LINCOLN ELECTRIC | **Cutting Systems**

TORCHMATE®
4400 | 4800 | 4510

USER GUIDE

October 12, 2021

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Lincoln Electric® Cutting Systems

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Unpacking Your New Machine

Your new Torchmate® 4400, 4800, or 4510 CNC machine is delivered assembled, but you will need to remove the shipping material and gantry locks before operation. Verify all items have been shipped without damage before you accept the order from the shipping company. Notify Lincoln Electric® 775-673-2200 to report any shipping damages. Your machine was fully tested at the factory and a cut metal sample can be found in the waterbed of the machine.

	Qty.	Description	Part Number
	1	Lincoln Electric 4400 Torchmate CNC Table with FlexCut™ 80 Plasma Unit	LECS-080-4400-00
	1	Lincoln Electric 4400 Torchmate CNC Table with FlexCut™ 125 Plasma Unit	LECS-125-4400-00
	1	Lincoln Electric 4800 Torchmate CNC Table with FlexCut™ 80 Plasma Unit	LECS-080-4800-00
	1	Lincoln Electric 4800 Torchmate CNC Table with FlexCut™ 125 Plasma Unit	LECS-125-4800-00
	1	Lincoln Electric 4510 Torchmate CNC Table with FlexCut™ 80 Plasma Unit	LECS-080-4510-00
	1	Lincoln Electric 4510 Torchmate CNC Table with FlexCut™ 125 Plasma Unit	LECS-125-4510-00
	1	Touchscreen Monitor and Computer (installed)	
	1	Consumable Starter Package LC100	BK12849-SK
		TM-CAD/CAM and Security dongle preinstalled	
		Black/Silver Instructional Flash Drive	

To uncrate your new Torchmate 4400/4800/4510, pry the top of the crate off or remove the ghost frame, remove the sides and set it aside. Remove the shrink wrap and inspect the machine for damage. If damaged, do not accept the shipment!

Upon acceptance of the shipment, cut the plastic straps holding the plasma power supply to the crate. The plasma power supply weighs (75 lbs+) and requires a team lift to move it. Set the plasma power supply aside until final machine placement.

A forklift is required to place the machine in its operational position. Do not lift the machine from the gantry or cable carrier side. Place forks in locations marked "fork here" being careful not to hit the motion controller with the forks. Once the machine is in position level the table using the adjustable feet. It is required to utilized extended forks (60" or greater) to unload and maneuver the 4510.

Make sure the table does not rock.
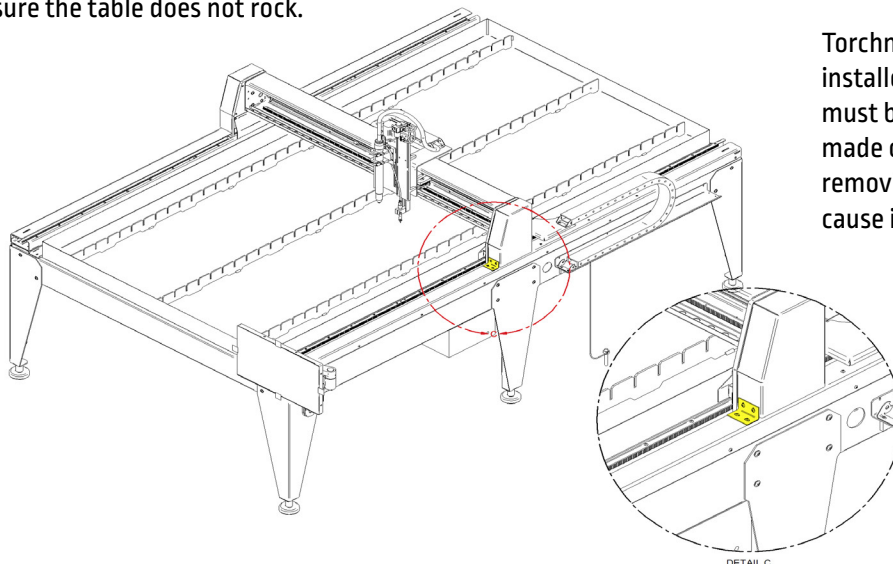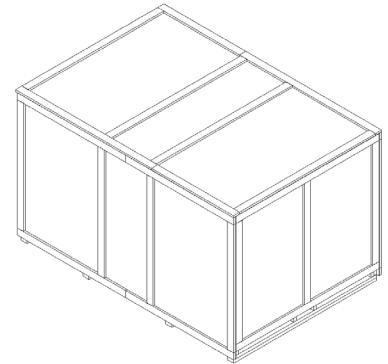
Torchmate 4x00 models are shipped with factory installed gantry locks. The yellow locking devices must be removed before the machine can be made operational. DO NOT replace the bolts after removing the yellow locking devices as this will cause irreversible damage to the gantry.

Do Not Fork Lift From Cable Carrier Side Of Machine!

DETAIL C

Technical Support | On-Site Service

Lincoln Electric Cutting Systems provides a number of technical support opportunities with the purchase of your new 4400, 4800, or 4510 Torchmate CNC cutting machine. The following is a brief outline of available options. Onsite visits are available at an additional cost, call 775-673-2200 for additional information.

- **Phone Support:**

Phone support is available Monday – Friday 7:00am-4:00pm Pacific Time.
Lincoln Electric will make every effort to handle phone calls in a timely manner, but due to the nature of machine diagnoses and the varied capabilities of machine operators, we cannot guarantee hold wait times for phone-in technical support. Technical support includes machine assembly, troubleshooting, configuration, and quality-related issues. Operational training is not included in phone technical support.

- **E-mail:**

Lincoln Electric will return e-mail to the support@torchmate.com e-mail address within 24 hours Monday-Friday.

- **Torchmate Training:**

Lincoln Electric provides a number of training opportunities at our Reno, Nevada campus. Please call (775)-673-2200 for details or visit http://torchmate.com/training

- **Torchmate Academy:**

Torchmate Academy is a high-definition, detailed video walkthrough covering every aspect of your Torchmate table including setup, operation, detailed Torchmate CAD videos, and maintenance. Call (775) 673-2200 or visit the website to learn more.
http://torchmate.com/academy

- **Torchmate YouTube Channel:**

Lincoln Electric provides a wide selection of how to tutorials on our YouTube page.

https://www.youtube.com/user/torchmatedotcom

- **Torchmate Store:**

A variety of consumables, parts, and accessories can easily be purchased online through the Torchmate store. Visit https://www.torchmatestore.com/ to learn more.

Safety Information

Torchmate and Lincoln Electric Cutting Systems equipment is designed and built with safety in mind. However, your overall safety can be increased by proper installation and thoughtful operation.

WARNING: DO NOT INSTALL, OPERATE, OR REPAIR THIS EQUIPMENT WITHOUT READING THE SAFETY WARNINGS CONTAINED THROUGHOUT THIS MANUAL.

Please Note:

- PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH

- KEEP CHILDREN AWAY

- IF YOU WEAR A PACEMAKER, YOU SHOULD CONSULT WITH YOUR DOCTOR BEFORE OPERATING

- Read and understand the following safety highlights. For additional safety information, it is strongly recommended that you obtain a copy of "Safety in Welding & Cutting - ANSI Standard Z49.1" from the American Welding Society, P.O. Box 351040, Miami, Florida 33135 (free download available at https://www.aws.org/standards/page/ansi-z491), or purchase CSA Standard "Safety in Welding, Cutting and Allied Processes," CSA Standard W117.2 (https://www.cwbgroup.org/store/codes-standards/csa-w1172-2019-safety-welding-cutting-and-allied-processes).

- BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE, AND REPAIR PROCEDURES ARE PERFORMED ONLYBY QUALIFIED INDIVIDUALS

ELECTRIC SHOCK CAN KILL:

- The electrode and work (or ground) circuits are electrically "hot" when the power source is on. Do not touch these "hot" parts under any circumstances. Use suitable clothing, including gloves made from durable, flame resistant material.
- Disconnect the power source before performing any service or repairs. When the power source is operating, voltages in excess of 250 volts are produced. This creates the potential for serious electrical shock - possibly even fatal.
- Insulate yourself from work and ground using dry insulation. Wear dry gloves and clothing in good condition. Take extra care when the workplace is moist or damp.
- Always be sure the work cable makes a good electrical connection with the metal being cut, or gouged. The connection should be as close as possible to the area being cut or gouged.
- Ground the work or metal to be cut or gouged to a good electrical (earth) ground.
- Maintain the plasma torch, cable and work clamp in good, safe operating condition. Repair or replace all worn or damaged parts. Replace damaged insulation.
- Never dip the torch in water for cooling or plasma cut or gouge in or under water.
- When working above floor level, protect yourself from a fall should you get a shock.
- Operate the pilot arc with caution. The pilot arc is capable of burning the operator, others or even piercing safety clothing.

FOR ELECTRONICALLY POWERED EQUIPMENT:

- Install equipment in accordance with the U.S. National Electrical Code, all local codes and the manufacturer's recommendations.
- Ground the equipment in accordance with the U.S. National Electrical Code, all local codes and the manufacturer's   recommendations.
- Turn off input power using the disconnect switch at the fuse box before working on the equipment and comply with lock out/tag out procedures.

FUMES AND GASES can be dangerous:

Plasma cutting or gouging may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When cutting or gouging, keep your head out of the fumes. Use adequate ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone.

Use an air-supplied respirator if ventilation is not adequate to remove all fumes and gases.

When plasma cutting or gouging 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. In confined spaces or in some circumstances, outdoors, a respirator may be required.

Additional ventilation is required when cutting (zinc) galvanized steel or materials containing or coated with any of the following:

Antimony	Beryllium	Cobalt	Manganese	Selenium
Arsenic	Cadmium	Copper	Mercury	Silver
Barium	Chromium	Lead	Nickel	Vanadium

The operation of plasma cutting or gouging fume control equipment is affected by various factors, including proper use and positioning of the equipment, maintenance of the equipment, and the specific procedure and application involved. Worker exposure levels must be checked upon installation and periodically thereafter to be certain levels are within applicable OSHA PEL and ACGIH TLV limits. For information on how to test for fumes and gases in your work place, refer to the publications section of this manual.

Do not use plasma cutting or gouging equipment 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. Remove all sources of these vapors.

Gases used for plasma cutting and gouging can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to ensure breathing air is safe. Use an air-supplied respirator if ventilation is not adequate to remove all fumes and gases.

Read and understand the manufacturer's instructions for this equipment and follow your employer's safety practices.

This product, when used for cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and/or cancer.

Some dust created by routing, sawing, grinding, drilling, and other construction activities contains chemicals known to cause cancer, birth defects or other reproductive harm. Avoid prolonged contact with this dust. Wear protective clothing and wash exposed areas with soap and water. Allowing dust to get into your mouth, eyes, or lay on the skin may promote absorption of harmful chemicals.

Some examples of these chemicals are:

Lead and/or cadmium from lead or cadmium-based paint.

Crystalline silica from bricks and cement and other masonry products.

Arsenic and chromium from chemically-treated lumber (CCA).

Your risk from these exposures varies, depending on factors that include: how often you do this type of work, the duration of the work, the metal alloy(s) being worked and the composition, and the number and types of other operations taking place in the work area. To reduce your exposure to these chemicals; work in a well ventilated area, and work with approved safety equipment, such as respiratory protection approved for the contaminants present and their airborne concentrations.

Cutting flame and sparks can cause FIRE OR EXPLOSION:
- Fire and explosion can be caused by hot slag, sparks, oxygen fueled cutting flame, or the plasma arc.
- Have a fire extinguisher readily available. Provide a fire watch when working in an area where fire hazards may exist.
- When not cutting or gouging, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.
- Be sure there are no combustible or flammable materials in the workplace. Any material that cannot be removed must be protected.
- Sparks and hot materials from cutting or gouging can easily go through small cracks and openings to adjacent areas.
- Avoid cutting or gouging near hydraulic lines.
- Do not cut or gouge tanks, drums, or containers until the proper steps have been taken to ensure that flammable and/or toxic vapors from substances inside have been completely removed. 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 (https://pubs.aws.org/p/232/f411999-recommended-safe-practices-for-the-preparation-for-welding-and-cutting-of-containers-and-piping-historical).
- Vent hollow castings or containers before heating, cutting, or gouging. They may explode.
- Do not add fuel to engine-driven equipment near an area where plasma cutting or gouging is being done.
- Connect the work cable to the work as close to the cutting or gouging area as practical. Work cables connected to the building framework or other locations away from the cutting or gouging area increase the possibility of the current passing through lifting chains, crane cablesm, or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.
- Hydrogen gas may be formed and trapped under aluminum work pieces when they are cut underwater or while using a water table. DO NOT cut aluminum alloys underwater or on a water table unless the hydrogen gas can be eliminated or dissipated. Trapped hydrogen gas that is ignited will cause an explosion.
- 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.

CYLINDER may EXPLODE if damaged:
- Use only compressed gas cylinders containing the correct 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.
- Always keep cylinders in an upright position, securely chained to an undercarriage or fixed support.
- Cylinders must be located away from areas where they may be struck or subjected to physical damage.
- They must be a safe distance from plasma cutting or gouging, arc welding operations and any other source of heat, sparks, or flame.
- Never allow any part of the electrode, torch, or any other electrically "hot" parts to touch a cylinder.
- Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.
- Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.

Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-1, "Standard for Safe Handling of Compressed Gases in Cylinders,"available from the Compressed Gas Association, 1235 Jefferson Davis Highway, Arlington, VA 22202. (https://portal.cganet.com/Publication/Details.aspx?id=P-1).
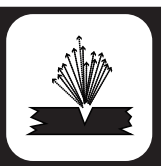
AIR LINES UNDER PRESSURE:
- Some tools use compressed air or gas. Flexible tubing (lines) bring the pressurized air and gas to the machine. Inspect all lines prior to machine operation. Damaged lines should be replaced prior to operation.
- Hot sparks, flying debris, or wear can melt, burn, or puncture these lines and cause damage to the operator.
- Route air and gas lines to keep away from traffic and from underfoot.

ARC RAYS CAN BURN:

· Plasma Arc Rays can injure your eyes and burn your skin. The plasma arc process produces very bright ultraviolet and infrared rays, which will damage your eyes and burn your skin if you are not properly protected.

· Use safety glasses and a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when performing or observing plasma arc cutting or gouging. Glasses, head-shield, and filter lens should conform to ANSI Z87. I standards.

· Use suitable clothing including gloves made from durable, flame-resistant material to protect your skin and that of your helpers from the arc rays.

· 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.

Arc Current	Minimum Shade No.	Suggested Shade No.
Less than 20A	4	4
20A-40A	5	5
40A-60A	6	6
60A-300A	8	9
300A-400A	9	12
400A-800A	10	14

PLASMA ARC can cause serious injury or death:

· Keep your body away from the 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.

HOT MATERIAL:

· Plasma cutting uses an electric arc that can reach temperatures of 45,000°F (25,000°C). Oxygen-fuel cutting flames can reach up to 6330°F (3500°C). Any parts and scrap will be hot after cutting.

· Use proper tools and wear heat-sheilded protective gloves in good condition when handling recently cut material.

· Allow proper cooling time prior to parts being handled.

