

CUTTING MACHINE

# LINC-CUT® S

# 1020w - 1530w

SAFETY INSTRUCTIONS FOR OPERATING AND MAINTENANCE

MACHINE No

AS-CM-LCS1020WF125; AS-CM-LCS1530WF125

AS-CM-LCS1020WTH80; AS-CM-LCS1530WTH80



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Instruction manual

REF : 8695 4795

Original instructions

**LINCOLN**<sup>®</sup>  
**ELECTRIC**

**Thank you very much for the trust you have shown by choosing this piece of equipment. It will give you trouble-free service if it is used and maintained as recommended.**

**Its design, component specifications and manufacturing are in accordance with applicable European directives.**

**Please refer to the CE declaration enclosed to identify the directives applicable to it.**

**The manufacturer shall not be liable for any combination of parts not recommended by it.**

**For your safety, please follow the non-limitative list of recommendations and obligations, a large part of which are included in the Labour Code.**

**Please inform your supplier if you find any error in this instruction manual.**

# Table of contents

Description of LINC-CUT® S 1020w-1530w.....	1
Technical support/on-site maintenance .....	2
Unpacking your LINC-CUT® S 1020w-1530w.....	3
Putting in place the LINC-CUT® S 1020w.....	4
Putting in place the LINC-CUT® S 1530w.....	5
Safety first .....	6
General safety instructions: .....	6
Airborne noise: .....	6
Particular safety instructions:.....	6
Laser safety: .....	7
Fumes/gas: .....	8
Noise measurement: .....	8
Preparing the floor.....	9
Dimensions and weight of LINC-CUT® S 1020w .....	10
General characteristics of LINC-CUT® S 1020w.....	10
Dimensions and weight of LINC-CUT® S 1530w .....	11
General characteristics of LINC-CUT® S 1530w.....	11
Options .....	12
Connecting your machine to the earth .....	12
Electricity/air/water requirements and installation.....	12
125A plasma process: FLEXCUT™ 125 CE + LC125M torch .....	14
Controls and parameters of the FLEXCUT™ 125 CE plasma .....	14
Main specifications of the FLEXCUT™ 125 CE plasma power source .....	15
Main specifications of the LC125M torch .....	15
Equipment performance .....	15
Use of consumables of the FLEXCUT™ 125 CE plasma .....	15
80A plasma process: TOMAHAWK® 1538 + LC100M torch .....	16
Controls and parameters of the TOMAHAWK® 1538 plasma unit .....	16
Main specifications of the TOMAHAWK® 1538 plasma power source.....	17
Main specifications of LC100M torch.....	17
Performance of the TOMAHAWK® 1538 + LC100M torch installation.....	17
Use of consumables of the LC100M torch - TOMAHAWK® 1538.....	18
100A manual plasma process: TOMAHAWK® 1538 + LC105 torch .....	18
Starting up the LINC-CUT® S 1020w-1530w.....	19
Shutting down the LINC-CUT® S 1020w-1530w.....	19
Overview of Visual Machine Designer (VMD).....	21
Job Group: .....	22
View Screen: .....	24
Datum/Program Zero Group: .....	26
Jogging:27	
AVHC and Dashboard: .....	28
Selection of options: .....	30
Using the Shape Library in VMD .....	31
Cut quality .....	35

Develop your own cut chart.....	36
Nesting.....	37
Performing Your First Test Cut.....	40
Maintenance.....	41
Daily maintenance.....	41
Monthly maintenance: .....	42
Maintenance as needed: .....	43
Bevel base .....	45
How the torch position affects bevel .....	46
What causes bad cuts .....	47
Optional marker: Marker installation and configuration.....	48
Basic troubleshooting.....	53
Spare parts .....	61
Customer Assistance Policy .....	64
PERSONAL NOTES .....	66

## INFORMATION

### DISPLAYS AND PRESSURE GAUGES

Measurement instruments or displays of voltage, intensity, speed, accuracy etc. are to be considered as indicators, whether they are analogue or digital.

### REVISIONS

**REVISION : A                      DATE : 04/20**

DESCRIPTION	PAGE
Created	All

**REVISION : B                      DATE : 06/20**

DESCRIPTION	PAGE
Revision of safety instructions	6

**REVISION : C                      DATE : 04/21**

DESCRIPTION	PAGE
Update	All

**REVISION : D                      DATE : 07/21**

DESCRIPTION	PAGE
1020w size added	All

**REVISION : E                      DATE : 05/22**

DESCRIPTION	PAGE
Update TOMAHAWK® 1538 power source added	

## Description of LINC-CUT® S 1020w-1530w

The **LINC-CUT® S 1020w-1530w** solution is a plasma cutting machine that is quick to put into service, easy to use, and an investment that can pay for itself in a short time.

The machine frame is made up of a steel table incorporating expendable plates that support the stock to cut and contain water mixed with a special fluid called "Plateguard red".

The water captures the dust generated during cutting.

The residual gas that is emitted remains below limit exposure values in certain conditions of use:

1. The machine must be installed in a workshop that is large enough, with air renewal,
2. Use must be limited to two hours of effective cutting per day (average observed cutting time)

A touch screen and an intuitive user interface with a library of integrated shapes will allow you to start cutting at once.

A software suite is supplied to work with your programs, which can be loaded from a USB drive.

The machine is easy to use and maintain, and is guaranteed for two years.

Thanks to **FLEXCUT 125 CE** or **TOMAHAWK® 1538** technology, the machine provides excellent compressed air cutting air quality with carbon steel and stainless steel, and offers very high profitability, a long life, reduced finishing operations, fewer burrs and better angular quality.

The main target applications are in the industries below:

- metal work,
- building hardware,
- art and leisure,
- prototyping,
- education,
- repair workshops.



**Lincoln Electric®** provides a variety of technical support packages with the **LINC-CUT® S 1020w-1530w** cutting machine. Here is a brief overview of the available options. On-site support may be provided for an additional charge; please call 0825 132 132 for more information.

- **Telephone assistance**

Telephone assistance is available from Monday to Friday from 8 am to 5 pm. **Lincoln Electric®** will make every effort to respond to telephone calls as soon as possible. Because of the nature of machine troubleshooting and the varying abilities of operators, we are unable to give any guarantee as to the telephone waiting time for support. Technical support covers assembly, troubleshooting, configuration and quality-related queries. Training in operating is not included in telephone technical support.

- **Email**

**Lincoln Electric®** will reply to email sent to the address "EU-AutomationServices@LincolnElectric.com" within 24 hours from Monday to Friday.

- **Training in LINC-CUT® S 1020w-1530w**

**Lincoln Electric®** offers several training packages, either in the customer's premises or in our Excellence Centre in Pont Sainte Maxence. Please call 0825 132 132 for more details.

## Unpacking your LINC-CUT® S 1020w-1530w

Your **LINC-CUT® S 1020w-1530w** machine is delivered assembled, but you need to remove the shipping material and locks before using it. Check that all the items have been received without damage before you accept the delivery from the carrier.

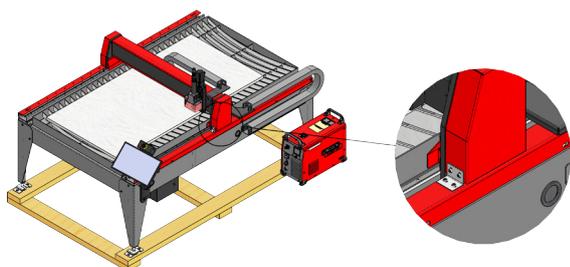
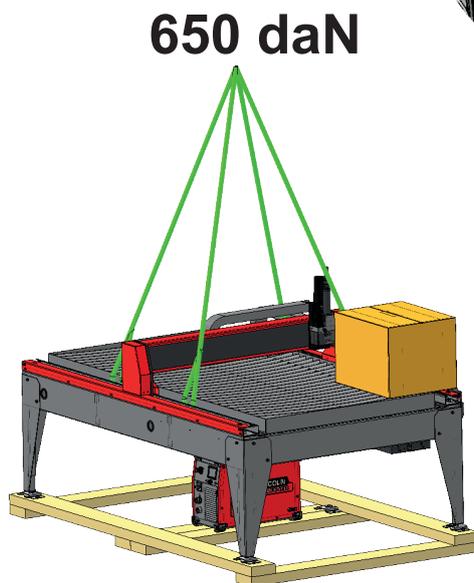
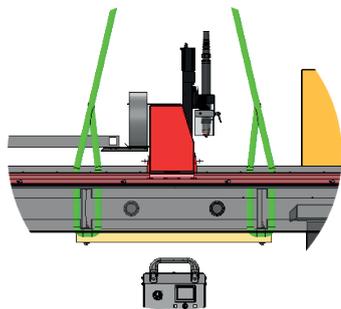
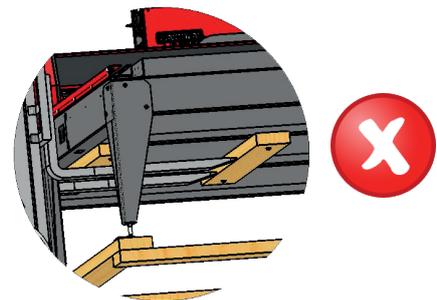
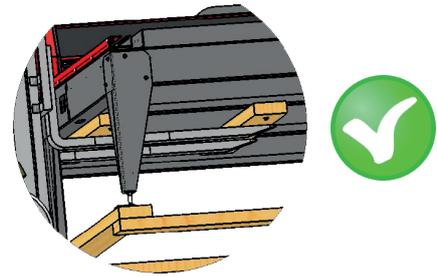
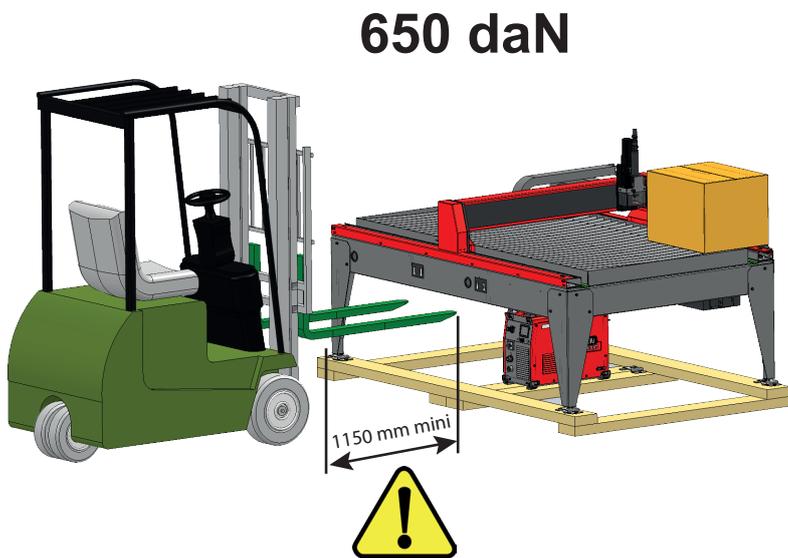
Inform **Lincoln Electric®** at 0825 132 132 to report any shipping damage. Your machine has been fully tested in the factory and a cut metal sample can be found in the machine water tray.

<input checked="" type="checkbox"/>	Qty	Description	Part number
<input checked="" type="checkbox"/>	1	<b>LINC-CUT® S 1530w</b> machine with <b>FLEXCUT™ 125 CE</b> plasma cutting unit	AS-CM-LCS1530WF125
	OR		
<input checked="" type="checkbox"/>	1	<b>LINC-CUT® S 1020w</b> machine with <b>FLEXCUT™ 125 CE</b> plasma cutting unit	AS-CM-LCS1020WF125
	OR		
<input type="checkbox"/>	1	<b>LINC-CUT® S 1530w</b> machine with <b>TOMAHAWK® 1538</b> plasma cutting unit	AS-CM-LCS1530WTH80
	OR		
<input type="checkbox"/>	1	<b>LINC-CUT® S 1020w</b> machine with <b>TOMAHAWK® 1538</b> plasma cutting unit	AS-CM-LCS1020WTH80
	OR		
<input type="checkbox"/>	1	<b>LC125M</b> consumables starter pack ( <b>FLEXCUT™ 125 CE</b> )	BK14300-SK
	OR		
<input type="checkbox"/>	1	<b>LC100M</b> consumables starter pack ( <b>TOMAHAWK® 1538</b> )	BK12849-SK
<input type="checkbox"/>	1	<b>LINC-CUT® S</b> TM-CAD/CAM pack	AS-CP-LCSCADCAM
<input type="checkbox"/>	2	Plateguard red	AS-CW-005981

To unpack your **LINC-CUT® S 1020w-1530w**, take off the plastic film and inspect the machine for damage. If there is any damage, do not accept the delivery.

