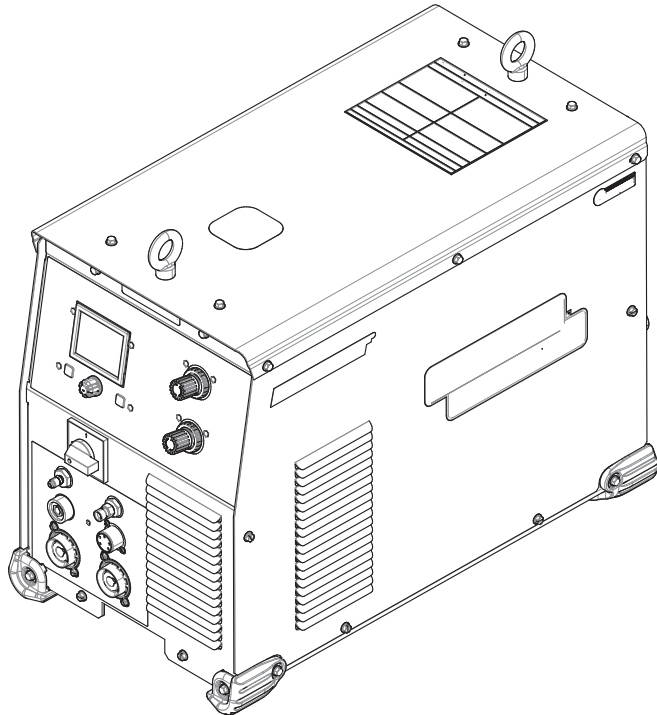




Operator's Manual

FlexCut[®] 200



For use with machines having Code Numbers:
12731, 12825



Register your machine:

www.lincolnelectric.com/register

Authorized Service and Distributor Locator:

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.

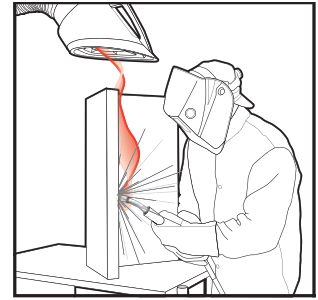
READ and obey the Safety Data Sheet (SDS) and the warning label that appears on all containers of welding materials.

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

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

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.

- 1.a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.
- 1.b. Operate engines in open, well-ventilated areas or vent the engine exhaust fumes outdoors.
- 1.c. Do not add the fuel near an open flame welding arc or when the engine is running. Stop the engine and allow it to cool before refueling to prevent spilled fuel from vaporizing on contact



with hot engine parts and igniting. Do not spill fuel when filling tank. If fuel is spilled, wipe it up and do not start engine until fumes have been eliminated.

- 1.d. Keep all equipment safety guards, covers and devices in position and in good repair. Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.
- 1.e. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.
- 1.f. Do not put your hands near the engine fan. Do not attempt to override the governor or idler by pushing on the throttle control rods while the engine is running.
- 1.g. To prevent accidentally starting gasoline engines while turning the engine or welding generator during maintenance work, disconnect the spark plug wires, distributor cap or magneto wire as appropriate.
- 1.h. To avoid scalding, do not remove the radiator pressure cap when the engine is hot.



ELECTRIC AND MAGNETIC FIELDS MAY BE DANGEROUS



- 2.a. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding current creates EMF fields around welding cables and welding machines
- 2.b. EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.
- 2.c. Exposure to EMF fields in welding may have other health effects which are now not known.
- 2.d. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:
 - 2.d.1. Route the electrode and work cables together - Secure them with tape when possible.
 - 2.d.2. Never coil the electrode lead around your body.
 - 2.d.3. Do not place your body between the electrode and work cables. If the electrode cable is on your right side, the work cable should also be on your right side.
 - 2.d.4. Connect the work cable to the workpiece as close as possible to the area being welded.
 - 2.d.5. Do not work next to welding power source.



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.



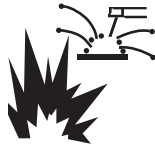
FUMES AND GASES CAN BE DANGEROUS.



- 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 1R3, Canada.
19. Canadian Electrical Code Part 1, Safety Standard for Electrical Installations, obtainable from the Canadian Standards Association, 178 Rexdale Boulevard, Toronto, Ontario M9W 1R3, Canada.

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Parts List parts.lincolnelectric.com

Content/details may be changed or updated without notice. For most current Instruction Manuals, go to parts.lincolnelectric.com.

**TECHNICAL SPECIFICATIONS -
K4812-1 FlexCut® 200**
POWER SOURCES - INPUT VOLTAGE AND CURRENT

MODEL	DUTY CYCLE	INPUT VOLTAGE \pm 10%	INPUT AMPERES	IDLE POWER (W)	POWER FACTOR
K4812-1	100% rating	380- 400- 415 / 460 /575	71 / 63 / 55	225	.95

POWER SOURCES - RECOMMENDED INPUT WIRE AND FUSE SIZES¹

VOLTAGE	INPUT AMPERES	FUSE (SUPER LAG) OR BREAKER SIZE ²	TYPE 75C COPPER WIRE IN CONDUIT AWG (IEC) SIZES 40C (104°F) AMBIENT	TYPE 75C COPPER GROUND WIRE IN CONDUIT AWG (IEC) SIZES
380-400-415V/3/50/60	71	80	4 (25)	8 (10)
460V/3/50/60	63	70	4 (25)	8 (10)
575V/3/50/60	55	60	6 (16)	10 (6)

- 1 Cord and Fuse Sizes based upon the U.S. National Electric Code and maximum output
- 2 Also called 'inverse time' or 'thermal/magnetic' circuit breakers; circuit breakers that have a delay in tripping action that decreases as the magnitude of

RATED OUTPUT AT 40° C

DUTY CYCLE	CURRENT	VOLTAGE
100%	200A	190 VDC

OUTPUT

CURRENT RANGE	OPEN CIRCUIT VOLTAGE	PILOT CURRENT
20 - 200 Amps	300 VDC	30 Amps

AGENCY APPROVALS

MARKET	CONFORMITY MARK	STANDARD
US and Canada	cCSA _{US}	CAN/CSA-E60974-1 ANSI/IEC 60974-1

*In some countries U_0 is also known as OCV (see CAN/CSA - W117.2)

GAS

PLASMA GAS MAXIMUM FLOW RATE	SHIELD GAS MAXIMUM FLOW RATE	INLET GAS PRESSURE RATINGS
67 SCFH (1897 LPH) Oxygen or Air	19 SCFH (538 LPH) – Oxygen 225 SCFH (6371 LPH) – Air or Nitrogen	minimum - 90 psi (6.2 bar) nominal - 110 psi (7.6 bar) maximum - 130 psi (9.0 bar)

PHYSICAL DIMENSIONS

Height	Width	Depth	Weight
23.66 in (60.1 cm)	15.97 in (40.6 cm)	32.19 in (81.8 cm)	190 lbs (86.2 kg)

TEMPERATURE RANGES

OPERATING TEMPERATURE	STORAGE TEMPERATURE	INSULATION CLASS
14°F to 104°F (-10C to 40C)	-40°F to 185°F (-40C to 85C)	Class F (155°C)

GENERAL DESCRIPTION

The FlexCut® 200 is designed for mechanized plasma cutting applications.

The FlexCut® 200 is a high performance, digitally controlled inverter plasma cutter. It is capable of producing 200A of plasma cutting current at a 100% duty cycle. It utilizes complex, high-speed waveform control to support cutting, grid and gouge modes of operation along with a precision, dual gas torch that is capable of piercing mild steel up to 1-1/2" thick and severance cut up to 3".

The FlexCut® 200 power source is designed to be a part of a complete cutting system in combination with the FlexCool® cooler and FlexStart® arc start console. The FlexCut® 200 is primarily designed to interface with Lincoln Electric® Cutting Systems tables and pipe cutters. However, it can also be utilized to upgrade your plasma cutting power source on a variety of existing applications. The result is a highly integrated and flexible plasma cutter.

The FlexCut® 200 is designed for use with the liquid-cooled torch head and base listed below.

RECOMMENDED PROCESSES

The FlexCut® 200 is designed for plasma cutting. Each machine is factory programmed with 4 modes of operation: cut, grid, gouge, and mark. The FlexCut® 200 carries an output rating of 200 amps, 190 volts (at 100% duty cycle).

PROCESS LIMITATIONS

The FlexCut® 200 is suitable only for the processes listed. Do not use the FlexCut® 200 for pipe thawing applications.

EQUIPMENT LIMITATIONS

Operating Temperature Range is -10° C to + 40° C.

The FlexCut® 200 will support a maximum average output current of 200 Amps at 100% Duty Cycle.

USER RESPONSIBILITY

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

The FlexCut® 200 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.

- 200A/ 100% Duty Cycle Plasma Cutting System
- Production Piercing of 1.25" (32 mm) @ 25 ipm
- Production Edge start of 2.00" (50 mm) @ 8 ipm
- Production Severance of 3.00" @ 5ipm
- Proven reliable inverter engine
- Highest power to weight ratio
- Long consumable life
- Excellent cut quality
- HMI control of the FlexCut® 200 when integrated with Lincoln Electric® Cutting Systems tables and pipe cutters
- HMI display of feedback from the FlexCut® 200 for output current, output voltage, plasma pressure, shielding pressure, ok to move, and any power source errors
- Capable of working with other torch height controls using an integrated voltage divider board, providing options of raw arc voltage as well as divided voltages of 20:1, 30:1, 40:1 and 50:1
- Optional integration kit which provides capability for remote current control via an analog voltage, a hold signal to delay firing the pilot until removed, and a corner current reduction signal to reduce output current for more square corners
- Plasma marking capability
- Circuit breaker protected 15-amp auxiliary power
- F.A.N. (fan as needed). Cooling fan runs when the output is energized
- Thermal protection by thermostats with thermal indicator LED
- Built-in Line Voltage Compensation holds the output constant over $\pm 10\%$ input voltage fluctuations
- Modular construction for easy servicing
- Electronic over current protection
- Input over voltage protection
- Utilizes digital signal processing and microprocessor control
- Simple, reliable input voltage changes
- Conforms to the IEC 60974-1 and GB/T15579-2013 Standards

INSTALLATION

READ ENTIRE INSTALLATION SECTION BEFORE INSTALLING THE FlexCut® 200 .

WARNING

ELECTRIC SHOCK CAN KILL.

- **TURN OFF INPUT POWER TO THE POWER SOURCE AT THE DISCONNECT SWITCH OR FUSE BOX BEFORE WORKING ON THIS EQUIPMENT. TURN OFF THE INPUT POWER TO ANY OTHER EQUIPMENT CONNECTED TO THE WELDING SYSTEM AT THE DISCONNECT SWITCH OR FUSE BOX BEFORE WORKING ON THE EQUIPMENT.**
- **DO NOT TOUCH ELECTRICALLY HOT PARTS.**
- **ALWAYS CONNECT THE GROUNDING LUG (LOCATED UNDERNEATH THE INPUT TERMINAL BLOCK) TO A PROPER SAFETY (EARTH) GROUND.**



LOCATION AND VENTILATION FOR COOLING

Place the machine where clean cooling air can freely circulate in through the rear louvers and out through the case sides and front. Maintain at least 10 inches (25 cm) of space on all sides of the unit. Dirt, dust, or any foreign material that can be drawn into the machine should be kept at a minimum. A properly installed machine will allow for dependable service and reduced periodic maintenance time. Failure to observe these precautions can result in excessive operating temperatures and nuisance shutdowns.

LIFTING

Lift the machine by the lift bails only. In order to prevent damage, the power supply should be lifted by both lift bales while keeping the unit as horizontal as possible. Only hoisting straps approved for the weight of the machine should be used. The lifts bails are designed to lift the power source with an attached FlexCool™ 35.

STACKING

The FlexCut® 200 cannot be stacked. It is designed to be mounted on top of the FlexCool™ 35.

TILTING

The FlexCut® 200 must be placed on a stable, level surface so it will not topple over.

ENVIROMENTAL LIMITATIONS

The FlexCut® 200 is IP23 rated for use in an outdoor environment. The FlexCut® 200 should not be subjected to falling water during use nor should any parts of it be submerged in water or snow. Doing so may cause improper operation as well as pose a safety hazard. The best practice is to keep the machine in a dry, sheltered area.

Do not mount the FlexCut® 200 over combustible surfaces. Where there is a combustible surface directly under stationary or fixed electrical equipment, that surface shall be covered with a steel plate at least .060" (1.6mm) thick, which shall extend not less than 5.90"(150mm) beyond the equipment on all sides.

HIGH FREQUENCY INTERFERENCE PROTECTION

The FlexCut® 200 employs a solid state high frequency generator. Locate the FlexCut® 200 away from radio controlled machinery. The normal operation of the FlexCut® 200 may adversely affect the operation of RF controlled equipment, which may result in bodily injury or damage to the equipment. By taking the following steps, high frequency interference to the machine and the environment it is used in 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. The FlexStart® console should be mounted as close to the torch as possible. A ground cable should be connected from the FlexStart® enclosure to the cutting table. The table should be grounded.
3. Where possible, the output cables should be separated from the control cables by a minimum of 6"(15 cm).

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.

INPUT CONNECTION

⚠ WARNING

ELECTRIC SHOCK CAN KILL.

ONLY A QUALIFIED ELECTRICIAN SHOULD CONNECT THE INPUT LEADS TO THE FlexCut. CONNECTIONS SHOULD BE MADE IN ACCORDANCE WITH ALL LOCAL AND NATIONAL ELECTRICAL CODES AND THE CONNECTION DIAGRAM LOCATED ON THE INSIDE OF THE RECONNECT/INPUT ACCESS DOOR OF THE MACHINE. FAILURE TO DO SO MAY RESULT IN BODILY INJURY OR DEATH.



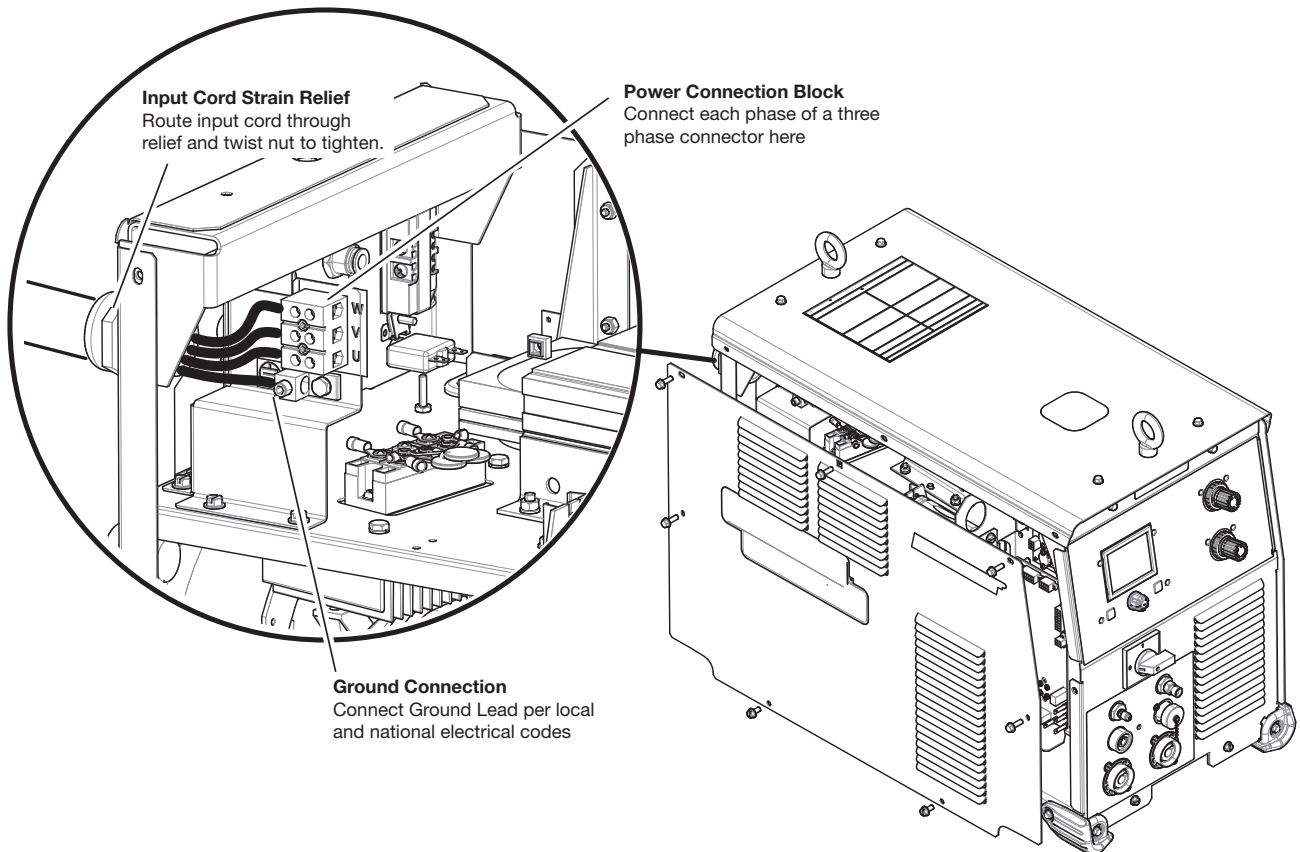
Use a three-phase supply line. A 1.75 inch (45 mm) diameter access hole for the input supply is located on the case back. Connect L1, L2, L3 and ground per connection diagrams and National Electric Code. To access the input power connection block, remove the seven screws and the left case side of the machine as shown.

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

INPUT FUSE & 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

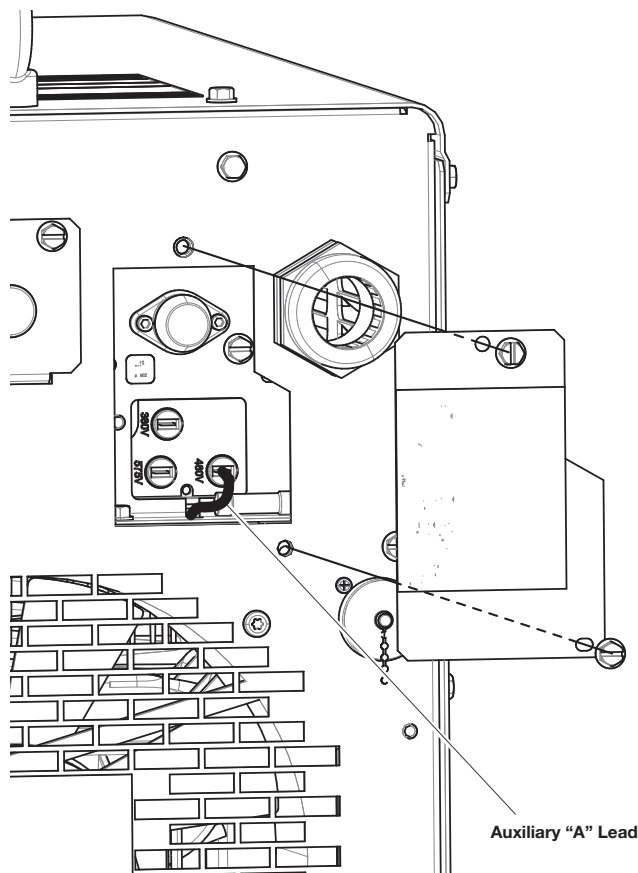


INPUT VOLTAGE SELECTION

The FlexCut® 200 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, display an error, or the fuse may open. Should the fuse open, remove input power, replace the fuse, reconnect the “A” lead to the correct voltage and re-apply power.

FIGURE A.2



GAS SUPPLY REQUIREMENTS

Supply the FlexCut® 200 with clean, dry, oil-free compressed air, nitrogen or oxygen. A high pressure regulator **MUST** be used with a compressor or a high pressure cylinder. Flashback arrestors are to be used with applicable gases.

Supply pressure must be between 90-120 psi (6.21 - 8.27 bar) with flow rates of at least 300 SCFH or 8500 LPH.

⚠ WARNING

Air supply pressure should never exceed 130 psi (8.96 BAR) or damage to the machine may occur!

The FlexCut® 200 is supplied with 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.

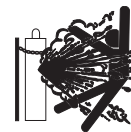
Specify dry air when using compressed cylinders. Breathing quality air contains moisture and should not be used.

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 (8.96 BAR).



CONNECTING THE GAS SUPPLY

Air must be supplied to the FlexCut® 200 with 3/8" inside diameter tubing and a 1/4" NPT quick disconnect coupler. Nitrogen or oxygen can be supplied to the machine using the dual gas kit provided (see F3-F6).