ELECTRIC AND MAGNETIC FIELDS may be dangerous:

· Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMFs). Cutting or gouging current creates EMFs around torch cables and cutting machines.

· EMFs may interfere with some pacemakers and other medical implant devices, so operators who have a pacemaker should consult their physician before cutting or gouging.

· All operators should use the following procedures in order to minimize exposure to EMF fields from the cutting or gouging circuit:

    · Route the torch and work cables together and secure them with tape whenever possible.

    · Never coil the torch cable around your body.

    · Do not place your body between the torch and work cables. If the torch cable is on your right side, the work cable should also be on your right side.

    · Connect the work cable to the workpiece as close as possible to the area being cut or gouged.

    · Do not work next to cutting power source.

For more information on electromagnetic interference please visit:

http://torchmate.com/white-papers/EMI-Reduction

AUTOMATIC OPERATION:

- Any computer numerical control (CNC) machine may begin to operate automatically without warning. Only a trained individual familiar with the software, machine, and computer system should operate this equipment.
- All untrained persons should not work on or near a CNC machine.
- Keep the immediate area around the CNC machine clear of materials that may cause interference. Keep area clear of bystanders.
- Do not leave the CNC machine unattended while power is on to the computer, controller, or plasma power source of the system.

NOISE:

- Long exposure to noise can lead to hearing damage or loss. CNC operations, plasma arc cutting, plate marking can create noise levels that exceed safe limits. Use appropriate ear protection when operating the system
- Protect the operator and others around the system by using appropriate ear protection suited for the work environment and decible rating of the facility.
- Recommended to test the noise levels (decibles) during operation to validate excess of safe levels.

HEAVY PARTS:

- Parts of CNC machines and raw materials can be heavy. To avoid injury, get someone to help you, or use a mechanical lifter in the event material needs to be lifted or moved. When using a mechanical lifter, follow all the manufacturer's safety guidelines.

FLYING DEBRIS:

- Metal cutting and marking operations create waste that can fragment and fly. Make sure you and everyone close to the CNC machine during operations has proper eye protection.

PINCH AND CRUSH POINTS:

- Pinch and crush points are those normally moving parts of machinery, like CNC machines, that can pinch, capture, crush, or sever parts of the body. Be aware of hazardous pinch and crush points.
- Never repair or adjust the machine without the controls on lock out/tag out.
- When the end of a CNC machine's travel creates a "hard stop," it creates a crush point. Keep fingers and hands away from this.
- Do not stack or store any additional items on or in contact with the CNC machine, as this can create pinch or crush points, and a falling hazard.

MECHANICAL DRIVES:

- High-speed mechanical drives made of gears, belts, and/or drive screws are used by CNC machines. Keep clear of them during operation.
- Do not attempt to service, adjust, or otherwise touch these components without first ensuring that the machine is on lock out/tag out.
- Secure any loose clothing and cables to prevent entanglement.
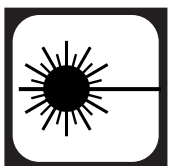
Laser Usage:

- This product contains a diode laser. Make sure to follow all safety precautions when operating.
- DO NOT look into the direct or reflected beam. This can cause eye injury up to 110 ft. (34 m) away.
- NEVER point any laser towards aircraft or vehicles; it is unsafe and illegal. The laser can cause visual interference with pilots and drivers, and interferes with vision up to 2,400 ft (730 m) away. The laser can be a distraction up to 4.5 miles (7.3 km) away.
- Class 3R lasers are safe when handled carefully. DO NOT look into the beam.
- Wear appropriate eye protection when working on the installation of the laser diode.

PUBLICATIONS

Refer to the most recent versions of the following standards for more information:

- OSHA, SAFETY AND HEALTH STANDARDS, 29CFR 1910, obtainable from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C.

- ANSI Standard Z49.1, SAFETY IN WELDING AND CUTTING, obtainable from the American Welding Society, 8669 NW 36 Street, #130; Miami, Florida 33166-6672

- NIOSH, SAFETY AND HEALTH IN ARC WELDING AND GAS WELDING AND CUTTING, obtainable from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402

- ANSI Standard Z87.1, SAFE PRACTICES FOR OCCUPATION AND EDUCATIONAL EYE AND FACE PROTECTION, obtainable from American National Standards Institute, 1430 Broadway, New York, NY 10018

- ANSI Standard Z49.2, FIRE PREVENTION IN THE USE OF CUTTING AND WELDING PROCESSES, obtainable from American National Standards Institute, 1430 Broadway, New York, NY 10018

- AWS Standard A6.0, WELDING AND CUTTING CONTAINERS WHICH HAVE HELD COMBUSTIBLES, obtainable from American Welding Society, 8669 NW 36 Street, #130; Miami, Florida 33166-6672

- NFPA Standard 51, OXYGEN-FUEL GAS SYSTEMS FOR WELDING, CUTTING AND ALLIED PROCESSES, obtainable from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269

- NFPA Standard 70, NATIONAL ELECTRICAL CODE, obtainable from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269

- NFPA Standard 51B, CUTTING AND WELDING PROCESSES, obtainable from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269

- CGA Pamphlet P-1, SAFE HANDLING OF COMPRESSED GASES IN CYLINDERS, obtainable from the Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202

- CSA Standard W117.2, CODE FOR SAFETY IN WELDING AND CUTTING, obtainable from the Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3

- NWSA booklet, WELDING SAFETY BIBLIOGRAPHY obtainable from the National Welding Supply Association, 1900 Arch Street, Philadelphia, PA 19103

- ANSI Standard Z88.2, PRACTICE FOR RESPIRATORY PROTECTION, obtainable from American National Standards Institute, 1430 Broadway, New York, NY 10018
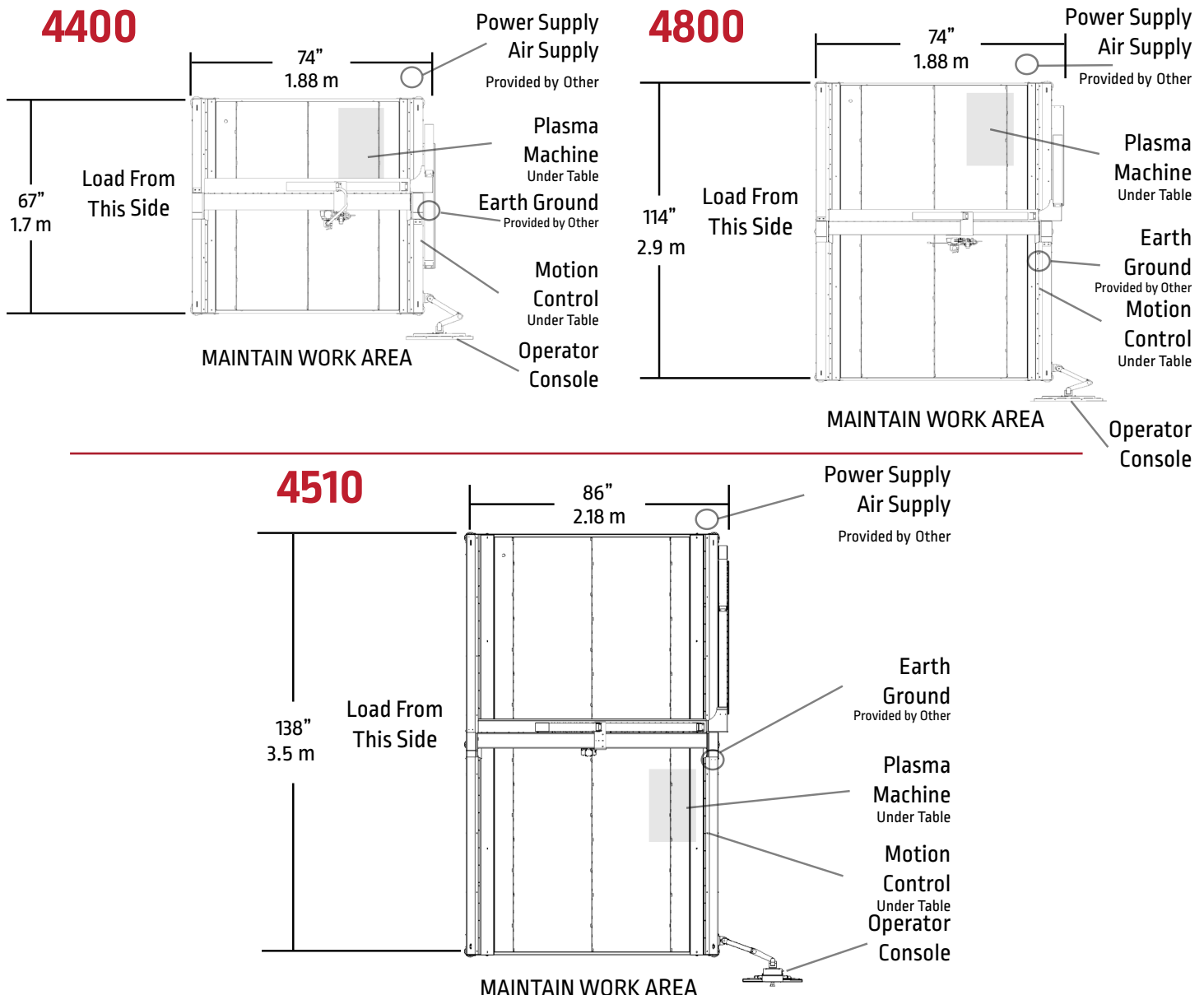
Machine Specifications

TORCHMATE CNC PLASMA SYSTEMS SPECIFICATIONS	Product Specification
TABLE DIMENSIONS	
4400	74" x 67" x 63"
4800	74" x 114" x 63"
4510	86" x 138" x 63"
MACHINE WEIGHT W/O WATER	
4400	840 lbs
4800	1252 lbs
4510	1595 lbs
Water Capacity	
4400	60 gal
4800	107 gal
4510	140 gal
TOOL CAPACITY	
All 4000 Series	2 [1-Plasma	1- Plate Marker]
MATERIAL CAPACITY	
FlexCut 80	3/4" Mild Steel
FlexCut 125	1" Mild Steel
**POWER	AIR REQUIREMENTS**	
HMI	Motion Control	Dedicated 115V / 15A
Air Supply	87-109 psi [6-7.5 bar] 380 SCFH 180 SLPM
FlexCut 80 Single Phase	208V / 1 / 50 / 60 or 230V / 1 / 50 / 60
FlexCut 80/125 Three Phase	208V / 3 / 50 / 60 or 230V / 3 / 50 / 60 or 460V / 3 / 50 / 60 or 575V / 3 / 50 / 60
Machine Ground	Dedicated Earth Ground Supplied By Customer
PRECISION GEAR RACK AND PINION DRIVE SYSTEM	
Stepper Motors	[3] 390 oz-in
Gear Box	[3] 5:1
Gear Engagement	Fixed
Traverse Speed	Up to 500 ipm
Machine Resolution	0.001
Frame Construction	Fabricated Steel Frame with Poweder Coated Finish
CUT CAPACITY [MILD STEEL]	
Maximum Pierce Capacity	
FlexCut 80	3/4" in.
FlexCut 125	1" in.
WARRANTY	
Machine and Plasma Torch Lead	2-years from Invoice Date
Plasma Power Supply	3-years from Invoi

Site Preparation

When installing a Lincoln Electric CNC Cutting System in your shop, there are many factors that will influence the potential productivity, ease of use of the machine and the safety of the operator. The main factors to prepare for include: the physical layout and placement of the machine in the shop, the availability of power, an EMI ground, compressed air and other gasses, and ventilation.

Please Note:

- When preparing to install the Lincoln Electric CNC Cutting System, provide sufficient space. Three feet of work space (914 mm) should be obstacle free around the machine.

- Forklift load material opposite the cable carrier only. Utilize the back of the machine to park the gantry while loading material.

- A dedicated earth ground must be provided and should be installed in a manner to reduce trip hazard.

- The power lead included is limited to 10 feet.

4400

74"
1.88 m

67"
1.7 m

Load From This Side

Power Supply
Air Supply
Provided by Other

Plasma Machine
Under Table

Earth Ground
Provided by Other

Motion Control
Under Table

Operator Console

MAINTAIN WORK AREA

4800

74"
1.88 m

114"
2.9 m

Load From This Side

Power Supply
Air Supply
Provided by Other

Plasma Machine
Under Table

Earth Ground
Provided by Other

Motion Control
Under Table

MAINTAIN WORK AREA

Operator Console

4510

86"
2.18 m

138"
3.5 m

Load From This Side

Power Supply
Air Supply
Provided by Other

Earth Ground
Provided by Other

Plasma Machine
Under Table

Motion Control
Under Table

Operator Console

MAINTAIN WORK AREA

Grounding Your Machine

The 4x00 machines require an earth ground rod to ensure personnel safety, and to supress the high-frequency noise created by the plasma power supply. A star ground point on the table will connect directly to the earth ground rod via a 6 AWG stranded wire or other stranded, grounding cable. Consult with a qualified electrician to verify your connections.

Please Note:

- Use 6 AWG stranded wire to connect the star ground on the table to the customer supplied dedicated earth ground.

- For proper operation of your CNC cutting tables you are required to run a 6 AWG cable from the "star" ground to a dedicated earth-ground rod.

- Ground rod installations are covered by NEC Section 250.

- The earth ground is not included with the machine.

Step 1:

Place the plasma unit into the appropriate location.

Re-install the power lead and the table ground into the front of the machine.

DETAIL C

DETAIL D
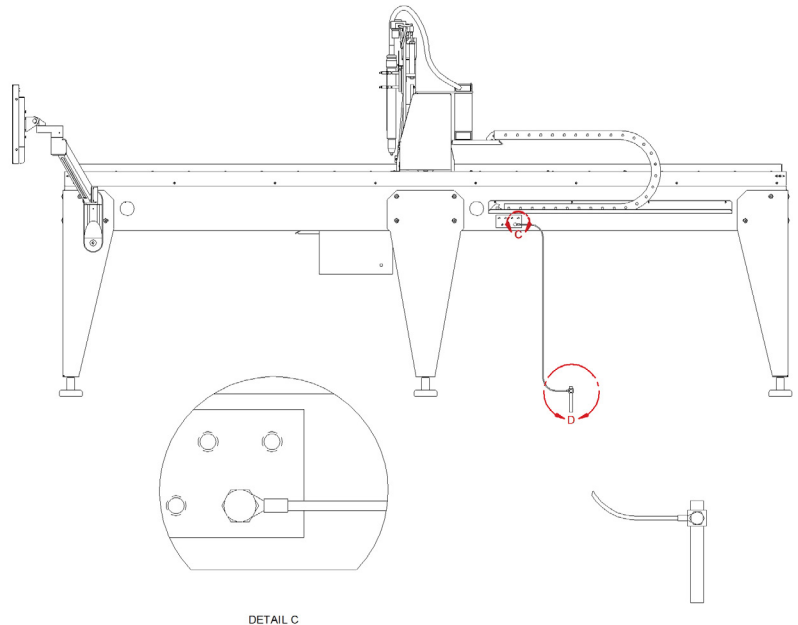
Step 2:

The FlexCut plasma unit is shipped with a factory ground attached to the star ground. In addition, a work ground is attached to the star ground to connect to your material to be cut.

