the best of their ability based on information and specifications provided to them by the customers and the knowledge they may have concerning the application. Our employees, however, are not in a position to verify the information provided or to evaluate the engineering requirements for the particular weldment, or to provide engineering advice in relation to a specific situation or application. Accordingly, Lincoln Electric does not warrant or guarantee or assume any liability with respect to such information or communications. Moreover, the provision of such information or technical information does not create, expand, or alter any warranty on our products. Any express or implied warranty that might arise from the information or technical information, including any implied warranty of merchantability or any warranty of fitness for any customers' particular purpose or any other equivalent or similar warranty is specifically disclaimed.

Lincoln Electric is a responsive manufacturer, but the definition of specifications, and the selection and use of specific products sold by Lincoln Electric is solely within the control of, and remains the sole responsibility of the customer. Many variables beyond the control of Lincoln Electric affect the results obtained in applying these types of fabrication methods and service requirements.



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