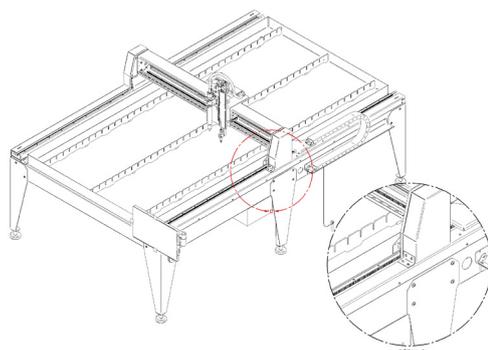
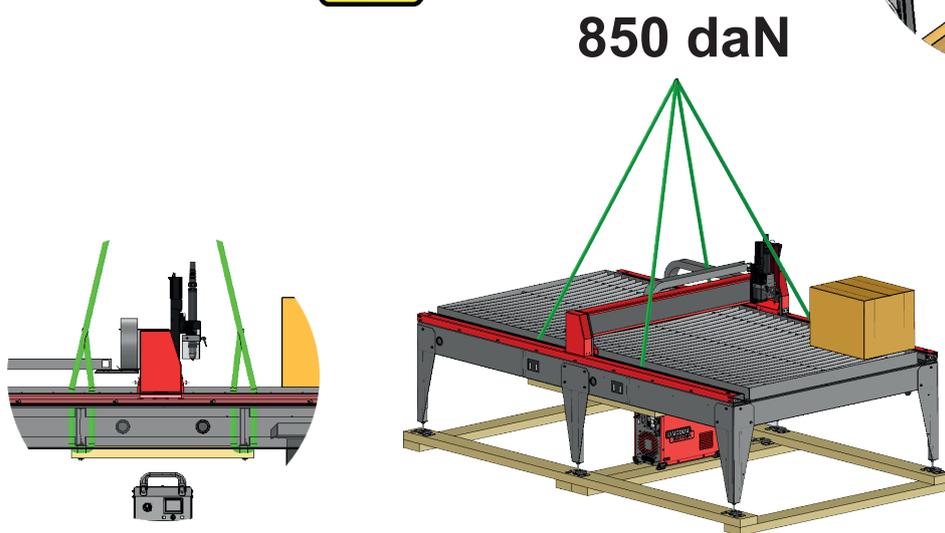
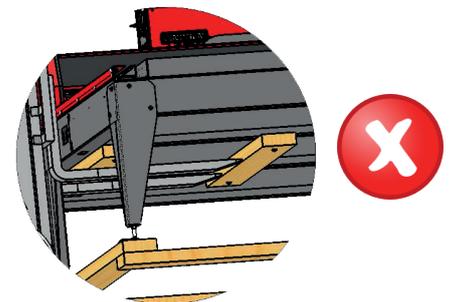
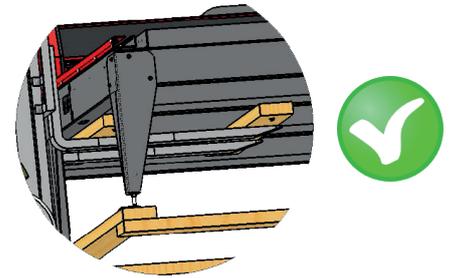
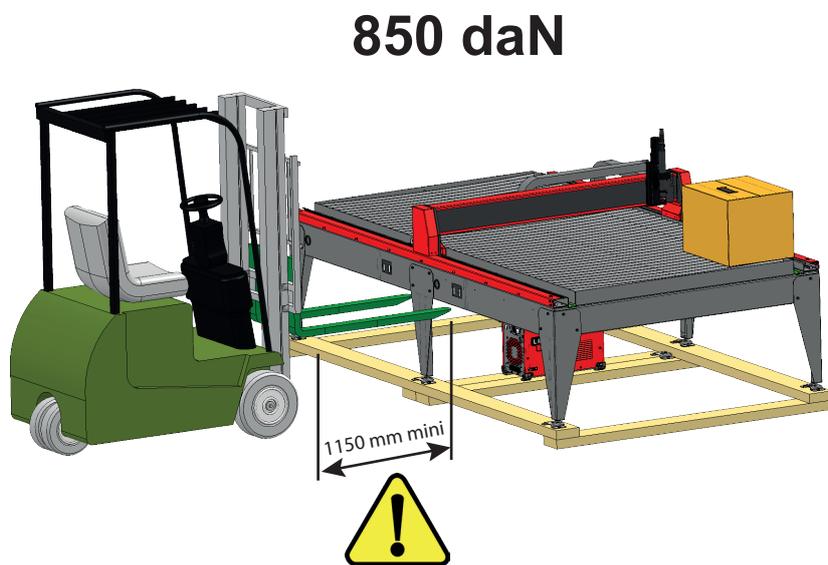
A travelling crane or a lift truck will be required to put the machine in place in its operating position. Do not lift the machine from the cable drag chain or cable carrier side. Once the machine is in position, level the table with the adjustable feet. Start with the four corner feet and end with the two central feet (only on **LINC-CUT® S 1530w**).

Make sure that the table does not rock.



The **LINC-CUT® S 1020w** model is supplied with factory-installed locks. The locking devices must be removed before using the machine. **DO NOT PUT BACK** the bolts after removing the locking devices, as that will lead to permanent damage to the gantry.

**Do not lift the machine from the cable drag chain or cable carrier side!**



The **LINC-CUT® S 1530w** model is supplied with factory-installed locks. The locking devices must be removed before using the machine. **DO NOT PUT BACK** the bolts after removing the locking devices, as that will lead to permanent damage to the gantry.

**Do not lift the machine from the cable drag chain or cable carrier side!**

The equipment for **LINC-CUT® S 1020w-1530w** supplied by **Lincoln Electric®** is designed and manufactured to ensure safety. However, you can heighten the overall safety of your machine by installing it correctly and using it wisely.

**WARNING**

**MAKE SURE YOU DO NOT INSTALL, USE OR REPAIR THE EQUIPMENT WITHOUT FIRST READING THE SAFETY INSTRUCTIONS IN THIS MANUAL. Think before you act, and be cautious.**

**General safety instructions:**



Read and understand the general safety instructions in the dedicated manual (no 86957050) supplied with the equipment.

**Airborne noise:**



Refer to the dedicated manual (no 86957050) supplied with the equipment.

**Particular safety instructions:**



Protect yourself and others from the risk of serious injury or death.



Keep children away.



If you use a pacemaker, please seek the advice of your physician before using the machine.



Make sure that all installation, operation, maintenance and repair procedures are carried out **by qualified personnel only**.



**Handling conditions**

For installation or maintenance operations, the operator must use an appropriate lift truck and lift the **LINC-CUT® S 1020w-1530w** from the side opposite the cable drag chain.



**Stability**

The machine must be adjusted via its levelling feet so that it is stable.



**“No climbing** on the structure of the machine other than on platforms or gangways designed for that purpose.

To access equipment at heights, the user must use accessing means in accordance with the regulations, such as a safe mobile gangway, an aerial lift etc.



Clean the working area from time to time.



Before any work on the torch, it is **absolutely necessary** to switch off the **FLEXCUT 125 CE** or **TOMAHAWK® 1538** power source.



**Conditions of use:**

- No object is to be placed on the rolling tracks.
- Do not climb on the cable drag chain.
- Before handling plates, make sure that the safety of personnel and property is protected.
- Before using the machine, make sure that all the guards are in place. All guard covers must be screwed in. Only authorised personnel may access electrical cabinets, which must have locking systems.
- No maintenance may be carried out on the machine when it is supplied with power.
- In the event of any extended absence, the operator must shut off the supply of utilities (electricity and fluids).
- Before any work on the machine, make sure the power supply to the machine has been switched off (locking an emergency stop button is sufficient).



Any movement of the machine will make it necessary to level the table once again.



Never modify the machine.  
The machine is not designed for anchoring lifting equipment.



The use of Personal Protective Equipment (PPE) is **mandatory**.



Machine maintenance **must** be carried out with all the energy supplies switched off.  
The disconnection and padlocking of all energy sources is **mandatory**.



The emergency stop and safety lines **must be** interlocked and tested in accordance with the electrical diagram of the machine.



**Handling of parts:**

- The equipment for handling workpieces that have been or need to be cut is not part of the supply and is to be provided by the customer. The customer must therefore take protective measures appropriate for the equipment for handling the workpieces.
- **IMPORTANT:** While handling sheets to cut, take the necessary precautions to avoid impacts on the machine and the rolling tracks.
- Impacts on any of the elements can lead to squareness faults or the malfunctioning of the electrical shaft and therefore incorrect cutting of the workpieces. An accidental manoeuvre could restart the movement unintentionally.
- An operator entering the area between the rolling tracks could be caught between the pieces and the machines.
- The machine must remain under the supervision of a trained operator when it is operating.

## Laser safety:



- The pointer is a class 3R laser pointer. Use it with caution. Do not activate when the torch impact safety system is dislodged.
- This product contains a laser diode. Make sure you follow all the safety precautions during use.
- **DO NOT LOOK INTO THE BEAM**, whether direct or reflected. The beam can injure the eyes at a distance of up to 34 m.
- **NEVER POINT THE LASER** towards an aircraft or other vehicle; that is hazardous and illegal. The laser may interfere with the eyesight of pilots, and can interfere with eyesight up to 730 m. Lasers can be distracting up to 7.3 km.
- Class 3R lasers are safe when they are handled with care. • **DO NOT LOOK INTO THE BEAM.** Avoid accidental exposure of the eyes.
- It is not a toy. Always keep children under supervision.

## Fumes/gas:

The water table catches most solid particles and some of the gaseous emissions from harmful fumes. However, their residual concentration, possibly in combination with quantities of substances already present in the ambient air due to other sources of pollution, may exceed limit or peak workplace exposure values.

Under the regulations:

- The limit value for short-term exposure (15-minute duration) to NO<sub>2</sub> (majority pollutant in NO<sub>x</sub>) must remain below 6 mg/m<sup>3</sup>
- The limit value for occupational exposure (eight-hour duration) to NO<sub>2</sub> (majority pollutant in NO<sub>x</sub>) must remain below 1.2 mg/m<sup>3</sup>

Based on a guidance (see note 1) usage scenario with two hours of cutting over an eight-hour day (15 minutes of cutting/hour), below is an estimate of the fresh air flow rate required to stay within the limit exposure values read with 25 mm thick steel plates. This is the least favourable case in relation to other readings taken on 10 mm thick steel and 10 and 20 mm thick stainless steel. **LINC-CUT® S 1020w-1530w** machines are not designed for cutting aluminium. Cutting aluminium on a water table is hazardous: risk of explosion due to the discharge of hydrogen.

	Workshop 5 m high 5 m wide 10 m long	Workshop 5 m high 10 m wide 10 m long	Workshop 5 m high 10 m wide 15 m long	Workshop 5 m high 10 m wide 25 m long
Volume (m <sup>3</sup> )	250	500	750	1250
Fresh air inflow rate (m <sup>3</sup> /h) required to not exceed the short-term (15 minutes) exposure limit value for NO <sub>2</sub> , 6 mg/m <sup>3</sup>	420	170	0	0
Fresh air inflow rate (m <sup>3</sup> /h) required to not exceed the occupational (eight hours) exposure limit value for NO <sub>2</sub> , 6 mg/m <sup>3</sup>	3300	3270	3240	3200

Note 1: The concentration stated indicates the average value in the area. In reality, it is higher close to the table.

The quantity of residual fumes emitted depends closely on the quality of the cut metal, cutting parameter settings and the water level height.

That is why **Lincoln Electric®** cannot commit to specific values regarding the fume concentration at the workstation.

In order to take account of all the varied conditions of use, only individual in-situ exposure measurements by an approved body can determine the concentrations created, in order to then define any ventilation requirements.

## Noise measurement:

Noise measurement of **LINC-CUT® S 1020w-1530w** with a **FLEXCUT 125 CE** and an **LC125M** torch (measurements **M1** and **M2**) or a **TOMAHAWK® 1538** (measurement **M1**) with an **LC100M** torch in accordance with the Machinery Directive 2006/42/EC has brought out the following conclusions set out in the table below:

LC125M LC100M		MEASUREMENT CONDITIONS			
		M1		M2	
Intensity		85A		125A	
Material		Carbon steel: 8mm		Carbon steel: 20mm	
Gas		Compressed air		Compressed air	
		LAeq level in dB(A)	LCpeak levels in dB(C)	LAeq level in dB(A)	LCpeak levels in dB(C)
Distance of measuring point from torch	1 metre	101.2	114.3	95.2	108
	2 metres	96.2	109	90.6	103.6
	3 metres	93.2	106.3	89	103.8
	4 metres	90.8	103.8	85.9	98.6
	5 metres	89.7	102.6	84.4	98.8



## Preparing the floor

When you install a **Lincoln Electric**® CNC cutting system in your workshop, many factors will influence the potential productivity, the 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 gases, and ventilation.

The machine must be placed on a stable floor of the industrial type as an example.

Single-piece concrete slab made at least 21 days previously (BAEL 93 standard), 200 mm thick. The thickness of the slab and its reinforcement are provided for guidance and must be adapted to the characteristics of the floor.

### OR

Concrete longitudinal members in one piece. 20 Mpa (350 kg/m<sup>3</sup>) concrete with metal reinforcement.



Flatness over the entire site with additional travelling tracks  $\pm 10$  mm. Slab level difference 30 mm (maximum 5 mm/m).

- While preparing the installation of a **Lincoln Electric**® CNC cutting machine, provide for sufficient space. 800 mm clear space around the machine.
- Lift the machine using a travelling crane or a lift truck from the side opposite the cable carrier only.
- A dedicated earth connection must be provided and installed so as to minimise the risk of tripping.
- The supplied power cable is limited to 3 metres.

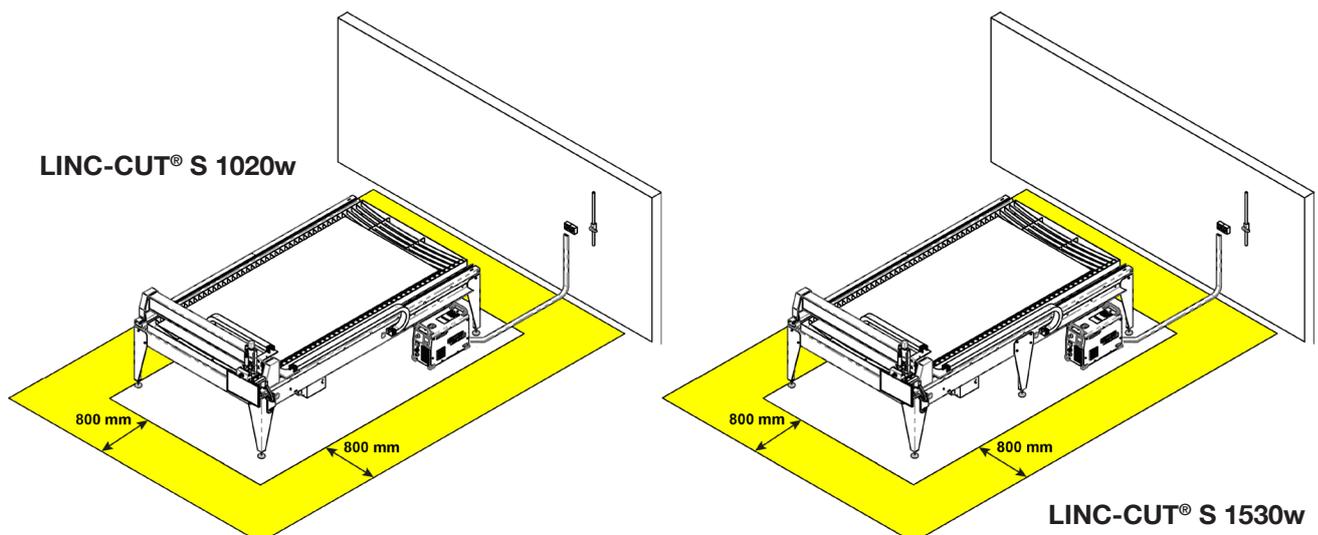


While locating the **LINC-CUT**® S 1020w-1530w, you must take account of the length of cables:

- The supplied power cable of the **LINC-CUT**® S 1020w-1530w is limited to 3 metres,
- The supplied power cable of the **FLEXCUT**™ 125 CE or the **TOMAHAWK**® 1538 is limited to 5 metres
- The supplied 16<sup>2</sup> equipotential bonding cable is limited to 10 metres.