If the work piece is painted or dirty, it may be necessary to expose the bare metal to make a good electrical connection.
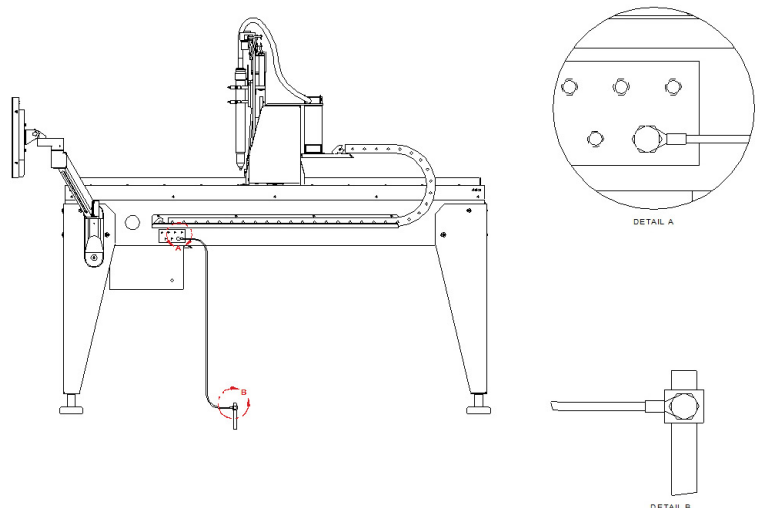
DETAIL A

DETAIL B

Please refer to the FlexCut operators manual for complete installation and operation guidelines. Only a qualified electrician should connect the input leads to the FlexCut Plasma unit. Connections should be made in accordance with all local and national electrical codes. Failure to do so may result in bodily injury or death.

The 4x00 table has a single 120v NEMA 5-15P plug that powers the table and computer/monitor.

The FlexCut 80 is rated for 208 VAC through 575 VAC input voltages, single or three phase and 50 or 60 Hz.

The FlexCut 125 is rated for 380 VAC through 575 VAC input voltage, three phase only and 50 or 60 Hz.

Before connecting the machine to power, be sure the input supply voltage, phase and frequency all match those listed on the machine rating plate.

The FlexCut 80 automatically senses and adjusts to work with any input voltage, phase or frequency listed on the rating plate. No reconnect switch settings are required. The power supply cord is supplied without an attachment plug to accommodate single phase or three phase installations.

Warning:
The FlexCut on/off switch is not intended as a service disconnect for this equipment. Only a qualified electrician should connect the input leads to the Torchmate 4400/4800/4510.

TO ACCUMOVE

TO FLEXCUT 80   TO FLEXCUT 80   TO FLEXCUT 80
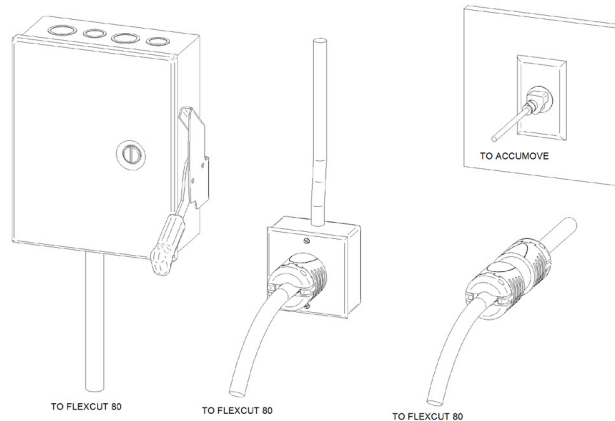
The Torchmate 4400/4800/4510 CNC machine requires clean, dry, oil-free compressed air or nitrogen. A high pressure regulator MUST be used with a compressor or high pressure cylinder.

Supply pressure must be between 87-110 psi (6-7.6 bar) with flow rated rates of at least 300 SCFH or 140 SLPM.

AIR SUPPLY PRESSURE SHOULD NEVER EXCEED 110 PSI OR DAMAGE TO THE MACHINE MAY OCCUR!

A standard nominal 5 micron in-line filter is recommended, but for optimal performance, select a pre-filter with a 3 micron absolute rating. Air must be supplied to the plasma with 3/8" inside diameter tubing and 1/4 NPT quick disconnect coupler. Air lines should be run as to not create a trip hazard. We recommend using the TMS-214-0000-00 approved air filtration assembly, available from www.torchmatestore.com

Water should be installed in the table pan before operation. Rust inhibitors such as non-sodium nitrite based products may be used as a corrosion inhibitor in CNC plasma water tables. Operators are encouraged to use Lincoln Electric® PlateGuard™. PlateGuard is mixed at a 10:1 ratio with water. Visit www.torchmatestore.com to purchase.

Water Capacity
· 4400 models hold approximately 60 gallons (230 liters). 6 gallons of PlateGuard.
· 4800 models hold approximately 107 gallons (405 liters). 10.7 gallons of PlateGuard.
· 4510 models hold approximately 140 gallons (530 liters). 14 gallons of PlateGuard.

Please refer to the complete operation and user manual for your FlexCut 80 located with the plasma unit. When the Machine is turned on, and auto-test is executed, all of the LEDs on the Control Panel will light up.
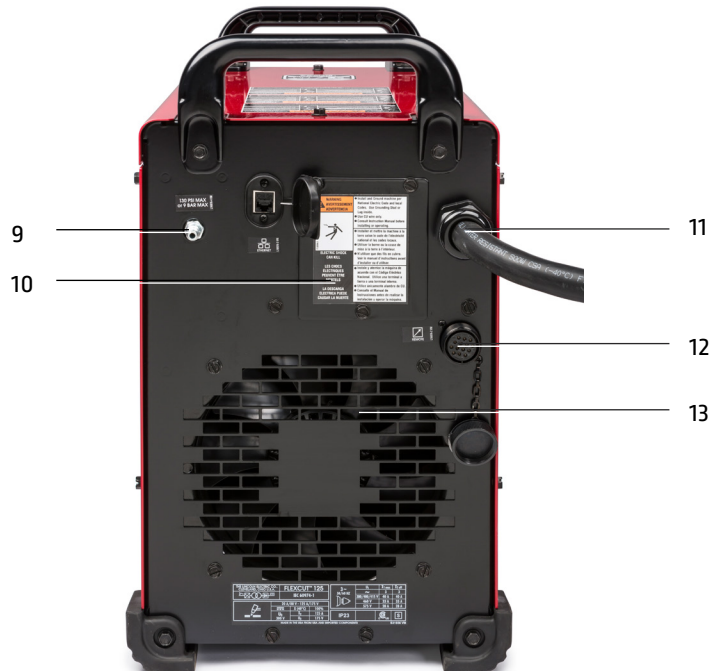
Controls »

FRONT

1. CUTTING OPERATING MODE SELECTION

2. PRIMARY AIR, GAS PRESSURE GAUGE AND REGULATOR KNOB

3. TORCH CONNECTION

4. SINGLE PHASE GREEN LED

5. POWER ON/OFF GREEN LED

6. OUTPUT RED LED

7. THERMAL YELLOW LED

8. GAS PRESSURE YELLOW LED

9. PARTS-IN-PLACE (PIP) YELLOW LED

10. OUTPUT CURRENT KNOB

11. CNC INTERFACE

12. WORK GROUND

BACK

13. INPUT CORD - 10 ft. (3.0 M)

14. POWER SWITCH

15. AIR OR GAS INLET (1/4 in. NPT QUICK CONNECT)

16. FAN

FlexCut 80 Plasma Controls & Settings

Please refer to the FlexCut operators manual for complete installation and operation guidelines. Do not overtighten the consumables. Only tighten until the parts are seated properly.

Product Name	Product Number	Input Power Voltage/Phase/Hertz	Rated Output: Current/ Voltage/Duty Cycle	Input Current @ Rated Output	Output Range	Gas Pressure Required	Gas Flow Rate	H x W x D in (mm)	Net Wt. lb (kg)
FlexCut 80	K4809-1	200-208/230/380/ 460/575/3/50/60	60A/140V/100%	3PH/100% 31/28/16/14/12	3PH 25-80A	87 to 109 PSI (6.0-7.5 Bar)	380 SCFH @ 80 PSI 180 SLPM @ 5.5 Bar	17.9 x 11.8 x 25.4 (455 x 301 x 645)	96 (44)
			80A/140V/80%	3PH/80% 41/37/21/18/14					
		230/1/50/60	60A/140V/100% 80A/140V/80%	1PH/100% 48 1PH/80% 62	1PH 25-80A				
		200-208/1/50/60	60A/140V/100% 80A/140V/60%	1PH/100% 52 1PH/60% 71	25-80A				

MECHANIZED CUT CAPACITY - MATERIAL THICKNESS MILD STEEL

Recommended cut capacity at 24 ipm	3/4 in. (19 mm)

PIERCE CAPACITY - MATERIAL THICKNESS MILD STEEL

Pierce capacity with programmable torch height control	3/4 in. (19 mm)

MAXIMUM CUT SPEEDS - MILD STEEL

1/4 in. (6.35 mm)	148 ipm
1/2 in. (12.7 mm)	52 ipm
3/4 in. (19 mm)	26 ipm

CONSUMABLES STARTER KIT FOR LC100M MACHINE TORCH (BK12849-SK)

Electrode (LC100M)	BK12849-3	5 Qty
Shield Cap 60A-80A (LC100M)	BK12849-15	1 Qty
Nozzle 40A (LC100M)	BK12849-4	1 Qty
Nozzle 60A (LC100M)	BK12849-5	2 Qty
Nozzle 80A (LC100M)	BK12849-6	2 Qty
Swirl Ring (LC100M)	BK12849-9	1 Qty
Retaining Cap-CTP (LC100M)	BK12849-22	1 Qty
Shield Cap-40A (LC100M)	BK12849-14	1 Qty

FlexCut 125 Plasma Controls & Settings

Please refer to the complete operation and user manual for your FlexCut 125 located with the plasma unit. When the Machine is turned on, and auto-test is executed, all of the LEDs on the Control Panel will light up.

Controls »

FRONT

1. LCD DISPLAY

2. PRIMARY AIR, GAS PRESSURE GAUGE AND REGULATOR KNOB

3. HOME BUTTON

4. ON/OFF SWITCH

5. TORCH CONNECTION

6. WORK LEAD CONNECTION

7. MENU CONTROL KNOB/BUTTON

8. PURGE

BACK

9. AIR OR GAS INLET (1/4"IN. NPT QUICK CONNECT)

10. RECONNECT PANEL ACCESS

11. INPUT CORD STRAIN RELIEF

12. 14-PIN CNC INTERFACE

13. FAN

FlexCut 125 Plasma Controls & Settings

Please refer to the FlexCut operators manual for complete installation and operation guidelines. Do not overtighten the consumables. Only tighten until the parts are seated properly.

Product Name	Product Number	Input Power Voltage/Phase/Hertz	Rated Output: Current/ Voltage/Duty Cycle	Input Current @ Rated Output	Output Range	Gas Pressure Required	Gas Flow Rate	H x W x D in (mm)	Net Wt. lb (kg)
FlexCut 125	K4811-1	380/400/415/460 /575/3/50/60	125A/175V/100%	3PH/100% 40/40//40/33/28	3PH 20-125A	90-120 PSI (6.21-8.27 Bar)	550 SCFH @90 PSI 260 SLPM @6.21 Bar	20.72 x 12.25 x 25.53 (526 x 311 x 648)	118 (53.5)

MECHANIZED CUT CAPACITY - MATERIAL THICKNESS MILD STEEL

Recommended cut capacity at 32ipm	1 in. (25.4 mm)

PIERCE CAPACITY - MATERIAL THICKNESS MILD STEEL

Pierce capacity with programmable torch height control	3/4 in. (19 mm)

MAXIMUM CUT SPEEDS - MILD STEEL

1/4 in. (6.35 mm)	180 ipm
1/2 in. (12.7 mm)	72 ipm
3/4 in. (19 mm)	40 ipm
1 in. (25.4 mm)	23 ipm

CONSUMABLES STARTER KIT FOR LC125M MACHINE TORCH (K4302-2)

Electrode (LC125M)	BK14300-1	2 Qty
Shield Cap 45 A - 65 A (LC125M)	BK14300-3	1 Qty
Shield Cap 85 A - 125 A (LC125M)	BK14300-4	1 Qty
Nozzle 45A (LC125M)	BK14300-7	1 Qty
Nozzle 65A (LC125M)	BK14300-8	1 Qty
Nozzle 85A (LC125M)	BK14300-9	1 Qty
Nozzle 105A (LC125M)	BK14300-10	2 Qty
Nozzle 125A (LC125M)	BK14300-11	2 Qty
Swirl Ring 45 A - 125 A (LC125M)	BK14300-13	1 Qty
Retaining Cap-CTP (LC125M)	BK14300-15	1 Qty

Powering Up the Torchmate 4x00

To power up the Torchmate 4000 Series CNC machine, please follow the instructions below. The complete user guide is available as an embedded file in the VMD. Use the button with the question mark to access this file.

Step 1:
Turn the Accumove power swith to ON. Twist the E-STOP knob 1/4 turn clockwise. This will power the Accumove and start the computer.

*If a grey WINDOWS screen appears, swipe your finger up on the touchscreen monitor. Enter 'cncop' into the password prompt. Press the arrow.

Step 2:
Once the computer boots up, it will launch the Visual Machine Designer software.

Step 3:
On the screen, press DATUM. This will enable the drives. The head will come to the lower left corner of the table to its 'HOME' position. Your machine is now prepared and ready to run.

Lower Left Corner

To power down the Torchmate 4400/4800/4510 CNC machine, please follow the instructions below.

Step 1:
Press SHUTDOWN.

Step 2:
A prompt will display "Turn Off the Accumove Controller before pressing OK". Press on the E-STOP button to power down the controller.