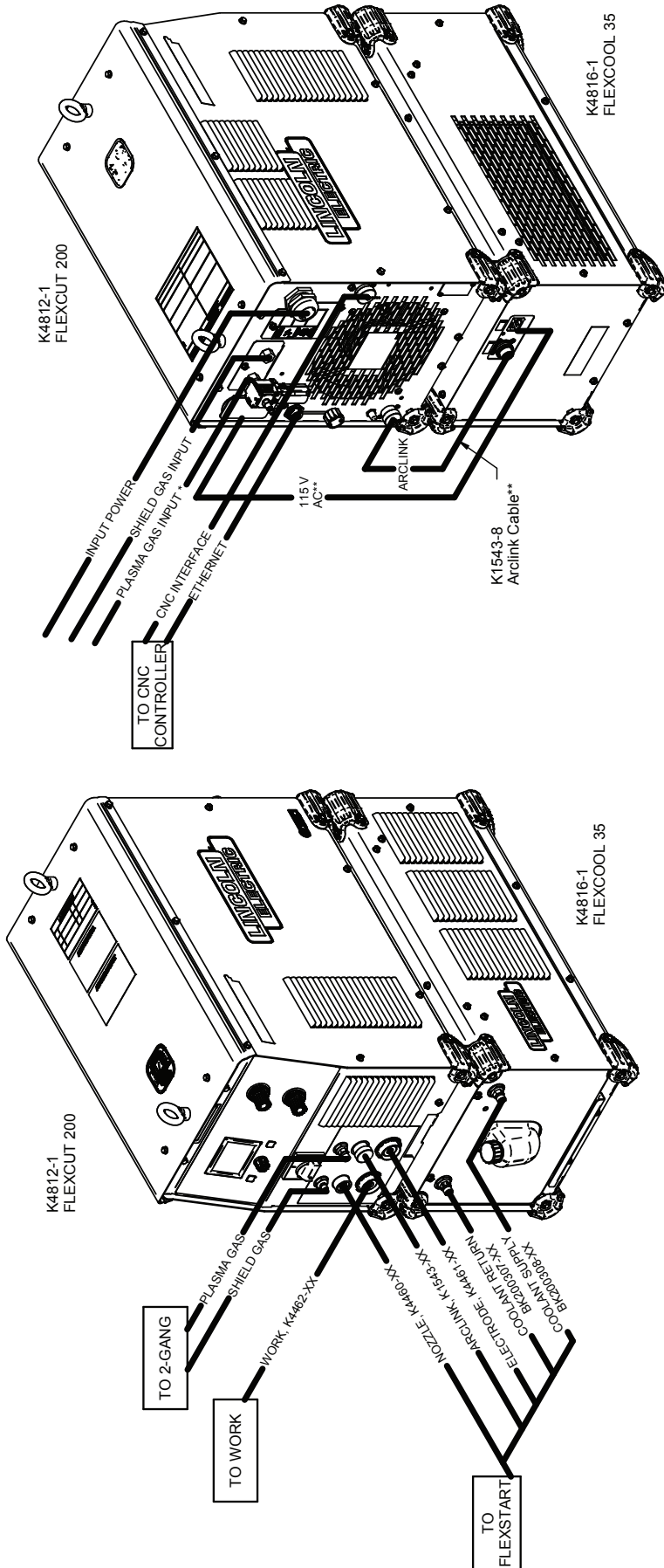
OUTPUT CONNECTIONS

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.

SYSTEM OVERVIEW

The FlexCut® 200 power source is designed to be a part of a modular cutting system typically controlled by a Torchmate® HMI. Reference the list of recommended equipment in Technical Specifications for equipment referenced in the following connection diagrams. The connection diagrams depict the layout of typical systems.

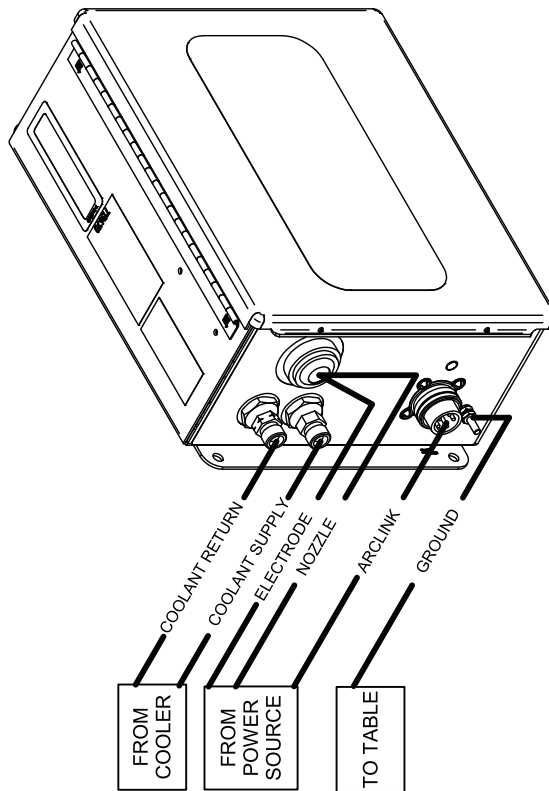
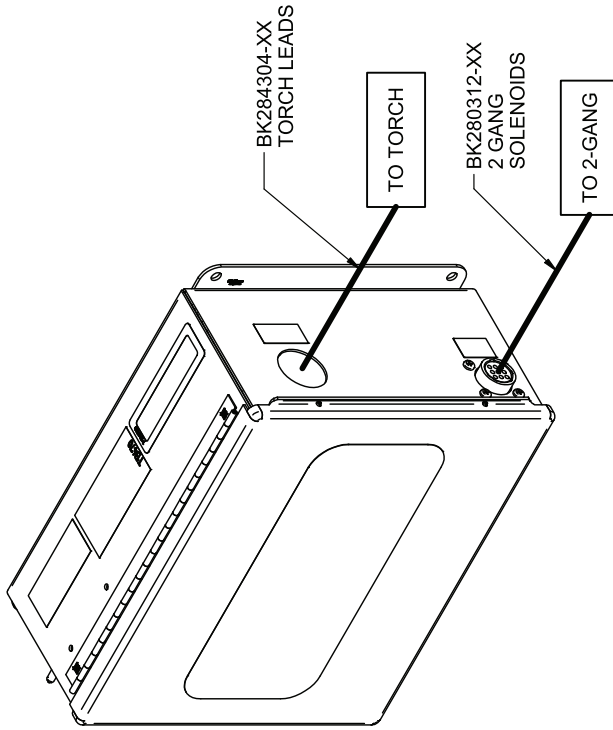
CONNECTION DIAGRAM



* NOTE MACHINE IS FACTORY CONFIGURED FOR AIR/AIR CUTTING. CONSULT IM FOR ALTERNATE GAS CUTTING CONFIGURATIONS

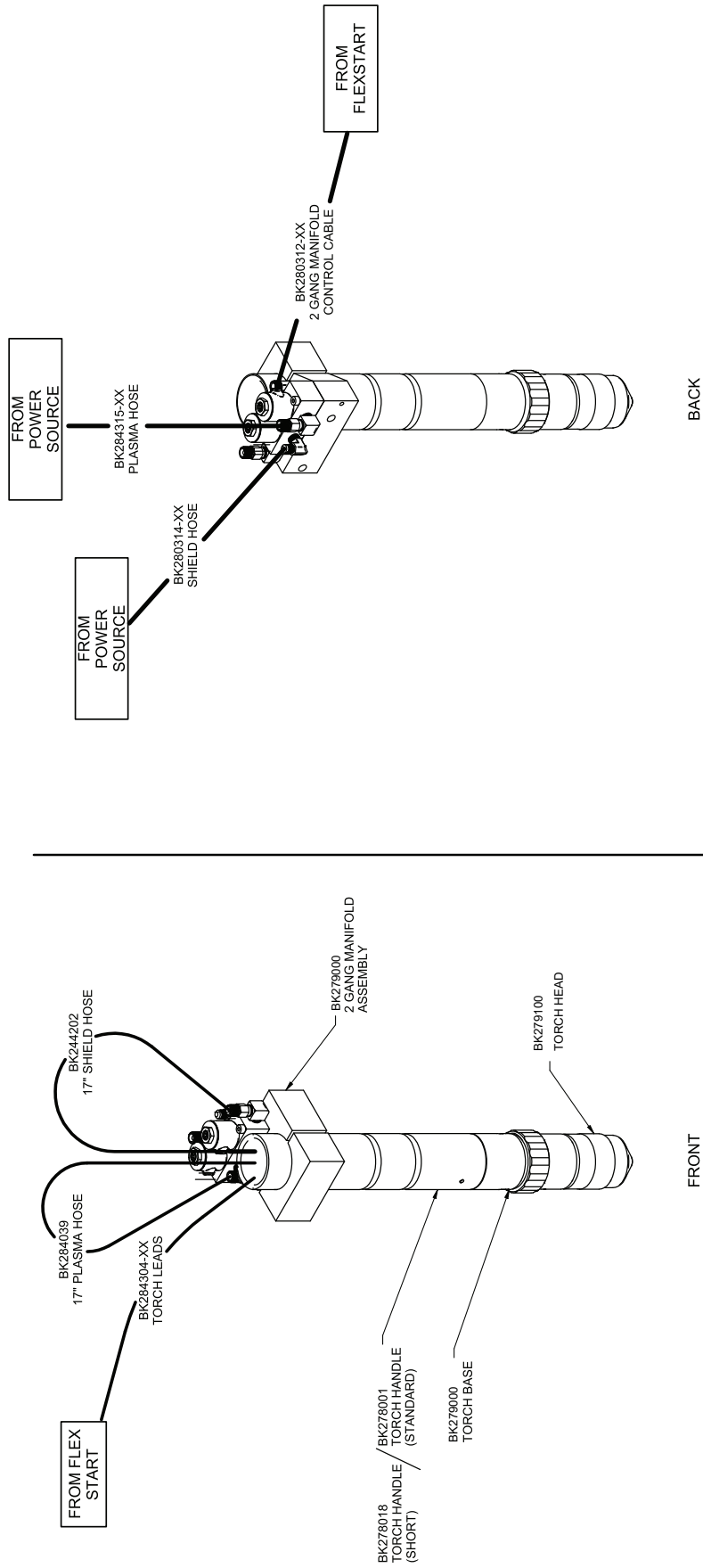
** SUPPLIED WITH COOLER

CONNECTION DIAGRAM

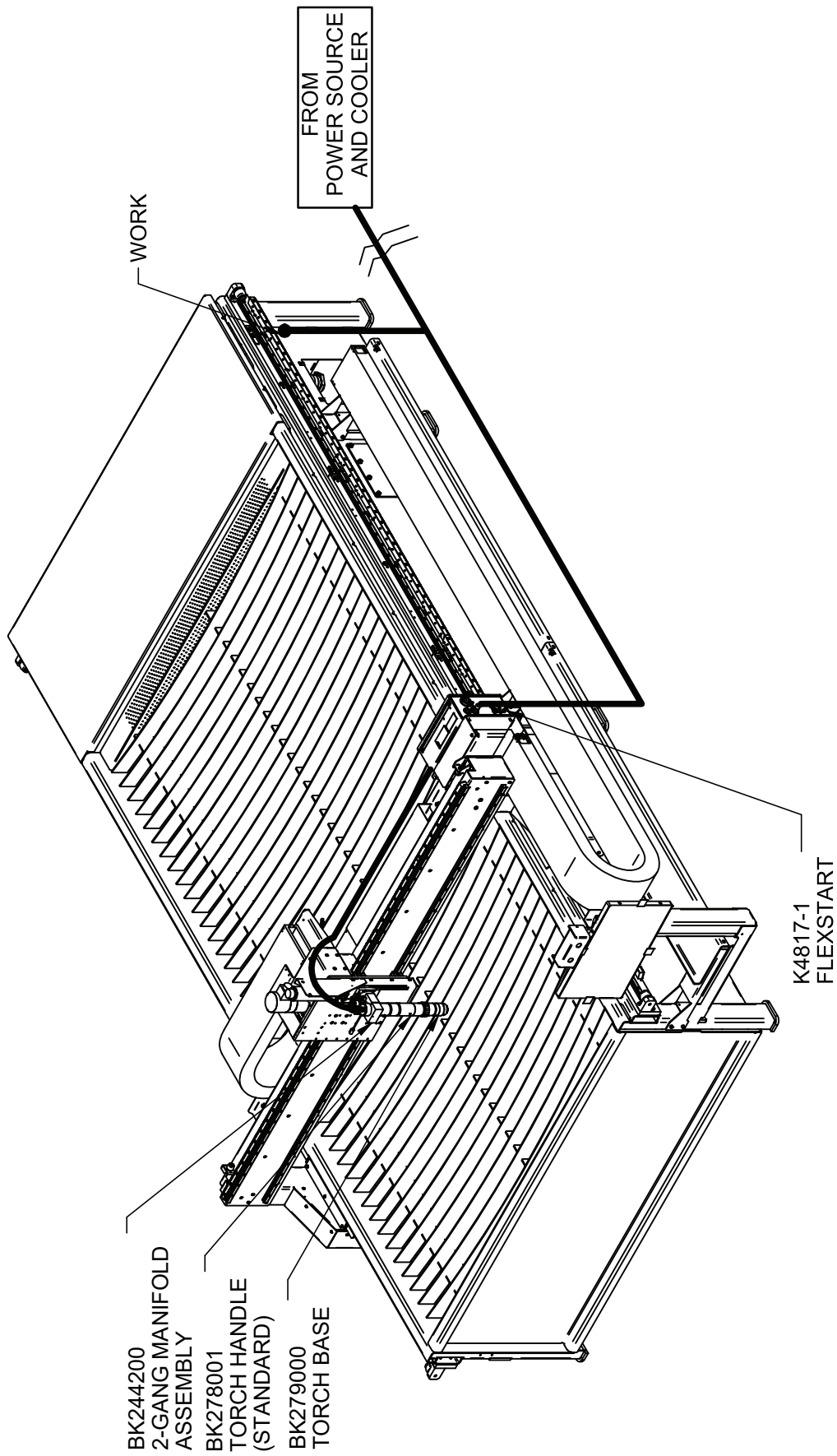


CONNECTION DIAGRAM

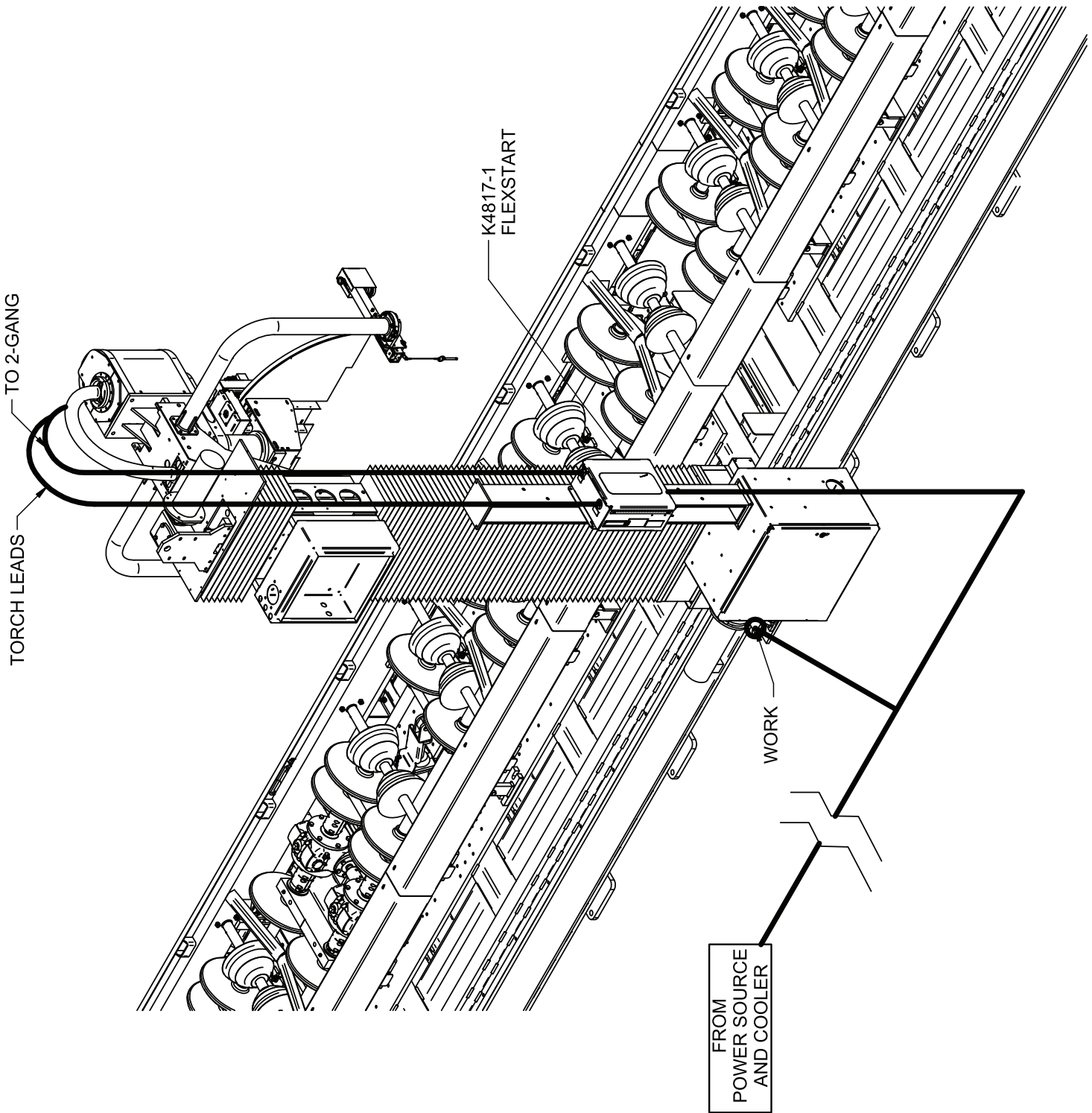
TORCH CONNECTIONS



CONNECTION DIAGRAM



CONNECTION DIAGRAM



POWER SUPPLY OUTPUT CONNECTIONS

Perform the following steps to connect the output of the FlexCut to the FlexStart® arcstart console and the cutting equipment.

Electrode Lead

Connect the twist mate connector of the #1/0 AWG electrode cable to the “electrode” connector on the power source (located at the lower right on the front of the machine). Route the other end of the cable through the strain relief on the FlexStart® arcstart console and connect it to the cathode manifold.

Nozzle Lead

Connect the twist mate connector of the #6 AWG nozzle cable to the “nozzle” connector on the power source (located on the lower left on the front of the machine above the work connector). Route the other end of the cable through the strain relief on the FlexStart® arcstart console and connect it to the HFByPass PCB.

Work Lead

Connect the twist mate connector of the #1/0 AWG work cable to the “work” connector on the power source (located on the lower left of the front of the machine). Connect the other end of the work lead to the start ground point on the cutting system. Be sure the connection to the work makes tight metal-to-metal electrical contact.

CONTROL CABLE CONNECTIONS

General Guidelines

Genuine Lincoln Electric® control cables should be used at all times (except where noted otherwise). Lincoln Electric® cables are specifically designed for the communication and power needs of the systems. Most are designed to be connected end to end for ease of extension. Generally, it is recommended that the total length not exceed 100 feet (30.5 m). The use of non-standard cables, especially in lengths greater than 25 feet, can lead to communication problems (system shutdowns). Always use the shortest length of control cable possible, and DO NOT coil excess cable.

Regarding cable placement, best results will be obtained when control cables are routed separate from the output power cables. This minimizes the possibility of interference between the high currents flowing through the output power cables, and the low level signals in the control cables. These recommendations apply to all communication cables including optional CNC and Ethernet connections.

Common Equipment Connections

Connection Between the FlexCut 200, FlexCool 35 and FlexStart

A K1543-8 5 pin ArcLink control cable is provided with the FlexCool 35 to provide connection between the ArcLink connector located on the back of the FlexCut®200 and the receptacle on the back of the FlexCool 35. A K1543-XX control cable is needed to connect the FlexCut®200 to the FlexStart® console.

The FlexStart® console should be placed as close to the torch as possible. The recommended combined length of the ArcLink control cable network should not exceed 100ft.

The control cable consists of two power leads, one twisted pair for digital communication, and one lead used in welding applications for voltage sensing. The control cable is keyed and polarized to prevent improper connection. Control cables should not be routed with welding cables.

Connection Between the FlexStart and the 2-Gang Valve

The BK280312-XX 9 pin cable connects the FlexStart® console to the 2-Gang torch valve. The FlexStart® should be placed as close as possible to the torch in order to minimize the cable length of the control cable.

The control cable consists of two leads to drive the plasma solenoid and two leads to drive the shield solenoid.

Connection Between the FlexCut® 200 and HMI

FlexCut 200 is equipped with an 8P8CRJ45 style ethernet jack for this purpose. The receptacle is located on the rear panel of the machine.

Note: Ethernet cables should not be routed with weld cables, wire drive control cables, or any other current carrying device that can create a fluctuating magnetic field.

In a typical system, an ethernet cable is used to connect the power source to a network switch, which connects to the other components of the system.

OPERATION

SAFETY PRECAUTIONS

WARNING

ELECTRIC SHOCK can kill.

- Do not touch electrically live parts or torch with your skin or wet clothing
- Insulate yourself from the 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.