In order to avoid water splashing on the **FLEXCUT**™ 125 CE or **TOMAHAWK**® 1538, users are strongly advised to place the unit under the water table (e.g. under the rear right leg).



## Dimensions and weight of LINC-CUT® S 1020w



\* Weight without water

### FLEXCUT 125 CE

55 daN



### TOMAHAWK® 1538

34 daN



## General characteristics of LINC-CUT® S 1020w

Machine model	<b>LINC-CUT® S 1020w</b>
Numerical control	VMD SP3
Plate dimensions	1000 x 2000 mm
Machine dimensions	Width: 1.069 mm Length: 2.481 mm Height: 1.600 mm
Net machine weight (without liquid)	650 daN
Delivered on a pallet	2150 x 3700 x 1750 mm
Water capacity	260 litres
Height between bottom of beam and top of table	127 mm
Thickness capacity of the table	20 mm with 1000x2000 mm plate 25 mm on half the surface
Engines	step/2.8 Nm
Reduction drive	3:1 belt reduction drives Clutch with pre-loaded springs
Guides and drive	Longitudinal guides with 20 mm bearing pads and racks Transverse guides with 15 mm bearing pads and racks
Recommended service time	4 hours per day (2 hours of effective cutting)
Certification	CE certification

## Dimensions and weight of LINC-CUT® S 1530w



\* Weight without water

### FLEXCUT 125 CE

55 daN



### TOMAHAWK® 1538

34 daN



## General characteristics of LINC-CUT® S 1530w

Machine model	LINC-CUT® S 1530w
Numerical control	VMD SP3
Plate dimensions	1500 x 3000 mm
Machine dimensions	Width: 2.027 mm Length: 3.481 mm Height: 1.600 mm
Net machine weight (without liquid)	850 daN
Delivered on a pallet	2150 x 3700 x 1750 mm
Water capacity	495 litres
Height between bottom of beam and top of table	127 mm
Thickness capacity of the table	20 mm with 1500x3000 mm plate 25 mm on half the surface
Engines	step/2.8 Nm
Reduction drive	3:1 belt reduction drives Clutch with pre-loaded springs
Guides and drive	Longitudinal guides with 20 mm bearing pads and racks Transverse guides with 15 mm bearing pads and racks
Recommended service time	4 hours per day (2 hours of effective cutting)
Certification	CE certification

## Options

Marker

See "Marker installation and configuration" section

## Connecting your machine to the earth

The machine must be connected to the earth appropriately to keep personnel safe and suppress high-frequency noise. The foundation for satisfactory earthing is an effective earth rod. A ground point is connected to the rod with a short, heavy conductor. A simple copper clad steel rod may be driven into the ground to create an earth rod. An earth rod must be installed. Bring in a qualified electrician to verify the earth connection of your system.

Use a 16<sup>2</sup> twisted cable to connect the earth rod on the table to the earthing connection provided by the customer.

For proper operation of your CNC cutting tables, you need to connect a 16<sup>2</sup> cable from the earth connection rod to the dedicated earth rod.

Put the plasma cutting unit in its appropriate location. Reinstall the power and earth cables of the table at the front of the machine.

The **FLEXCUT™ 125 CE** or **TOMAHAWK® 1538** plasma cutting unit is supplied with an earth connection attached to the earth connection bar. Further, a work earth connection is attached to the earth star to connect to the cut material. If the work piece is painted or dirty, you may need to expose the metal underneath for a good electrical connection.

The earth rod is not supplied with the machine



## Electricity/air/water requirements and installation

Please refer to the instruction manual of the **FLEXCUT™ 125 CE** or **TOMAHAWK® 1538** for complete instructions for installation and operation. Only a qualified electrician may connect the input leads to the **LINC-CUT® S 1020w-1530w** and the **FLEXCUT™ 125 CE** or **TOMAHAWK® 1538** plasma cutting units. Connections are to be made in accordance with all local and national electrical requirements. Failure to do so may result in injury or death.

The **LINC-CUT® S 1020w-1530w** is designed for an input voltage of 220/230 V, single phase, 50 or 60 Hz. Before connecting the machine to the power supply, make sure that the voltage, phase and frequency of the input current match those indicated on the name plate.

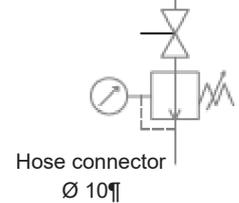
The **FLEXCUT™ 125 CE** or **TOMAHAWK® 1538** is designed for an input voltage of 400 V, three phase, 50 or 60 Hz. Before connecting the machine to the power supply, make sure that the voltage, phase and frequency of the input current match those indicated on the name plate.

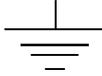
### **WARNING**

The On/Off switch of the **FLEXCUT™ 125 CE** or **TOMAHAWK® 1538** is not designed to be used as a cut-out device for the machine. Only a qualified electrician may connect the input leads to the **LINC-CUT® S 1020w-1530w**.

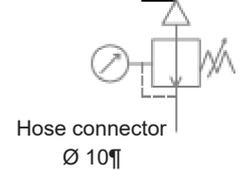
Supply by the customer of two power supplies + earth		
		
<b>Machine:</b>	<b>Power source</b> <b>FLEXCUT™ 125 CE:</b>	
0.75 Kw - 0.9 kVA - 4A - 220/230 V 2P + E 230V/16A single-phase female wall connector	22 Kw - 28 kVA - 40A - 400 V 3P + E 400V/63A three- phase female wall connector	Building earth 5 Ohms max

**FLEXCUT™ 125 CE**  
15.6 m<sup>3</sup>/h - 7.2 bar



Supply by the customer of two power supplies + earth		
		
<b>Machine:</b>	<b>Power source</b> <b>TOMAHAWK® 1538:</b>	
0.75 Kw - 0.9 kVA - 4A - 220/230 V 2P + E 230V/16A single-phase female wall connector	13.7 Kw - 17.4 kVA - 20A - 400 V 3P + E 400V/32A three- phase female wall connector	Building earth 5 Ohms max

**TOMAHAWK® 1538**  
16.8 m<sup>3</sup>/h - 6.7 bar



The **LINC-CUT® S 1020w-1530w** CNC machine must be used with:

- dry compressed air free from oil or nitrogen
- clean compressed air. A standard inline filter with a five-micron nominal rating is recommended; however, for optimum performance a pre-filter with a three-micron rating should be preferred.

A high-pressure regulator **MUST** be used with the compressor or high-pressure cylinder.

The supply pressure must be 7.2 bar, with a flow rate of 15.6 m<sup>3</sup>/h.



**THE AIR SUPPLY PRESSURE MAY NEVER EXCEED 7.5 BAR. IF IT DOES, THE MACHINE WOULD BE DAMAGED!**

### WARNING

The quality of the air used for the plasma has a significant impact on cutting results.

The user must provide a source of compressed air with a regulator that can supply the required flow and pressure. The air must be clean, de-oiled and degreased.

QUALITY CLASS: as per standard ISO 8573-1

Solid pollutant class	Class 3	Grain size 5µm	Mass concentration 5mg/m <sup>3</sup>
Water class	Class 3	Maximum dew point under pressure -20°C	
Total oil class	Class 5	Concentration 25 mg/m <sup>3</sup>	

Plasma air supply must be through a pipe with a 10 mm diameter and a 1/4 NPT quick disconnect coupler. Air pipes must be routed so as to not create a tripping hazard.

Water must be poured into the table tray before use. 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 a readily available product designed for use in CNC plasma tables.

**Water capacity:** The **LINC-CUT® S 1530w** may contain approximately 495 litres (approximately 10L of Plateguard Red and water for the remaining volume). The **LINC-CUT® S 1020w** may contain approximately 260 litres (approximately 7.5L of Plateguard Red and water for the remaining volume)



The level is right when the liquid reaches the upper level of the slats.

## Controls and parameters of the FLEXCUT™ 125 CE plasma

Please refer to the operating manual of your **FLEXCUT™ 125 CE** supplied with the plasma cutting unit. When the machine is on and the automatic test is executed, all the indicators light up on the control panel.

### Front controls

1	LCD display
2	Main air, gas pressure gauge and regulator button
3	Home button
4	On/Off switch
5	Torch connection
6	Work cable connection
7	Menu control button
8	Bleeding



### Rear controls

9	Air or gas inlet (1/4" (6.35 mm) NPT quick connect)
10	Access to reconnection panel
11	Input cable tie
12	14-pin CNC interface
13	Fan



## Main specifications of the FLEXCUT™ 125 CE plasma power source

<b>Weight</b>	53 kg
<b>Primary power supply</b>	380/400/415 V (+/-10%) - Three phase - 50 - 60 Hz
<b>Input current</b>	40 A @ 100%
<b>Duty factor</b>	125 A - 175 V @ 100 % (40 °C)
<b>No-load voltage</b>	300 V
<b>Cutting current regulation</b>	20 to 125 A
<b>Gas supply</b>	Compressed air – 6.5 bars - 260 l/min (cooling and cutting gas)

## Main specifications of the LC125M torch

<b>Striking</b>	Contact without HF
<b>Bundle length</b>	7.5 metres
<b>Connector</b>	Universal central connector

## Equipment performance

<b>Materials</b>	Carbon steels - stainless steels
<b>Mid-plate thickness</b>	up to 25 mm (steel)
<b>Angular cutting quality</b>	Range 4-5 according to ISO9013
<b>Life of consumables</b>	350 cutting cycles (20 sec) at 125 A and 750 cycles at 105 A
<b>Processes switchable with no change of consumables</b>	Compressed air – 6.5 bars - 260 l/min (cooling and cutting gas)

## Use of consumables of the FLEXCUT™ 125 CE plasma

Please refer to the operator's manual of the **FLEXCUT™ 125 CE** for complete installation and operating instructions. Do not tighten the consumables excessively. Tighten only till the parts are securely seated.

### Wearing part for LC125M torch

Front insulator assembly ( <b>LC125M</b> )	BK14300-18	Qty 1
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### Consumables starter pack for LC125M (BK14300-SK) torch

Electrode ( <b>LC125M</b> )	BK14300-1	Qty 2
Diffuser, 45 A - 125 A ( <b>LC125M</b> )	BK14300-13	Qty 1
Nozzle 45 A ( <b>LC125M</b> )	BK14300-7	Qty 1
Nozzle 65 A ( <b>LC125M</b> )	BK14300-8	Qty 1
Nozzle 85 A ( <b>LC125M</b> )	BK14300-9	Qty 1
Nozzle 105 A ( <b>LC125M</b> )	BK14300-10	Qty 2
Nozzle 125 A ( <b>LC125M</b> )	BK14300-11	Qty 2
CTP cap ( <b>LC125M</b> )	BK14300-15	Qty 1
Protective top 45 A - 65 A ( <b>LC125M</b> )	BK14300-3	Qty 1
Protective top 85 A - 125 A ( <b>LC125M</b> )	BK14300-4	Qty 1



## Controls and parameters of the TOMAHAWK® 1538 plasma unit

Please refer to the operating manual of your TOMAHAWK® 1538 supplied with the plasma cutting unit. When the machine is on and the automatic test is executed, all the indicators light up on the control panel.

### Front controls

1	Cutting mode selection
2	Pressure regulator
3	Torch connection
4	On/Off indicator
5	Output indicator
6	Thermal indicator
7	Compressed air pressure fault indicator
8	Torch safety indicator
9	Output current adjustment
10	Work cable connection
11	CNC interface



### Rear controls

12	Air inlet
13	Fan
14	Power supply cable
15	On/Off switch



## Main specifications of the TOMAHAWK® 1538 plasma power source

<b>Power supply</b>	400V ± 15%, three phase		
<b>Power consumption</b>	7.1 kW at 100% DF 13.7 kW at 40% DF		
<b>Frequency</b>	50/60 Hz		
<b>Nominal output at 40°C</b>			
<b>Duty factor</b>	<b>Output current</b>	<b>Output voltage</b>	
100%	60A	104 VDC	
60%	85A	114VDC	
40%	100A	120VDC	
<b>Output current range</b>			
<b>Cutting current range</b>	<b>Maximum no-load voltage</b>	<b>Pilot arc current</b>	
20 - 100A	320 VDC	20A	
<b>Compressed air</b>			
<b>Output</b>		<b>Service pressure</b>	
280 ± 20% l/min at 5.5 bar		6 - 7 bar	
<b>Recommended power supply cable and fuses</b>			
<b>Fuse (slow-blow) or circuit breaker, D characteristic</b>		<b>Power cable</b>	
32 A		4 x 4 mm <sup>2</sup>	
<b>Dimensions</b>			
<b>Height</b>	<b>Width</b>	<b>Length</b>	<b>Weight</b>
455 mm	301 mm	640 mm	34 kg
Operating temperature	-10°C to +40°C		
Storage temperature	-25°C to +55°C		

## Main specifications of LC100M torch

<b>Striking</b>	Contact without HF
<b>Bundle length</b>	7.5 metres
<b>Connector</b>	Universal central connector

## Performance of the TOMAHAWK® 1538 + LC100M torch installation

<b>Materials</b>	Carbon steels - stainless steels
<b>Mid-plate thickness</b>	up to 25 mm (steel)
<b>Angular cutting quality</b>	Range 4-5 according to ISO9013
<b>Processes switchable with no change of consumables</b>	Compressed air – 5.5 bars - 280 l/min (cooling and cutting gas)
<b>Cutting current range</b>	40 - 60 - 80A

## Use of consumables of the LC100M torch - TOMAHAWK® 1538

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Please refer to the operating manual of the **TOMAHAWK® 1538** for complete installation and operating instructions. Do not tighten the consumables excessively. Tighten only till the parts are securely seated.