Step 3:
Press OK. The computer will then power down. The machine is now properly shut down.
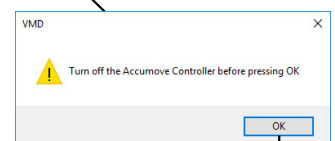
Overview of the Visual Machine Designer

Visual Machine Designer (VMD) is the driver software to all ACCUMOVE® CNC controllers. This design allows the operator to access a majority of the table's controls from the main screen, while hosting other features that aid in creating and manipulating files. This quick guide will give you an overview of the features along with its operation.
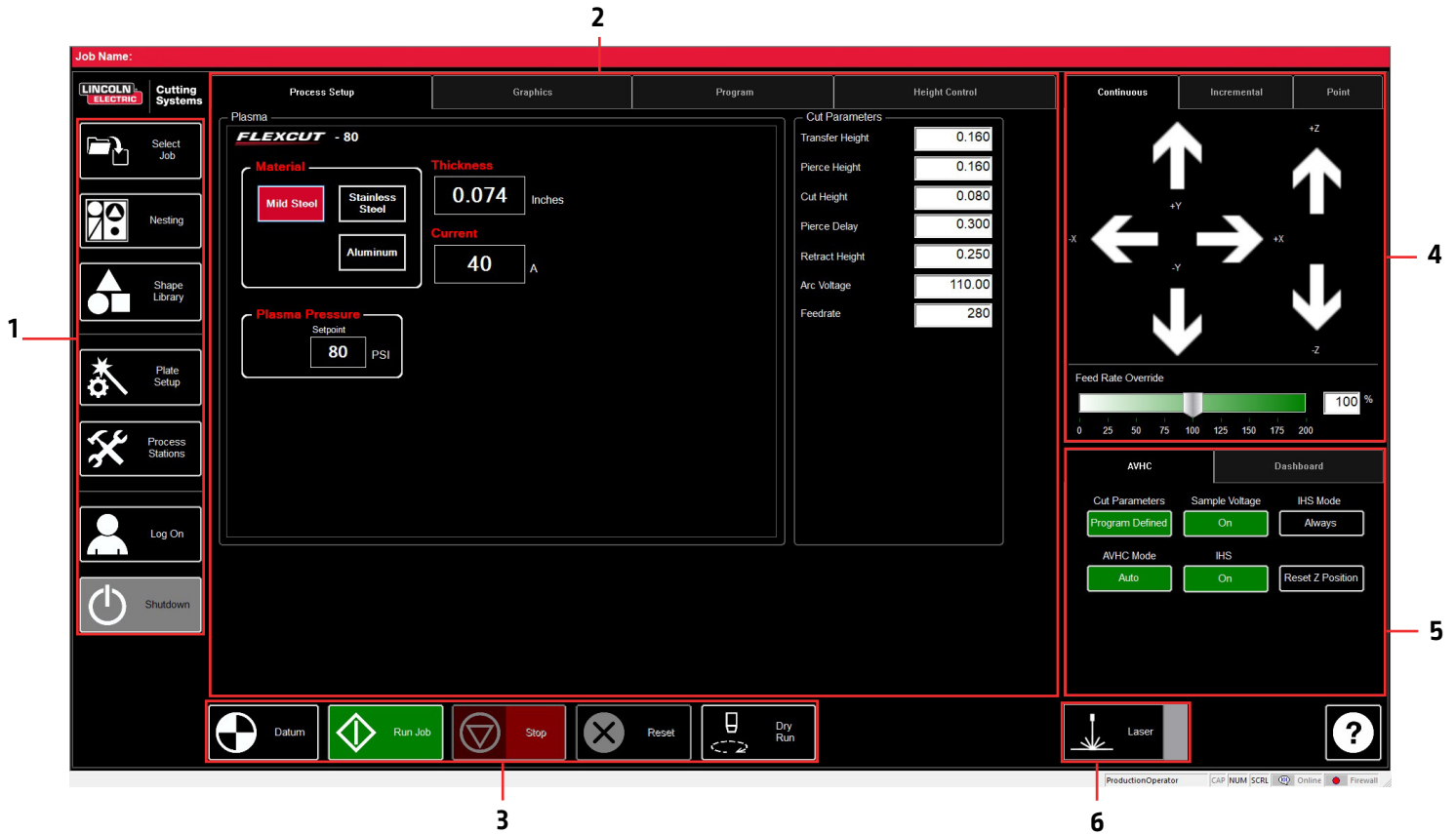
The main screen of the VMD is broken into sections for easy navigation and operation. Overview of all the buttons and functions will be covered in sections.

1. **Job Group -** Opens and controls all aspects of the file being entered or the creation of jobs. Includes SHUTDOWN.

2. **View Screen -** Shows the Process Setup, graphic of the job, g-code of the job, graph of the AVHC lifter station movements, and Oxy Fuel and Water Fill controls.

3. **Run Group -** These buttons control the start and stop of the job.

4. **Jogging -** Controls the torch movement on the machine along with program run speed.

5. **AVHC/Dashboard -** Control the AVHC and displays the coordinates of the head along with all of the indicators being monitored on the machine.

6. **Accessory Toggle -** This hosts the on/off toggle button for the laser pointer accessory.

Job Group

The Job Group covers any "job" type functions. This group directly deals with selecting a job, creating a job (Shape Library), Nesting, and other Job type functions.

Select Job:
Allows the operator to choose the job which they would like to load.

The SELECT JOB folder shows the "HOT FOLDER" and the loaded jobs in that folder.

*C:\ControllerData\Jobs is the HOT FOLDER.

To select another source, press BROWSE and that will open the standard WINDOWS dialog.

The PREVIEW window will display the selected job from the list.

IS JOB KERF COMPENSATED: Toggles the software to accommodate for KERF. If generating parts from TMCAD/VMD NEST, select YES. Shape Library parts require KERF correction, select NO. Uses the KERF diameter setting in TOOL LIBRARY.

Nesting:
Launches the VMD Nesting program.

See the Nesting section for an overview of the features.

Shape Library:
Feature opens the dialog to create a user-defined shape based on 36 of the most common parts.

See the USING THE SHAPE LIBRARY section for details.

Plate Setup:
The options in Plate Setup allows you to make alterations to the job itself and control the water level on water table configurations.

- **ROW AND COLUMN -** Allows you to add multiples by adding numbers to generate a GRID ARRAY of the job you have selected.
- **TRANSFORMS -** MIRROR, ROTATE, or SCALE your job.
- **MATERIAL SENSING -** Works in conjunction with the CUT PARAMETERS by setting a measurement for the TOP OF MATERIAL and the MATERIAL THICKNESS of the plate you are cutting. This setting is only utilized when cutting with IHS disabled.
- **PLATE ALIGNMENT -** Used to have the controller 'angle' the job to the skewed material on the table.
- **SET PLATE ORIGIN -** Establishes the PLATE ORIGIN.
- **GO TO PLATE ORIGIN -** Moves the head back to the PLATE ORIGIN.
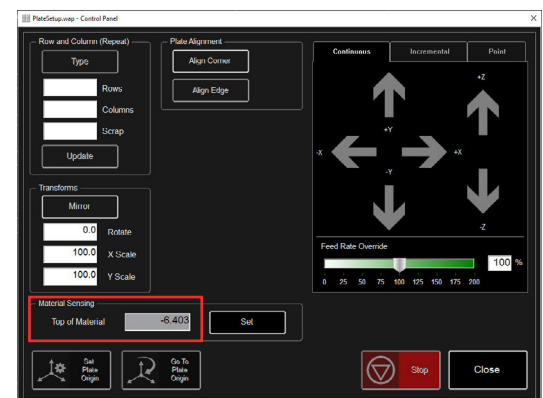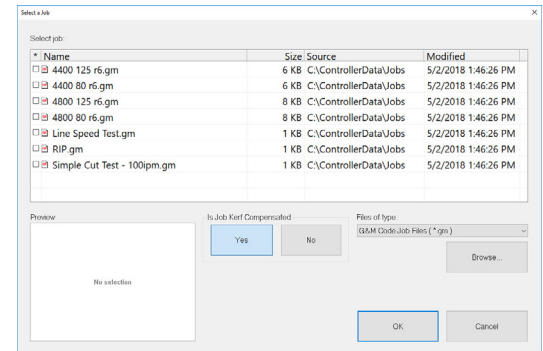
Job Group:

Process Stations:
Configure and control the tool outputs on the machine.

- **Kerf** - Add a Kerf value to compinsate for the tool kerf value.
- **Set Offset** - Capture the distance based on the torch position to a Plate Origin
- **On/Off Dwell** - Add time delay to sending signals to the associated tool.
- **Pierce Count** - Counts the processes ARC ON commands.
- **Activate** - Toggles the tool to get a ON command. Toggle to turn off.
- **State** - Indicates the ON/OFF status of the tool.

Log On:
LOG ON switches users of the VMD software.

- **ADMIN** - Opens the MACHINE SETTINGS (password protected).
- **OPERATOR** - Displays the standard user with the standard interface.
- **PRODUCTION OPERATOR (default)** - Standard user with a simplified interface.
- **TECH SUPPORT** - Used only for tech support (password protected).
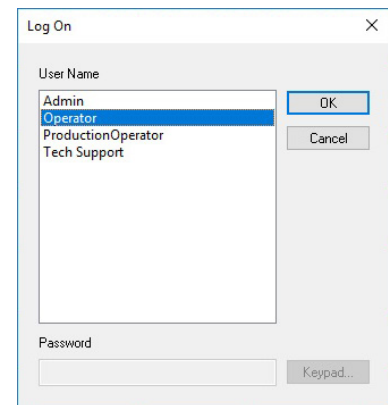
Shutdown:
SHUTDOWN will close the VMD and power down the computer.

This should be used when shutting down the system.

- Prompts a dialog box to TURN OFF ACCUMOVE CONTROLLER.
- Press the E-Stop button to power down the controller.
- The computer will then shut down.
- Turn the power switch to OFF.
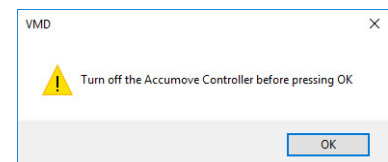
View Screen

The main view screen of the VMD hosts tabs that control and display the job and the corresponding settings for cutting the material. The tabs at the top of the screen gives the operator different views and controls for the job planning to be cut.

Process Setup:

The process setup tab is used to enter the material you are planning to cut. Once entered, it will update the cut parameters to the cut chart parameters.

- **Process Cutting** - Determines the mode of the loaded job. Plasma, Marking, or Grid (Expanded)

- **Thickness** - Material thickness.

- **Material** - Type of material being cut. Mild Steel, Aluminum, or Stainless Steel/H17

- **Current** - Amperage used to cut the material.

Once entered, the appropriate consumables and part numbers will display and auto-fill the Cut Parameters to the appropriate settings.

Cut Parameters:

All the parameters in the Cut Parameters and AVHC tab set the torch in proper position in relation to the material during operation. Most of the parameters can be found in your FlexCut manual under Cut Charts.

- **Transfer Height** - Distance the torch will retract off the material to initiate a pilot arc, prior to moving up to the pierce height.

- **Pierce Height** - Distance the head sits above the material during piercing.

- **Cut Height** - Distance between the torch tip and top of material during cutting.

- **Pierce Delay** - The time delay for the torch to pierce through the material before executing movement.

- **Retract Height** - Distance the head will retract off the material during rapid travels when moving in between cuts in a job.

- **Arc Voltage** - Voltage feedback comparison value. If using sample voltage this will adjust during cutting.

- **Feedrate** - Displays/sets to the optimal feedrate in the cut charts for the thickness of material and amperage set.

View Screen:

Graphics View:

The machine limits are displayed in blue. The head is represented with white crossed lines.

- · Plasma assigned tool paths are displayed in red.

- · Plate Marker assigned tool paths are displayed in green.

- · Rapid travels will be a dashed grey line.

- · **Zoom to Machine -** Zoom to the programmed machine limits.

- · **Zoom to Job -** Zooms the display to the job loaded.

- · **Run From Torch Position -** Starts the stopped job where the torch is located on the job.

- · **Maximize Plan View -** Displays all views in one screen.
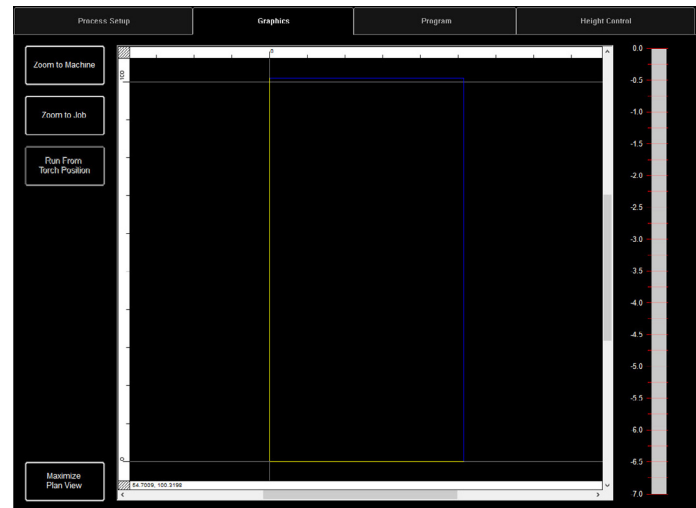
Program View:

Displays the G-Code of the job that is loaded.

- · **Edit Job -** Opens the current G-Code in the default text editor.

- · **Maximize Viewport -** Display all views in one screen.
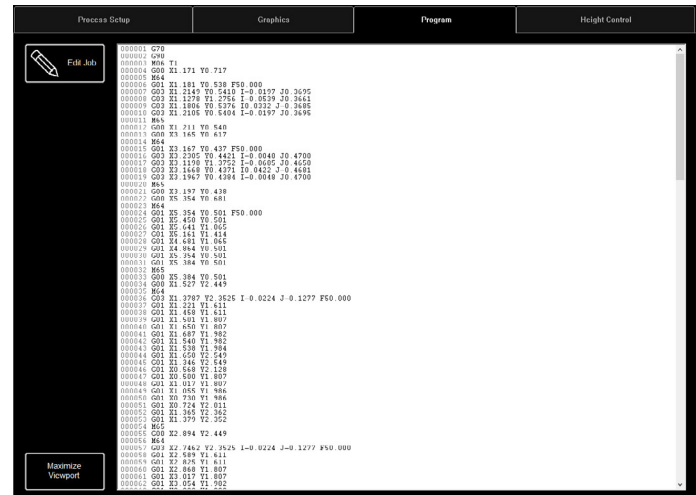
Height Control View:

This displays the lifter station movements while operating in a moving graph.

- · **Trace Pause/Resume -** Pauses the graph if tracing.

- · **Trace Off/On -** Toggles viewing the lifter station's movement during operation.

- · **Maximize Viewport** - Displays all views in one screen.
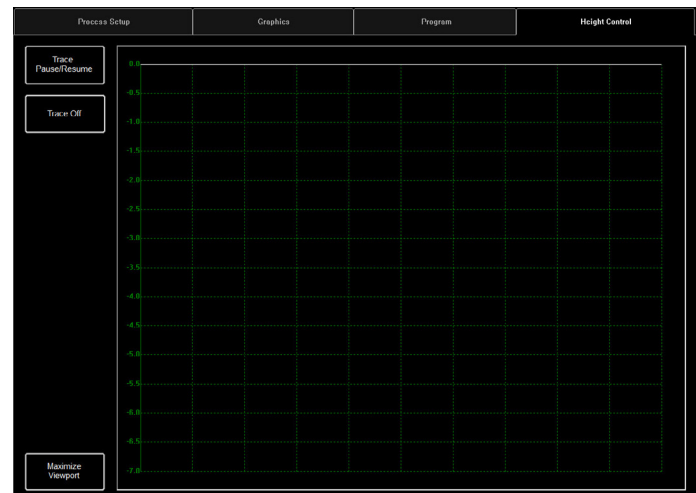
Run Group

The Run group controls the startup of the machine along with running jobs.

Datum:
Datum has several features. When first starting up your machine, datum will power your motors and move the machine to establish its MACHINE ZERO.

Once the torch has moved to the far left corner, the machine is ready to operate.

Run Job:
- **Run Job** - Starts the job that is loaded into the VMD.
- **Stop** - Stops any activity or motion of the machine.

Reset:
The resets the job to start over. If the job has started and not completed you will need to RESET to start the job over.