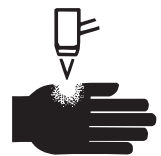
ARC RAYS can burn.

- 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.

POWER-UP SEQUENCE

When power is applied to the FlexCut® 200 the User Interface will initialize, during this time the system will purge plasma and shielding gas while circulating coolant for 30 seconds.. This is normal and indicates FlexCut® 200 is performing a self test, and mapping (identifying) each component in the local ArcLink system. The UI and status lights of the FlexStart® and FlexCool™ will flash green as a result of a system reset or configuration change during operation. When the UI displays the cut settings and the status lights on the FlexStart® and FlexCool™ become steady green the system is ready for normal operation.

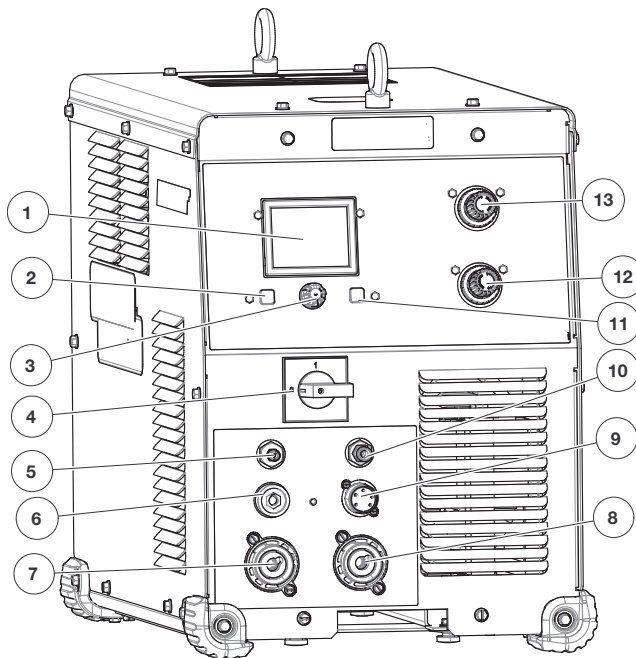
If the status lights do not become steady green consult the troubleshooting section of this manual for further instruction.

GRAPHIC SYMBOLS THAT APPEAR ON THIS MACHINE OR IN THIS MANUAL

	WARNING OR CAUTION		REMOTE
	GAS PURGE		ETHERNET
	READ INSTRUCTION MANUAL		ELECTRODE
	PROTECTIVE GROUND		NOZZLE
	GAS INPUT		WORK
	CUT		
	GRID or EXPANDED METAL		
	GOUGE		
	MARKING		
	POWER ON		
	POWER OFF		
	PLASMA GAS		
	SHIELD GAS		

CASE FRONT CONTROLS

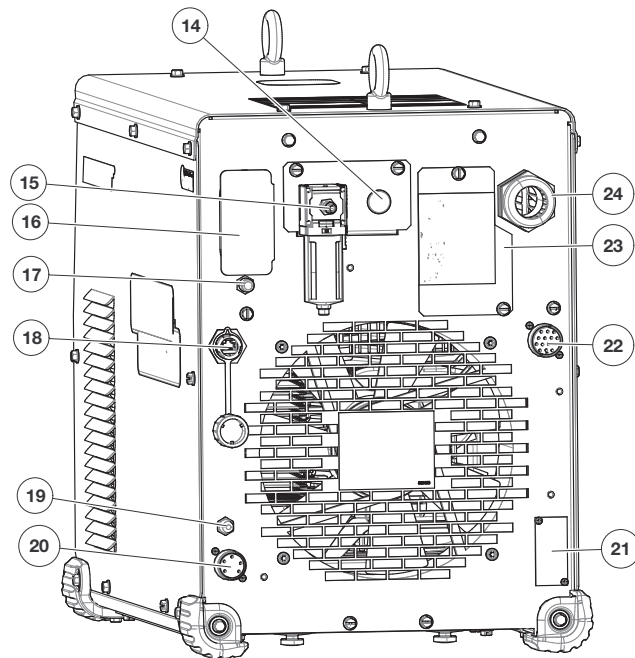
FIGURE B.1



1. **LCD Display:** Shows available modes and real time parameters and system errors.
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. **On/Off Switch:** Turns the input power to the machine ON/OFF.
5. **Shield Gas Outlet:** Connect a gas hose from here to the shield gas inlet on the torch.
6. **Nozzle Lead Connection:** Connect a #6 AWG cable from here to pilot connection in FlexStart® console.
7. **Work Lead Connection:** Connect a 1/0 AWG cable from here to cutting table.
8. **Electrode Lead Connection:** Connect a 1/0 AWG cable from here to electrode connection in the FlexStart® console.
9. **ArcLink Connector (5 Pin):** Provides power and communication to the FlexStart® console.
10. **Plasma Gas Outlet:** Connect gas hose from here to 2-Gang plasma gas inlet.
11. **Purge:** Allows the user to enable airflow from the machine for both plasma and shielding gas.
12. **Shield Gas Regulator:** Allows the regulation of the shield air/gas pressure.
13. **Plasma Gas Regulator:** Allows the regulation of the plasma air/gas pressure.

CASE BACK CONTROLS

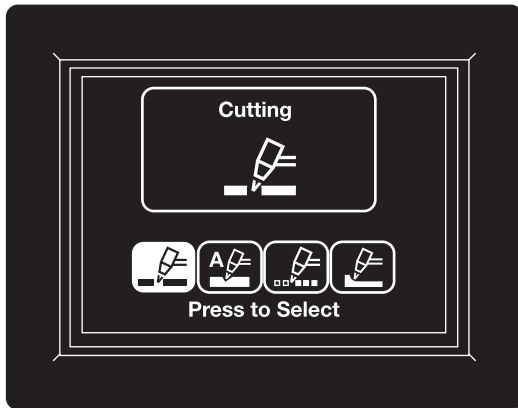
FIGURE B.2



14. **Shielding Gas Inlet (optional):** Allows ability for independent air/gas to be connected for shield .
15. **Plasma Gas Inlet:** Compressed air or gas connection.
16. **115V/10A Auxiliary Power Receptacle.**
17. **10 Amp Circuit Breaker (CB-2):** Protects the 115V Auxiliary Power Receptacle.
18. **Ethernet Connector (RJ-45):** Used for ArcLink® XT communication.
19. **10 Amp Circuit Breaker (CB-2):** Protects the 40V ArcLink Power Supply
20. **ArcLink Connector (5 Pin):** Provides power and communication to the FLEXCOOL cooler.
21. **Analog Terminal Strip (optional):** Provides additional input controls for corner current reduction, hold, and remote potentiometer control.
22. **14-Pin CNC Interface:** Allows access to Arc Start Trigger, Arc Initiated contact, raw or divided voltage Arc Voltage, and Forced Mark.
23. **Reconnect Panel Access:** Allows the unit to be configured for 380/400/415, 460, or 575 VAC input.
24. **Input Cord Strain Relief:** Used to connect the unit to input power.

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.



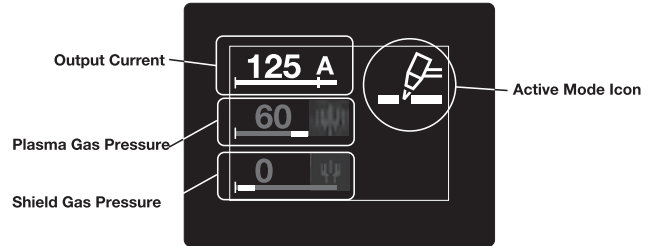
Grid – For cutting operations on a non-continuous workpiece.



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

Upon power up the machine will default to the last used mode and workpoint, if this is the first power up the machine will default to a cut mode and the maximum work point on the display. Pressing the “HOME” button will allow the user to select between the 4 different modes of operations. These modes can be selected by depressing the Menu Control Knob/Button of the desired highlighted box. Use of the User Interface is locked out should the machine be connected to an HMI control via the Ethernet port on the back of the machine.

FIGURE B.4 - ACTIVE MODE SCREEN



The Active Mode Screen will display the following information:

Active Mode Icon- The currently selected mode icon will be displayed here. To select a new mode, press the HOME button and choose the desired mode, or utilize the HMI. When being controlled remotely via the System HMI, the mode icon will be grayed out.

Output Current – Turn the control knob to adjust the desired output current, or update with the HMI. While cutting, the screen will display the actual cutting current in Amps. Output current range is dependent on the mode selected..

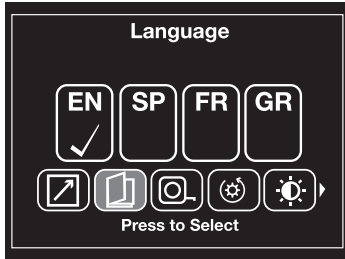
Plasma Gas Pressure- The plasma gas pressure is displayed on a linear scale, with the center of the green range as the recommended plasma gas pressure based on the selected mode. Use the plasma gas regulator knob on the front of the machine to adjust the plasma gas pressure. It is recommended that this be done only while gas is flowing. Hold the PURGE button to the right of the control knob while pulling out and then turning the plasma gas regulator knob to adjust the pressure to the desired setting. A purge command can also be initiated via the HMI.

Shield Gas Pressure- The shield gas pressure is also displayed on a linear scale, with the center of the green range as recommended shield gas pressure based on the selected mode. Use the shield gas regulator knob on the front of the machine to adjust the shield gas pressure. It is recommended that this be done only while gas is flowing. Hold the PURGE button while pulling out and then turning the shield gas regulator knob to adjust the pressure to the desired setting. A purge command can also be initiated via the HMI.

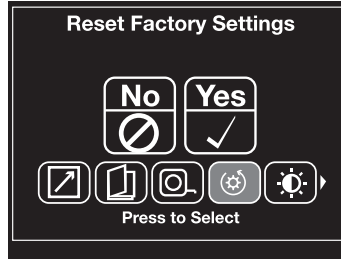
Settings

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

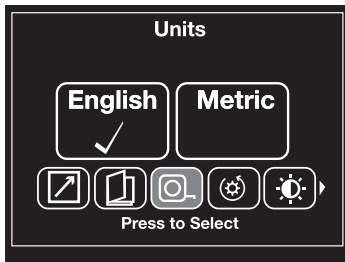
Options (turn the knob to scroll and press the knob to select):



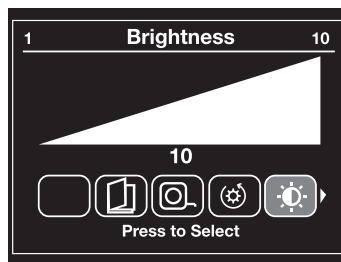
Language – Choose between English, Spanish, French, or German



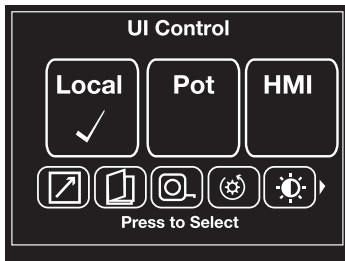
Reset Factory Settings – Use to restore the machine back to the factory settings



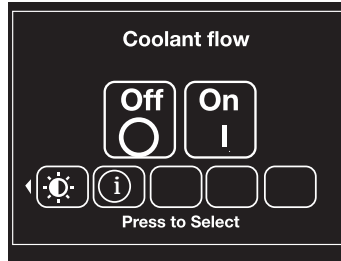
Units – Choose between English or Metric units



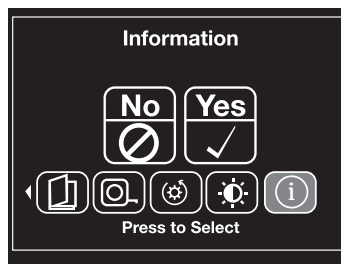
Brightness – Used to dim or brighten the LCD display



UI Control - Set the control of the machine to “local”, “pot”, or “HMI”. “Local” control (default) allows mode and workpoint changes with the knob and buttons on the front of the machine. “Pot” control allows the current to be adjusted with a 10kΩ potentiometer connected through the analog terminal strip (optional). “HMI” control allows the HMI controller of the plasma cutting table to set the mode and workpoint of the machine.



Coolant flow – Allows manual control over the coolant pump for priming or troubleshooting purposes.



Advanced – Used for diagnostic purposes

MACHINE INTERFACE

The FlexCut® 200 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.5

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:

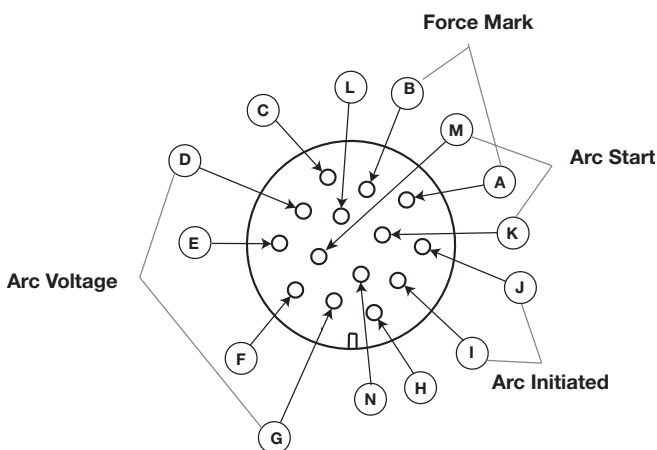
The Arc Voltage circuit can be used for activating a torch height control. This circuit can be accessed through pins D and G of the 14 pin connector. The circuit provides full electrode to work arc voltage (300VDC maximum). A divided arc voltage of 20:1, 30:1, 40:1 or 50:1 is available. See “Accessing 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.5



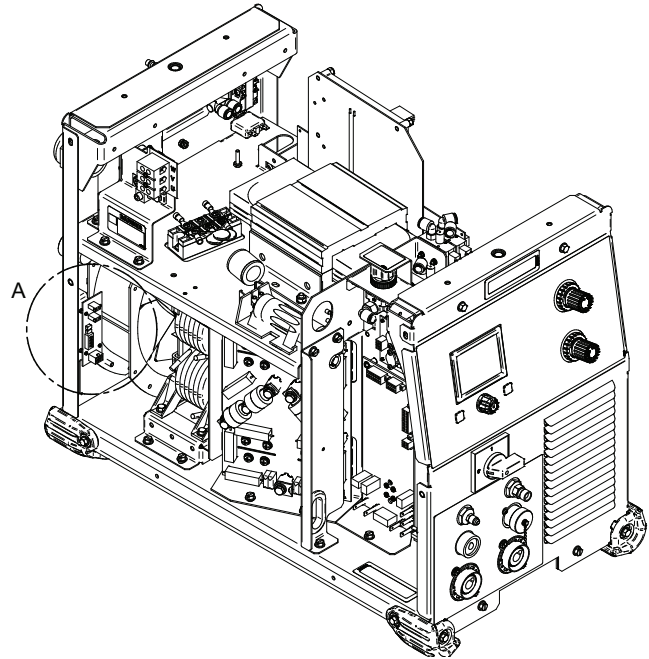
14-PIN BOX RECEPTACLE, FRONT VIEW

ACCESSING DIVIDED ARC VOLTAGE

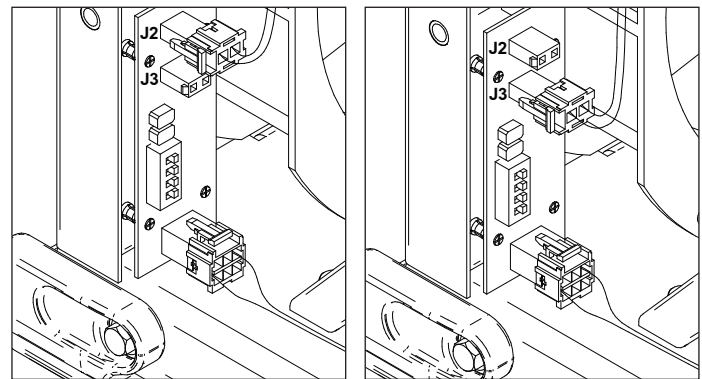
The Flexcut™ 200 is factory set to provide raw arc voltage through the 14 pin CNC Connector.

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:

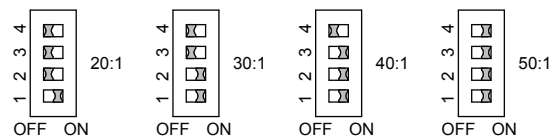
1. Turn off and disconnect the Flexcut™ 200 from incoming power.
2. Remove the left case side (left side while viewing the front of the machine).
3. Located in the lower left rear corner is the voltage divider board.



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



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



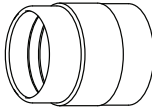
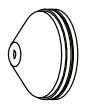
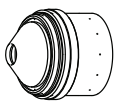



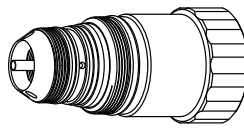
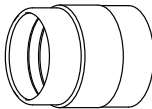
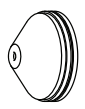
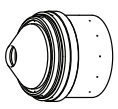



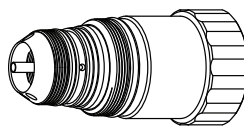
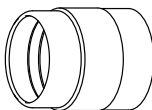
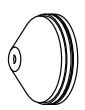
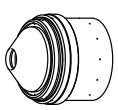



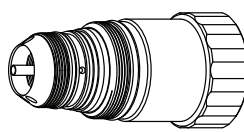
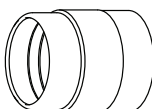
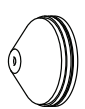
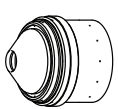



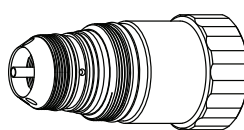
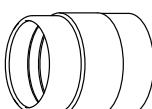
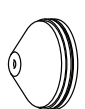
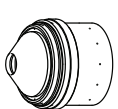



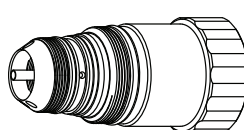
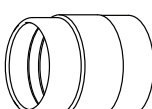
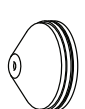
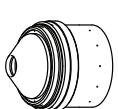



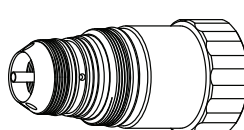
6. Reinstall the left case side.
7. Apply power to the machine and confirm output voltage during operation.

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.