### Consumables starter pack for LC100M torch (BK12849-SK)

Electrode (LC100M)	BK12849-3	Qty 5
Diffuser, 60A - 80A (LC100M)	BK12849-9	Qty 1
Nozzle, 40A (LC100M)	BK12849-4	Qty 1
Nozzle, 60A (LC100M)	BK12849-5	Qty 2
Nozzle, 80A (LC100M)	BK12849-6	Qty 2
Ring (LC100M)	BK12849-9	Qty 1
CTP cap (LC100M)	BK12849-22	Qty 1
Protective top, 40A (LC100M)	BK12849-14	Qty 1
Protective top, 60A - 80A (LC100M)	BK12849-15	Qty 1



## 100A manual plasma process: TOMAHAWK® 1538 + LC105 torch

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In addition to the **LC100M** automatic torch, your **TOMAHAWK 1538** installation is supplied with the **LC105** manual torch.

That torch may be used occasionally, possibly for skeleton cutting. Its use is simple, but requires some precautions:

- Switch off the **TOMAHAWK 1538**
- Remove the external control cable from the machine
- Remove the connector of the **LC100M** torch
- Connect the connector of the **LC105** torch
- Check that the consumables are appropriate for the desired cutting intensity
- Switch on the **TOMAHAWK 1538**.

To go back to the automatic mode with the **LC100M** torch:

- Switch off the **TOMAHAWK 1538**
- Remove the connector of the **LC105** torch
- Connect the connector of the **LC100M** torch
- Connect back the external control cable from the machine.
- Check that the consumables are appropriate for the desired cutting intensity
- Switch on the **TOMAHAWK 1538**

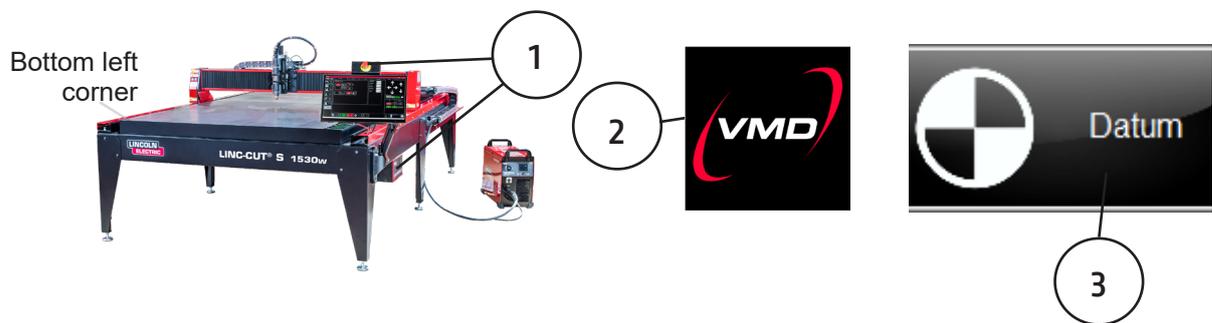
**Starting up the LINC-CUT® S 1020w-1530w**

To start up the **LINC-CUT® S 1020w-1530w** CNC machine, please follow the instructions below. The complete user guide is available as an embedded file in VMD. Use the button with the question mark to access the file.

**Step 1** Set the switch of the Accumove power unit to On. Turn the emergency stop button by giving it a quarter-turn clockwise. That will power up the Accumove and start the computer. If a grey Windows screen is displayed, swipe your finger to the top of the touch screen. Enter “cncop” as the password. Press the arrow

**Step 2** Once the computer starts up, it will start up the Visual Machine Designer (VMD) software.

**Step 3** On the screen, press Datum. That will activate the variable drives. The head will move to the bottom left corner of the table, its Home position. Your machine is now ready to operate



**Shutting down the LINC-CUT® S 1020w-1530w**

**Method 1**  
**Shutting down the machine when it remains powered by the electrical system:**

**Step 1** Apply the machine emergency stop; the Accumove will go off.



**Step 2** Press the Shutdown key.



**Step 3** The screen will go of and the PC will go into long standby.

**To switch on the machine:**

**Step 4** Release the emergency stop; the Accumove will start.

**Step 5** The PC will notice network activity and come out of standby.

**Step 6** VMD will start.

**Method 2**  
**Shutting down the machine when it is to be disconnected from the electrical system:**

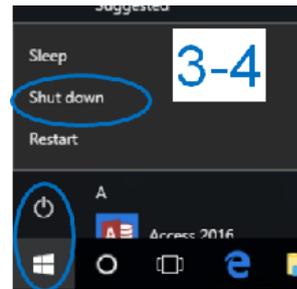
**Step 1** Apply the machine emergency stop.

**Step 2** Swipe your finger on the screen, starting from the left-hand edge up to the centre.



**Step 3** Press the **Windows** button

**Step 4** Press **Shutdown**



**Step 5** Switch off the power supply to the machine.

**To switch on the machine:**

**Step 7** Switch on the power supply to the machine.

**Step 8** If shuttle PC (with On/Off button): press the On button of the PC.



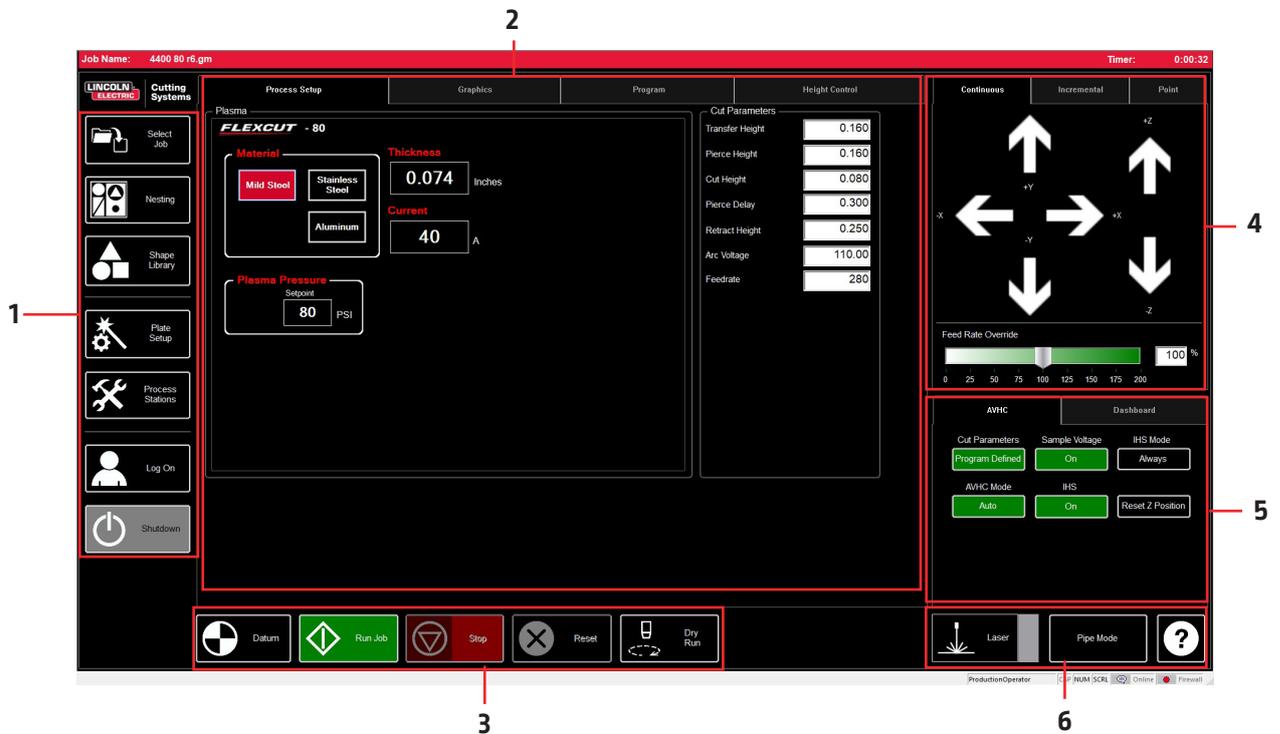
**Step 9** If metal PC: the PC will start automatically

**Step 10** Release the emergency stop.

**Step 11** VMD will start.

## Overview of Visual Machine Designer (VMD)

Visual Machine Designer (VMD) is the software that drives all **ACCUMOVE**® CNC controllers. Most table commands can be found on the main screen, along with features for creating and manipulating files. This quick guide will provide you with an overview of its features and operation.



The main screen of VMD is broken into sections for easy navigation and operation. The overview of all buttons and functions is addressed in sections.

1. Job group - Opens and controls all the aspects of the input file or job creation
2. View Screen - Displays the job setup, job graph, job g-code or a chart of tool-holder movements.
3. Datum/Program Zero - Establishes the machine zero through DATUM along with the program zero on the machine.
4. Cut Parameters/AVHC - Settings for the height control and it's functions.
5. Run group - These buttons control job starting and stopping.
6. Jogging - Controls the torch movement on the machine with the program run speed
7. Dashboard - Displays the coordinates of the head and all the indicators monitored in the machine.

## Job Group:

The JOB GROUP at the top, covers any “job” type functions. This group directly allows you to select a job, create a job (shape library) or modify job functions.

### Selecting a job:

Here is how to open a job in VMD..  
In the SELECT JOB area, you will find the HOT FOLDER and the loaded jobs in that folder. \* C:\ControllerData\Jobs is the HOT FOLDER.

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

The PREVIEW window displays the job selected from the list.

IS JOB KERF COMPENSATED: switches the software to adapt to compensation (KERF). If you are generating parts using TMCAD/VMD NEST, select YES.  
The parts in the shape library require KERF correction; select NO.  
Use the setting of the KERF diameter in TOOL LIBRARY.

### Nesting:

This opens the VMD NESTING.

View the NESTING section for an overview of these features.

### Shape library:

This will enable you to create a user-defined shape based on 27 common parts.

See the USING THE SHAPE LIBRARY section for details.

### Project configuration:

In PLATE SETUP, you can make alterations to the job itself.

ROW AND COLUMN: Allows you to add multiples by adding numbers to generate a GRID ARRAY of the job you have selected.

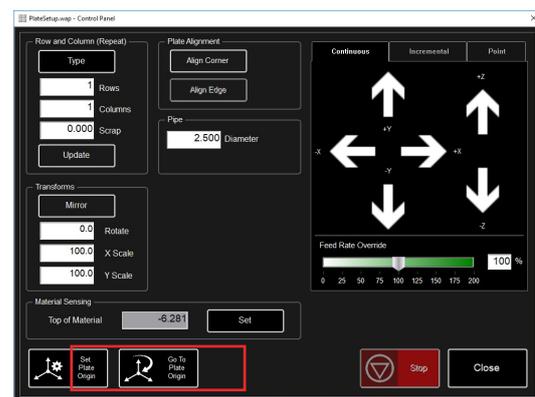
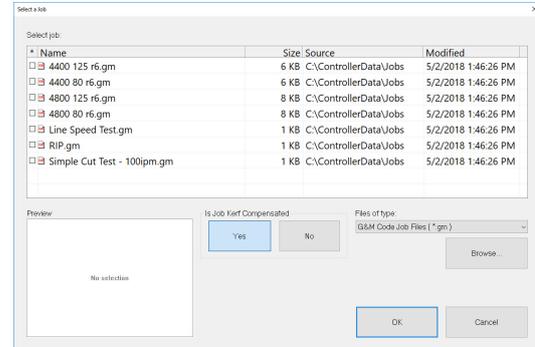
TRANSFORMS: Allows you to MIRROR, ROTATE or SCALE your job.

MATERIAL SENSING: This function 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.

PLATE ALIGNMENT: Used to make the controller “tilt” the job in relation to the material placed at an angle on the table.

SET PLATE ORIGIN: Used to set the origin of the plate.

GO TO PLATE ORIGIN: Sends the head to the PLATE ORIGIN.



**Process Stations:**

PROCESS STATIONS configures and controls the parameters of the tools used with the machine.

KERF and DWELL times can be added by programming the offset with the pneumatic marker.



**Log On:**

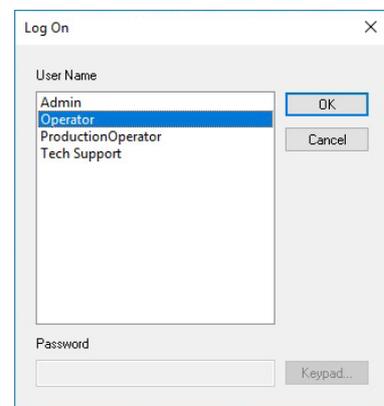
LOG ON switches users of the VMD software.

ADMIN opens the MACHINE SETTINGS. (password protected)

OPERATOR means a standard user with a standard interface.

PRODUCTION OPERATOR means a standard user with a simplified interface.

TECH SUPPORT is only used by technical support staff (password protected).



**Shutdown:**

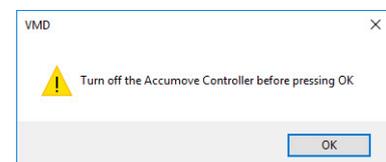
SHUTDOWN allows you to shut down VMD and the computer.

This is to be used when you want to shut down the computer.

The TURN OFF ACCUMOVE CONTROLLER popup window is displayed.

Press the emergency stop button to switch off the power to the **Accumove** controller.

Press OK. The PC will go into standby.



## View Screen:

The main VIEW SCREEN of VMD has tabs that control and display the job and the corresponding parameters for cutting the material. The tab at the top of the screen offers the operator different views and controls for planning the cutting job.

### Process setup:

The PROCESS SETUP tab is used to enter the material you plan to cut. Once that has been input, the CUT PARAMETERS will be updated in relation to the CUT CHART parameters.

- **Material** is the type of material you will cut.
- **Thickness** is the thickness of the material.
- **Current** is the current used for cutting.
- **Plasma Pressure** displays the appropriate air pressure required for the entered intensity/thickness pair.
- **Selected Process** adjusts the CUT PARAMETERS in the PLASMA or MARKING parameters. (**FLEXCUT™ 125 CE** only)



### Cut Parameters:

All the parameters of the CUT PARAMETER and AVHC tab place the torch in the right position in relation to the material during operation. Most of the parameters can be found in your **FLEXCUT™ 125 CE** or **TOMAHAWK® 1538** manual, in the cut charts.