Active Run/Dry Run: Toggles between ACTIVE RUN and DRY RUN.

- **ACTIVE RUN** - Activates your torch to fire when you RUN a job.
- **DRY RUN** - Deactivates your torch from operation. If in DRY RUN, the torch will simulate all movements without firing the torch.
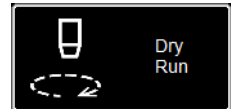
Jogging

Jogging allows the user to move the head by pressing on the direction. The Jogging group has several types of jogs that can be executed, allowing the user finite control over the direction, distance, and speed the head will move.

Jog:

The JOG keys are assigned to the movement of torch to the origin of the operators console. By pressing more towards the center of the arrow, the torch body will move slower. Pressing more towards the outside of the arrow, the torch body will move faster. Continuous will move as long as your finger is active on the direction.

- **FEED RATE OVERRIDE -** Alter the running feedrate of the job that is active. The feedrate updates the change on the next ARC ON command.
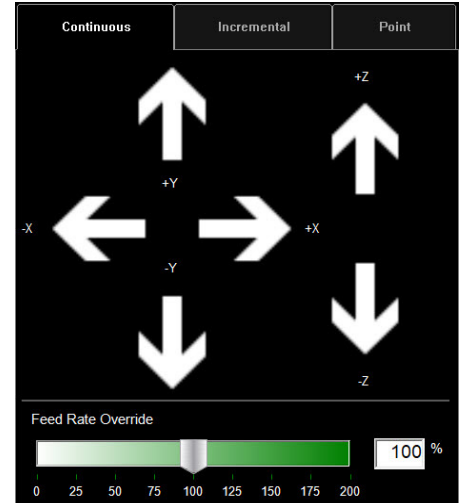
Incremental Jog:

Pressing a direction will travel the torch the assigned Incremental Distance

Using the slider will give you increments between .000 - .100. Directly enter any number into the dialog.
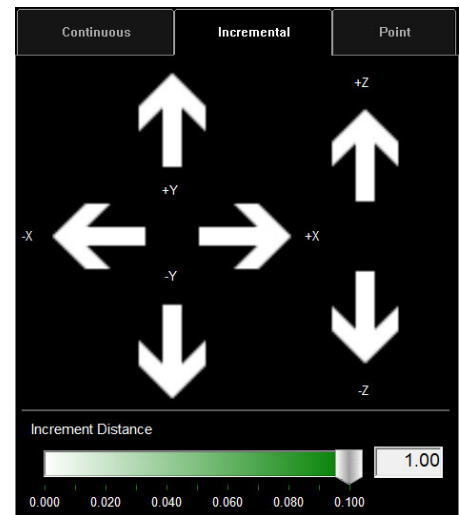
Point Jog:

Allows the user to define the position the torch to travel to, an origin, and a set feedrate.

- **CUT TO POSITION -** Process a ARC ON signal and move the torch to the postion and feedrate defined.
- **MOVE TO POSTION -** Moves the torch to the defined position and feedrate defined.
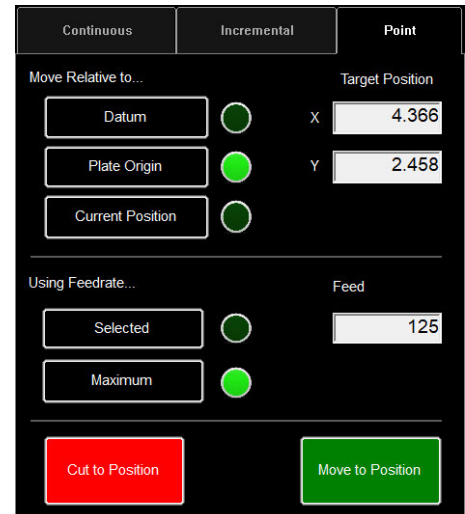
AVHC & Dashboard

AVHC (Arc Voltage Height Control) hosts "how" the controllelr handles the lifter station. Dashboard gives the operator insight into the head position and other status indicators.
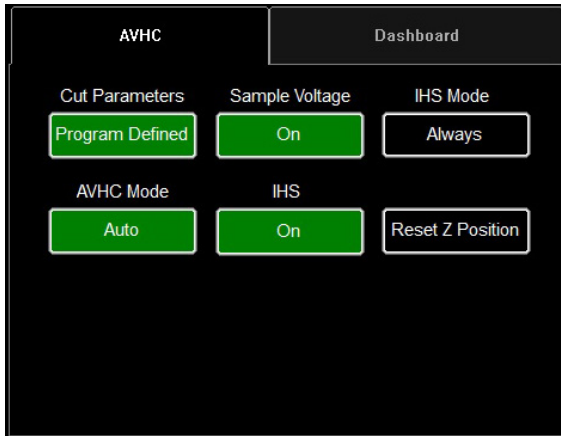
AVHC (Automatic Voltage Height Control):

Cut Parameters can be toggled between Program Defined and User Defined:

- **Program Defined** - The cut parameters will automatically generate based on the type of material and material thickness entered in the process setup tab.
- **User Defined** - You can manually enter the cut parameters based off of the cut charts found in the FlexCut manual.

Sample Voltage is a toggle between On or Off:

- **On (with MODE: AUTO)** - At the beginning of the cut the controller learns the proper Arc Voltage and maintains the desired Cut Height value entered in the CUT PARAMETERS.
- **Off (with MODE: AUTO)** - The AVHC will adjust based on the set voltage and current voltage only. If the set voltage is different than the current voltage, then the lifter will adjust to account for the difference.
- **On/Off (with AVHC Mode: Manual)** - This feature is disabled.

IHS MODE is the process used to detect the material height and how it reacts between pierces:

- **Optimal** - Optimal makes an initial (ohmic) material detection and utilizes a parameter based on material thickness to process another ohmic detection. This process makes the head "skip" detecting ohmic until out of that material thickness, based on that parameter.
- **Always** - The head will detect the material via OHMIC at every pierce.

AVHC Mode is a toggle between manual or auto:

- **Manual** - The torch will stay at the Cut Height established at each material pierce. Will not automatically adjust the cut height during cutting.
- **Auto** - The torch will maintain the distance entered in cut height and profile the material based on the set voltage and the current voltage being read from the plasma power supply.

AVHC & Dashboard:
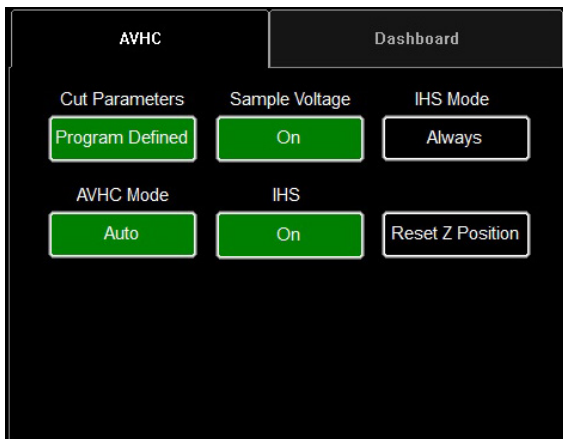
IHS (Initial Height Sense): This setting turns OHMIC Detection on or off:

- **On** - The head will detect material when the ohmic cap comes into contact with the grounded, conductive material on the table. Once detected the head will retract to the transfer height setting.

- **Off** - The head will move to top of material setting (Job Setup) and retract to transfer height.

RESET Z POSITION:

Resets the Z lifter to its Zero Position by moving the head to its upper stroke and re-establishing its zero position.

Dashboard:

The dashboard displays the host indicators and tools for the operator:

- **Arc Voltage** - Displays Arc Voltage feedback from the plasma during cutting.

- **Plasma Pierce Count** - This is used for keeping track of how many pierces the plasma consumables make. You will RESET every time you change the consumables.

- **Process** - This displays the current cutting process.

- **Feedrate** - This displays the feedrate override %.

- **X, Y, Z** - This shows the torch coordinates relative to the machine space.

- **OK to Move** - Indicates when the plasma has pierced through the material and is ready to start the program.

- **IHS** - Indicates when the material is detected via OHMIC.

- **Breakaway** - Indicates if the breakaway circuit is open/closed.

Accessory Toggle

The accessory panel hosts the added accessories toggle buttons. These added toggle buttons are not visible unless commissioned through the options panel. Below are the instructions to operate the laser pointer accessory. The Pipe Cutter Accessory operation will be covered in a separate document.

Laser Operation:

The Laser Plate Finder is intended to aid an operator at the control console to locate the approximate centerline position of the torch body on the surface of the material by projecting a red laser dot onto it. This can assist in the locating of the plate origin position, performing plate alignments, as well as performing a dry run with the laser indicating the approximate cut position of the part.

It is critical to the proper function of this attachment that the torch position be set properly and the material thickness be defined before setting program zero, performing a plate alignment, or running a program using dry run with the laser enabled.

How the Laser Works:

The laser is positioned at a slight angle to the torch, so that it crosses directly under its centerline. With the torch positioned properly on the machine and the material thickness entered into the system, the z axis will make a position adjustment when activated so that the projected dot will land on the surface of the material underneath the centerline of the torch.

The laser can only be activated when the system is switched to the Dry Run mode, but will automatically turn itself off when the system is set to Active Run, and a part program is executed.

| Step 1: | In the process setup tab, enter the thickness of material and the proper amperage.
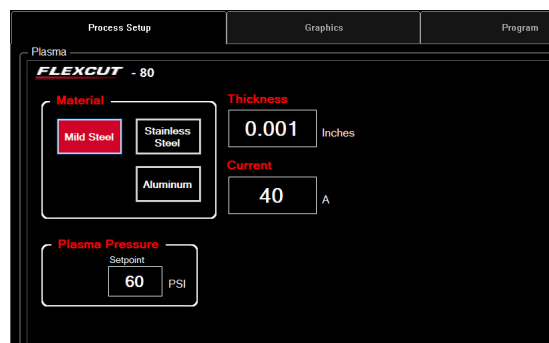
 Toggle to Dry Run. |

| Step 2: | Toggle the Laser On. The button will display green. The head will move down to the proper position and illuminate the laser. |

| Step 3: | Move the head and use the indicator for setting plate origin, setting plate alignment, dry run a job, or for visualizing a point on the plate. |

| Step 4: | Once done using the laser, toggle the laser to Off.

 By changing to Active Run, the laser will power off automatically. |

Using the Shape Library in VMD

In the VMD, you can generate one of 36 standard shapes without needing to generate them in your CAD software.
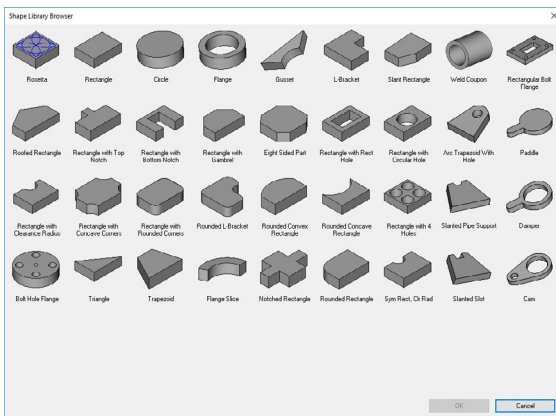
Access the Shape Library:

To get to the Shape Library, press Shape Library located on the left hand side of the VMD screen, in the Job Group. The shape library offers 36 of the most popular shapes to customize to your dimensions along with Lead In/Out and Tool.

Select the shape you are looking for and press OK. This will open the shape configuration for the shaped selected.
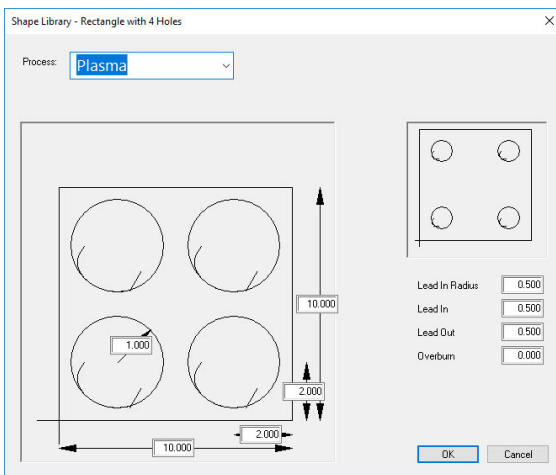
Configure Your Shape:

First, you will select the tool you are planning to use: Plasma, Plate Marker, or Oxy.

- **Lead In Radius -** Creates a radium for your lead in. If a line lead in is required, then enter 0.
- **Lead In -** Length of the pierce point movement into the tool path. This is usually .12.
- **Lead Out -** Length of the cut created out of the cut path. If using plasma, enter 0.
- **Overburn -** The measured length past the end/ start point. Used for thicker materials, or in the oxy process.
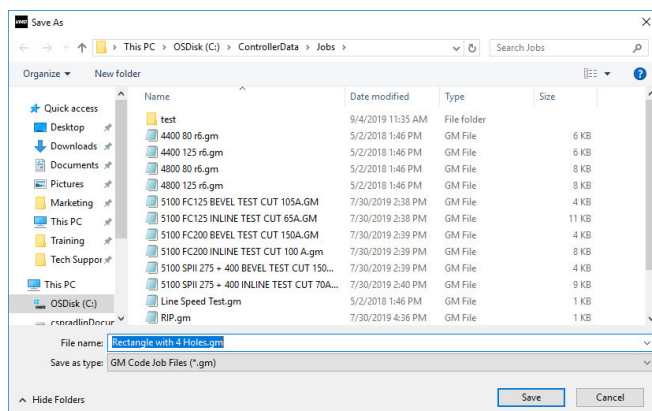
You will be prompted to save your shape. Double click the jobs folder. By default, the name of the file will be the shape you selected or can be changed to a user defined naming convention. Once named, press save.

The VMD will load the job to active and toggle to 'no kerf'.

Using the Shape Library:
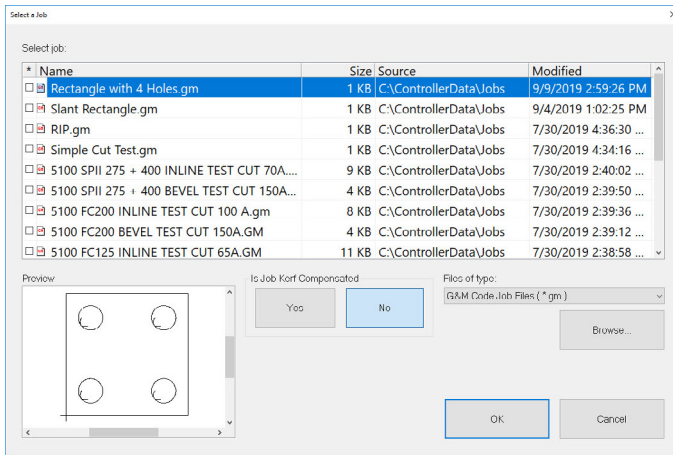
Open Shape in VMD:

In the upper left of the screen, press 'Select Job'. This will open the Select a Job screen. Select the job from the list. If you didn't save in the JOBS folder, you will need to press 'browse' and locate your job.