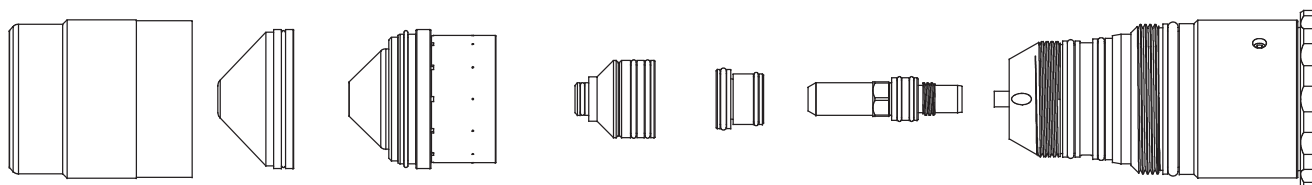
MATERIAL	CURRENT	PAGE
CONSUMABLES		B-7
MILD STEEL - AIR PLASMA / AIR SHIELD	50 AMPS	B-8
MILD STEEL - AIR PLASMA / AIR SHIELD	100 AMPS	B-9
MILD STEEL - AIR PLASMA / AIR SHIELD	150 AMPS	B-10
MILD STEEL - AIR PLASMA / AIR SHIELD	200 AMPS	B-13
STAINLESS STEEL - AIR PLASMA / AIR SHIELD	50 AMPS	B-12
STAINLESS STEEL - AIR PLASMA / AIR SHIELD	100 AMPS	B-13
STAINLESS STEEL - AIR PLASMA / AIR SHIELD	150 AMPS	B-14
STAINLESS STEEL - AIR PLASMA / AIR SHIELD	200 AMPS	B-15
ALUMINUM - AIR PLASMA / AIR SHIELD	50 AMPS	B-16
ALUMINUM - AIR PLASMA / AIR SHIELD	100 AMPS	B-17
ALUMINUM - AIR PLASMA / AIR SHIELD	150 AMPS	B-18
ALUMINUM - AIR PLASMA / AIR SHIELD	200 AMPS	B-19
CONSUMABLES		B-20
MILD STEEL - OXYGEN PLASMA / OXYGEN OR AIR SHIELD	50 AMPS	B-21
MILD STEEL - OXYGEN PLASMA / AIR SHIELD	100 AMPS	B-22
MILD STEEL - OXYGEN PLASMA / AIR SHIELD	150 AMPS	B-23
MILD STEEL - OXYGEN PLASMA / AIR SHIELD	200 AMPS	B-24
CONSUMABLES		B-25
STAINLESS STEEL - AIR PLASMA / NITROGEN SHIELD	50 AMPS	B-26
STAINLESS STEEL - AIR PLASMA / NITROGEN SHIELD	100 AMPS	B-27
STAINLESS STEEL - AIR PLASMA / NITROGEN SHIELD	150 AMPS	B-28
STAINLESS STEEL - AIR PLASMA / NITROGEN SHIELD	200 AMPS	B-29
ALUMINUM - AIR PLASMA / NITROGEN SHIELD	50 AMPS	B-30
ALUMINUM - AIR PLASMA / NITROGEN SHIELD	100 AMPS	B-31
ALUMINUM - AIR PLASMA / NITROGEN SHIELD	150 AMPS	B-32
ALUMINUM - AIR PLASMA / NITROGEN SHIELD	200 AMPS	B-33

**SELECTING CONSUMABLES -
AIR PLASMA / AIR SHIELD**

	Outer Retaining Cap	Shield Cap	Inner Retaining Cap	Nozzle	Swirl Ring	Electrode	Torch Head
50A MS/AL	BK284150 	BK277150 	BK277153 	BK277125 	BK277142 	BK277131 	BK279100 
50A SS	BK284150 	BK277149 	BK277110 	BK277123 	BK277142 	BK277137 	BK279100 
100A MS/SS/AL	BK284150 	BK277117 	BK277152 	BK277293 	BK277139 	BK277292 	BK279100 
150A MS/SS/AL	BK284150 	BK277274 	BK277266 	BK277289 	BK277143 	BK277291 	BK279100 
200A MS	BK284150 	BK277263 	BK277266 	BK277269 	BK277258 	BK277270 	BK279100 
200A SS/AL	BK284150 	BK277263 	BK277266 	BK277276 	BK277258 	BK277270 	BK279100 

50 Amps - Mild Steel

BK284150 BK277150 BK277153 BK277125 BK277142 BK277131 BK279100



Imperial*

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(ga)	(in)	(psi)	(psi)		(ipm)	(in)	(in)	(ms)	(in)	
26 ga	0.018	74	19	124	450	0.100	0.200	0	0.040	
24 ga	0.024			124	450	0.100	0.200	0	0.040	
22 ga	0.030			124	450	0.100	0.200	0	0.040	
20 ga	0.036			124	400	0.100	0.200	0	0.040	
18 ga	0.048			124	350	0.100	0.200	100	0.045	
16 ga	0.060			125	325	0.100	0.200	200	0.045	
14 ga	0.075			125	300	0.100	0.200	200	0.045	
12 ga	0.105			134	200	0.150	0.250	300	0.050	
10 ga	0.135			142	125	0.175	0.300	400	0.055	
3/16	0.188			142	80	0.175	0.350	500	0.060	
1/4	0.250			146	65	0.185	0.375	600	0.065	

Metric*

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(mm)		(BAR)	(BAR)		(mm/min)	(mm)	(mm)	(ms)	(mm)	
0.5		5.10	1.31	124	9800	2.5	5.1	0	1.0	
0.8				124	9800	2.5	5.1	0	1.0	
1.0				124	9800	2.5	5.1	0	1.1	
1.2				124	9000	2.5	5.1	100	1.1	
1.5				125	8300	2.5	5.1	200	1.1	
2.0				126	7300	2.7	5.2	200	1.2	
2.5				132	5625	3.5	6.1	300	1.2	
3.0				137	4250	4.1	6.9	400	1.3	
4.0				142	2700	4.4	8.2	500	1.5	
6.0				145	1725	4.6	9.4	600	1.6	

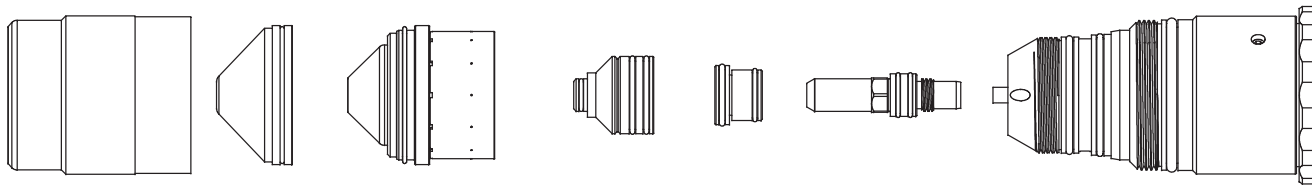
Marking*

Material All Thicknesses			Plasma		Shield		Arc Voltage	Travel Speed		Marking Height		Initial Height	
(Plasma)	(Shield)	Amps	(psi)	(BAR)	(psi)	(BAR)	(volts)	(ipm)	(mm/min)	(in)	(mm)	(in)	(mm)
Air	Air	15	25	1.72	19	1.31	110	250	6350	0.100	2.5	0.100	2.5

* Use an arc transfer height (ignition height) of .135" (3.4 mm) for cutting and .100" (2.5 mm) for marking.

100 Amps - Mild Steel

BK284150 BK277117 BK277152 BK277293 BK277139 BK277292 BK279100



Imperial*

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(ga)	(in)	(psi)	(psi)		(ipm)	(in)	(in)	(ms)	(in)	
12	0.105	83	15	150	320	0.110	0.200	300	0.086	
10	0.135			152	240	0.110	0.200	300	0.086	
3/16	0.188			153	150	0.110	0.200	300	0.087	
1/4	0.250			157	140	0.120	0.200	400	0.093	
3/8	0.375			159	90	0.150	0.250	600	0.095	
1/2	0.500			168	60	0.190	0.300	700	0.098	
5/8	0.625			174	43	0.215	0.325	900	0.107	
3/4	0.750			180	33	0.250	0.350	1200	0.111	

Metric*

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(mm)		(BAR)	(BAR)		(mm/min)	(mm)	(mm)	(ms)	(mm)	
3		5.72	1.03	151	7250	2.8	5.1	300	2.2	
6				156	3600	3.0	5.1	400	2.3	
10				160	2175	4.0	6.5	600	2.4	
12				166	1700	4.6	7.3	700	2.5	
16				174	1100	5.5	8.3	900	2.7	
20				182	750	6.6	9.1	1300	2.8	

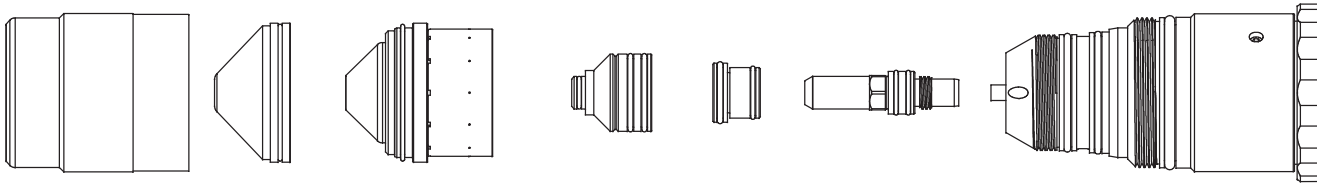
Marking*

Material All Thicknesses			Plasma		Shield		Arc Voltage	Travel Speed		Marking Height		Initial Height	
(Plasma)	(Shield)	Amps	(psi)	(BAR)	(psi)	(BAR)	(volts)	(ipm)	(mm/min)	(in)	(mm)	(in)	(mm)
Air	Air	15	25	1.72	15	1.03	125	250	6350	0.1	2.5	0.100	2.5

* Use an arc transfer height (ignition height) of .200" (5.1 mm) for cutting and .100" (2.5 mm) for marking

150 Amps - Mild Steel

BK284150 BK277274 BK277266 BK277289 BK277143 BK277291 BK279100



Imperial*

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(ga)	(in)	(psi)	(psi)		(ipm)	(in)	(in)	(ms)	(in)	
10	0.135	71	45	142	250	0.100	0.275	100	0.075	
3/16	0.188			144	165	0.100	0.275	300	0.080	
1/4	0.250			148	165	0.125	0.300	400	0.085	
3/8	0.375			152	115	0.150	0.325	500	0.095	
1/2	0.500			158	85	0.200	0.350	600	0.095	
5/8	0.625			160	70	0.200	0.350	700	0.105	
3/4	0.750			164	55	0.250	0.375	1200	0.110	
1	1.000			172	25	0.250	0.400	1500	0.130	
1 1/4	1.250			180	20	0.300	0.350	1000	0.140	●
1 1/2	1.500			184	10	0.250	0.350	1000	0.150	●

Metric*

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(mm)		(BAR)	(BAR)		(mm/min)	(mm)	(mm)	(ms)	(mm)	
3		4.90	3.10	141	7050	2.5	7.0	0	1.9	
6				147	4200	3.0	7.5	400	2.1	
10				153	2800	4.0	8.4	500	2.4	
12				157	2325	4.8	8.7	600	2.4	
16				160	1775	5.1	8.9	700	2.7	
20				165	1300	6.4	9.6	1300	2.9	
25				171	700	6.4	10.1	1500	3.3	
32				180	500	7.6	8.9	1000	3.6	●
38				184	250	6.4	8.9	1000	3.8	●

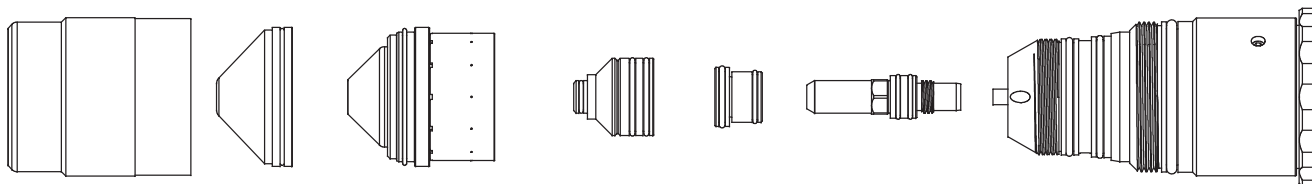
Marking*

Material All Thicknesses			Plasma		Shield		Arc Voltage	Travel Speed		Marking Height		Initial Height	
(Plasma)	(Shield)	Amps	(psi)	(BAR)	(psi)	(BAR)	(volts)	(ipm)	(mm/min)	(in)	(mm)	(in)	(mm)
Air	Air	15	25	1.72	45	3.10	145	250	6350	0.100	2.5	0.100	2.5

* Use an arc transfer height (ignition height) of .200" (5.1 mm) for cutting and .100" (2.5 mm) for marking

200 Amps - Mild Steel

BK284150 BK277263 BK277266 BK277269 BK277258 BK277270 BK279100



Imperial*

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(ga)	(in)	(psi)	(psi)		(ipm)	(in)	(in)	(ms)	(in)	
1/4	0.250	69	58	144	200	0.150	0.275	300	0.085	
3/8	0.375			148	140	0.160	0.275	400	0.095	
1/2	0.500			150	110	0.175	0.300	500	0.105	
5/8	0.625			153	85	0.200	0.350	600	0.115	
3/4	0.750			158	65	0.225	0.400	1000	0.125	
1	1.000			168	40	0.275	0.450	1500	0.140	
1 1/4	1.250			174	25	0.300	0.550	2500	0.155	●
1 1/2	1.500			180	16	0.300	0.400	1000	0.165	●
1 3/4	1.750			188	10	0.300	0.400	1200	0.170	●
2	2.000			192	8	0.300	0.400	1200	0.190	●

Metric*

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(mm)		(BAR)	(BAR)		(mm/min)	(mm)	(mm)	(ms)	(mm)	
6		4.76	4.00	144	5250	3.8	7.0	300	2.1	
10				148	3450	4.1	7.1	400	2.5	
12				150	2950	4.4	7.5	500	2.6	
16				153	2150	5.1	8.9	600	2.9	
20				159	1550	5.9	10.4	1100	3.2	
25				167	1050	6.9	11.4	1500	3.5	
32				174	625	7.6	11.4	2500	3.9	
38				180	400	7.6	10.2	1100	4.2	●
45				188	250	7.6	10.2	1200	4.4	●
50				191	200	7.6	10.2	1200	4.8	●

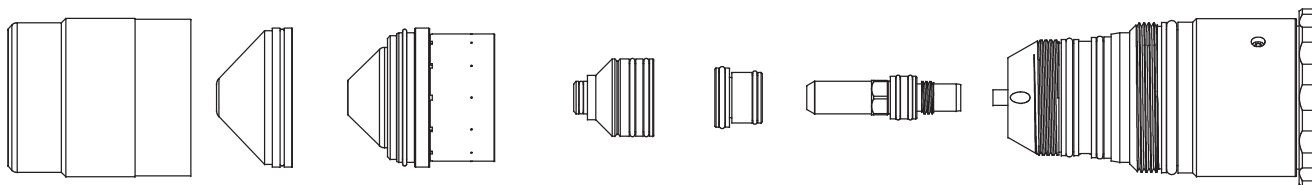
Marking*

Material All Thicknesses			Plasma		Shield		Arc Voltage	Travel Speed		Marking Height		Initial Height	
(Plasma)	(Shield)	Amps	(psi)	(BAR)	(psi)	(BAR)	(volts)	(ipm)	(mm/min)	(in)	(mm)	(in)	(mm)
Air	Air	15	25	1.72	58	4.00	130	250	6350	0.100	2.5	0.100	2.5

* Use an arc transfer height (ignition height) of .200" (5.1 mm) for cutting and .100" (2.5 mm) for marking

50 Amps - Stainless Steel

BK284150 BK277149 BK277110 BK277123 BK277142 BK277137 BK279100



Imperial

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(ga)	(in)	(psi)	(psi)		(ipm)	(in)	(in)	(ms)	(in)	
26 ga	0.018	66	40	86	305	0.040	0.100	0	0.055	
24 ga	0.024			86	280	0.040	0.100	0	0.055	
22 ga	0.030			86	270	0.040	0.100	100	0.055	
20 ga	0.036			86	255	0.040	0.100	100	0.055	
18 ga	0.048			86	230	0.040	0.100	100	0.055	
16 ga	0.060			86	195	0.040	0.100	100	0.055	
14 ga	0.075			86	165	0.040	0.100	100	0.055	
12 ga	0.105			87	125	0.040	0.100	100	0.060	
10 ga	0.135			88	85	0.040	0.100	200	0.060	
3/16	0.188			96	55	0.040	0.125	300	0.070	
1/4	0.250			99	40	0.060	0.150	400	0.070	

Metric

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(mm)		(BAR)	(BAR)		(mm/min)	(mm)	(mm)	(ms)	(mm)	
0.5		4.55	2.76	86	7575	1.0	2.5	0	1.4	
0.8				86	6775	1.0	2.5	100	1.4	
1.0				86	6300	1.0	2.5	100	1.4	
1.2				86	5875	1.0	2.5	100	1.4	
1.5				86	5025	1.0	2.5	100	1.4	
2.0				86	4075	1.0	2.5	100	1.4	
2.5				87	3400	1.0	2.5	100	1.5	
3.0				87	2725	1.0	2.5	200	1.5	
4.0				91	1825	1.0	2.8	300	1.6	
6.0				98	1100	1.4	3.7	400	1.8	

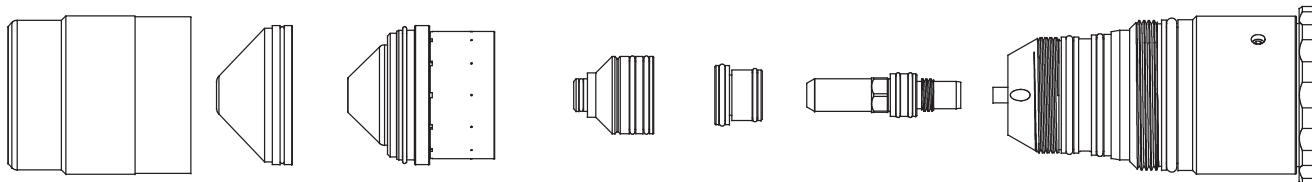
Marking*

Material All Thicknesses			Plasma		Shield		Arc Voltage	Travel Speed		Marking Height		Initial Height	
(Plasma)	(Shield)	Amps	(psi)	(BAR)	(psi)	(BAR)	(volts)	(ipm)	(mm/min)	(in)	(mm)	(in)	(mm)
Air	Air	15	25	1.72	40	2.76	96	250	6350	0.100	2.5	0.100	2.5

* Use an arc transfer height (ignition height) of .070" (1.8 mm) for cutting and .100" (2.5 mm) for marking.

100 Amps - Stainless Steel

BK284150 BK277117 BK277152 BK277293 BK277139 BK277292 BK279100



Imperial*

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(ga)	(in)	(psi)	(psi)		(ipm)	(in)	(in)	(ms)	(in)	
10	0.135	80	25	150	210	0.120	0.200	300	0.095	
3/16	0.188			152	150	0.120	0.200	400	0.100	
1/4	0.250			156	90	0.135	0.225	500	0.105	
3/8	0.375			167	65	0.185	0.250	600	0.105	
1/2	0.500			173	45	0.230	0.300	800	0.120	

Metric*

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(mm)		(BAR)	(BAR)		(mm/min)	(mm)	(mm)	(ms)	(mm)	
3		5.52	1.72	149	5825	3.0	5.1	300	2.4	
4				151	4700	3.0	5.1	400	2.5	
6				155	2625	3.3	5.6	500	2.6	
10				168	1575	4.9	6.5	700	2.7	
12				172	1250	5.6	7.3	800	3.0	

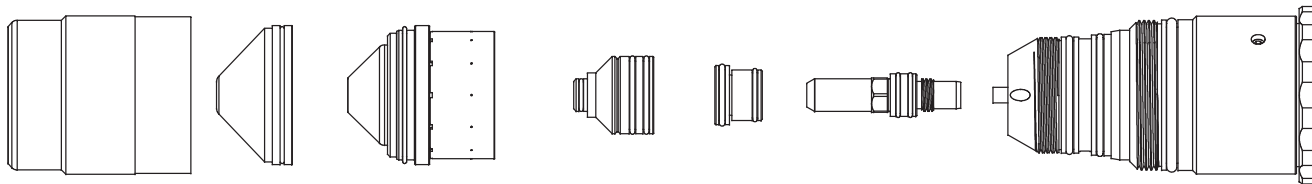
Marking*

Material All Thicknesses			Plasma		Shield		Arc Voltage	Travel Speed		Marking Height		Initial Height	
(Plasma)	(Shield)	Amps	(psi)	(BAR)	(psi)	(BAR)	(volts)	(ipm)	(mm/min)	(in)	(mm)	(in)	(mm)
Air	Air	15	25	1.72	25	1.72	136	250	6350	0.100	2.5	0.100	2.5

* Use an arc transfer height (ignition height) of .200" (5.1 mm) for cutting and .100" (2.5 mm) for marking

150 Amps - Stainless Steel

BK284150 BK277274 BK277266 BK277289 BK277143 BK277291 BK279100



Imperial*

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(ga)	(in)	(psi)	(psi)		(ipm)	(in)	(in)	(ms)	(in)	
3/16	0.188	71	70	152	210	0.140	0.225	300	0.120	
1/4	0.250			154	150	0.140	0.250	400	0.120	
3/8	0.375			158	115	0.180	0.275	500	0.125	
1/2	0.500			164	85	0.210	0.300	600	0.130	
5/8	0.625			168	60	0.240	0.325	800	0.140	
3/4	0.750			175	45	0.260	0.400	1500	0.140	
1	1.000			190	20	0.330	0.400	1500	0.160	●

Metric*

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(mm)		(BAR)	(BAR)		(mm/min)	(mm)	(mm)	(ms)	(mm)	
4		4.90	4.83	151	6075	3.6	5.4	300	3.0	
6				154	4150	3.6	6.2	400	3.0	
10				159	2800	4.7	7.1	500	3.2	
12				163	2325	5.2	7.5	600	3.3	
16				168	1500	6.1	8.3	800	3.6	
20				177	1050	6.9	10.2	1500	3.6	
25				189	550	8.3	10.2	1500	4.0	●

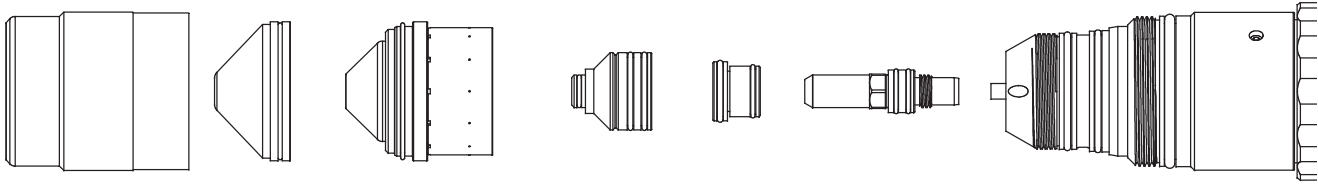
Marking*

Material All Thicknesses			Plasma		Shield		Arc Voltage	Travel Speed		Marking Height		Initial Height	
(Plasma)	(Shield)	Amps	(psi)	(BAR)	(psi)	(BAR)	(volts)	(ipm)	(mm/min)	(in)	(mm)	(in)	(mm)
Air	Air	15	25	1.72	70	4.83	150	250	6350	0.100	2.5	0.100	2.5

* Use an arc transfer height (ignition height) of .200" (5.1 mm) for cutting and .100" (2.5 mm) for marking