Cut Parameters	
Transfer Height	0.160
Pierce Height	0.160
Cut Height	0.080
Pierce Delay	0.300
Retract Height	0.250
Arc Voltage	110.00
Feedrate	280

- **Transfer Height** is the distance at which the torch will retract from the material to strike a pilot arc, before moving to the piercing height.
- **Pierce Height** is the distance at which the head is positioned above the material during piercing.
- **Cut Height** is the distance between the tip of the torch and the top of the material during cutting.
- **Pierce Delay** is the time during which the torch pierces the material before carrying out the movement.
- **Retract Height** is the height to which the head moves up during rapid journeys in the course of the job.
- **Arc Voltage** is the voltage feedback comparison value. If you use SAMPLE VOLTAGE, it will be adjusted during cutting.
- **Feedrate** is displayed/adjusted on FEEDRATE OPTIMAL in the cut charts for the thickness of the material and the cutting intensity used.

## Graphics View:

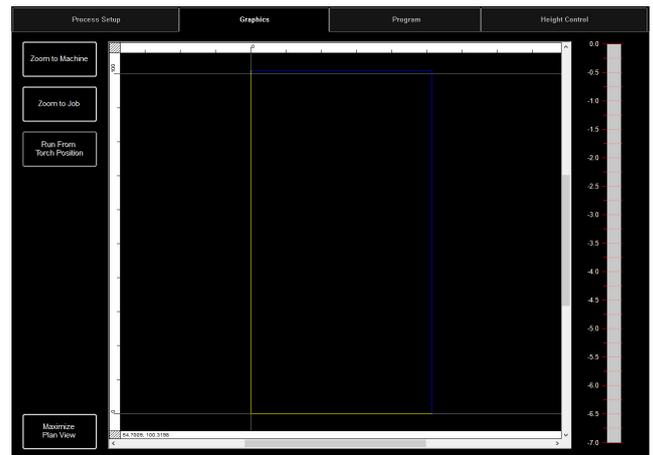
**MACHINE LIMITS** is used to display the machine limits in blue. The head position is represented by crossed white lines. The paths assigned to the plasma tool are displayed in red. The paths assigned to the pneumatic marker are displayed in green. Rapid travels are represented by a dotted grey line.

**Zoom to Machine** makes it possible to zoom to the programmed machine limits.

**Zoom to Job** makes it possible to zoom to the loaded project.

**Run From Torch Position** will resume the job from where the torch was located when it stopped.

**Maximize Plan View** will display all the views on a single screen.

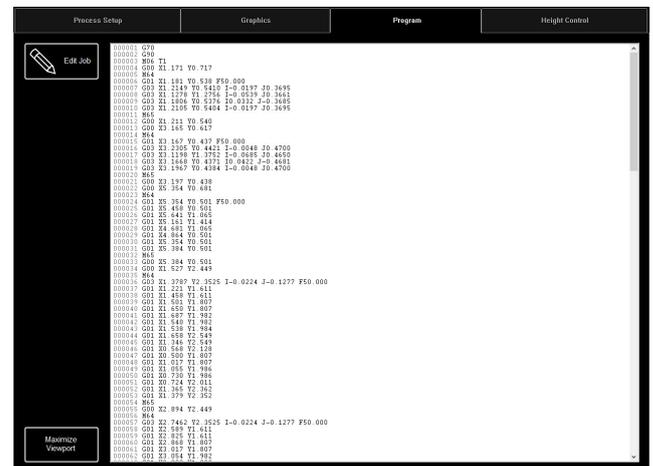


## Program View:

This is used to display the g-code of the loaded project.

**Edit job** is used to open the current g-code in a text editor.

**Maximize Viewport** will display all the views on a single screen.



## Height Control View:

This displays a graph of the movements of the tool holder when it is in operation.

**Trace Pause/Resume** puts the graph on pause in case of tracing.

**Trace off/on** switches the display of the controlled lifter station off and on.

**Maximize Viewport** will display all the views on a single screen.



## Datum/Program Zero Group:

---

This group controls the starting of the machine and the work being carried out.

### Datum:

Datum has several features. When you first start up your machine, Datum will switch on your motors and move the machine to establish the zero point (**MACHINE ZERO**).

Once the torch has moved to the lower left-hand corner, the machine is ready to operate.



### Run Job:

RUN JOB will start the job that is loaded into the VMD.



### Stop:

STOP button will stop the machine during any movement or process.



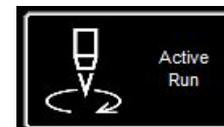
### Reset:

This will reset the job. If the job has started but is not completed, you must reset it to start the job once again.



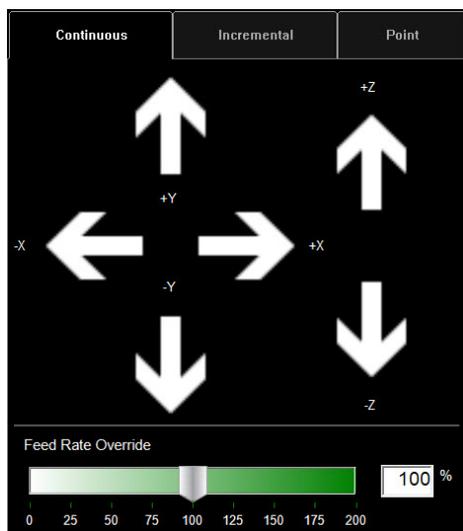
**Active Run/Dry Run:** This button switches between the **ACTIVE RUN** and **DRY RUN** modes.

- **ACTIVE RUN:** This will activate your torch to fire when you RUN a job.
- **DRY RUN:** This will deactivate your torch. In DRY RUN mode, the torch will simulate all the movements without activating the torch.



## Jogging:

Jogging allows you to move the head by pressing the direction arrow. The JOGGING group has tabs for moving the head to the appropriate location anywhere on the table.



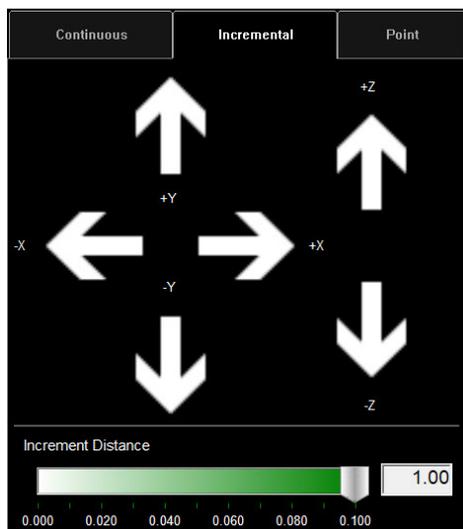
### Jog:

The JOG keys are laid out in the manner as the table moves. Pressing towards the centre of the JOG key makes the torch move slowly, and pressing it towards the outside leads to a faster movement. The JOG window is made up of three separate tabs:

- Continuous
- Incremental
- Point.

On the bottom, is the FEED RATE OVERRIDE %. That allows you to modify the feed speed of the active job. That function is used to precisely adjust the feed to obtain the best possible cutting quality.

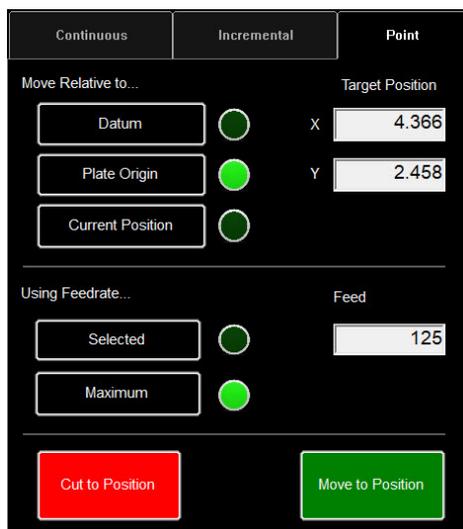
Continuous makes it possible to move the torch as long as a finger is pressing the arrow.



### Incremental Jog:

Pressing in a direction moves the torch in the same direction while using the increment distance adjustment bar to modify the distance.

The adjustment bar allows you to use increments from 0.000 and 0.100. You can directly enter any number in the dialogue box.



### Point Jog:

Point jog allows the user to define up to where the head must move, and from which location.

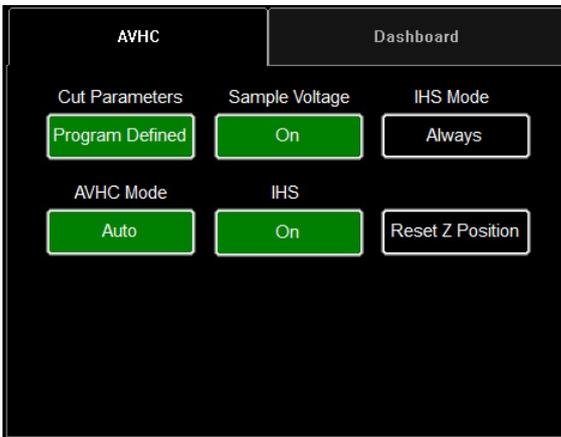
Select where you want the torch to start, what feed rate to travel and the X/Y coordinates and press MOVE TO POSITION.

CUT TO POSITION works the same way except it will go through the IHS sequence and fire the torch. That makes it possible to eliminate residues and obtain perfect lines.

## AVHC and Dashboard:

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AVHC (Arc Voltage Height Control) hosts how the controller manages the tool holder. The dashboard provides the operator with an overview of the head position and other status indicators.



### **AVHC (Automatic Voltage Height Control):**

Cut Parameters may be switched between pre-defined program and user-defined program.

- Program Defined - The cutting parameters will be generated automatically based on the type of material and material thickness entered in the tab PROCESS SETUP.
- User Defined - You can enter the cutting parameters manually based on the cut charts provided in the **FLEXCUT™ 125 CE** or **TOMAHAWK® 1538** manual.

### **Sample Voltage is an On/Off switch.**

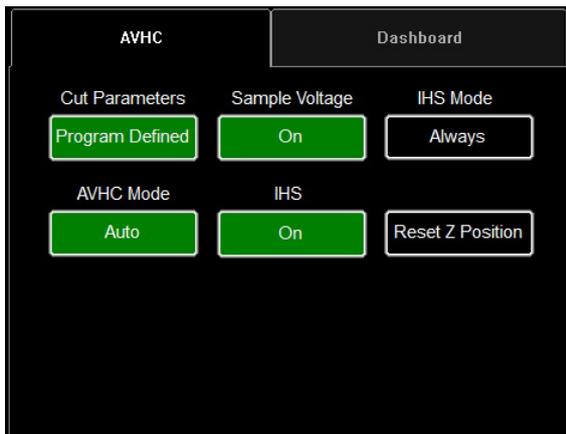
- On (with MODE: AUTO): At the beginning of the cut, the controller learns the proper Arc Voltage and maintains the desired Cut Height value entered in CUT PARAMETERS.
- Off (with MODE: AUTO): The AVHC will adjust based on the SET VOLTAGE and CURRENT VOLTAGE only. If the SET VOLTAGE is different from the CURRENT VOLTAGE, the tool holder will adjust its position to take account of the difference.
- On/Off (with AVHC MODE: MANUAL): This function is deactivated.

**IHS MODE** is the process used for detecting the material height and how it reacts between pierces.

- Optimal: Optimal carries out an initial detection (ohmic) of the material and uses a parameter based on the material thickness to process another ohmic detection. As a result of this process, the head “does away with” ohmic detection up to that material thickness, based on this parameter.
- Always: The head detects the material via ohmic detection at each pierce

### **AVHC MODE is a switch between the MANUAL and AUTO modes.**

- Manual - The torch will remain at the cut height established every time the material is pierced. That will not automatically adjust the cut height during cutting.
- Auto - The torch will maintain the distance entered in CUT HEIGHT and the material profile, based on the SET VOLTAGE and CURRENT VOLTAGE displayed on the plasma power source.



**IHS (Initial Height Sense):** this setting activates or deactivates the ohmic detection function (OHMIC DETECTION).

- **ON:** The head will detect material when the ohmic cap comes into contact with the grounded conductive material on the table. Once detection is complete, the head goes back to the pre-set TRANSFER HEIGHT piercing height.
- **OFF:** The head moves up to the preset TOP OF MATERIAL (job setup) height and moves back up to the piercing height.

**RESET Z POSITION:** resets the Z axis Position by moving the head to its upper limit and re-establishing its zero point.

**Dashboard:**

The dashboard displays the indicators and tools of the host for the operator.

**Arc Voltage:** displays the plasma arc voltage return during cutting.

**Plasma Pierce Count:** This counter is used for keeping a trail of the number of piercing operations carried out by plasma consumables. Counter to reset with each change of consumable.

**Process:** Displays the cutting process under way.

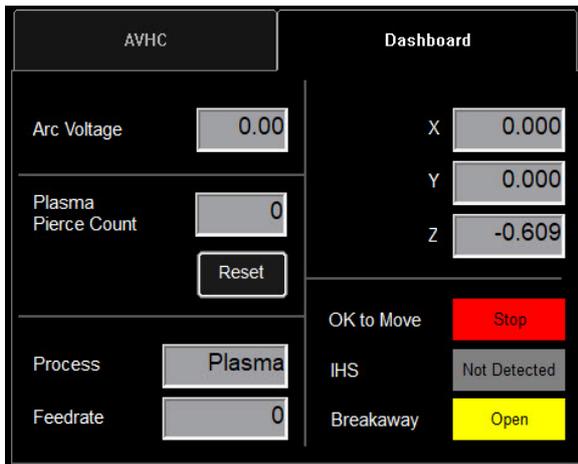
**Feed rate:** Displays the feed speed percentage.

**X, Y, Z:** Shows the coordinates of the torch in relation to the machine.

**OK to Move:** indicates when the plasma has pierced the plate to cut and is ready to start the program.

**IHS:** indicates when the plate is detected via the OHMIC contact.

**Breakaway:** indicates if the torch impact safety system is triggered or not.



## Selection of options:

The table of options contains the controls of the options added on. These added On/Off control buttons are only visible if they have been validated in the OPTIONS PANEL. Below are instructions for use of the optional laser pointer. The pipe cutting option is not available with the **LINC-CUT® S 1020w-1530w**.