For the 'Is the job kerf compensated' option: The shape library parts do not accommodate for kerf compensation. Select 'No' and it will add the kerf based on the material thickness to the part.
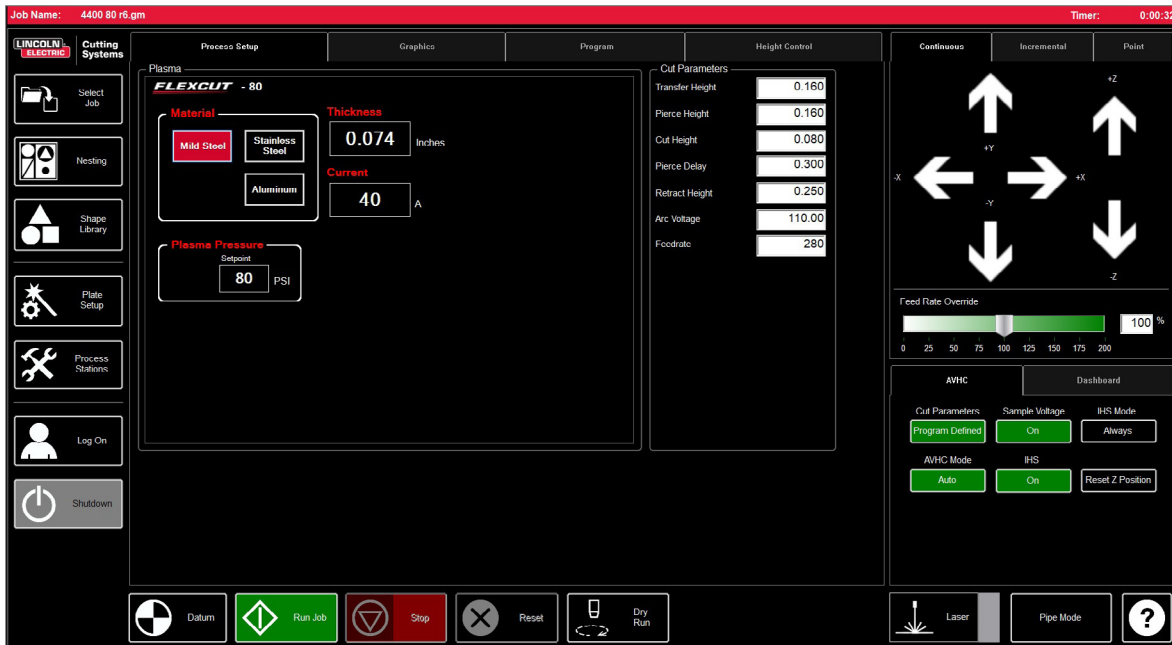
On VMDNest and TMCAD programmed jobs, select 'Yes'.

Once selected, press OK. The job will display in the graphics screen.
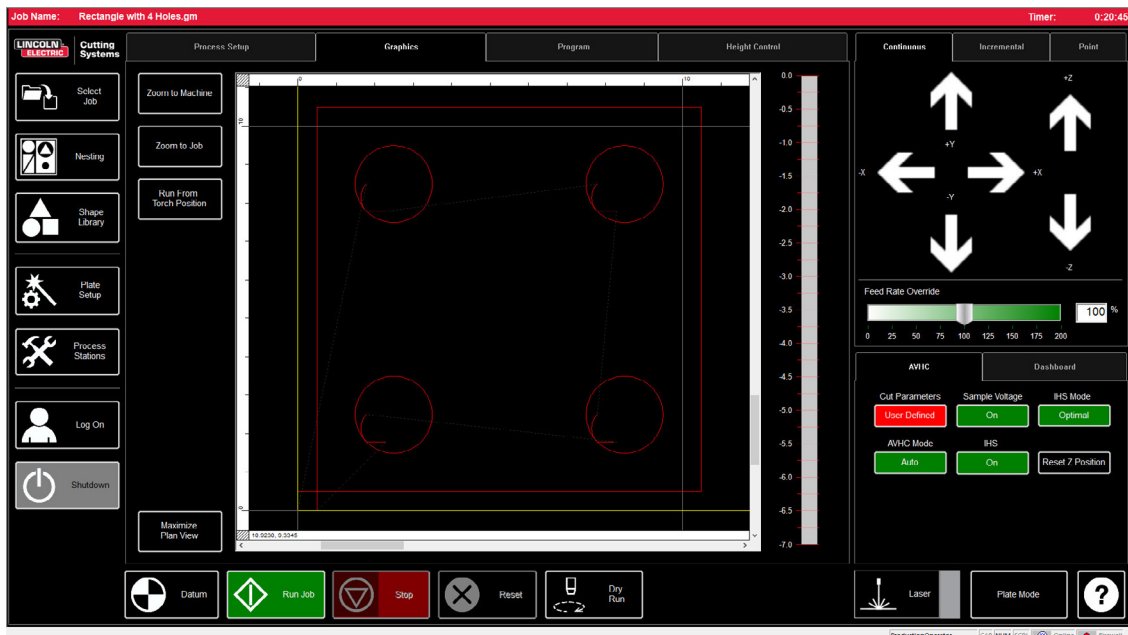
Running a Job

When you have a GM format file to run or shape generated in the VMD ready to cut, there is a simple process to follow to get the job produced through the VMD. This will go over the workflow of running the job.

Datum:
When you first start the Visual Machine Designer and are connected to the Accumove controller, the machine needs its motors powered on and machine zero postion established. A screen will display 'Please switch the drives on'. Press 'hide' and then in the lower left corner press Datum. The torch will travel to the limits of the machine and establish the machine zero.

Open a Job:
Once machine zero has been established, it is time to open a job and get it prepared to cut. Press select job and locate your file.

Set your Process:
In the Process Setup tab, enter in the material thickness and amperage you are planning to cut. This will populate the cut parameters with the appropriate settings for the thickness/amperage.

If you are using a different material thickness parameter than being cut, the outcome will not be to specification.

Running a Job:

Plate Setup:

Press Plate Setup. Then use the jog keys to move the torch body to the lower left corner of the material you are planning to cut.

Press Set Plate Origin. This establishes the Program Zero of the program, or the absolute X 0: Y 0 of the job.

Press Close.

On the bottom of the screen, toggle to Dry Run. Press Run Job. This will 'simulate' the job loaded without firing the plasma torch.

If satisfied with the Dry Run and the machine movements, toggle Dry Run to Active Run to cut the job loaded.

Press Run Job.

If you find that the machine is moving too fast for the material, you can alter the feedrate by using the Feedrate Override % slider bar.

By default, the slider is set to 100%. To slow down based on percentage, move the slider to the left. To speed up the feedrate, slide past 100%.
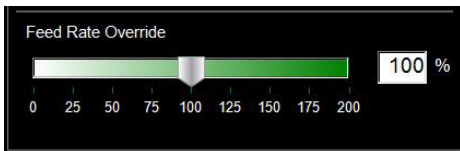
Cut Quality

Line Speed Test:

The total goal is to make sure the cuts coming off of your table are the best possible. This means that there is minimal dross accumulation on the underside of your cut parts and minimal bevel on the sides.

We have provided a file to cut to verify the feed rate for the material you are planning to cut with the amperage set on the power supply. The LINE SPEED TEST is in the job list and should be run on every thickness of material at the specified amperages in the cut chart to give you a visual reference to the output. The test cut is a 3" x 4" coupon that consists of nine lines. Each line is programmed to run at different speeds to illustrate the effects that speed has on cut quality.

With the FEED RATE OVERRIDE % at 100, the first line cuts at 170 ipm and drops 10 ipm each line until the last line set at 80 ipm, and the outside perimeter is 100 ipm. If the FEED RATE OVERRIDE % set to 50, the lines would range from 85 to 40 with the outside at 50. In the cut chart, verify the amperage and thickness of the material. Change the PROGRAM FEEDRATE OVERRIDE % if you need the feed rates higher or lower according to the thickness of the material and amperage you are running.

Load the LINE SPEED TEST.gm file

Enter in the AVHC settings according to the cut chart.

Jog the head to the bottom left corner. SET PLATE ORIGIN.

Run the LINE SPEED TEST.

Once the test is complete there are a few things to look for. On the top of the cut you want to see a clean cut without a lot of bevel. Ideally, it has the same kerf width both on top, all the way through to the bottom.

On the backside you will observe the width of the cut and the dross accumulation. The key is the 3-4 lines that have least amount of dross. The dross should be easy to remove by picking at it. Usually the optimum speed is the high end of the three lines that are relatively clean. Straight lines will cut relatively clean but the "inside features" of your cuts will be at a lower speed because of the nature of movement and mechanics of the machine. With those three you know that the inside features will be just as clean as the straight line.

Line Speed Test Cut:
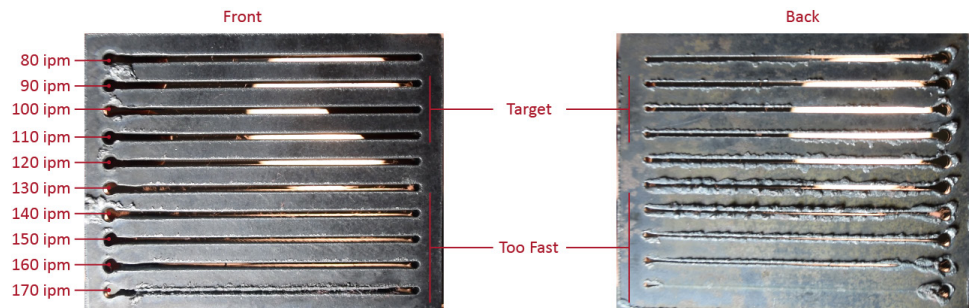
So in this example the 110 - 90 ipm will be the best speed for this material thickness and amperage setting. Now this process will be used for every thickness of material you plan on cutting to establish the proper speed. Once established, these coupons can be used as a visual cut chart or you can use the provided sheet to document your settings.

Build Your Own Cut Chart

Use this template to create your own custom cut charts using the line speed test.

| Material Thickness Type	Amperage	Cut Speed	Pierce Delay	Pierce Height	Cut Height

VMDNesting is an irregular parts nesting program. This allows the operator to import DXF or DWG files without the need for an offline CAM software to generate the proper G-Code. The nesting will apply the kerf correction along with the appropriate lead-ins to all features. Also, it will generate the tightest nest available for the size of material you enter in.

Start by clicking the Nesting button and it will display the Nested Job List screen.

To start a new nest, press Nested Jobs.

Select New Nested Job and the Add Nested Job dialog opens.
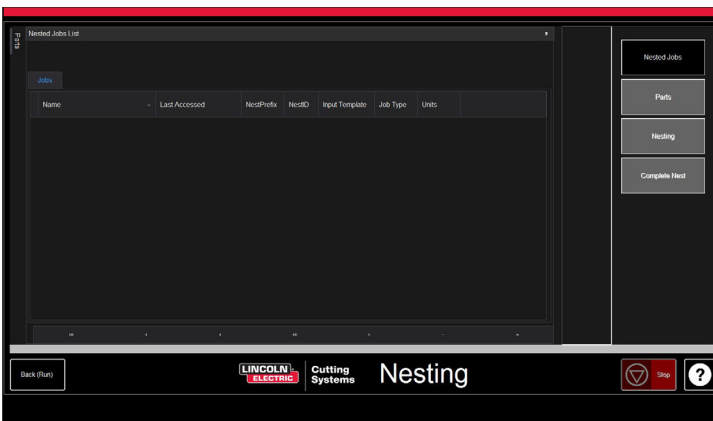
In this dialog, enter a name for your nest in NESTED JOB NAME. This will become the file name of your project. Each dialog after is a drop down.

Enter the thickness of material you plan on cutting along with the size of sheet.

Select the table and plasma cutter you are using along with the amperage appropriate to the application, and press SAVE.
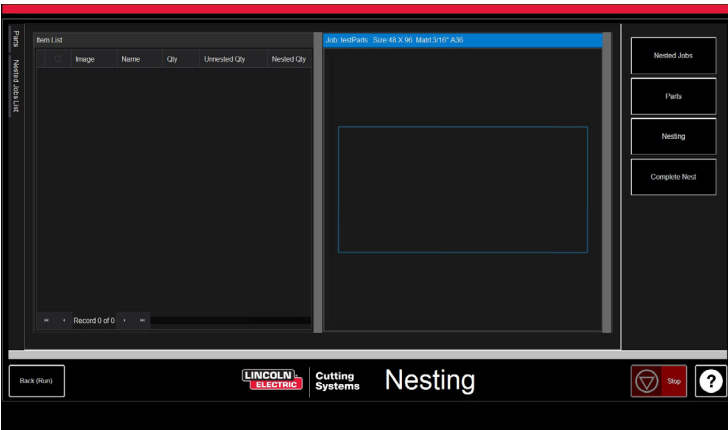
Item List will open along with the Nest Layout.

To add parts, go to the right toolbar and press Parts. This will open the parts list.

Select Import CAD Drawings for DXF/DWG files. This will bring up the Part Selector.

Apply Tool Paths:

At the top of the screen will be File Type, Source, and Destination.

File Type: Toggles between DXF and DWG type files.

Source: Location of file source (i.e. Flash Drive, Job Folder)

Destination: Location on where the output files will save. VMD default folder is located at C:\ControllerData\Jobs

The two check boxes Verify and Artwork: Verify will display the parts to look at layers and other details on the individual parts. Artwork will change the toolpaths to an ONLINE toolpath and bypass the kerf adjustments.

On the right, is the Job Properties that will be applied to your parts when posting.

Importing Properties: holds basic changes to the POST and importing of the file.

Tooling Properties: holds tool pathing configuration for sequencing, kerf correction, and lead-ins.

Change this setting if you need particular lead-ins or kerf diameters.

Layer Map: separates the layers present in the job. Select the appropriate process for the layers to be Plasma, Plasma Marking, Ignore.
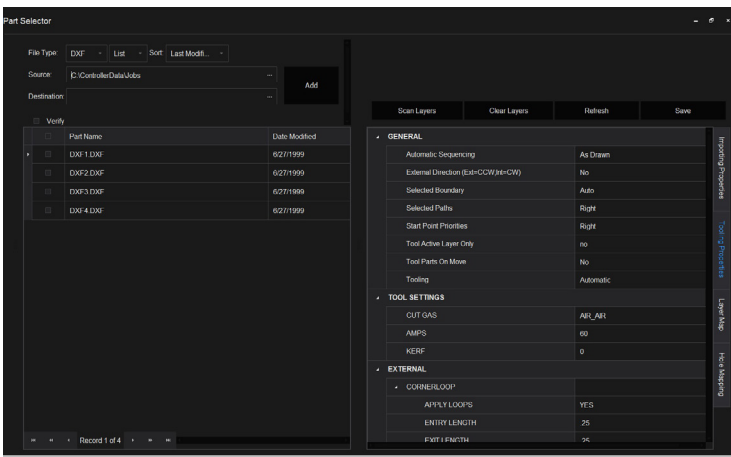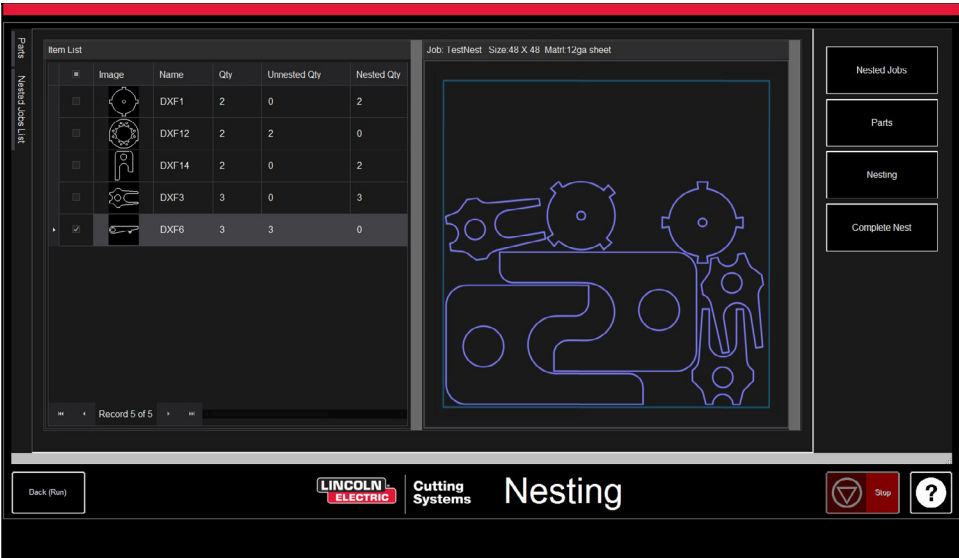
Make Nest:

When all the parts have the proper quantity, go to the right button list and select Nesting.