200 Amps - Stainless Steel

BK284150 BK277263 BK277266 BK277276 BK277258 BK277270 BK279100



Imperial*

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(ga)	(in)	(psi)	(psi)		(ipm)	(in)	(in)	(ms)	(in)	
3/16	0.188	69	45	145	240	0.150	0.200	300	0.125	
1/4	0.250			146	210	0.150	0.225	400	0.130	
3/8	0.375			147	160	0.150	0.250	500	0.140	
1/2	0.500			152	110	0.185	0.300	600	0.140	
5/8	0.625			157	75	0.215	0.350	800	0.150	
3/4	0.750			164	60	0.275	0.400	1200	0.155	
1	1.000			173	35	0.325	0.450	1500	0.160	●
1 1/4	1.250			185	20	0.365	0.450	1500	0.185	●
1 1/2	1.500			190	12	0.380	0.450	1500	0.190	●
1 3/4	1.750			192	10	0.385	0.450	2000	0.195	●
2	2.000			196	8	0.390	0.450	2000	0.200	●

Metric*

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(mm)		(BAR)	(BAR)		(mm/min)	(mm)	(mm)	(ms)	(mm)	
6		4.76	3.10	146	5500	3.8	5.6	400	3.3	
10				148	3875	3.9	6.5	500	3.6	
12				151	3075	4.5	7.3	600	3.6	
16				157	1900	5.5	8.9	800	3.8	
20				165	1425	7.2	10.4	1300	4.0	
25				172	925	8.2	11.4	1500	4.1	●
32				185	500	9.3	11.4	1500	4.7	●
38				190	300	9.6	11.4	1500	4.8	●
45				192	250	9.8	11.4	2000	5.0	●
50				195	200	9.9	11.4	2000	5.1	●

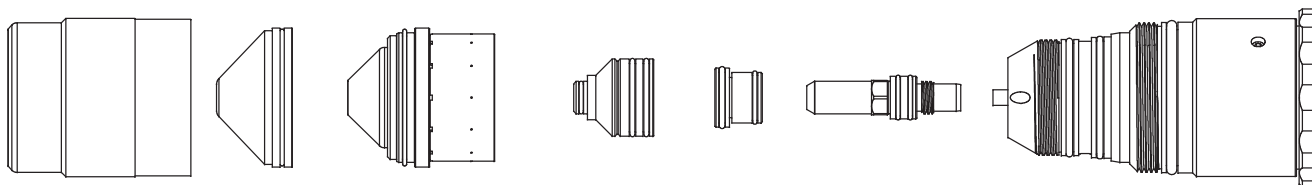
Marking*

Material All Thicknesses			Plasma		Shield		Arc Voltage	Travel Speed		Marking Height		Initial Height	
(Plasma)	(Shield)	Amps	(psi)	(BAR)	(psi)	(BAR)	(volts)	(ipm)	(mm/min)	(in)	(mm)	(in)	(mm)
Air	Air	15	25	1.72	70	3.10	135	250	6350	0.100	2.5	0.100	2.5

* Use an arc transfer height (ignition height) of .200" (5.1 mm) for cutting and .100" (2.5 mm) for marking

50 Amps - Aluminum

BK284150 BK277150 BK277153 BK277125 BK277142 BK277131 BK279100



Imperial

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(ga)	(in)	(psi)	(psi)		(ipm)	(in)	(in)	(ms)	(in)	
26 ga	0.018	60	20							
24 ga	0.024			123	310	0.070	0.110	0	0.062	
22 ga	0.032			124	295	0.070	0.120	100	0.063	
20 ga	0.040			125	270	0.080	0.130	100	0.065	
18 ga	0.048			126	210	0.080	0.130	200	0.070	
16 ga	0.060			131	165	0.090	0.140	200	0.075	
14 ga	0.080			133	145	0.110	0.150	200	0.080	
12 ga	0.102			134	125	0.130	0.160	300	0.085	
10 ga	0.125			137	105	0.140	0.160	300	0.085	
3/16	0.188			141	75	0.160	0.180	400	0.090	
1/4	0.250			147	55	0.160	0.225	600	0.090	

Metric

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(mm)		(BAR)	(BAR)		(mm/min)	(mm)	(mm)	(ms)	(mm)	
0.5		4.14	1.38	122	8075	1.8	2.7	0	1.6	
0.8				124	7525	1.8	3.0	100	1.6	
1.0				125	6900	2.0	3.3	100	1.6	
1.2				126	5475	2.0	3.3	200	1.8	
1.5				131	4275	2.3	3.5	200	1.9	
2.0				133	3725	2.8	3.8	200	2.0	
2.5				134	3250	3.2	4.0	300	2.1	
3.0				136	2825	3.5	4.1	300	2.2	
4.0				139	2275	3.8	4.3	400	2.2	
6.0				146	1500	4.1	5.5	600	2.3	

Marking*

Material All Thicknesses			Plasma		Shield		Arc Voltage	Travel Speed		Marking Height		Initial Height	
(Plasma)	(Shield)	Amps	(psi)	(BAR)	(psi)	(BAR)	(volts)	(ipm)	(mm/min)	(in)	(mm)	(in)	(mm)
Air	Air	12	25	1.72	20	1.38	140	250	6350	0.100	2.5	0.100	2.5

* Use an arc transfer height (ignition height) of .070" (1.8 mm) for cutting and .100" (2.5 mm) for marking.

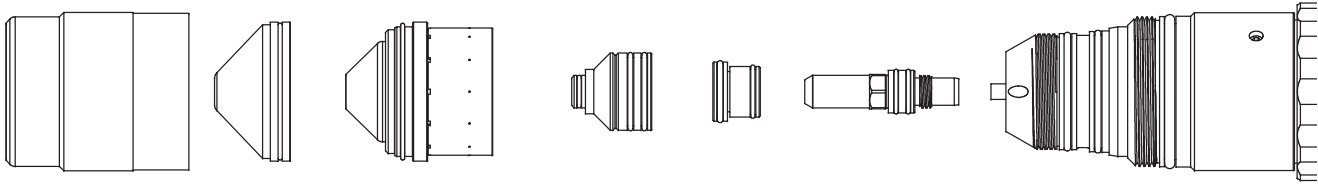
WARNING

Explosion Hazard
Do not cut Aluminum over water tables



100 Amps - Aluminum

BK284150 BK277117 BK277152 BK277293 BK277139 BK277292 BK279100



Imperial*

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(ga)	(in)	(psi)	(psi)		(ipm)	(in)	(in)	(ms)	(in)	
12 ga	0.102	80	25	153	400	0.120	0.225	200	0.090	
10 ga	0.125			155	250	0.135	0.225	200	0.095	
3/16	0.188			162	125	0.155	0.250	300	0.105	
1/4	0.250			165	105	0.155	0.250	400	0.105	
3/8	0.375			170	90	0.180	0.275	500	0.110	
1/2	0.500			174	65	0.195	0.300	600	0.115	

Metric*

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(mm)		(BAR)	(BAR)		(mm/min)	(mm)	(mm)	(ms)	(mm)	
2.5		5.52	1.72	153	10750	3.0	5.7	200	2.3	
3				154	7500	3.3	5.7	200	2.4	
4				159	4725	3.7	6.0	300	2.5	
6				164	2775	3.9	6.4	400	2.7	
10				171	2200	4.6	7.1	500	2.8	
12				173	1800	4.9	7.5	600	2.9	

Marking

Material All Thicknesses			Plasma		Shield		Arc Voltage	Travel Speed		Marking Height		Initial Height	
(Plasma)	(Shield)	Amps	(psi)	(BAR)	(psi)	(BAR)	(volts)	(ipm)	(mm/min)	(in)	(mm)	(in)	(mm)
Air	Air	15	25	1.72	25	1.72	143	250	6350	0.100	2.5	0.100	2.5

* Use an arc transfer height (ignition height) of .225" (5.7 mm) for cutting and .100" (2.5 mm) for marking

 **WARNING**

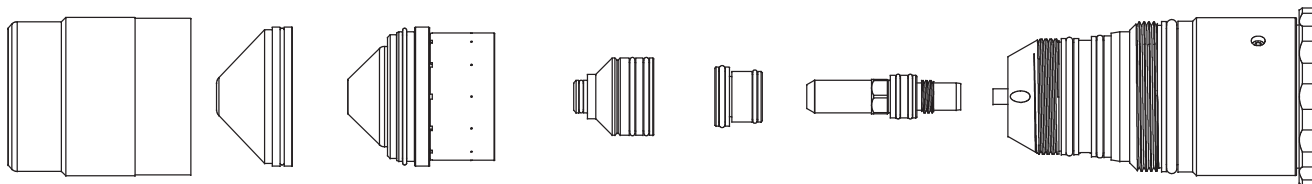
Explosion Hazard

Do not cut Aluminum over water tables



150 Amps - Aluminum

BK284150 BK277274 BK277266 BK277289 BK277143 BK277291 BK279100



Imperial*

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(ga)	(in)	(psi)	(psi)		(ipm)	(in)	(in)	(ms)	(in)	
3/16	0.188	71	50	155	160	0.120	0.250	300	0.115	
1/4	0.250			156	145	0.130	0.250	400	0.120	
3/8	0.375			166	115	0.185	0.275	500	0.132	
1/2	0.500			173	90	0.230	0.300	600	0.135	
5/8	0.625			177	65	0.250	0.325	800	0.140	
3/4	0.750			182	45	0.250	0.350	1200	0.145	
1	1.000			189	27	0.250	0.350	1500	0.147	●

Metric*

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(mm)		(BAR)	(BAR)		(mm/min)	(mm)	(mm)	(ms)	(mm)	
4		4.90	3.45	155	4250	2.9	6.4	300	2.9	
6				156	3775	3.2	6.4	400	3.0	
10				167	2825	4.9	7.1	500	3.4	
12				171	2425	5.6	7.5	600	3.4	
16				177	1625	6.4	8.3	800	3.6	
20				183	1075	6.4	8.9	1300	3.7	
25				189	725	6.4	8.9	1500	3.7	●

Marking

Material All Thicknesses			Plasma		Shield		Arc Voltage	Travel Speed		Marking Height		Initial Height	
(Plasma)	(Shield)	Amps	(psi)	(BAR)	(psi)	(BAR)	(volts)	(ipm)	(mm/min)	(in)	(mm)	(in)	(mm)
Air	Air	15	25	1.72	25	1.72	143	250	6350	0.100	2.5	0.100	2.5

* Use an arc transfer height (ignition height) of .200" (5.1 mm) for cutting and .100" (2.5 mm) for marking.

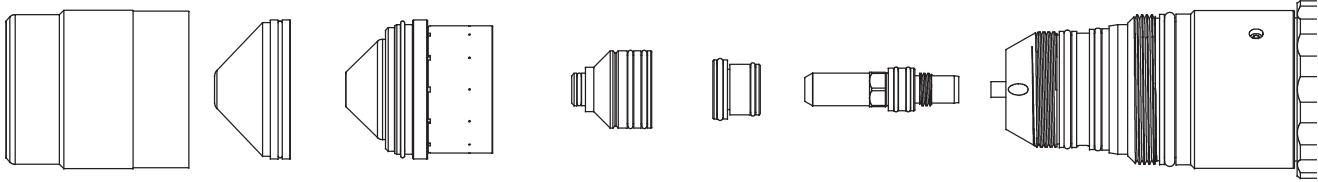
⚠ WARNING

Explosion Hazard
Do not cut Aluminum over water tables



200 Amps - Aluminum

BK284150 BK277263 BK277266 BK277276 BK277258 BK277270 BK279100



Imperial*

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(ga)	(in)	(psi)	(psi)		(ipm)	(in)	(in)	(ms)	(in)	
3/16	0.188	69	35	150	220	0.170	0.250	400	0.147	
1/4	0.250			152	190	0.180	0.275	500	0.148	
3/8	0.375			156	135	0.190	0.300	600	0.148	
1/2	0.500			160	105	0.200	0.350	700	0.150	
5/8	0.625			164	90	0.220	0.375	800	0.150	
3/4	0.750			169	65	0.240	0.400	1000	0.155	
1	1.000			177	40	0.260	0.400	1000	0.160	●
1 1/4	1.250			189	20	0.270	0.400	1500	0.170	●
1 1/2	1.500			196	12	0.280	0.400	1500	0.180	●

Metric*

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(mm)		(BAR)	(BAR)		(mm/min)	(mm)	(mm)	(ms)	(mm)	
4		4.76	2.41	149	5975	4.2	6.0	400	3.7	
6				152	5000	4.5	6.8	500	3.8	
10				157	3325	4.9	7.8	600	3.8	
12				159	2825	5.0	8.6	700	3.8	
16				164	2250	5.6	9.5	800	3.8	
20				170	1550	6.2	10.2	1000	4.0	
25				176	1050	6.6	10.2	1000	4.1	●
32				189	500	6.9	10.2	1500	4.3	●
38				196	300	7.1	10.2	1500	4.6	●

Marking

Material All Thicknesses			Plasma		Shield		Arc Voltage	Travel Speed		Marking Height		Initial Height	
(Plasma)	(Shield)	Amps	(psi)	(BAR)	(psi)	(BAR)	(volts)	(ipm)	(mm/min)	(in)	(mm)	(in)	(mm)
Air	Air	18	25	1.72	35	2.41	126	250	6350	0.100	2.5	0.100	2.5

* Use an arc transfer height (ignition height) of .200" (5.1 mm) for cutting and .100" (2.5 mm) for marking.

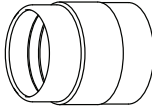
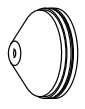
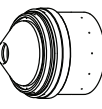



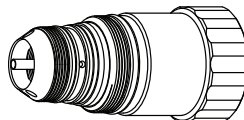
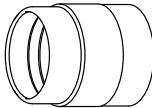
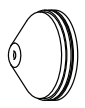
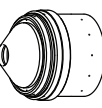



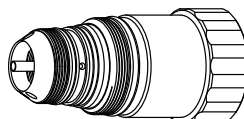
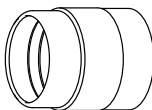
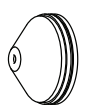
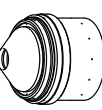



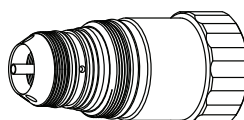
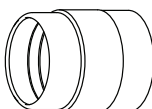
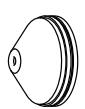
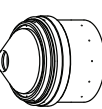



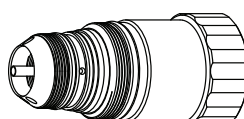
! WARNING

Explosion Hazard

Do not cut Aluminum over water tables

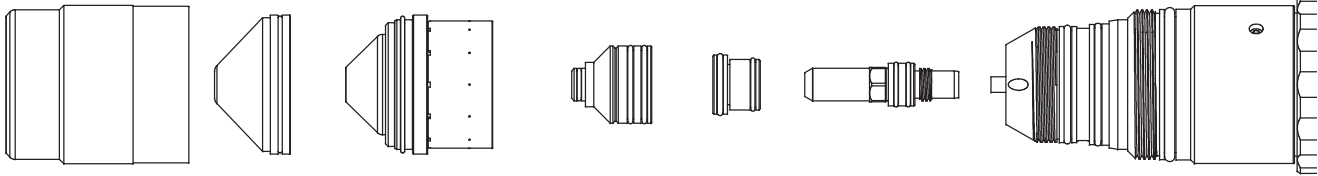


**SELECTING CONSUMABLES -
 OXYGEN PLASMA / OXYGEN OR AIR SHIELD (50A)
 OXYGEN PLASMA / AIR SHIELD (100A, 150A, 200A)**

	Outer Retaining Cap	Shield Cap	Inner Retaining Cap	Nozzle	Swirl Ring	Electrode	Torch Head
50A MS	BK284150 	BK277115 	BK277153 	BK277122 	BK277140/ BK277142 	BK277131 	BK279100 
100A MS	BK284150 	BK277286 	BK277151 	BK277284 	BK277283 	BK277282 	BK279100 
150A MS	BK284150 	BK277117 	BK277151/ BK277152 	BK277293 	BK277139 	BK277292 	BK279100 
200A MS	BK284150 	BK277274 	BK277266 	BK277289 	BK277143 	BK277291 	BK279100 

50 Amps - Mild Steel - Oxygen Plasma / Oxygen or Air Shield

BK284150 BK277115 BK277153 BK277122 BK277140/ BK277131 BK279100
BK277142



Imperial

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(ga)	(in)	(psi)	(psi)		(ipm)	(in)	(in)	(ms)	(in)	
Cold-Rolled Steel – Oxygen Shield – Swirl Ring BK277140										
12	0.105	74	12	123	70	0.120	0.135	100	0.075	
11	0.120			126	60	0.125	0.135	200	0.078	
10	0.135			128	50	0.135	0.135	200	0.078	
Hot-Rolled Steel – Air Shield – Swirl Ring BK277142										
14	0.075	74	19	106	200	0.100	0.135	100	0.050	
12	0.105			106	190	0.100	0.135	100	0.050	
1/8	0.125			106	180	0.100	0.135	200	0.050	
10	0.135			110	170	0.110	0.135	200	0.050	
3/16	0.188			113	105	0.140	0.200	300	0.053	
1/4	0.250			117	75	0.140	0.225	400	0.060	

Metric

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(mm)		(BAR)	(BAR)		(mm/min)	(mm)	(mm)	(ms)	(mm)	
Cold-Rolled Steel – Oxygen Shield – Swirl Ring BK277140										
2.5		5.1	0.83	121	1895	2.9	3.4	100	1.9	
3				125	1555	3.1	3.4	200	2.0	
Hot-Rolled Steel – Air Shield – Swirl Ring BK277142										
2.5		5.1	1.31	106	4885	2.5	3.4	100	1.9	
3				106	4660	2.5	3.4	200	2.0	
5				113	2555	3.6	5.1	400	2.2	
6				116	2075	3.6	5.5	400	2.2	

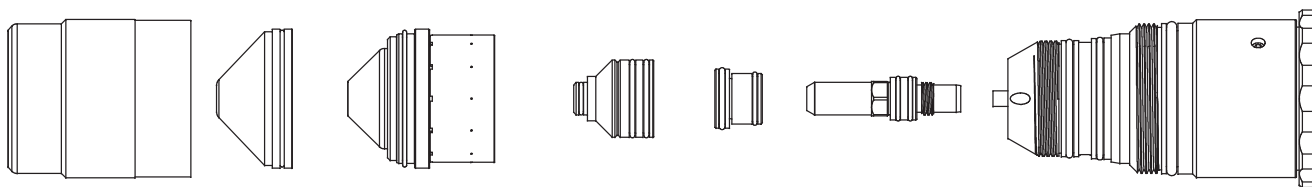
Marking

Material All Thicknesses			Plasma		Shield		Arc Voltage	Travel Speed		Marking Height		Initial Height	
(Plasma)	(Shield)	Amps	(psi)	(BAR)	(psi)	(BAR)	(volts)	(ipm)	(mm/min)	(in)	(mm)	(in)	(mm)
Oxygen	Air	12	25	1.72	19	1.31	140	250	6350	0.175	4.4	0.100	2.5

* Use an arc transfer height (ignition height) of .200" (5.1 mm) for cutting and .100" (2.5 mm) for marking.

100 Amps - Mild Steel - Oxygen Plasma / Air Shield

BK284150 BK277286 BK277151 BK277284 BK277283 BK277282 BK279100



Imperial

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(ga)	(in)	(psi)	(psi)		(ipm)	(in)	(in)	(ms)	(in)	
1/4	0.250	83	26	125	150	0.090	0.200	300	0.070	
3/8	0.375			130	100	0.130	0.250	400	0.078	
1/2	0.500			130	65	0.155	0.300	500	0.085	
5/8	0.625			143	47	0.185	0.325	800	0.092	
3/4	0.750			145	35	0.185	0.350	1000	0.098	

Metric

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(mm)		(BAR)	(BAR)		(mm/min)	(mm)	(mm)	(ms)	(mm)	
6		5.72	1.79	124	3950	2.1	4.9	300	2.3	
10				130	2405	3.3	6.5	500	2.3	
12				130	1850	3.7	7.3	500	2.3	
16				143	1180	4.7	8.3	1000	2.4	
20				145	800	4.7	9.0	1000	2.4	

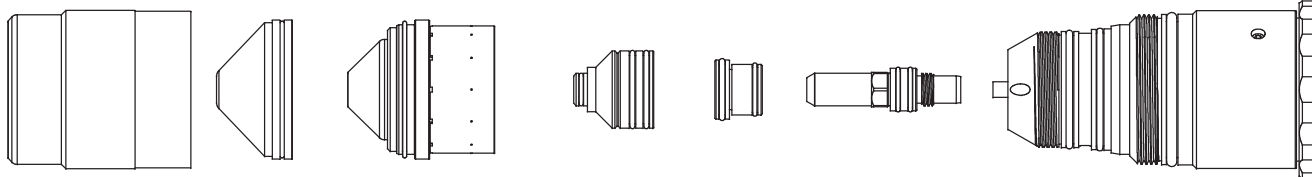
Marking

Material All Thicknesses			Plasma		Shield		Arc Voltage	Travel Speed		Marking Height		Initial Height	
(Plasma)	(Shield)	Amps	(psi)	(BAR)	(psi)	(BAR)	(volts)	(ipm)	(mm/min)	(in)	(mm)	(in)	(mm)
Oxygen	Air	12	25	1.72	26	1.79	130	250	6350	0.100	2.5	0.100	2.5

* Use an arc transfer height (ignition height) of .200" (5.1 mm) for cutting and .100" (2.5 mm) for marking.