### Laser Operation:

The Laser Plate Finder is designed to help an operator at the control console to locate the approximate middle position of the torch body on the surface of the plate by projecting a red laser point on it. That can help locate the PLATE ORIGIN position, align plates, and do a dry run with the laser indicating the approximate cutting position of the piece.

For the proper working of this option, it is essential that the torch position is correctly adjusted and that the plate thickness is defined before resetting the program, aligning the plate or executing a dry run of the program with the laser activated.

### How the Laser Works:

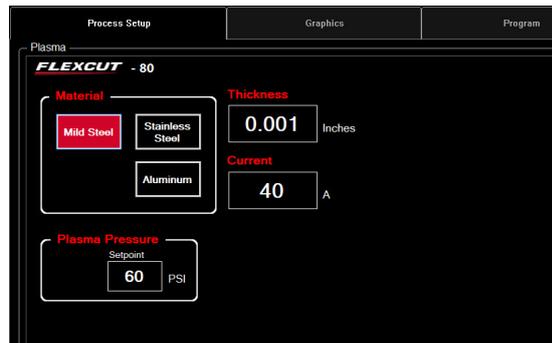
The laser is positioned with a slight angle in relation to the torch, so that it passes directly under its median line. With the torch correctly positioned on the machine and the plate thickness entered in the system, the Z axis will adjust the position when it is activated, so that the projected point is on the plate surface under the central line of the torch.

The laser can only be activated when the system is put into Dry Run mode, but it goes off automatically when the system is set to Active Run and a part program is executed.

#### Step 1

In the PROCESS SETUP tab, enter the plate thickness and the appropriate cutting intensity.

Switch to DRY RUN mode.



#### Step 2

Activate the LASER. The button will be displayed in GREEN. The head will go down to the right position and the laser will go on.



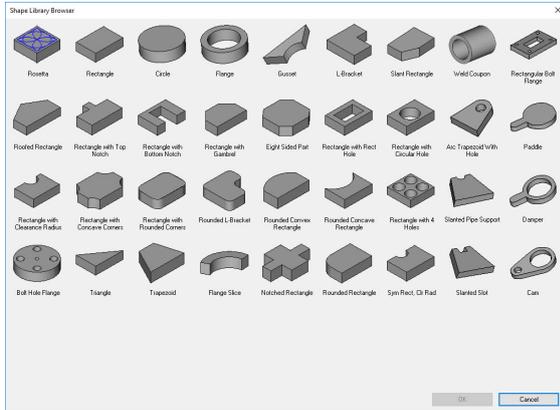
#### Step 3

Move the head and use the indicator to define PLATE ORIGIN, set the plate alignment, execute a job in dry run mode or see a point on the plate.

#### Step 4

When you have finished using the laser, set the laser to OFF. When you switch to ACTIVE RUN mode, the laser goes off automatically.

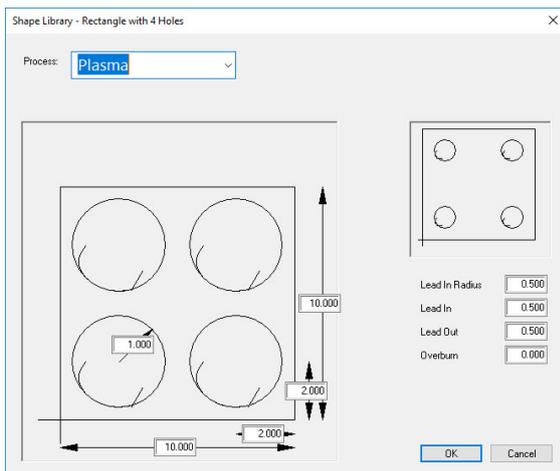
In VMD, you can generate one of 36 standard shapes without needing to generate them in your CAD software.



### Access the Shape Library:

To get to the Shape Library press SHAPE LIBRARY on the top centre of the VMD screen. The shape library proposes the 36 most common shapes where the dimensions, entry and exit, feed speed and tools can be personalised.

Select the shape you are looking for and press OK. That will open the setup tool of the selected shape.



### Set up your shape:

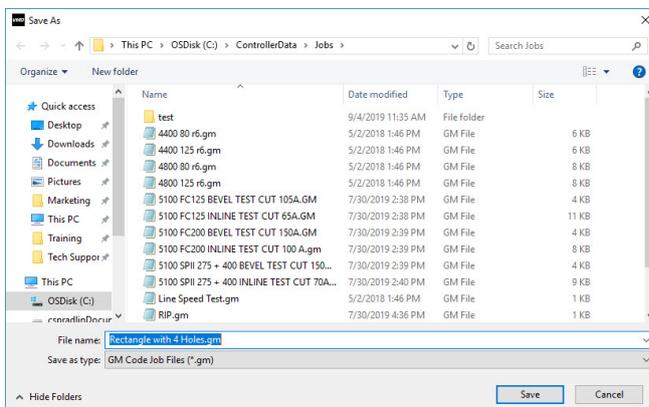
You must first select the tool you wish to use. Plasma, plate marker or oxy.

**Lead In Radius** allows you to create the lead-in radius. If a line lead in is necessary, set this to 0.

**Lead In** is the length of the pierce point movement on the tool path. This is usually 0.12.

**Lead Out** is the length of the cut created outside the cut path. This must be 0 if you are using plasma.

**Overburn** is the length measured after the end/start point. Used with thicker materials or the oxy process.



When you click OK, you will be asked to SAVE your shape. Double click the JOBS folder. By default, the file name is the shape you have selected; it can be modified to give a user-defined name. Once named press SAVE.

VMD will load the task to activate it and will switch to NO KERF.



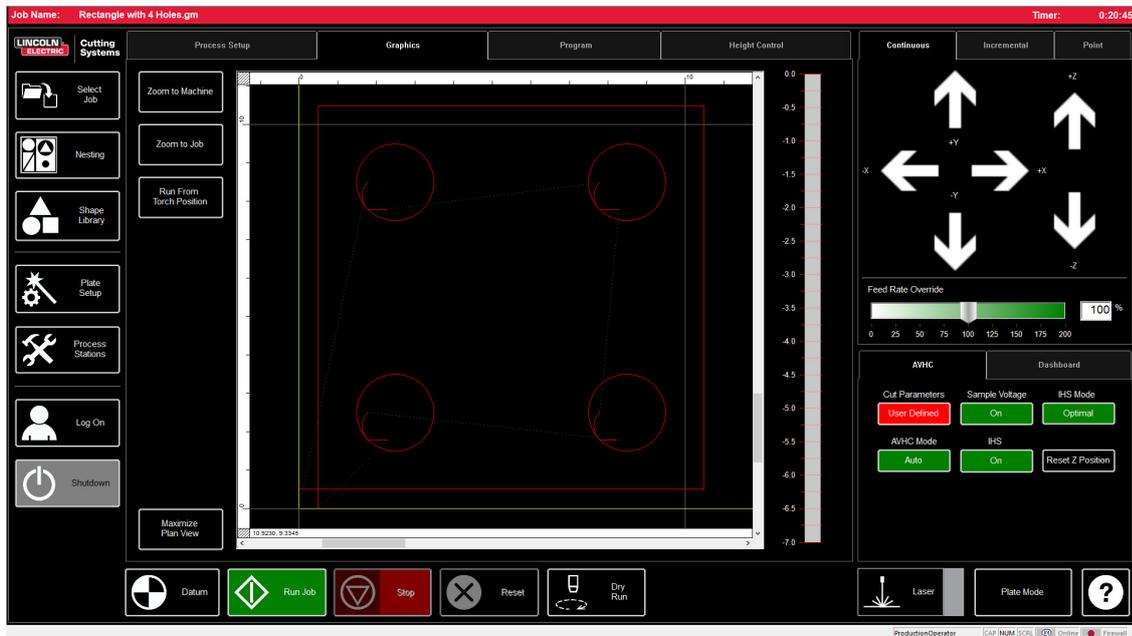
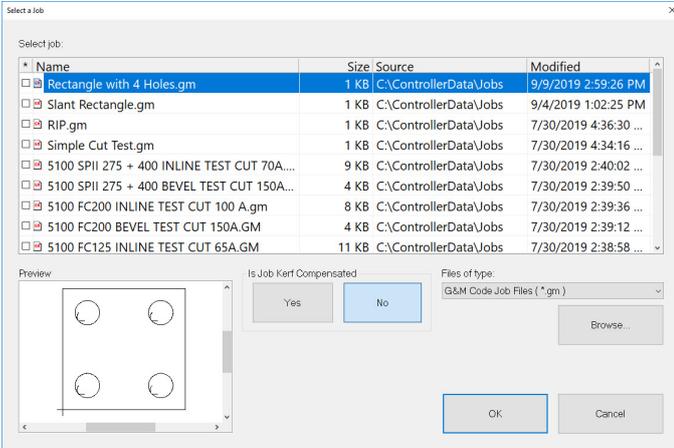
### Open Shape in VMD:

In the MAIN screen, press SELECT JOB. That will make it possible to open the job selection screen. Select the job from the list. If you have not saved it in the JOBS folder you will need to press BROWSE and locate your job.

IS THE JOB KERF COMPENSATED? The parts in the SHAPE LIBRARY are not suitable for KERF COMPENSATION. Select NO and that will add the kerf depending on the thickness of the material of the piece.

For VMD Nest and TMCAD programmed tasks, select YES.

Once selected, press ON. The job is displayed on the GRAPHICS screen.



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 for running the job.



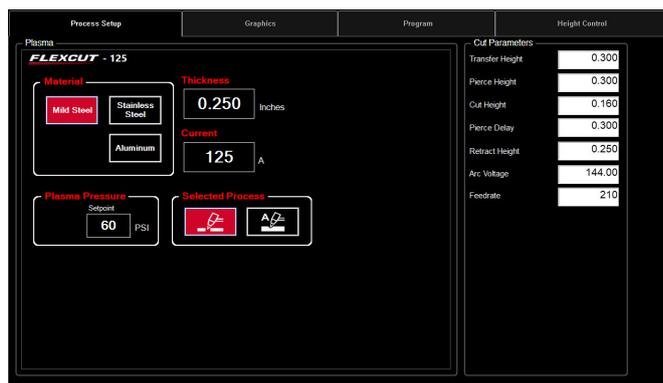
#### Datum:

When you start Visual Machine Designer for the first time and are connected to the Accumove controller, you need to load the machine configuration and switch on the motors. A screen displays PLEASE SWITCH 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 the 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 up the process:

In the PROCESS SETUP tab, enter the material thickness and the amperage to be used for cutting. That will complete the CUT SETUP with the preset parameters for the thickness/current pair. If you use a material thickness parameter that is different from that to be cut, the result will not comply with the specifications!



### Plate Setup:

Press PLATE SETUP. Use the movement keys in PLATE SETUP to move the torch body to the lower left-hand corner of the plate to cut.



Press SET PLATE ORIGIN. That sets the PROGRAM ZERO or the absolute coordinates (X= 0: Y=0) of the program.

Press CLOSE.



At the bottom of the screen, switch to DRY RUN mode. Press RUN JOB. That will “simulate” the loaded program without activating the plasma torch.

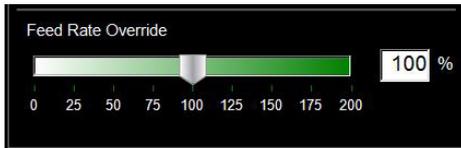
If you are satisfied with the dry run and machine movements, switch from the DRY RUN to the ACTIVE RUN mode to start the cut according to the loaded program.

Press RUN JOB.



If you believe the machine is moving too fast for the material, you can modify the feed speed using the FEED RATE OVERRIDE% scroll bar.

By default, the cursor is set to 100 %. To slow down based on the percentage, move the cursor to the left. To speed up the feed, slide it above 100 %.



**Line speed test:**

The aim is to ensure that the cuts delivered from your table are of the highest possible quality. That means minimal dross accumulation on the underside of your cut part and minimal bevel on the sides.

We have supplied a file to cut in order to verify the feed rate for the material you plan 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 visual reference to the output. The test cut is a piece measuring 76.2 mm x 101.6 mm made up of 9 lines. Each line is programmed to operate at different speeds to show the effects of speed on cut quality.

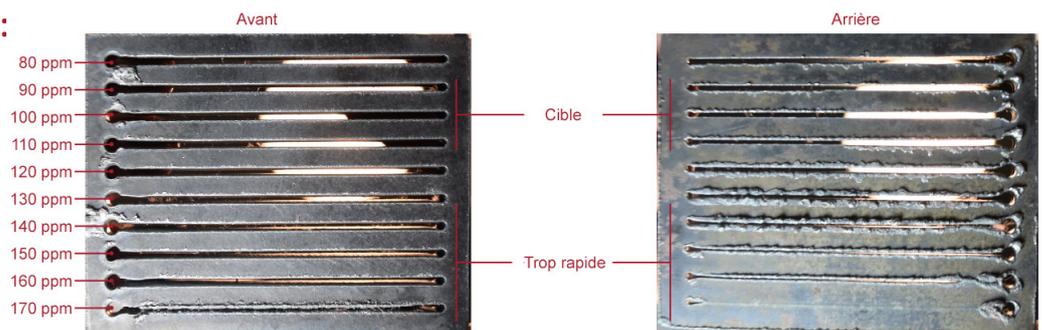
With the FEED RATE OVERRIDE % at 100, the first line cuts at 4.3 m/min and drops 10 ipm each line until the last line set at 80 ipm and the outside perimeter is 100 ipm. If the FEED RATE OVERRIDE % set to 50, the lines would range from 85 to 40 with the outside at 50. Check the amperage and thickness of material in the cut chart. Change the PROGRAM FEEDRATE OVERRIDE % if you need a higher or lower feed rate to suit the material thickness and amperage.

- Load the LINE SPEED TEST.gm file
- Enter the AVHC settings according to the cut chart.
- Jog the head to the bottom left corner. Set PROGRAM ZERO
- Run the LINE SPEED TEST.

Once the test is complete there are a few things you need to check. On the top of the cut you want to see a clean cut without too much bevel. Ideally, the kerf width is the same from top to bottom.