Press Nest and it will display a pop up asking for All or Selected parts. Make your selection and press OK. This will then arrange your parts into the material and display the layout in the Job screen.

Complete Nest:

If your nest does not need editing or if it is just a single part, then in the right toolbar select Complete Nest. This will open the Create Job Dialog. Enter the location you want the job to save to and verify the amperage you are cutting. Then press OK.
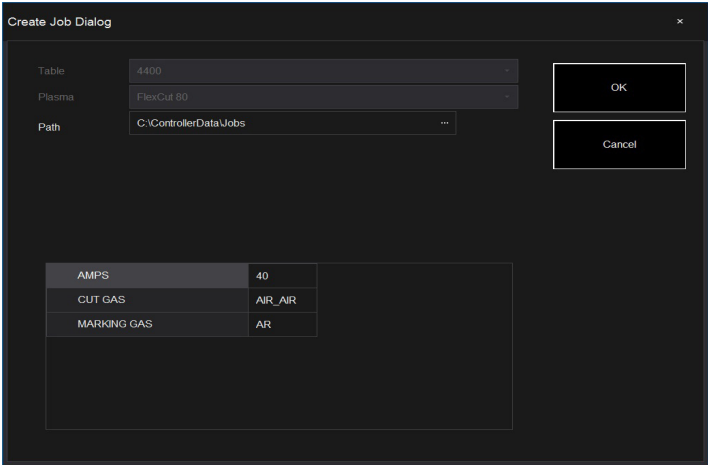
Open Nest in VMD:

In the Nest screen at the bottom left, press the Back (Run) button and it will   return you to the VMD Run screen.

To run your nest, go to Select Job and locate your file. In the AVHC tab, toggle AVHC Cut Charts to Charts. In the file, the optimum values will auto populate the Cut Parameters for the material thickness and amperage set.

Process and run the file as any normal file.

Performing Your First Test Cut

There are multiple test files pre-loaded on the computer of the Torchmate 4400/4800/4510 models for testing and cut quality purposes. The <u>Line Speed Test</u> and <u>Simple Test Cut</u> are provided to help determine the proper feed rate in IPMs to cut the material thickness to the amperage you have set on the plasma power supply. The 4x00 80/125 R6.gm files are quality test cuts. One will be cut at the facility prior to your machine leaving the assembly line to verify machine operation prior to shipment. We highly suggest using this as your first test cut to ensure your machine has transported in the same condition it has left the factory in. Please locate the factory test sample located in the water bed and load a piece of 3/16" mild steel for the comparison cut test.
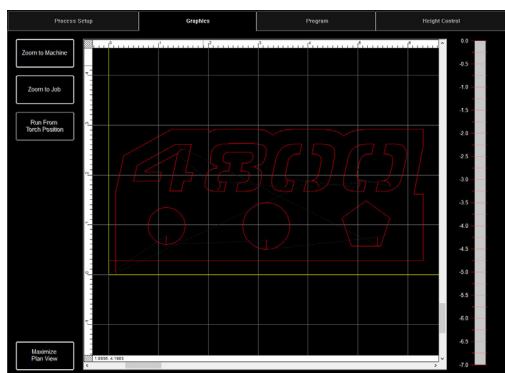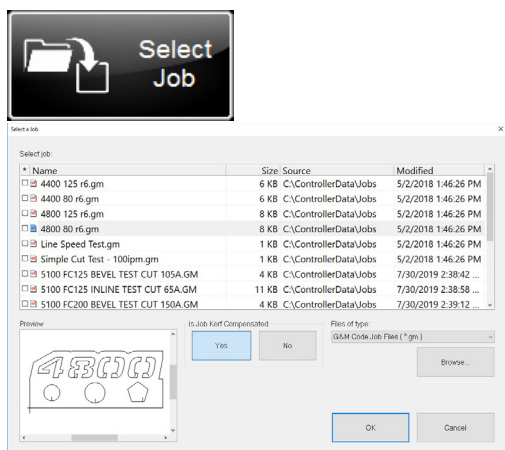
If you need to stop the machine at any time please hit the stop button on the touch screen.

1. Twist the ESTOP Knob 1/4 turn.
*If a WINDOWS clock appears, swipe your finger on the monitor up. Enter 'cncop' into the password prompt. Press the arrow by the prompt.
2. Once the computer boots, it will launch into the Visual Machine Designer software.
3. Press DATUM to establish the machine.
4. In the PROCESS SETUP tab, enter the material thickness (3/16" = .188) along with the amperage on the plasma cutter. FC80 – 40amp/ FC125 – 65amp. This will populate the CUT PARAMETERS to the proper settings based off of the cut charts.
5. Press SELECT JOB.
6. Locate the 4x00 80/125 R6.gm. Since this file is tool pathed, IS KERF COMPENSATED? Select YES and press OK.

There are four files loaded to the machine. They correspond to the machine you are running (4400/4800/4510) and the power supply you are using (FlexCut 80/125). Example: if you have a 4400 with a FlexCut 80 you will select the 4400 80 R6.gm file.
7. Press PLATE SETUP. Use the jog keys to move the torch head to the lower left of the material planning to be cut.
8. Press SET PLATE ORIGIN. This is PROGRAM ZERO (X 0 : Y 0). Press CLOSE.
9. At the top of the screen, press GRAPHICS to see the file.
10. PRESS RUN JOB (machine may throw sparks)
11. The cut will progress as follows.
      1. Inside circles and polygon first
      2. Numbers will cut next
      3. Outside perimeter

Once the file is done cutting, compare the output with the cut provided with your table to verify settings along with cut quality.

Congratulations on your first cut!

Cutout of the 4400 80 R6.gm

Maintenance

As with all machinery, there is required maintenance. This will cover Daily, Monthly, and 'As Needed' tasks to keep your 4400/4800/4510 running like new.

Daily Maintenance:

Plasma Power Supply:

The plasma power supply and torch body will need to be evaluated between material thicknesses or prior to cutting. Remove and check if the consumables need to be changed. Apply the following to know when the consumables need to be changed:

For reference and complete maintenance on the FlexCut plasma power supplies, see your Owners Manual. For a replacement manual, please call Torchmate technical support.

The nozzle is the most frequently replaced consumable. A sign the nozzle needs to be changed is an excessive amount of both dross and bevel angle appearing in your cuts. On the nozzle itself, you'll find that a larger orifice or an irregularly shaped hole will be the telltale signs of excessive wear.

The electrode: pay close attention to the amount of Hafnium left in the tip. The larger the crater within the electrode tip, the more wear that the electrode has gone through. Replace the electrode if the center pit depth is greater than .06" (1.5 MM). Also, notice darker swirl marks near the tip of the electrode. Although these swirl marks don't have a correlation with the life of the electrode, they do indicate contaminants within the air supply, such as excessive moisture or oil.

The shield cap: hold it up to a light and check if any of the holes are plugged. If they are then replace the shield. These holes are the outlet for the shield gas, and when clogged, they can misshape the plasma arc which leads to imprecise cuts.

The swirl ring will need to be checked intermittently for clogs or cracks.

The retaining cap is the most durable of the consumables, and will only need to be replaced when corrosion, clogging, or cracking is physically apparent.


Please Note:

· When not in use, we recommend removing the consumables from the torch until next time the machine is in use to help prevent corrosion building in the pins.

Daily Maintenance:

Machine:

The breakaway assembly has two magnets and three detents that should be cleaned from any collection of metallic debris, as this can cause the torch mount to be pushed far enough from the sensor for the breakaway to reliably activate.

Move the machine to the Datum position, and break the torch mount away by pulling the torch to the left or right at the bottom of the torch.
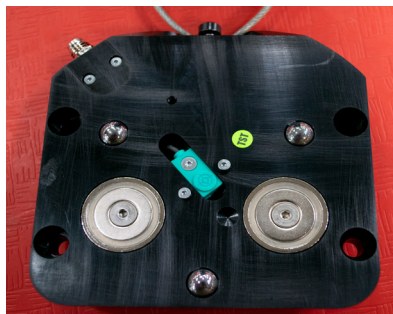
The back plate should now be exposed.

Take a rag to remove any metallic debris from the two magnets or the three detent positions.

To mount the torch, align the top edges of the torch mount first, slowly positioning the torch back into it's resting position.

Monthly Maintenance:

Machine:

Since the gantry rides on linear rails, you will need to occasionally grease the cassettes that ride on that rail. Build-up and water can impede the smooth operation of the cassettes that can cause issues for the gantry to move properly on the linear rails.

The grease that is recommended is Mobil SHC Mobilith SHC 100 Lithium based grease. This can be sourced and purchased locally.

Load the grease cassette into a grease gun and follow these steps to grease the side rails.

| **Step 1:** | With the machine on, move the gantry to the center of the table. |

| **Step 2:** | Shutdown the Accumove controller, and loosen the 1/8" Hex head bolts that hold the side cover in place two turns. DO NOT REMOVE THESE BOLTS. |

| **Step 3:** | Slide the side cover so the bolts can fit through the keyholes and remove the cover. |

| **Step 4:** | With the cover removed, the zerk fittings will be visible, attach the grease gun and pump until the grease comes from the bottom of the cassette. Grease the front and back zerk fittings. |
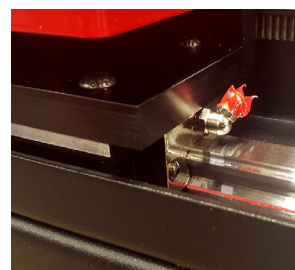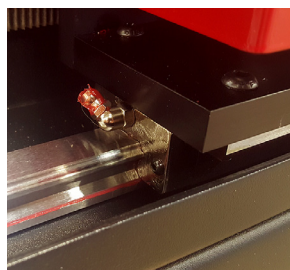
Step 5: Attach the side cover to the table.

PLEASE NOTE: Slide the cover so the bolts go back into their original position at the bottom of the keyhole, and torque the bolts to 17.8 in. lbs.
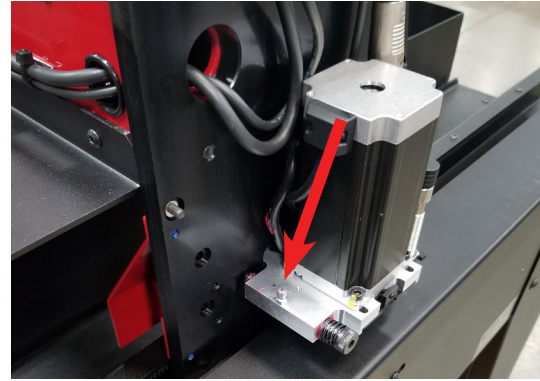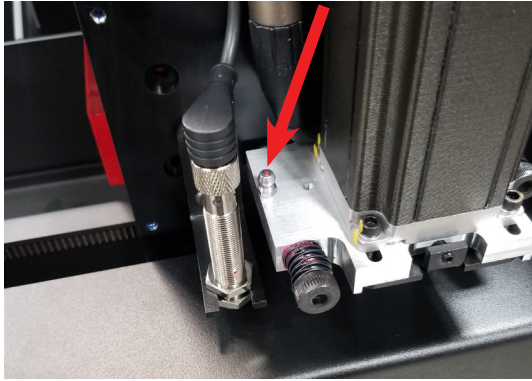

Step 6: Repeat steps 1-5 for the other side of the table.

Step 7: Remove the red Gantry Side Covers by removing the four 1/8" Hex head bolts on each cover.

Step 8: With the covers removed, the zerk fittings will be visible. Attach the grease gun and pump until the grease comes out from the pocket where the bolt and spring enter the assembly.

Step 9: Reinstall the gantry side covers.

As Needed Maintenance:

The following is based on how often the machine is being used. If the machine is running once a week the following steps will not be needed as often as a machine running every day.

Bellows:

The bellows are a consumable item that protects the inside of the gantry from water and debris. When the bellows are no longer protecting the inside of the gantry they should be replaced. Please contact the parts team to purchase new bellows.
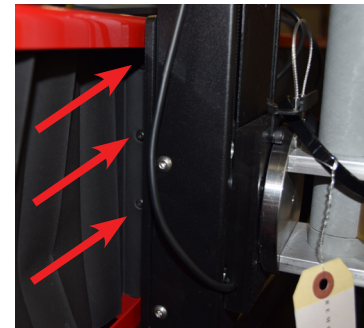
As Needed Maintenance (Cont.):

Slats:

Over time the slats will accumulate build up that will create an uneven cutting surface and poor continuity to the table that will directly affect your cut quality. When this occurs, replace the slats with new slats.

The slat size used in the 4x00 tables are 3/16" (T), 2" (H), 53" (L) for the 4400/4800 tables. The slats will be 61" (L) for the 4510 table. If the machine is used to cut primarily in the front of the table, another option is to rotate the slats from back to front and vice versa.

Clean the slats off by using a pneumatic needler or grinder and then flip the slats over to elongate use.
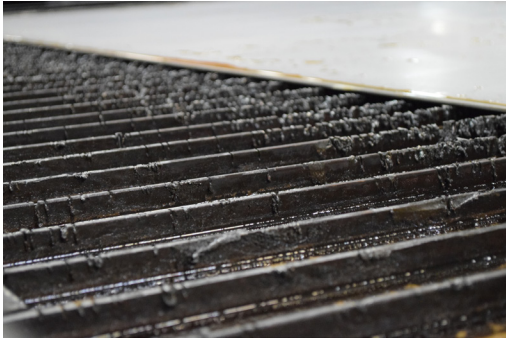
Water Pan:

The water in the pan needs to be drained and cleaned every 2-4 months based on usage. There is a plumbing valve (1/2 inch) located in the back left corner of the table.

To dispose of water, please contact your local EPA or water district authorities. After the water has been drained, remove all pieces of metal and discard according to local and federal regulation.