150 Amps - Mild Steel - Oxygen Plasma / Air Shield

BK284150 BK277117 BK277151/ BK277293 BK277139 BK277292 BK279100
BK277152



Imperial

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(ga)	(in)	(psi)	(psi)		(ipm)	(in)	(in)	(ms)	(in)	
Retaining Cap BK277151										
1/4	0.250	71	30	118	165	0.105	0.200	300	0.085	
3/8	0.375			123	125	0.135	0.250	400	0.090	
1/2	0.500			125	90	0.140	0.300	500	0.094	
Retaining Cap BK277152										
5/8	0.625	71	45	127	70	0.140	0.325	600	0.099	
3/4	0.750			130	55	0.140	0.350	1000	0.104	
1	1.000			134	40	0.150	0.400	1500	0.115	
1.25	1.250			145	25	0.200	0.700	3000	0.126	
1.5	1.500			155	15	0.225	0.350	1500	0.139	●

Metric

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(mm)		(BAR)	(BAR)		(mm/min)	(mm)	(mm)	(ms)	(mm)	
Retaining Cap BK277151										
6		4.90	2.07	117	4305	2.6	4.9	300	3.2	
10				123	3040	3.4	6.5	500	3.2	
12				124	2485	3.5	7.3	500	3.3	
Retaining Cap BK277152										
16		4.90	3.10	127	1760	3.6	8.3	1000	3.3	
20				130	1340	3.6	9.0	1500	3.4	
25				133	1040	3.7	10.1	1500	3.6	
32				145	625	5.1	17.8	3000	3.6	
38				154	385	5.6	8.9	1500	3.6	●

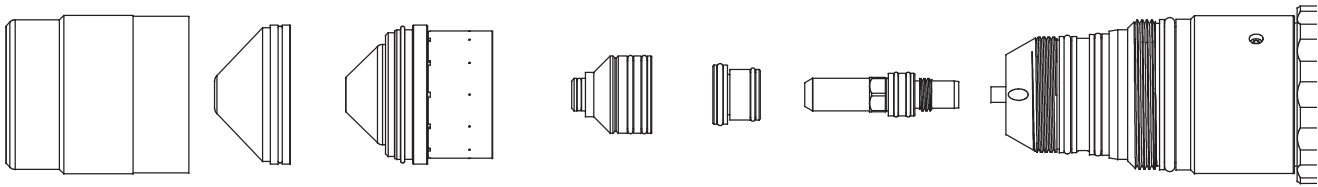
Marking

Material All Thicknesses			Plasma		Shield		Arc Voltage	Travel Speed		Marking Height		Initial Height	
(Plasma)	(Shield)	Amps	(psi)	(BAR)	(psi)	(BAR)	(volts)	(ipm)	(mm/min)	(in)	(mm)	(in)	(mm)
Oxygen	Air	15	25	1.72	45	3.10	140	250	6350	0.100	2.5	0.100	2.5

* Use an arc transfer height (ignition height) of .200" (5.1 mm) for cutting and .100" (2.5 mm) for marking.

200 Amps - Mild Steel - Oxygen Plasma / Air Shield

BK284150 BK277274 BK277266 BK277289 BK277143 BK277291 BK279100



Imperial

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(ga)	(in)	(psi)	(psi)		(ipm)	(in)	(in)	(ms)	(in)	
1/4	0.250	74	58	125	230	0.040	0.200	300	0.090	
3/8	0.375			130	140	0.090	0.250	400	0.094	
1/2	0.500			133	120	0.115	0.300	500	0.100	
5/8	0.625			137	100	0.130	0.350	600	0.107	
3/4	0.750			140	75	0.150	0.400	800	0.116	
1	1.000			147	50	0.175	0.450	1000	0.135	
1.25	1.250			155	25	0.240	0.500	1500	0.160	
1.5	1.500			165	17	0.300	0.350	1500	0.189	●
1.75	1.750			175	12	0.350	0.350	1500	0.222	●
2	2.000			185	7	0.500	0.500	1500	0.260	●

Metric

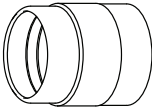
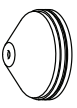
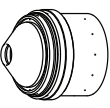



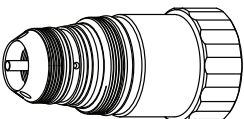
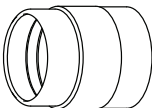
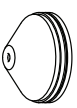
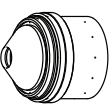



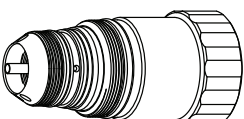
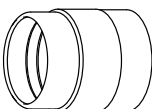

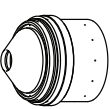



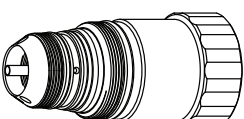
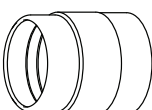

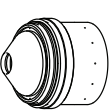



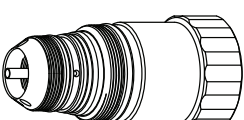
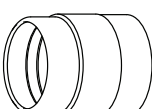
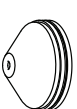
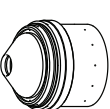



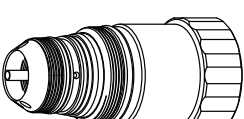
Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(mm)		(BAR)	(BAR)		(mm/min)	(mm)	(mm)	(ms)	(mm)	
6		5.10	4.00	124	6100	0.8	4.9	300	3.8	
10				130	3480	2.3	6.5	500	3.8	
12				132	3160	2.7	7.3	500	3.8	
16				137	2515	3.3	8.9	800	3.9	
20				141	1810	3.8	10.3	1000	3.9	
25				146	1310	4.3	11.3	1000	3.9	
32				155	610	6.1	12.7	1500	3.9	
38				164	435	7.5	8.9	1500	4.0	●
45				175	295	9.2	9.2	1500	4.0	●
50				183	195	12.2	12.2	1500	4.1	●

Marking

Material All Thicknesses			Plasma		Shield		Arc Voltage	Travel Speed		Marking Height		Initial Height	
(Plasma)	(Shield)	Amps	(psi)	(BAR)	(psi)	(BAR)	(volts)	(ipm)	(mm/min)	(in)	(mm)	(in)	(mm)
Oxygen	Air	18	25	1.72	58	4.00	125	250	6350	0.100	2.5	0.100	2.5

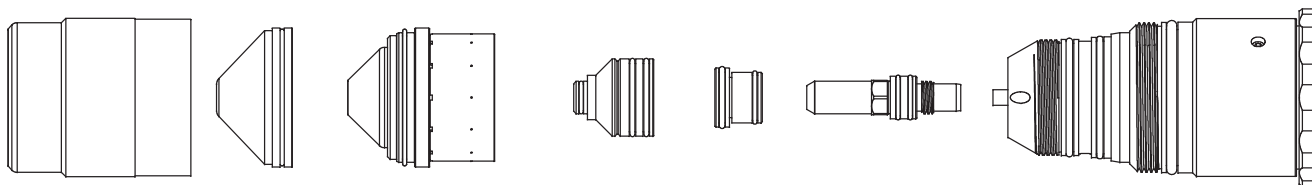
* Use an arc transfer height (ignition height) of .200" (5.1 mm) for cutting and .100" (2.5 mm) for marking.

**SELECTING CONSUMABLES -
AIR PLASMA / NITROGEN SHIELD**

	Outer Retaining Cap	Shield Cap	Inner Retaining Cap	Nozzle	Swirl Ring	Electrode	Torch Head
50A AL	BK284150 	BK277150 	BK277153 	BK277122 	BK277142 	BK277131 	BK279100 
50A SS	BK284150 	BK277149 	BK277110 	BK277123 	BK277142 	BK277137 	BK279100 
100A SS/AL	BK284150 	BK277286 	BK277151 	BK277284 	BK277283 	BK277282 	BK279100 
150A SS/AL	BK284150 	BK277117 	BK277152 	BK277293 	BK277139 	BK277292 	BK279100 
200A SS/AL	BK284150 	BK277274 	BK277266 	BK277289 	BK277143 	BK277291 	BK279100 

50 Amps - Stainless Steel - Air Plasma / Nitrogen Shield

BK284150 BK277149 BK277110 BK277123 BK277142 BK277137 BK279100



Imperial

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(ga)	(in)	(psi)	(psi)		(ipm)	(in)	(in)	(ms)	(in)	
14	0.075	66	40	87	105	0.035	0.070	100	0.105	
12	0.105			88	75	0.035	0.070	100	0.105	
11	0.120			89	65	0.035	0.070	200	0.105	
10	0.135			90	55	0.035	0.070	200	0.110	
3/16	0.188			94	50	0.040	0.080	300	0.110	
1/4	0.250			100	40	0.060	0.125	400	0.115	

Metric

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(mm)		(BAR)	(BAR)		(mm/min)	(mm)	(mm)	(ms)	(mm)	
2		4.55	2.76	87	2565	0.9	1.8	100	2.7	
2.5				87	2080	0.9	1.8	100	2.7	
3				88	1685	0.9	1.8	200	2.7	
5				94	1235	1.0	2.1	400	2.8	
6				98	1075	1.3	2.9	400	2.9	

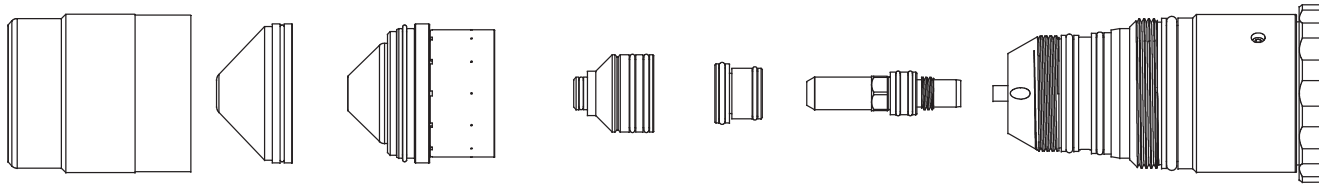
Marking

Material All Thicknesses			Plasma		Shield		Arc Voltage	Travel Speed		Marking Height		Initial Height	
(Plasma)	(Shield)	Amps	(psi)	(BAR)	(psi)	(BAR)	(volts)	(ipm)	(mm/min)	(in)	(mm)	(in)	(mm)
Air	Nitroge	15	25	1.72	40	2.76	108	250	6350	0.100	2.5	0.100	2.5

* Use an arc transfer height (ignition height) of .200" (5.1 mm) for cutting and .100" (2.5 mm) for marking.

100 Amps - Stainless Steel - Air Plasma / Nitrogen Shield

BK284150 BK277286 BK277151 BK277284 BK277283 BK277282 BK279100



Imperial

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(ga)	(in)	(psi)	(psi)		(ipm)	(in)	(in)	(ms)	(in)	
1/4	0.250	80	35	141	100	0.135	0.225	400	0.092	
3/8	0.375			147	80	0.170	0.250	500	0.095	
1/2	0.500			154	55	0.210	0.300	600	0.095	

Metric

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(mm)		(BAR)	(BAR)		(mm/min)	(mm)	(mm)	(ms)	(mm)	
6		5.52	2.41	140	2595	3.2	5.6	400	2.3	
10				148	1935	4.4	6.5	600	2.4	
12				152	1540	5.0	7.3	600	2.4	

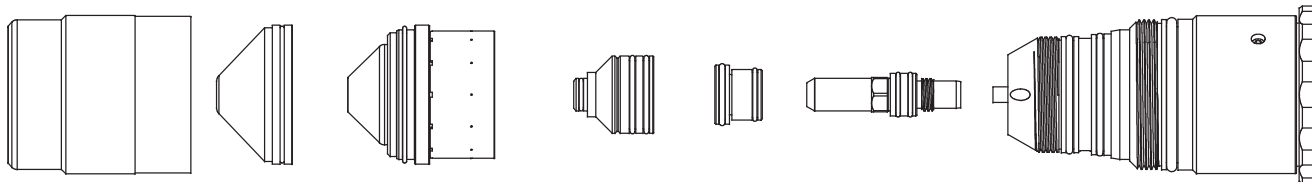
Marking

Material All Thicknesses			Plasma		Shield		Arc Voltage	Travel Speed		Marking Height		Initial Height	
(Plasma)	(Shield)	Amps	(psi)	(BAR)	(psi)	(BAR)	(volts)	(ipm)	(mm/min)	(in)	(mm)	(in)	(mm)
Air	Nitroge	12	25	1.72	35	2.41	145	250	6350	0.100	2.5	0.100	2.5

* Use an arc transfer height (ignition height) of .200" (5.1 mm) for cutting and .100" (2.5 mm) for marking.

150 Amps - Stainless Steel - Air Plasma / Nitrogen Shield

BK284150 BK277117 BK277152 BK277293 BK277139 BK277292 BK279100



Imperial

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(ga)	(in)	(psi)	(psi)		(ipm)	(in)	(in)	(ms)	(in)	
1/4	0.250	71	70	145	150	0.160	0.250	400	0.125	
3/8	0.375			150	115	0.180	0.275	500	0.125	
1/2	0.500			155	85	0.210	0.300	600	0.130	
5/8	0.625			160	60	0.220	0.325	800	0.130	
3/4	0.750			168	45	0.240	0.350	1200	0.135	

Metric

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(mm)		(BAR)	(BAR)		(mm/min)	(mm)	(mm)	(ms)	(mm)	
6		4.90	4.83	144	3910	4.0	6.3	400	3.2	
10				150	2805	4.7	7.0	600	3.2	
12				153	2330	5.1	7.4	600	3.3	
16				160	1510	5.6	8.3	800	3.3	
20				170	1030	6.2	9.0	1200	3.4	

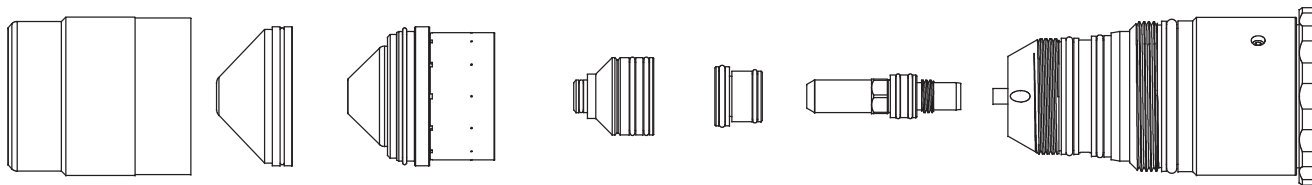
Marking

Material All Thicknesses			Plasma		Shield		Arc Voltage	Travel Speed		Marking Height		Initial Height	
(Plasma)	(Shield)	Amps	(psi)	(BAR)	(psi)	(BAR)	(volts)	(ipm)	(mm/min)	(in)	(mm)	(in)	(mm)
Air	Nitroge	15	25	1.72	70	4.83	145	250	6350	0.100	2.5	0.100	2.5

* Use an arc transfer height (ignition height) of .200" (5.1 mm) for cutting and .100" (2.5 mm) for marking.

200 Amps - Stainless Steel - Air Plasma / Nitrogen Shield

BK284150 BK277274 BK277266 BK277289 BK277143 BK277291 BK279100



Imperial

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(ga)	(in)	(psi)	(psi)		(ipm)	(in)	(in)	(ms)	(in)	
1/4	0.250	74	58	130	200	0.070	0.200	400	0.150	
3/8	0.375			133	150	0.070	0.250	500	0.150	
1/2	0.500			140	110	0.115	0.300	600	0.152	
5/8	0.625			146	75	0.150	0.350	800	0.155	
3/4	0.750			153	60	0.190	0.400	1200	0.155	
1	1.000			158	40	0.210	0.450	1500	0.160	
1.25	1.250			170	20	0.250	0.350	1500	0.165	●
1.5	1.500			180	10	0.275	0.350	1500	0.175	●

Metric

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(mm)		(BAR)	(BAR)		(mm/min)	(mm)	(mm)	(ms)	(mm)	
6		5.10	4.00	129	5220	1.8	4.9	400	3.8	
10				134	3655	1.9	6.5	600	3.8	
12				138	3020	2.6	7.3	600	3.9	
16				146	1890	3.8	8.9	800	3.9	
20				153	1450	4.8	10.3	1500	3.9	
25				157	1050	5.2	11.3	1500	4.1	
32				170	495	6.4	8.9	1500	4.2	●
38				179	260	6.9	8.9	1500	4.4	●

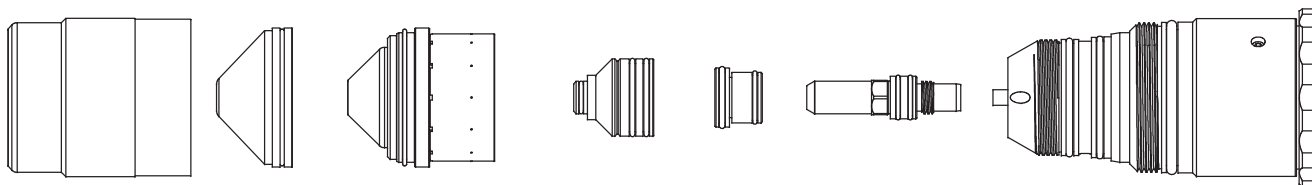
Marking

Material All Thicknesses			Plasma		Shield		Arc Voltage	Travel Speed		Marking Height		Initial Height	
(Plasma)	(Shield)	Amps	(psi)	(BAR)	(psi)	(BAR)	(volts)	(ipm)	(mm/min)	(in)	(mm)	(in)	(mm)
Air	Nitroge	18	25	1.72	58	4.00	138	250	6350	0.100	2.5	0.100	2.5

* Use an arc transfer height (ignition height) of .200" (5.1 mm) for cutting and .100" (2.5 mm) for marking.

50 Amps - Aluminum - Air Plasma / Nitrogen Shield

BK284150 BK277150 BK277153 BK277122 BK277142 BK277131 BK279100



Imperial

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(ga)	(in)	(psi)	(psi)		(ipm)	(in)	(in)	(ms)	(in)	
16	0.050	66	19	135	180	0.050	0.100	100	0.080	
14	0.063			138	140	0.065	0.100	150	0.082	
12	0.080			143	90	0.075	0.150	200	0.085	

Metric

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(mm)		(BAR)	(BAR)		(mm/min)	(mm)	(mm)	(ms)	(mm)	
1.5		4.55	1.31	137	3870	1.5	2.5	150	2.1	
2				142	2360	1.8	3.7	200	2.2	

Marking

Material All Thicknesses			Plasma		Shield		Arc Voltage	Travel Speed		Marking Height		Initial Height	
(Plasma)	(Shield)	Amps	(psi)	(BAR)	(psi)	(BAR)	(volts)	(ipm)	(mm/min)	(in)	(mm)	(in)	(mm)
Air	Nitroge	12	25	1.72	19	1.31	165	250	6350	0.200	5.1	0.100	2.5

* Use an arc transfer height (ignition height) of .200" (5.1 mm) for cutting and .100" (2.5 mm) for marking.

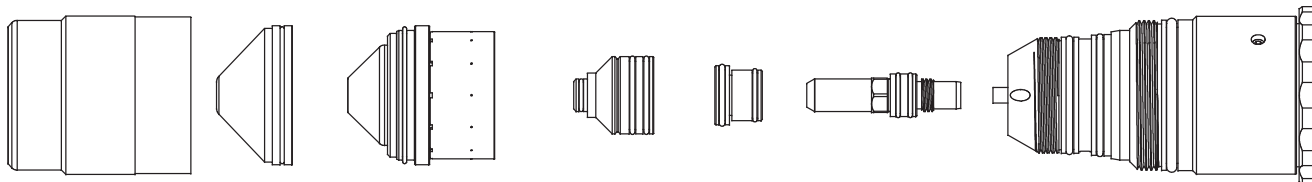
WARNING

Explosion Hazard
Do not cut Aluminum over water tables



100 Amps - Aluminum - Air Plasma / Nitrogen Shield

BK284150 BK277286 BK277151 BK277284 BK277283 BK277282 BK279100



Imperial

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(ga)	(in)	(psi)	(psi)		(ipm)	(in)	(in)	(ms)	(in)	
1/4	0.250	80	26	158	105	0.155	0.250	300	0.095	
3/8	0.375			162	90	0.180	0.275	400	0.098	
1/2	0.500			165	70	0.195	0.300	500	0.100	

Metric

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(mm)		(BAR)	(BAR)		(mm/min)	(mm)	(mm)	(ms)	(mm)	
6		5.52	1.79	158	2710	3.8	6.3	300	2.4	
10				162	2210	4.6	7.0	500	2.5	
12				165	1890	4.9	7.4	500	2.5	

Marking

Material All Thicknesses			Plasma		Shield		Arc Voltage	Travel Speed		Marking Height		Initial Height	
(Plasma)	(Shield)	Amps	(psi)	(BAR)	(psi)	(BAR)	(volts)	(ipm)	(mm/min)	(in)	(mm)	(in)	(mm)
Air	Nitroge	12	25	1.72	26	1.79	165	250	6350	0.100	2.5	0.100	2.5

* Use an arc transfer height (ignition height) of .200" (5.1 mm) for cutting and .100" (2.5 mm) for marking.