On the other side, you will see the width of the cut and dross accumulation. The key is in lines 3 and 4, with the least dross. Also the dross should also be easy to remove. Usually the optimum speed is the high end of the three lines that are relatively clean. Straight lines will be cut relatively clean, but the “inside” 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 will be just as clean as the straight line.

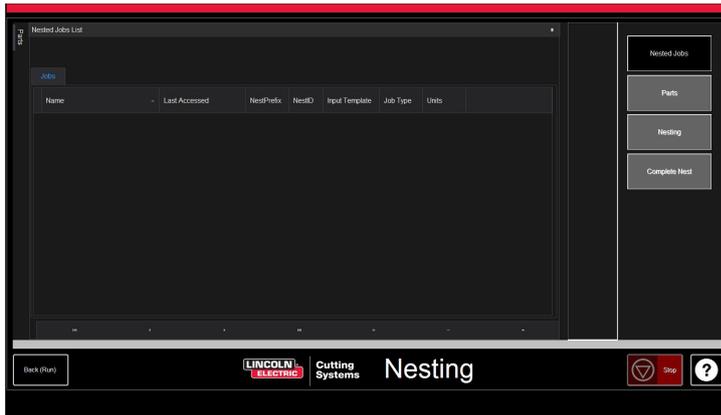
**Line Speed Test cut:**



In this example, 110 - 90 ipm will be the best speed for this material thickness and amperage setting. From now on, this process will be used for every material thickness you plan to cut to establish the proper speed. Once established, these coupons may be used as a visual cut chart or you can use the provided sheet to document your settings.



VMD allows you to nest irregular parts. That means that you can import DXF and DWG files without needing offsite CAM software to generate the proper G-Code. NESTING will apply kerf correction and the Lead in value to all features. Also, it will generate the closest nest available for the size of material you enter in.



Start by clicking the NESTING button, and NESTED JOB LIST will be displayed on the screen.

To start a new nest, press NESTED JOBS.

Select NEW NESTED JOB and the ADD NESTED JOB dialogue box opens.

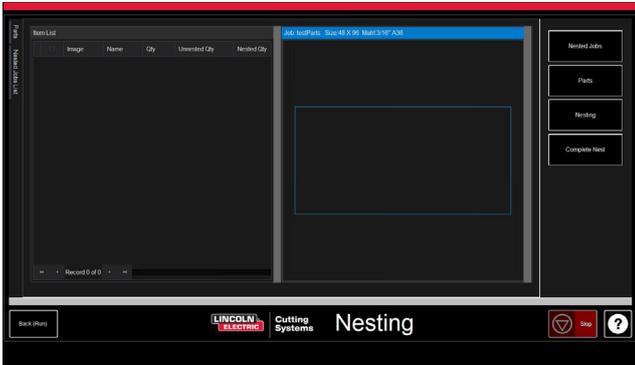
A dialog box titled "Add Nested Job" with a close button (X) in the top right corner. It contains several input fields and pull-down menus. The fields are: "Nested Job Name" (empty), "Nest Prefix (Job Number)" (8), "Material" (3/16" A36), "Sheet Length (Y)" (48), "Sheet Width (X)" (96), "Table" (4400), "Plasma" (FlexCut 125), "CutGas" (AIR\_AIR), and "Amps" (45). There are "Save" and "Cancel" buttons on the right side.

In this dialogue box, enter a name for your nest in NESTED JOB NAME. This will become the file name of your job. The dialogue boxes below offer pull-down lists

Find the thickness of the material you plan to cut along with the size of the piece.

Select the table/plasma cutter you are using along with the amperage appropriate for the application and press SAVE.

# Parts



The ITEM LIST will open along with the NEST LAYOUT.

To add parts, go to the right-hand 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.

# Parts

## Apply the tool path:

At the top of the screen, you will see FILE TYPE, SOURCE and DESTINATION.

**File Type:** switches between file types DXF and DWG.

**Source:** location of the source of the file (i.e. flash drive, job folder)

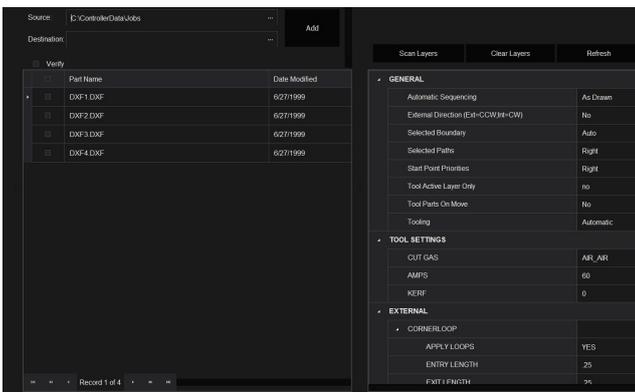
**Destination:** location where the output files will be saved. The default VMD folder is in C: \ ControllerData\Jobs

# Import CAD Drawing(s)

## The two check boxes VERIFY and ARTWORK:

VERIFY will display the pieces to examine layers and other details about the individual parts. ARTWORK will change the tool paths to an ONLINE tool path and bypass the kerf adjustments.

On the right, you will see the **JOB PROPERTIES** that can be applied to your parts.



**IMPORTING PROPERTIES** includes basic changes to the POST and file import.

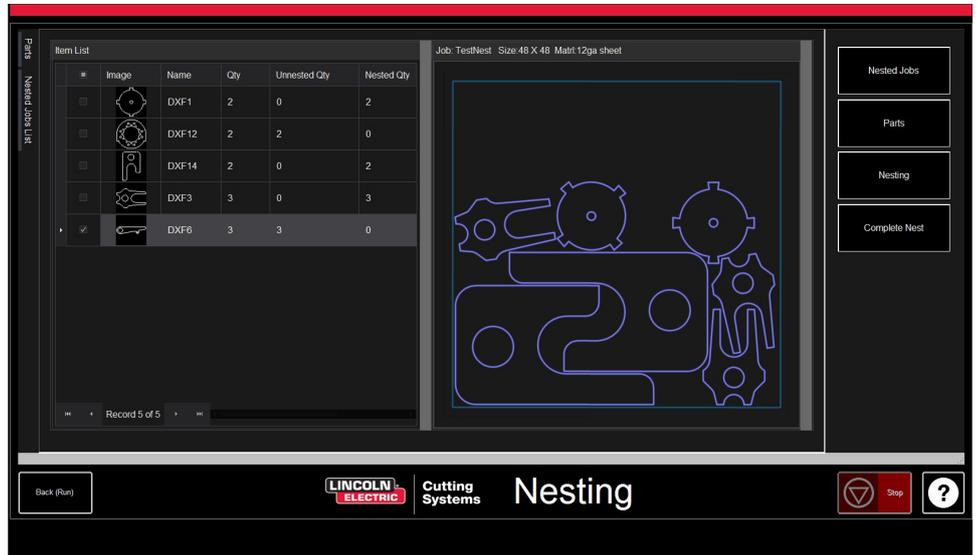
**TOOLING PROPERTIES** includes tool path configuration for sequencing, kerf correction, and lead ins. Change these settings if you need particular lead ins or kerf diameters.

**LAYER MAP** separates the layers present in the job. Select the appropriate process for the layers PLASMA, PLASMA MARKING and IGNORE.

### Make Nest:



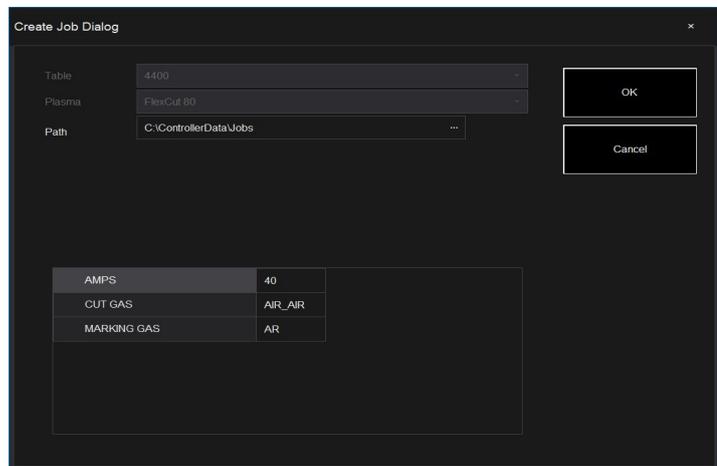
When all the parts have the appropriate quantity, go to the list on the right hand and select NESTING.  
 Press NEST to display a pop-up window asking if you want ALL or SELECTED parts. Make your choice and press OK. This will then arrange your parts into the material and display the layout in the Job screen



### Complete Nest:



If your nest does not need editing or is just a single part then select COMPLETE NEST in the right-hand toolbar. This will open the CREATE JOB dialogue box. Enter the location where you want to save the job and check the amperage you are using. Then press OK.



### Open Nest in VMD:



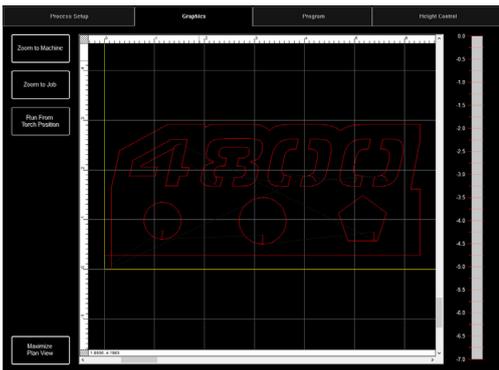
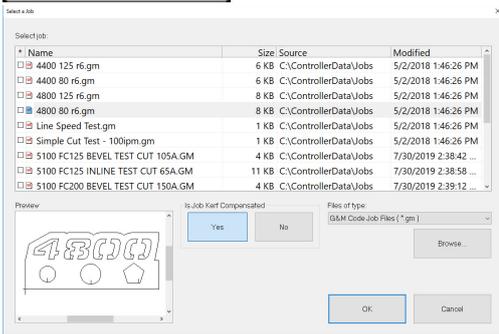
In the NEST screen at the bottom left, press BACK (RUN), which will take you back to the VMD RUN screen.  
 From now on, to run your nest, go to SELECT JOB and locate your file. In the AVHC tab, switch from AVHC CUT CHARTS to CHARTS. In the file, the optimum values will automatically populate the CUT PARAMETERS for the material thickness and amperage.  
 Process and run the file as any normal file.



## Performing Your First Test Cut

There are multiple test files preloaded on the computer of the **LINC-CUT® S 1020w-1530w** for testing and cut quality purposes. The LINES SPEED TEST and SIMPLE TEST CUT tests are provided to help determine the appropriate cutting speed in inches per minute (IPM) to cut the plate thickness with the current value that you have set on the power source. The 1530W-65A-5mm\_V1.gm files are quality test cuts. One of them will be cut in the factory before your machine leaves the assembly line to verify machine operation prior to shipment. We strongly advise you to first cut using the 1530W-65A-5mm\_V1.gm, to make sure that your machine is in the same condition after transport as when it left the factory. Please locate the factory test sample located in the water bed and load a piece of 5 mm mild steel for the comparison cut test.

For the **LINC-CUT® S 1020w-1530w**, use file 1530W-65A-5mm\_V1.gm.



**If you need to stop the machine at any time, you can press the emergency stop button on the touch screen.**



1. Turn the ESTOP button over a quarter turn.  
\* If a Windows window is displayed, swipe the monitor upward with your finger. Enter "cncop" as the password. Press the arrow at the prompt.

2. Once the computer has started, Visual Machine Designer will start automatically.

3. Press DATUM to establish the machine zero point.

4. In the PROCESS SETUP tab, enter the plate thickness (5 mm) and the appropriate amperage of the plasma consumables. **FLEXCUT™ 125 CE - 65amp.** That will load the cutting parameters with the appropriate parameters depending on the cut charts.

5. Press SELECT JOB.

6. Locate the file 1530W-65A-5mm\_V1.gm. As the file is traced by a tool, IS KERF COMPENSATED? Select YES and press OK.

The other xxxR6.gm files correspond to machines other than the **LINC-CUT® S 1020w-1530w - FLEXCUT™ 125 CE.**

7. Press PLATE SETUP. Use the scroll keys to move the torch head to the bottom left of the plate to cut.

8. Press SET PLATE ORIGIN. That sets the 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 (the machine may throw sparks)

11. The cut will progress as follows.

1. Inside circles and polygons first.
2. Numbers will cut next.
3. Outside perimeter.

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

Congratulations on your first cut!



Cutout of the 4400 80 R6.gm

Like all machinery, this machine requires maintenance. This part covers daily, monthly, and 'as needed' tasks to keep your **LINC-CUT® S 1020w-1530w** running like new.

### Daily maintenance

#### Plasma power supply:

The plasma power supply and torch body must be inspected between material thickness measurements and prior to cutting. Remove the consumables and check if they need to be replaced. Apply the following to know when the consumables need to be changed.

For complete maintenance instructions about the **FLEXCUT™ 125 CE** or **TOMAHAWK® 1538** plasma power supply, refer to your owner's manual.

For a replacement manual, please call the **LINC-CUT® S 1020w-1530w** technical support.



#### **The insulator** (only with **FLEXCUT™ 125 CE**):

If the electrode slides in the insulator, that leads to wear and tear. When the electrode is not properly secured, the insulator must be changed. Otherwise, there is a risk of damaging the torch.



**The electrode:** pay close attention to the amount of hafnium left in the tip. The larger the crater in the electrode tip, the more the electrode is worn. Replace the electrode if the centre pit depth is greater than 0.06" (1.5 mm). Also, see if there are dark swirl marks near the tip of the electrode. Although these swirl marks are not correlated with the life of the electrode, they do indicate contaminants in the air supply, such as excessive moisture or oil.



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



**The nozzle** is the most frequently replaced consumable. One of the signs that 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 will find that a larger orifice or an irregularly shaped hole will be the telltale signs of excessive wear.



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

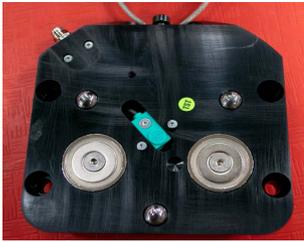


**The protective cap:** hold it up to a light and check if any of the holes are plugged. If they are, then replace the cap. These holes are outlets for the shield gas, and when clogged, they can misshape the plasma arc and lead to imprecise cuts.