Close the valve and refill the table with water. The 4400 holds 60 gallons (230 liters), the 4800 holds 107 gallons (405 liters), and the 4510 holds 140 gallons (530 liters).

Lincoln Electric Cutting Systems recommends PLATEGUARD© (TMS-310-0001-00) as a water additive for rust prevention and anti-bacterial growth. Add the recommended quantity per machine.

Visit www.torchmatestore.com for more information and to purchase.

Please Note:

- The purchasers of products from Lincoln Electric Cutting Systems are responsible for disposing of consumables, fluids, and machinery at the end of the life cycle in accordance with federal and local regulations.

Beveled edges are caused by the motion of the plasma gas as it is emitted from the nozzle. In plasma cutting, it is unavoidable. A high-definition plasma cutter produces less bevel than a standard cutter.

Torch height, air pressure, air quality, cut direction, and consumable condition all influence bevel.

In plasma arcs used for cutting, the gas forms into a vortex. Because of this, the arc has a direction of rotation, which causes one side of the cut to have more bevel than the other side. To reduce the bevel on the part, the proper direction of travel must be used.

The direction of cuts are referred to as "conventional" and "climbing". In a conventional cut, the torch will go counter-clockwise on outside cuts and clockwise on inside cuts. A climbing cut is the opposite, and the best bevel is achieved by using a climbing cut. The best bevel is to the right of the direction of travel.
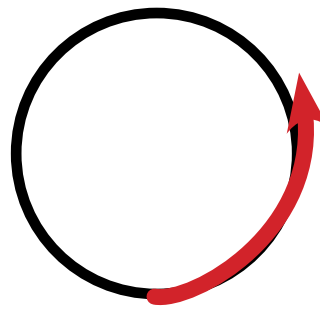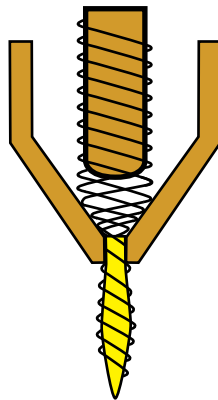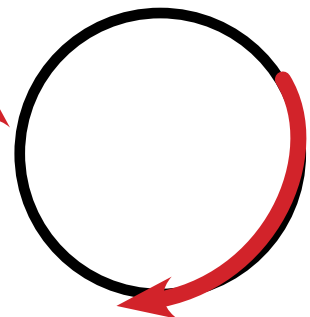
Conventional   Climbing

Corners can have more bevel than a normal cut. This is caused when the machine slows down for the direction change. A lower amperage in some cases allows for slower travel speeds and reduces "slowdown" bevel through corners.

Sharp corners can be achieved by cutting a larger shape that puts the slow down and acceleration of the machine into a scrap area. This cut is used more often on thicker materials, where the corner bevel is increased dramatically.

Replace consumables regularly to reduce bevel. A worn tip or one with slag buildup can redirect air flow causing random bevel and varying cut quality. Always check consumables when troubleshooting bevel.

One of the easiest ways to reduce bevel is by cutting at the proper speed and height for the material and amperage. Air that is clean, dry, and at a constant pressure can also decrease bevel.

Beveled Edge
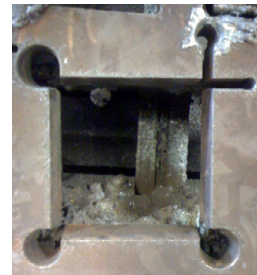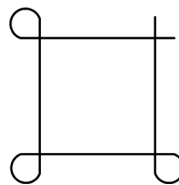
Corner Loops

How Torch Position Affects Bevel:

Correct torch height: Torch square to material	Torch angled to material	Incorrect torch height: Torch too high	Incorrect torch height: Torch too low

Position of torch while cutting

Bevel of finished part

Equal bevel on all sides	Unequal bevel	Excessive bevel	Reversed bevel
Minimal bevel	One side may be straight the another excessively beveled	Cut may not go all the way through material	Torch may contact material and short out or damage tip
Longest consumable life	Can be caused by worn tip		

What Causes Bad Cuts:

Instances where the metal was not fully cut indicate a few problems:

1. Ground clamp is not properly attached to the material

2. Air pressure drop or surge

3. Moisture in the air line

4. Drop in power

5. Contact with the material by the torch - most plasma cutters go into a low power mode on contacting the material, causing the cut to not fully penetrate the material.

When the machine begins to move before a pierce is completed, the cut will not complete. In this case, the dwell time or pierce delay must be adjusted to allow for enough time to pierce the material.

When a cut's path does not return to the starting point, there may be mechanical slipping or binding. In some cases, it will be clear which axis is losing position. Examine the particular axis for build up or obstructions that can cause binding.
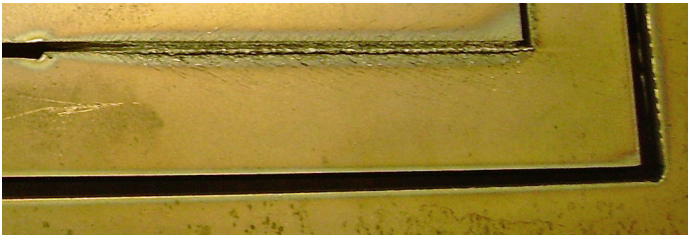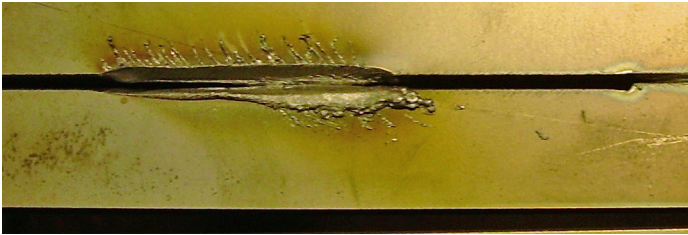
Basic Troubleshooting

Machine Faults:

Problem	Solution
One motor will not engage when DATUM the machine.	LOG ON as ADMIN. Reload your configuration. Press OK. DATUM machine. If the issue still persists, contact Customer Support.
Binding of the gantry when running parts	Grease the side cassettes. If the issue still persists, contact Customer Support.
Cuts are not coming out square or degraded cut quality	Check consumables in the Plasma torch along with the settings from the cut chart. Check the torch is square to the material on the table. Follow the CUT QUALITY section pg. 29

Laser Faults:

Problem	Solution
An error message occurs when attempting to turn the Laser on stating "The laser cannot be activated in Active Run"	Toggle the system to Dry Run mode.
The laser does not appear to be landing where the centerline of the torch would be on the material	Reset the Z axis. If a larger error is reported, the laser position would be off. Enter the material thickness decimal equivalant, and turn the laser off and back on again.

Software Faults:

Problem	Solution
During an Initial Height Sensing routine, the Ohmic Light does not indicate a Yellow Detected status when the torch contacts the material.	Check to make sure the Orange Ohmic Wire is connected to the ohmic clip. Validate the clip is contacting the shield. Check that the material surface is free of rust or corrosion that may inhibit an electrical contact with the shield. See Ohmic Troubleshooting Guide.
During an Initial Height Sensing routine, the torch does not come down and sense the material, but rather fires the torch in the air.	Remove the retaining cap from the torch body and inspect/clean consumables for any debris, replace once cleaned. Verify under Job Setup the TOP OF MATERIAL has the proper thickness of material entered in.
Error "IHS Failure: Check VFC Ground"	Check to make sure the Orange Ohmic Wire is connected to the ohmic clip. Validate the clip is contacting the shield. Check that the material surface is free of rust or corrosion that may inhibit an electrical contact with the shield. See Ohmic Troubleshooting Guide.
Error "IHS Failure: Clear slag from consumables" With the torch not contacting the material surface.	Remove the retaining cap from the torch body and inspect/clean consumables for any debris, replace once cleaned. Replace the consumables with new items, including the retaining cap. Check Orange Ohmic wire for Short to Ground.
Torch pierces the material, but no motion occurs.	Check g-code programmed feed rate, and feedrate override percentage value for proper settings. Check that the torch has enough material at the pierce point that the plasma can establish a full power cutting arc. Check that the Aux Input Cable is plugged into the back of the Accumove Controller.

Software Faults (Cont.):

Problem	Solution
During the initial cut movement, the torch shield comes into contact with the material stopping the machine.	Check that the Cut height is set at the correct value. Check that the AVHC Auto/Manual mode is set to Auto. Check that the Sample Voltage mode is set to ON. Check if at the point of stopping the machine crossed into another previous cut, or collided with another previous cut.
During cutting, the torch retracts far enough away from the material the arc is stretched or extinguished.	Check that the Cut height is set at the correct value. Check that the AVHC Auto/Manual mode is set to Auto. Check that the Sample Voltage mode is set to ON. Verify Raw Arc Voltage connection to VFC box and Plasma Cutter.
The torch traces the part out but does not fire.	Check that the Dry Run/Active Run button says Active Run. If OK to Move is disabled, check Plasma Power Supply for errors. Verify that the g-code has M64/M65 in the code. If not then the POST isn't configured correctly in the TMCAD.
The torch stays firing between cuts, and the job preview shows solid red lines for all of the machine's motions.	When in the Torchmate CAD/CAM software, check that the Machine Output screen has the Device set to Accumove Imperial and the Tool set to Multi-Tool.
VMD screen displays an "Accumove Controller Not Connected" screen for more than 30 seconds.	Close the VMD software completely, shut off the Accumove controller for at least 30 seconds. Then power on the Accumove controller, wait another 30 seconds and open the VMD software Check the Red Ethernet cable is plugged into the computer and the Accumove controller. Also verify that the red Ethernet cable is plugged into the right or outermost port on Accumove 2 controllers

Software Faults (Cont.):

Problem	Solution
When VMD is opened, a Trial Period screen appears.	To register the software, e-mail the support@torchmate.com e-mail address with the 8 digit alpha numeric code that appears on the registration screen.
The Breakaway Indicator shows as Yellow and Not Connected, even though the torch is in the correct position.	Check that the breakaway capture leash and any debris on the magnet are not keeping the torch from sitting fully in position. Check contact points for any signs of corrosion, clean and oil to keep the breakaway functioning normally. Verify the Breakaway cable is connected at the breakaway, and at the back of the Accumove Controller, re-seat if necessary.
When attempting to Datum the machine, the machine runs into the hard stops making a loud grinding noise.	Verify that the Input harness is plugged in fully on the back of the Controller (Accumove 2) Verify the Limit Switch input cable is screwed in fully on the back of the controller (Accumove 3)
The torch does not retract off the material when moving between cuts, but the torch does shut off.	Jog the Z axis all the way to the top of its travel and click Reset Z, then click Run Job. Verify that the Retract Height value is set to the desired retract distance in between cuts.
Part way through a program a Limit Exceeded in X or Y axis occurs.	When executing a program the system will determine whether or not the next line of g-code keeps the machine within its normal operating envelope. If this message is occurring, the program is too large to fit on the machine based on its current program zero position. Verify Program Zero position Use the View panel to verify the part is extending beyond the machine limits, and adjust zero position and/or program accordingly
Torch fires at the material, but does not pierce fully through it, no motion occurs.	Verify plasma cutter work lead connection to the machine. Verify material is contacting the slat supports and nothing is electrically hindering that connection. Verify Pierce Height is at recommended values and not any higher both in the settings and visually at the machine.

Software Faults (Cont.):

Problem	Solution
When opening the VMD software a "Language Deserialization Error" appears.	Verify that the windows installation is using the language package English (US). Verify that the user has full administrative rights to the local computer. Verify the .NET 3.5 Framework is enabled under Windows Features, both HTML Activation and Non-HTML Activation.
The controller won't turn on (Accumove 2).	Disengage the E-STOP Verify the power brick is plugged in and indicates a solid Blue LED light. Verify the power brick is plugged fully into the back of the Accumove 2 controller. Listen for fans spinning inside the Accumove 2 controller when the switch is turned ON.
The controller won't turn on (Accumove 3).	Disengage the E-STOP Verify the power cable is plugged in. Verify the fuse on the back power port is in intact Verify the Voltage Selector switch is set to the proper 110v or 220v incoming power.
The controller has a Blinking Power light (Accumove 2).	An input is shorted to ground, disconnect the Breakaway, Height Control, and Input harness and identify which connection causes the blinking light condition. Resolve the short to ground.
VMD screen displays a "Please update the firmware" error message.	The firmware currently uploaded to the controller is not the matching version for that software. Log in as an Admin (password 1234) and load the firmware under the Machine Settings - Advanced tab, follow the on-screen instructions After FIRMWARE is complete, go to BASIC tab and press FACTORY RESET.

Software Faults (Cont.):

Problem	Solution
One of the machine's motors is not moving when attempting to Datum or Jog the machine	Power down the Accumove controller and verify all motor cable connections are fully seated on the back of the Accumove controller, as well as at each motor. Power up the Accumove controller and after 30 seconds open the VMD software. Log in as an Admin, go to the Machine Settings button and then choose Load Configuration. Choose the appropriate configuration file for your machine and click OK. Restart the controller and VMD software
Job displays rotated or angled on the Job Plan screen.	Verify that the plate is aligned properly by setting program zero at the lower left corner, then choosing Align Corner, jog the Y axis Positive a small amount, and clicking Align Edge. The machine will return to the program zero position. Return to Select Job and reopen the job. If the part displays incorrectly the issue is present in the g-code file itself and it must be recreated correctly
Error occurs "Execution Error Overtravel Detected" when clicking the Run Job button.	Verify that all home and limit switches are not depressed (TMX table Only). If operating near the extents of the machine, reset program zero and material further away from machine extents.
Error occurs "Limit Exceed in Z-axis" when running a job.	Jog the Z axis all the way to the top of its travel, and click Reset Z, then click Run Job to continue. If indicator for Ohmic detection comes on when clicking Run Job briefly before the error is displayed, remove and clear consumables of any debris.
Torch does not purge air or fire after completing an Ohmic Sense, the Stop button is illuminated and the Plasma indicator light is lit up green on the VMD Dashboard.	Check FlexCut power supply for error codes on the front panel. Verify that the CNC interface cable is plugged into the FlexCut Power Supply, and to the Accumove controller & VFC box.

Software Faults (Cont.):

Problem	Solution
Torch retracts fully to the top after sensing the material in an ohmic sense, and the Run Job button becomes available to click.	Clear the surface of the material of any corrosion that would hinder the ohmic sensing process. Verify the torch lead is not getting pulled tight on the way down to the surface of the material. Check for the torch pushing against the material deflecting it before stopping and retracting.
Torch collides with the material after 1" of cut. The torch is cutting too high from the material.	Verify Pierce and Cut height are at recommended book values. Verify the height control mode is set to Auto and not Manual. Verify the Sample Voltage function is turned ON. Check for part tip-ups near the piercing points that may interfere with the torch sensing the materials height.
Torch does not appear to maintain a consistent cut height with the material as it warps.	Verify the height control mode is set to Auto and not Manual. Verify the Sample Voltage function is turned ON. If the part involves very complex geometry, the system may be in a Lockout Mode for extended periods of time. Login as Admin, go to Machine Settings, and on the Basic tab change the Distance to Corner value to .250.

Customer Assistance Policy

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