WARNING

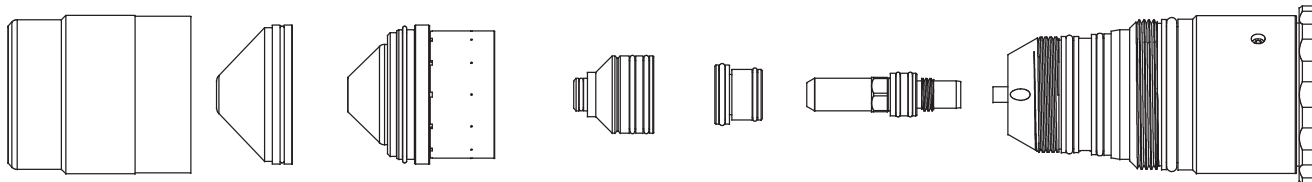
Explosion Hazard

Do not cut Aluminum over water tables



150 Amps - Aluminum - Air Plasma / Nitrogen Shield

BK284150 BK277117 BK277152 BK277293 BK277139 BK277292 BK279100



Imperial

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(ga)	(in)	(psi)	(psi)		(ipm)	(in)	(in)	(ms)	(in)	
1/4	0.250	71	50	145	145	0.130	0.250	400	0.125	
3/8	0.375			155	115	0.185	0.275	500	0.125	
1/2	0.500			165	90	0.230	0.300	600	0.130	
5/8	0.625			170	65	0.250	0.325	800	0.135	
3/4	0.750			170	45	0.250	0.350	1200	0.140	

Metric

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(mm)		(BAR)	(BAR)		(mm/min)	(mm)	(mm)	(ms)	(mm)	
6		4.90	3.45	143	3770	3.1	6.3	400	3.2	
10				156	2825	4.8	7.0	600	3.2	
12				162	2430	5.5	7.4	600	3.3	
16				170	1630	6.4	8.3	1200	3.4	
20				170	990	6.4	9.0	1200	3.6	

Marking

Material All Thicknesses			Plasma		Shield		Arc Voltage	Travel Speed		Marking Height		Initial Height	
(Plasma)	(Shield)	Amps	(psi)	(BAR)	(psi)	(BAR)	(volts)	(ipm)	(mm/min)	(in)	(mm)	(in)	(mm)
Air	Nitroge	15	25	1.72	50	3.45	153	250	6350	0.100	2.5	0.100	2.5

* Use an arc transfer height (ignition height) of .200" (5.1 mm) for cutting and .100" (2.5 mm) for marking.

⚠ WARNING

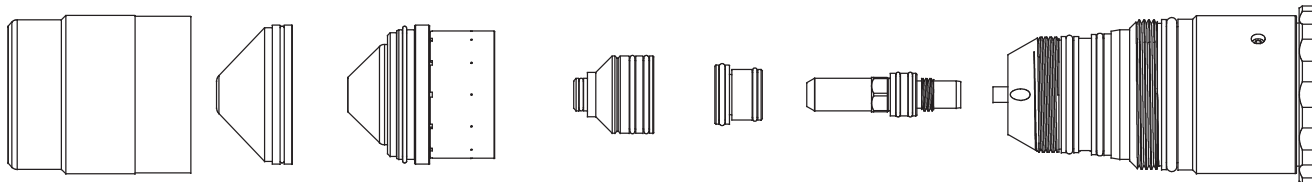
Explosion Hazard

Do not cut Aluminum over water tables



200 Amps - Aluminum - Air Plasma / Nitrogen Shield

BK284150 BK277274 BK277266 BK277289 BK277143 BK277291 BK279100



Imperial

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(ga)	(in)	(psi)	(psi)		(ipm)	(in)	(in)	(ms)	(in)	
1/4	0.250	74	58	150	190	0.135	0.250	300	0.150	
3/8	0.375			155	145	0.140	0.275	400	0.150	
1/2	0.500			155	110	0.135	0.300	500	0.155	
5/8	0.625			160	95	0.135	0.350	600	0.155	
3/4	0.750			160	65	0.150	0.400	800	0.160	
1	1.000			175	35	0.200	0.400	1000	0.170	●

Metric

Material Thickness		Plasma Pressure	Shield Pressure	Arc Voltage	Travel Speed	Cutting Height	Pierce Height	Pierce Time	Kerf Width	Edge Start
(mm)		(BAR)	(BAR)		(mm/min)	(mm)	(mm)	(ms)	(mm)	
6		5.10	4.00	149	4955	3.3	6.3	300	3.8	
10				155	3545	3.5	7.0	500	3.8	
12				155	2995	3.4	7.4	500	3.9	
16				160	2380	3.4	8.9	800	3.9	
20				162	1575	3.9	10.2	1000	4.1	
25				174	940	5.0	10.2	1000	4.3	●

Marking

Material All Thicknesses			Plasma		Shield		Arc Voltage	Travel Speed		Marking Height		Initial Height	
(Plasma)	(Shield)	Amps	(psi)	(BAR)	(psi)	(BAR)	(volts)	(ipm)	(mm/min)	(in)	(mm)	(in)	(mm)
Air	Nitroge	18	25	1.72	58	4.00	142	250	6350	0.100	2.5	0.100	2.5

* Use an arc transfer height (ignition height) of .200" (5.1 mm) for cutting and .100" (2.5 mm) for marking.

⚠ WARNING

Explosion Hazard

Do not cut Aluminum over water tables



OPTIONS/ACCESSORIES

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

COMMON EQUIPMENT PACKAGES

K4812-1	FlexCut® 200
K4816-1	FlexCool™ cooler
K4817-1	FlexStart™ arc start console
K1543-XX	Control Cable (5 pin – 5 pin) FlexCut to FlexStart®
K4400-XX	CNC Interface Cable
K4460-XX	Nozzle Lead
K4461-XX	Electrode Lead
K4462-XX	Work Lead
BK279000	Quick Disconnect Torch Base
BK279100	Quick Disconnect Torch Head
BK278001	Torch Handle (standard)
BK244200	2-Gang Manifold Assembly
BK284304-XX	Torch Leads
BK280312-XX	2-Gang Control Cable
BK200307-XX	Coolant Return
BK200308-XX	Coolant Supply
BK280314-XX	Shield Hose
BK280315-XX	Plasma Hose
BK284039	17" Plasma Hose
BK244202	17" Shield Hose
BK500695	Lincoln Electric certified coolant, 1 Gallon

MAINTENANCE

WARNING

ELECTRIC SHOCK CAN KILL.

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



ROUTINE MAINTENANCE

Routine maintenance consists of periodically blowing out the machine, using a low-pressure air stream, to remove accumulated dust and dirt from the intake and outlet louvers, and the cooling channels in the machine.

PERIODIC MAINTENANCE

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 and the ground connection 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 connections at the FlexStart are tight and that there are no leaks. Only tighten enough to provide an air tight seal. The connections are subject to damage if overtightened.
2. Inspect the torch leads for nicks or cuts and replace if necessary.

WORK GROUND

1. Verify that the 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. Ensure that gas lines remain free from contaminants such as oil and grease. Contaminants can degrade gas components, and the mixture of such contaminants with gases presents a fire hazard.
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, torch overheating, and increased operating costs.
4. Replace the filter element as necessary. If the pressure drop across the filter is more than 10 psi (0.69 BAR), the element needs to be replaced. To replace the element:
 - Remove the bowl from the filter body
 - Remove the element and holder from the 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
5. Internal gas hoses are rated for the life of the machine and do not require replacement unless damaged.

CALIBRATION SPECIFICATION

Calibration of the FlexCut® 200 is critical to its operation. Generally speaking the calibration will not need adjustment. However, neglected or improperly calibrated machines may not yield satisfactory cutting performance. To ensure optimal performance, the calibration of output Voltage and Current should be checked yearly.

TRUBLESHOOTING

How to Use troUblesHooting gUide



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

This Troubleshooting Guide is provided to help you locate and repair possible machine malfunctions. Simply follow the three-step procedure listed below.

Step 1. LOCATE PROBLEM (SYMPTOM).

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

Step 2. POSSIBLE CAUSE.

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

Step 3. RECOMMENDED COURSE OF ACTION

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

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

USING THE STATUS LED TO TROUBLESHOOT SYSTEM PROBLEMS

Prior to cycling power to the system, check the power source LCD screen, the FlexCool 35 LED, FlexCut® 200 LED and the FlexStart™ LED for error sequences as noted below.

The STATUS LIGHTS are dual-color LED’s that indicate system errors. Normal operation for each is steady green. Error conditions are indicated in the following table.

LIGHT CONDITION	MEANING
Steady Green	System OK. Power source is operational, and is communicating normally with all healthy peripheral equipment connected to its ArLink network.
Blinking Green	Occurs during power up or a system reset, and indicates the system is mapping (identifying) each component in the system. Normal for first 1-60 seconds after power is turned on, or if the system configuration is changed during operation.
Fast Blinking Green	Under normal conditions indicates Auto-mapping has failed.
Alternating Green and Red	Non-recoverable system fault. If the Status lights are flashing any combination of red and green, errors are present. Read the error code(s) before the machine is turned off. Error Code interpretation through the Status light is detailed in the Service Manual. Individual code digits are flashed in red with a long pause between digits. If more than one code is present, the codes will be separated by a green light. Only active error conditions are accessible through the Status Light. To clear the active error(s), turn power source off, and back on to reset.
Steady Red	Not applicable.
Blinking Red	Not applicable.



0021

DESCRIPTION:
Pilot Transfer Failed

Possible Cause
Pilot timeout error
Recommended Course of Action
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.



0021

DESCRIPTION:
*Open Pilot -
Check Consumables*

Possible Cause
No pilot arc could be established
Recommended Course of Action
Check that all leads are properly connected between the power source, FlexCut and torch. Verify that the consumables are correctly installed.



0729

DESCRIPTION:
Release Trigger

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



0036

DESCRIPTION:
Thermal Trip

Possible Cause
Machine has overheated and must be allowed to cool before continuing.
Recommended Course of Action
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

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



0447

DESCRIPTION:
FlexStart Not Found

Possible Cause
Arclink Cable not connected between Flexstart and power source
Recommended Course of Action
Check that the Arclink cable is properly attached to both the Arc Start Console and the power source. Try an alternate cable is possible.



0298

DESCRIPTION:
Low Gas Pressure

Possible Cause
Plasma gas is not connected to the rear of the machine or the plasma pressure regulator is turned down too far.
Recommended Course of Action
Check that the plasma gas supply is connected to the rear of the power source. Increase the plasma pressure on the front of the machine to match the cut charts for material and cutting current.



0299

DESCRIPTION:
Low Shield Gas Pressure

Possible Cause
Shield gas is not connected to the rear of the machine or the shield pressure regulator is turned down too far.
Recommended Course of Action
Check that the shield gas supply is connected to the rear of the power source. Increase the shield pressure on the front of the machine to match the cut charts for material and cutting current.



0446

DESCRIPTION:
FlexCool Not Found


Possible Cause
Armlink Cable not connected between cooler and power source
Recommended Course of Action
Check that the Armlink cable is properly attached to both the cooler and the power source. Try an alternate cable if possible.



0815

DESCRIPTION:
Cooler Level Fault

Possible Cause
Not enough coolant in cooler reservoir
Recommended Course of Action
Add more coolant to reservoir of cooler. Check for leaks or disconnected hoses.



0814

DESCRIPTION:
Cooler Flow Fault

Possible Cause
Coolant hoses not connected, leaking or blocked
Recommended Course of Action
Coolant hoses not connected, leaking or blocked



0817

DESCRIPTION:
Coolant Temperature Too High

Possible Cause
Torch coolant has exceeded its temperature limit
Recommended Course of Action
Allow coolant to fully cool before continuing. Verify that the cooler fans are working properly and radiator is not blocked. Verifying cutting current and voltage do not exceed rating plate limits.

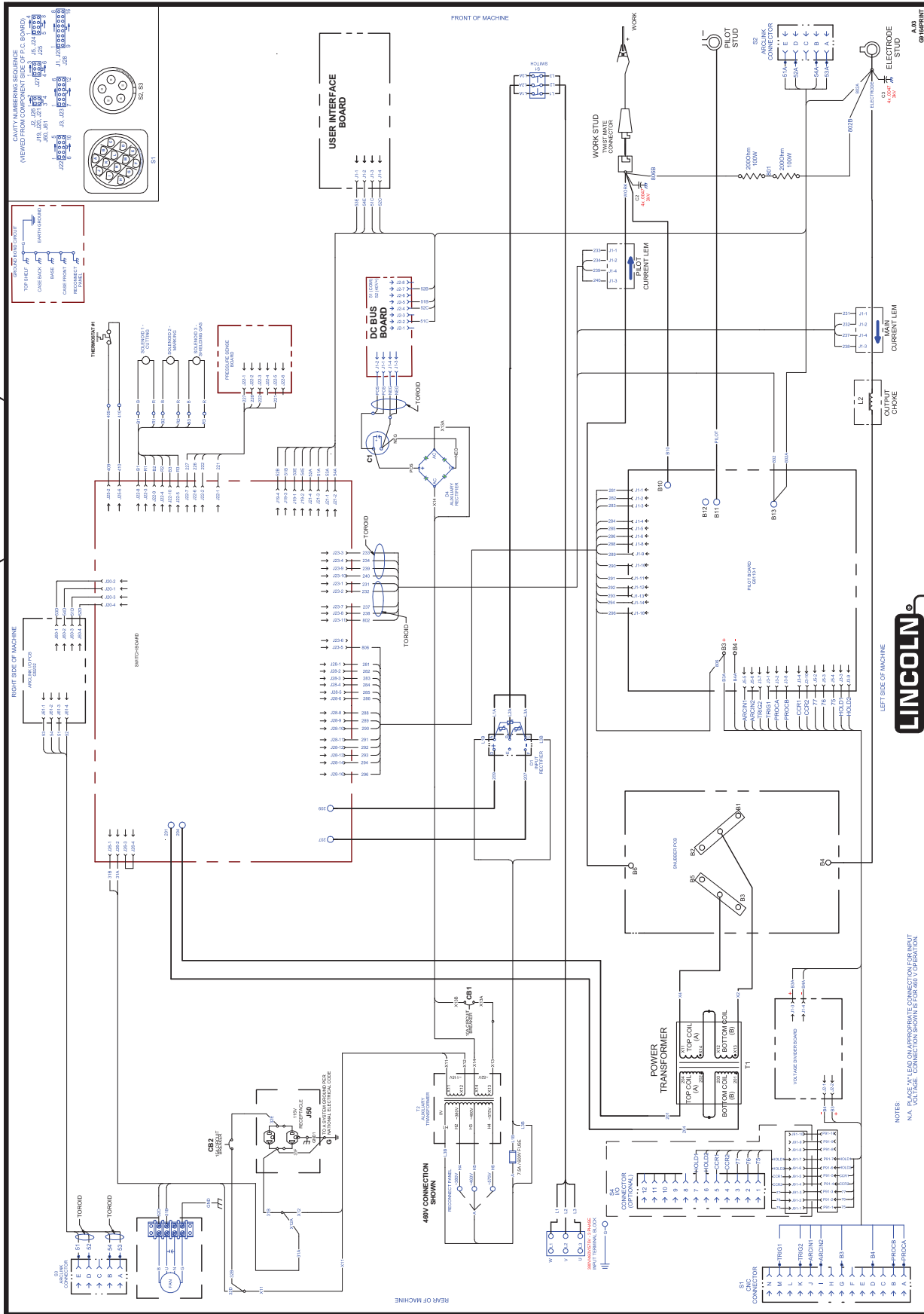


0811

DESCRIPTION:
FlexStart door open

Possible Cause
The door to the FlexStart console is open
Recommended Course of Action
Close the FlexStart door and latch it tightly. Check door switch if problems persist.

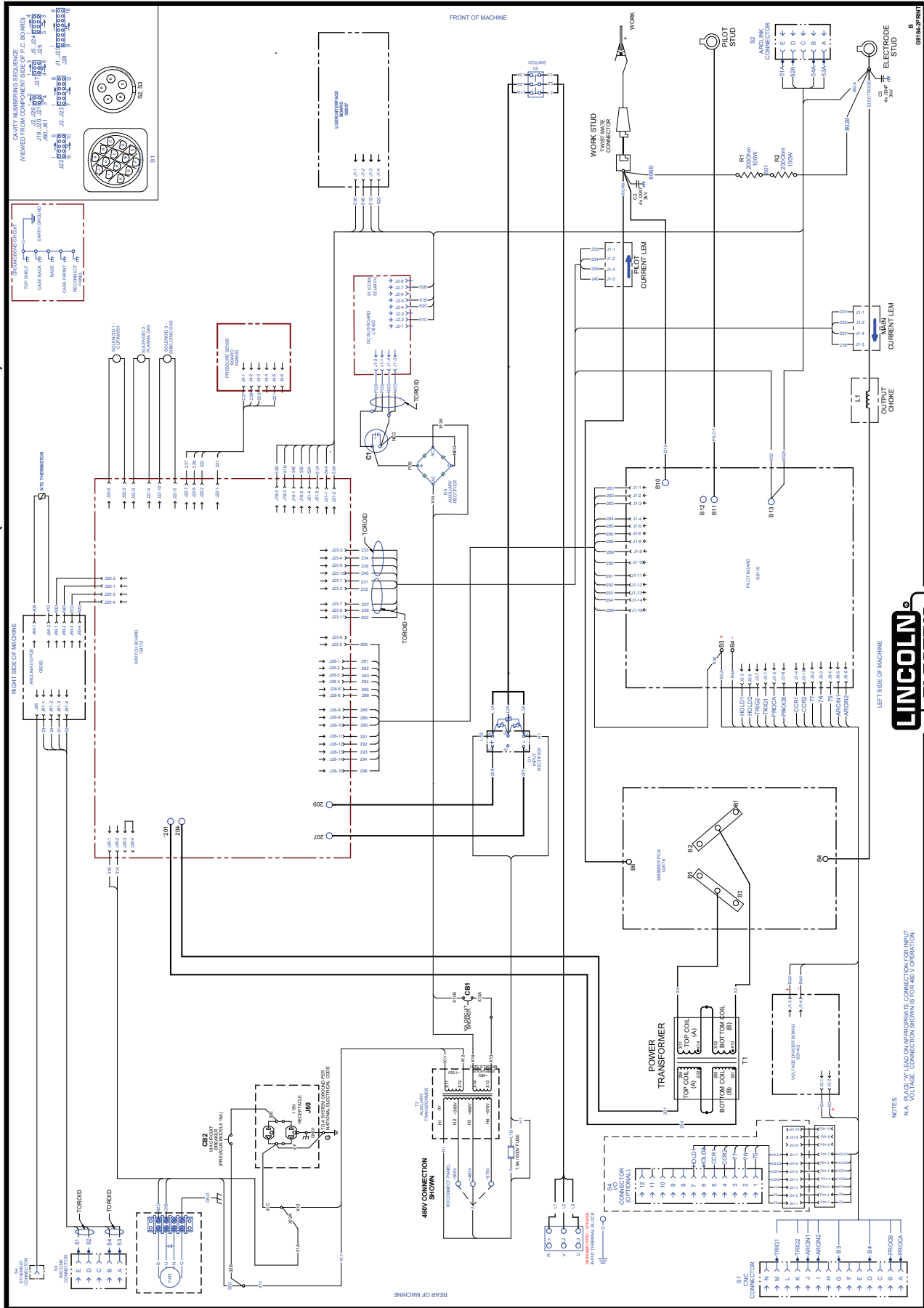
FlexCut 200 WIRING DIAGRAM (CODE 12731)



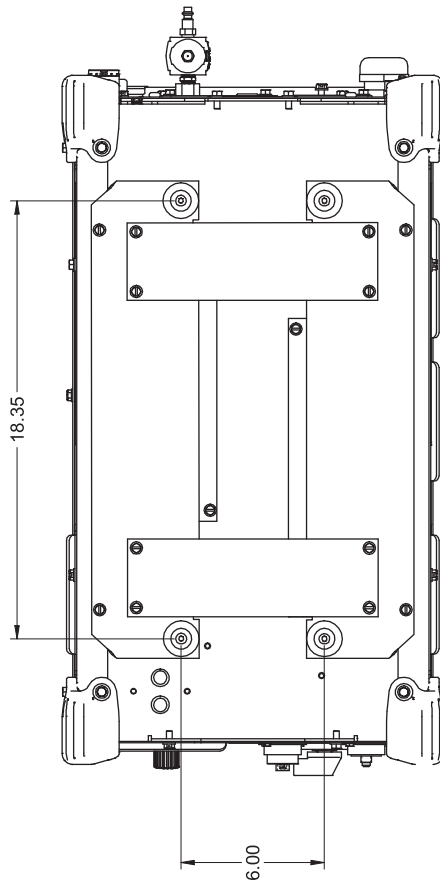
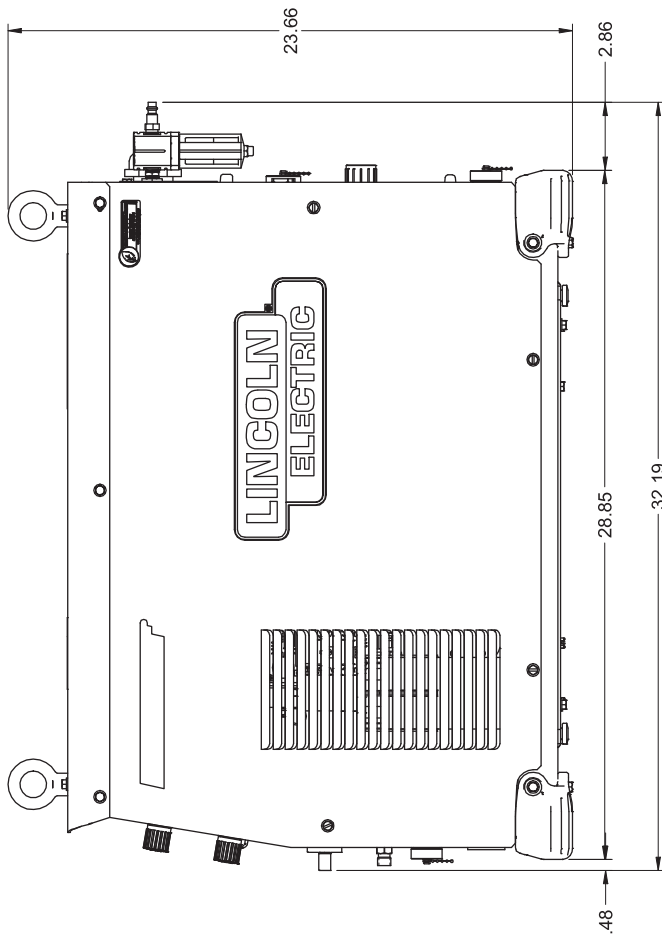
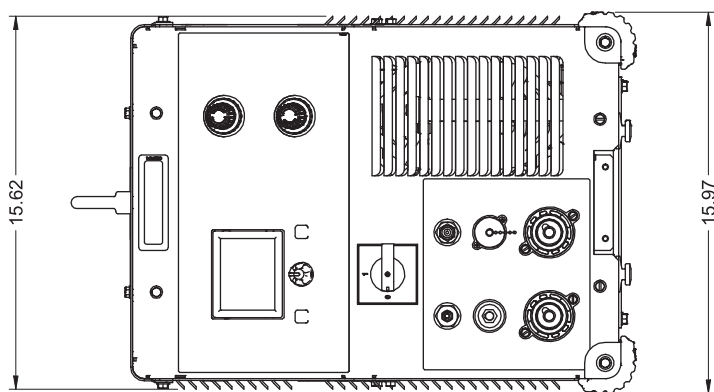
NOTES:
 N.A. PLACE 'A' LEAD ON APPROPRIATE CONNECTION FOR RIGHT
 VOLUME CONNECTIONS FOR LEFT VOLUME

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.

FLEXCUT 200 WIRING DIAGRAM (CODE 12825)



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



L17374 A.01


FlexCut® 200 DUAL GAS INSTRUCTIONS

INSTALLATION INSTRUCTIONS:

OVERVIEW:

The FlexCut® 200 is shipped from the factory configured for air plasma and air shield gas cutting.

These instructions show and explain how to modify the FlexCut® 200 machine to use different plasma and shield gases.

⚠ WARNING	
	<ul style="list-style-type: none"> • Disconnect input power before servicing. • Do not operate with covers removed. • Do not touch electrically live parts. • Only qualified persons should install, use or service this equipment.
ELECTRIC SHOCK CAN KILL	

PARTS LIST:

Item	Part Number	Description	Qty
1	S30229-4	Plug-In Fitting - Bulkhead	1
1	T14557-42	Oxygen Fitting	1
1	T14557-43	Nitrogen Fitting	1

Oxygen Plasma Gas – Air Shield Gas

RECOMMENDED TOOLS:

- 3/8" nut driver or other suitable tool.
- Two adjustable wrenches

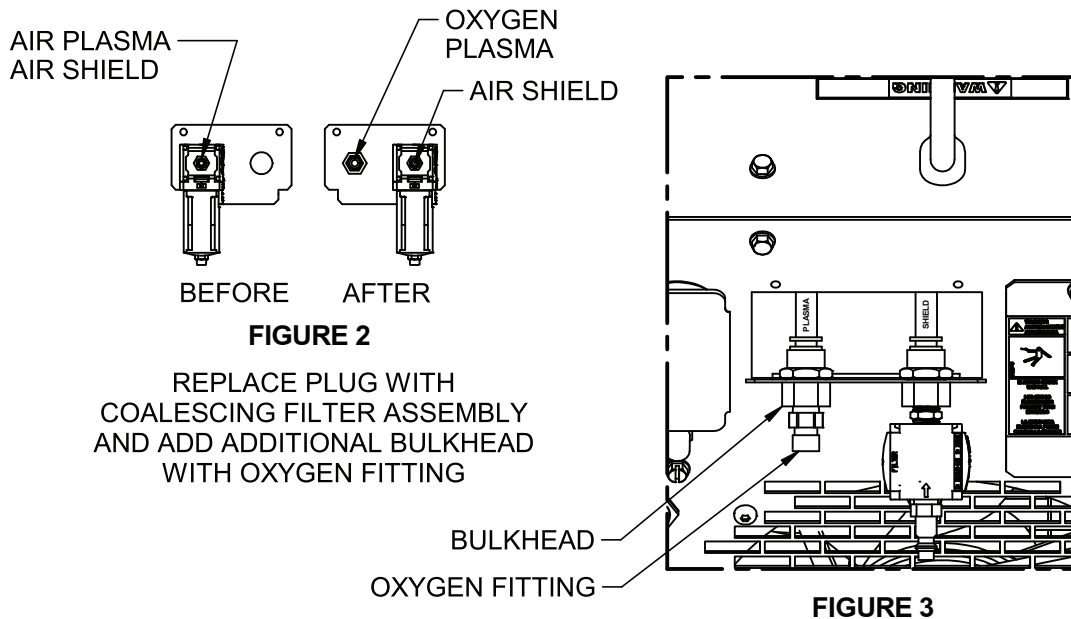
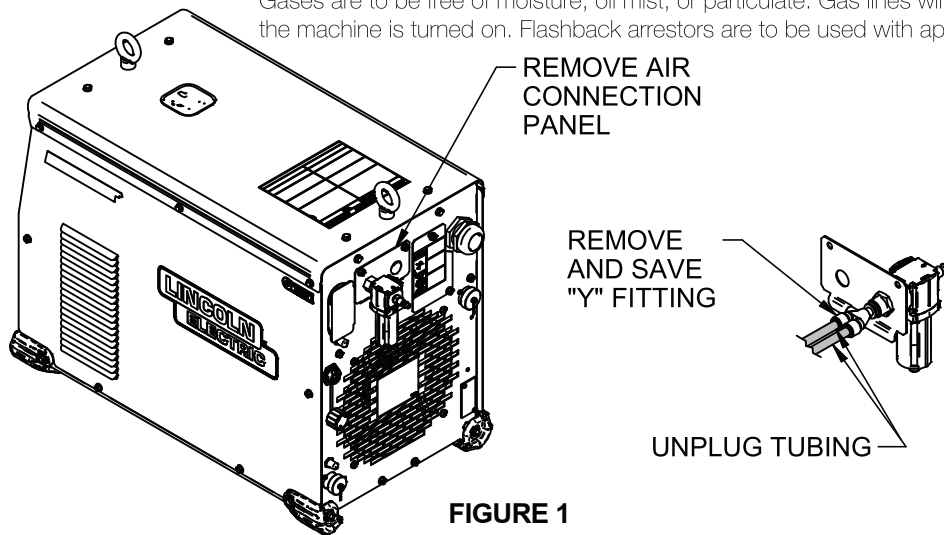
INSTALLATION:

1. Turn off input power to the Flexcut and any other equipment connected to the cutting system at the disconnect switch or fuse box before beginning work. Disconnect any plasma/shield gases.
2. Remove the rear air connection panel by removing the 2 fastening screws. Disconnect the "Y" fitting from the bulkhead fitting. Save the screws for re-installation. See Figure 1.
3. Remove the bulkhead/coalescing filter from the air connection panel and reinstall in place of the plastic plug. Install the included bulkhead fitting and oxygen fitting (external threads) where the bulkhead/coalescing filter was located. Be sure to apply a thread sealant formulated for use with oxygen on the NPT threads between the bulkhead and the oxygen fitting. PTFE tape that is oil/grease free is suitable for oxygen fittings. Tighten the fittings with two wrenches. Reattach the air panel to the rear of the machine. See Figure 2.



4. Remove the “Y” fitting from the two tubes and save. Attach the tube labelled “PLASMA” into the bulkhead fitting without the filter assembly. Attach the tube labelled “SHIELD” into the fitting with the filter. See Figure 3.
5. Re-install the air reconnect panel using the retained screws from Step 2.
6. Connect a regulated oxygen supply to the plasma gas inlet and a regulated air or nitrogen supply to the shield gas inlet. See Figure 4.

Gases are to be free of moisture, oil mist, or particulate. Gas lines will purge when the machine is turned on. Flashback arrestors are to be used with applicable gases.



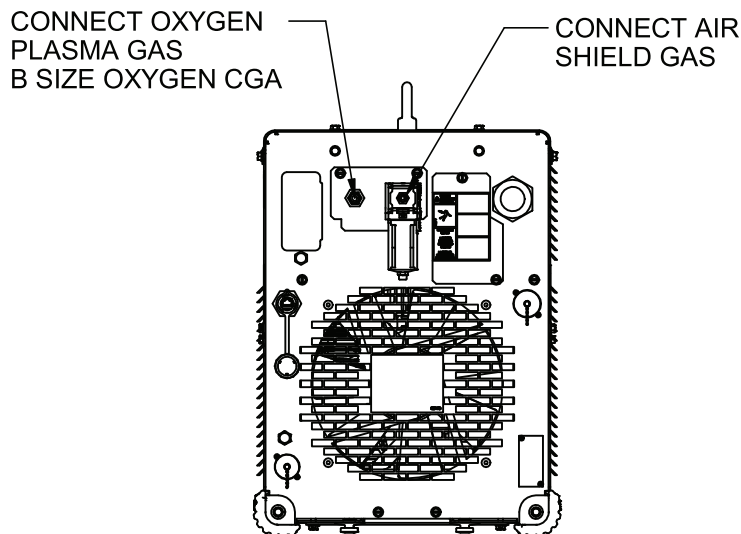


FIGURE 4

Air Plasma Gas – Nitrogen Shield Gas

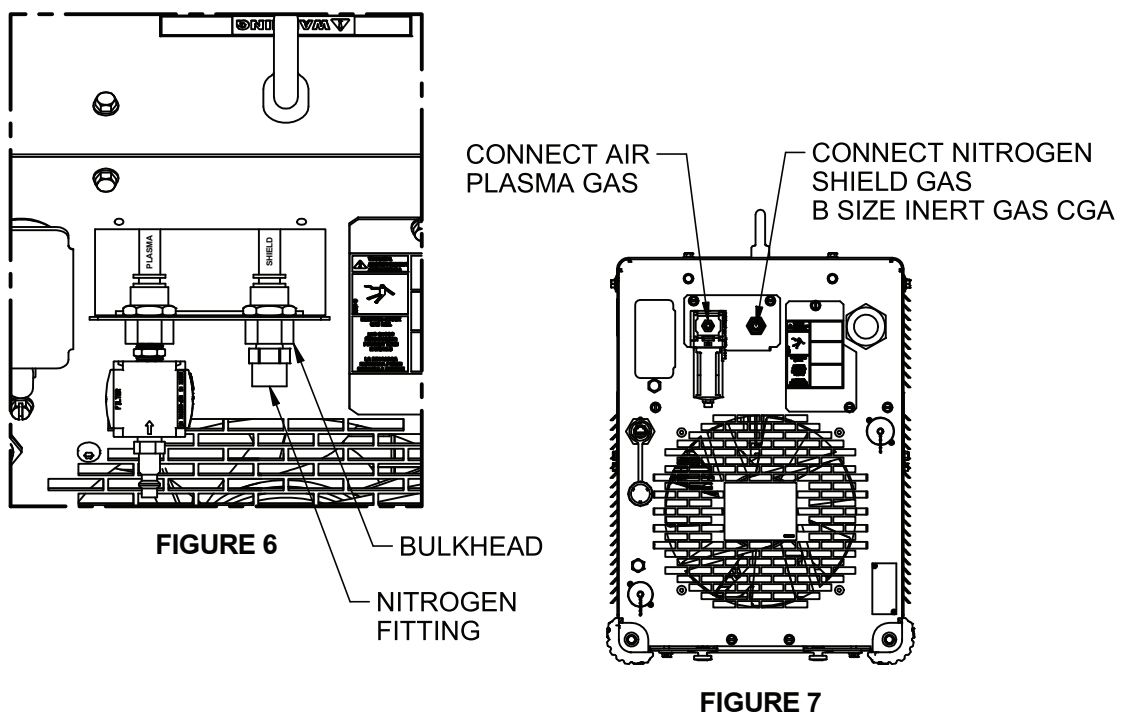
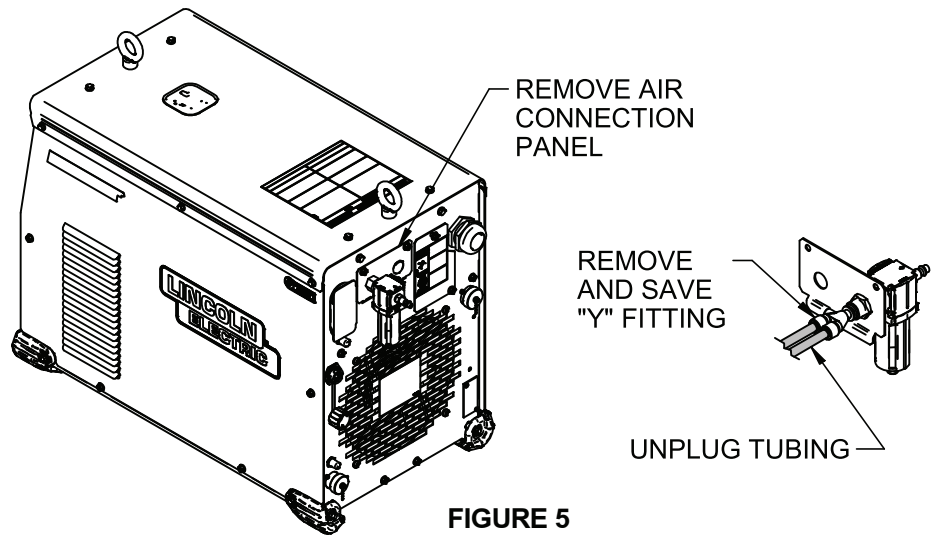
RECOMMENDED TOOLS:

- 3/8" nut driver or other suitable tool.
- Two adjustable wrenches

INSTALLATION:

1. Turn off input power to the Flexcut and any other equipment connected to the cutting system at the disconnect switch or fuse box before beginning work. Disconnect any plasma/shield gases.
2. Remove the rear air connection panel by removing the 2 fastening screws. Disconnect the "Y" fitting from the bulkhead fitting. Save the screws for re-installation. See Figure 5.
3. Remove the plastic plug from the air connection panel and replace with the included bulkhead fitting and nitrogen fitting (internal threads). Be sure to apply a thread sealant on the NPT threads between the bulkhead and nitrogen fitting. Tighten the fittings with two wrenches.
4. Remove the "Y" fitting from the two tubes and save. Attach the tube labelled "PLASMA" into the bulkhead fitting with the filter assembly. Attach the tube labelled "SHIELD" into the fitting without the filter. See Figure 6.
5. Re-install the air reconnect panel using the retained screws from Step 2.
6. Connect a regulated air supply to the plasma gas inlet and a regulated nitrogen supply to the shield gas inlet. See Figure 7.

Gases are to be free of moisture, oil mist, or particulate. Gas lines will purge when the machine is turned on. Flashback arrestors are to be used with applicable gases.



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WARNING	<ul style="list-style-type: none"> ● Do not touch electrically live parts or electrode with skin or wet clothing. ● Insulate yourself from work and ground. 	<ul style="list-style-type: none"> ● Keep flammable materials away. 	<ul style="list-style-type: none"> ● Wear eye, ear and body protection.
Spanish AVISO DE PRECAUCION	<ul style="list-style-type: none"> ● No toque las partes o los electrodos bajo carga con la piel o ropa mojada. ● Aíslese del trabajo y de la tierra. 	<ul style="list-style-type: none"> ● Mantenga el material combustible fuera del área de trabajo. 	<ul style="list-style-type: none"> ● Protéjase los ojos, los oídos y el cuerpo.
French ATTENTION	<ul style="list-style-type: none"> ● Ne laissez ni la peau ni des vêtements mouillés entrer en contact avec des pièces sous tension. ● Isolez-vous du travail et de la terre. 	<ul style="list-style-type: none"> ● Gardez à l'écart de tout matériel inflammable. 	<ul style="list-style-type: none"> ● Protégez vos yeux, vos oreilles et votre corps.
German WARNUNG	<ul style="list-style-type: none"> ● Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung! ● Isolieren Sie sich von den Elektroden und dem Erdboden! 	<ul style="list-style-type: none"> ● Entfernen Sie brennbares Material! 	<ul style="list-style-type: none"> ● Tragen Sie Augen-, Ohren- und Körperschutz!
Portuguese ATENÇÃO	<ul style="list-style-type: none"> ● Não toque partes elétricas e electrodos com a pele ou roupa molhada. ● Isole-se da peça e terra. 	<ul style="list-style-type: none"> ● Mantenha inflamáveis bem guardados. 	<ul style="list-style-type: none"> ● Use proteção para a vista, ouvido e corpo.
Japanese 注意事項	<ul style="list-style-type: none"> ● 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。 ● 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。 	<ul style="list-style-type: none"> ● 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。 	<ul style="list-style-type: none"> ● 目、耳及び身体に保護具をして下さい。
Chinese 警告	<ul style="list-style-type: none"> ● 皮肤或湿衣物切勿接触带电部件及焊条。 ● 使你自己与地面和工作件绝缘。 	<ul style="list-style-type: none"> ● 把一切易燃物品移离工作场所。 	<ul style="list-style-type: none"> ● 佩戴眼、耳及身体劳动保护用具。
Korean 위험	<ul style="list-style-type: none"> ● 전도체나 용접봉을 젖은 헝겊 또는 피부로 절대 접촉치 마십시오. ● 모재와 접지를 접촉치 마십시오. 	<ul style="list-style-type: none"> ● 인화성 물질을 접근시키지 마십시오. 	<ul style="list-style-type: none"> ● 눈, 귀와 몸에 보호장구를 착용하십시오.
Arabic تحذير	<ul style="list-style-type: none"> ● لا تلمس الاجزاء التي يسري فيها التيار الكهربائي أو الألكترود بجسد الجسم أو بالملابس المبللة بالماء. ● ضع عازلا على جسمك خلال العمل. 	<ul style="list-style-type: none"> ● ضع المواد القابلة للاشتعال في مكان بعيد. 	<ul style="list-style-type: none"> ● ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.

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

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

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

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

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

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

CUSTOMER ASSISTANCE POLICY

The business of The Lincoln Electric Company is manufacturing and selling high quality welding equipment, consumables, and cutting equipment. Our challenge is to meet the needs of our customers and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for advice or information about their use of our products. We respond to our customers based on the best information in our possession at that time. Lincoln Electric is not in a position to warrant or guarantee such advice, and assumes no liability, with respect to such information or advice. We expressly disclaim any warranty of any kind, including any warranty of fitness for any customer's particular purpose, with respect to such information or advice. As a matter of practical consideration, we also cannot assume any responsibility for updating or correcting any such information or advice once it has been given, nor does the provision of information or advice create, expand or alter any warranty with respect to the sale of our products.

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Subject to Change – This information is accurate to the best of our knowledge at the time of printing. Please refer to www.lincolnelectric.com for any updated information.



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