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

## **Machine:**

The torch impact safety system (breakaway) assembly contains two magnets and three notches that must be cleared of any dross build-up, as it could move the torch support sufficiently far from the sensor to set off the torch impact safety system.



Move the machine to the reference position and separate the torch support by pulling the torch down to the left or right. The rear plate must now be visible. Using a cloth, remove any metal debris from the two magnets or the three positioning notches. To assemble the torch, first line up the upper edges of the torch support, and slowly put the torch back in its idle position.

## **Monthly maintenance:**

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### **Machine:**

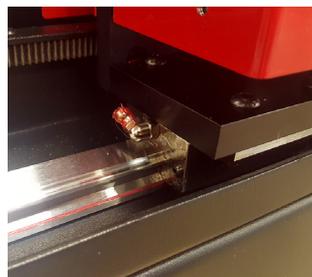
As the gantry runs on linear rails, you will need to grease the glides on that rail from time to time. Build-up of dross and dust can hinder the smooth operation of the glides and lead to problems that prevent the gantry from moving smoothly on the rails. The recommended grease is Mobil SHC Mobilith SHC 100 lithium grease. It can be sourced and purchased locally. Load the grease cartridge into a grease gun and follow these steps to grease the side rails.

**Step 1** With the machine powered up, move the gantry to the centre of the table.

**Step 2** Shut down the Accumove controller, and loosen the 3.175 mm 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 pass through the holes and remove the cover.

**Step 4** With the cover removed, the grease fittings will be visible; fix the grease gun and pump until the grease comes out through the bottom of the compartment. Lubricate the front and rear grease fittings.



Put back the longitudinal cover.

**Step 5**

**\*IMPORTANT\*** Slide the cover so the bolts go back into their original position at the bottom of the keyhole, and tighten the bolts to 2Nm.

**Step 6**

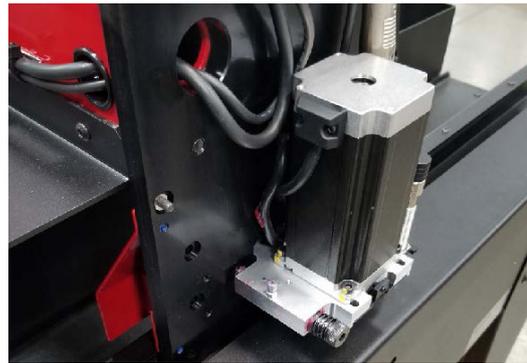
Repeat steps 1 to 5 on the other side of the table.

**Step 7**

Remove the red side covers of the gantry by removing the 3.175 mm hex head bolts on each cover.

**Step 8**

Once the covers are removed, the grease fittings are visible. Fix the grease gun and pump until the grease comes out through the pocket where the bolt and spring enter the assembly.



**Step 9**

Put back the side covers of the gantry.



**Do not power the machine once again before the longitudinal covers are back in place; the machine zero point setting would not otherwise be possible.**

### ***Maintenance as needed:***

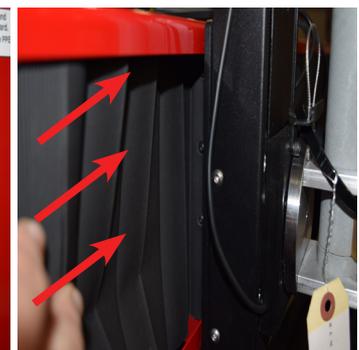
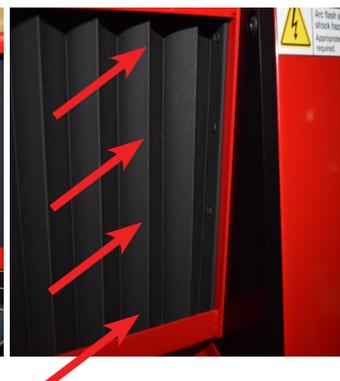
The following will depend on how often the machine is being used. If the machine is used once a week, the steps below will not be needed as often as for a machine that runs every day.

**Bellows:**

The bellows are a consumable item that protect the inside of the gantry from dross and dust. When the bellows no longer protect the inside of the gantry, they should be replaced. Please contact the After-Sales Service department to purchase new bellows.

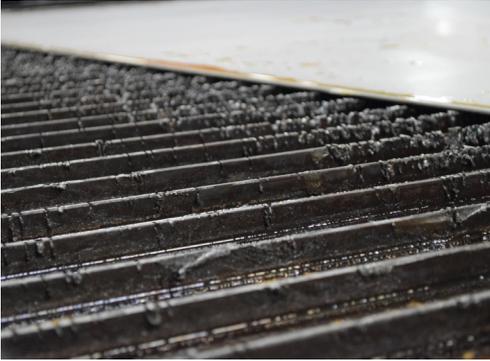


**NB: The LINC-CUT® S 1020w-1530w is supplied with an appropriate short screwdriver. To extend the life of the bellows, you could at any time remove them and put them back on whenever they are incorrectly folded.**



### Slats

Over time, the expendable plates will accumulate build up that will create an uneven cutting surface and poor continuity on the table, with a direct effect on cut quality. When this occurs, replace the expendable plates with new ones. The size of the expendable plates used in the tables of the **LINC-CUT® S 1530w** is 5 mm x 50 mm x 1650 mm and 5 mm x 50 mm x 1230 mm for the **LINC-CUT® S 1020w**. If the machine is mostly used to cut at the front of the table, another option would be to rotate the expendable plates from back to front and vice versa. Clean the expendable plates by using a grinder and turn the plates over to lengthen their life.



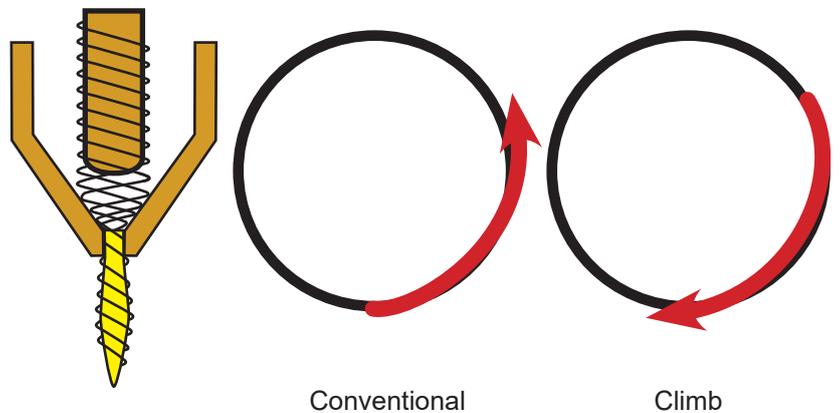
### Water pan

The water in the pan must be emptied and the pan cleaned every 2 to 4 months. There is a plumbing valve (12.7 mm) at the rear left of the table. To dispose of the water, please contact your local environmental or water authorities. After draining the water, remove all pieces of metal and dispose of them in accordance with national and local regulations. Close the valve and refill the table with water. The **LINC-CUT® S 1020w** can contain 260 litres and the **LINC-CUT® S 1530w** 495 litres. **Lincoln Electric®** recommends the use of Plateguard Red as a water additive to prevent rust and bacterial growth.



Purchasers of products from **Lincoln Electric®** are responsible for disposing of consumables, fluids and machines at the end of the life cycle in accordance with national and local regulations.

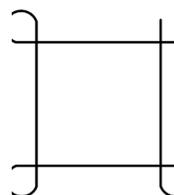
- Bevelled edges are caused by the motion of the plasma gas as it is emitted from the nozzle. The phenomenon is unavoidable with plasma cutting. A high-definition plasma cutter produces less bevel than a standard cutter.
- Torch height, air pressure, air quality, cut direction, and consumable condition all influence bevel.
- In plasma arcs used for cutting, the gas forms into a vortex. As a result, 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 appropriate direction of travel must be used.
- The direction of cuts are referred to as “conventional” and “climb”. In a conventional cut, the torch turns anticlockwise on outside cuts and clockwise on inside cuts. A climb cut is the opposite, and is the cut that delivers the best bevel.
- Basically, the best bevel is to the right of the direction of travel.



- Corners may show more bevel than normal cuts. That happens when the machine slows down for the direction change. In some cases, a lower amperage allows slower travel speeds and reduces the slowdown bevel at 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 increases significantly.
- Replace consumables regularly to reduce bevel. A worn tip or one with dross buildup can redirect air flow causing random bevel and varying cut quality. Always check the 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 at constant pressure and clean and dry also decreases bevel.



Bevelled edge



Corner loops

**How the torch position affects bevel**

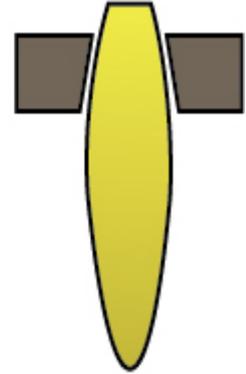
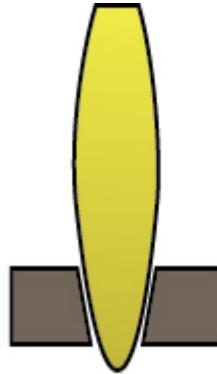
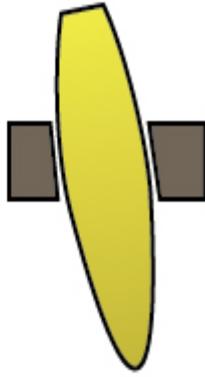
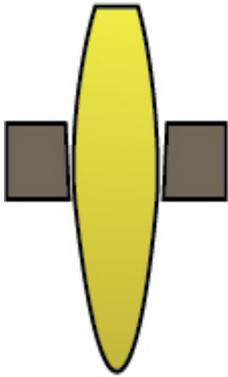
Correct torch height  
Torch square to material

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

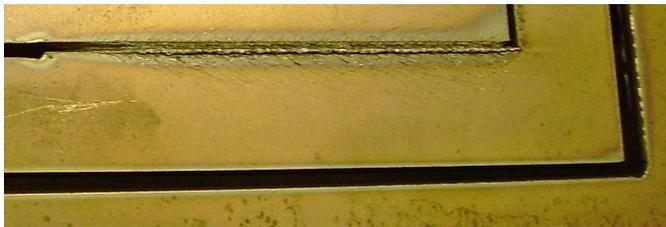
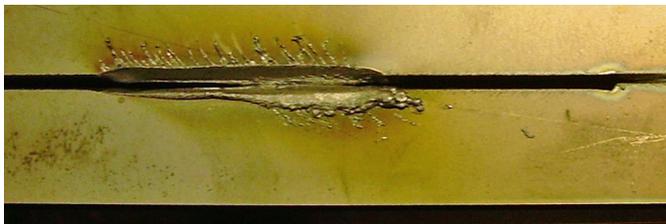
Minimum bevel  
Longer consumable life

One side may be straight and the other excessively bevelled  
The cut may not go all the way through the material  
May be caused by a worn tip

The torch may touch the material and short out or damage the tip

## What causes bad cuts

- Cases where the metal is not fully cut may indicate different problems:
  - 1) The earth clamp is not correctly attached to the material
  - 2) Drop or rise in air pressure
  - 3) Presence of humidity in the air pipe
  - 4) Drop in power supply
  - 5) Contact between torch and material  
(most plasma cutting tools switch to low-power mode when they touch the material, which prevents the cut from going through the material).
- When the machine begins to move before a pierce is completed, the cut will not be complete. In such a case the dwell time or pierce delay must be adjusted to allow for enough time to pierce the material.
- When a path of the cut does not return to the starting point, there may be mechanical slipping or binding. In some cases it will be easy to identify the axis that is losing position. Examine that particular axis for build up or obstructions that can cause binding.

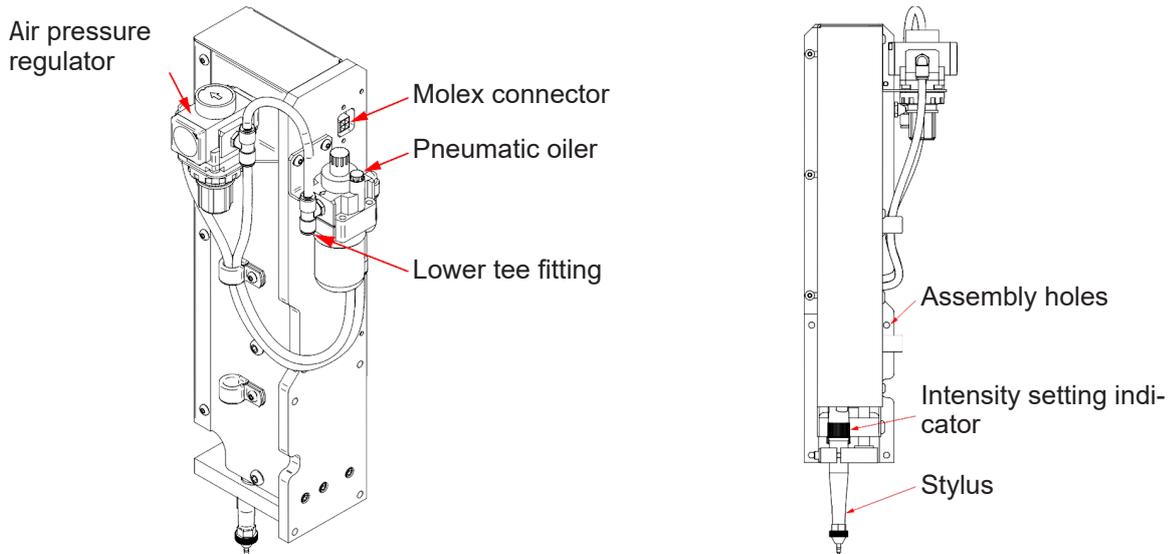


## Optional marker: Marker installation and configuration

The marker is a pneumatic oscillating marking tool. It is supplied with air. The air supply moves a series of pneumatic cylinders and a solenoid which is activated via the control interface of the **Accumove** controller.

The marker requires minimum air pressure of 6 bar and will consume approximately 1.7 m<sup>3</sup>/h at 6 bar. The normal operating feed speed of the plate marker ranges from 750 to 1800 mm/min.

- The plate marker should be tested to find the best oscillation and feed speed settings for the material to mark.
- The stylus has an intensity adjustment feature; these settings control stylus oscillation and the range is 1-5 and off. Never adjust the intensity when the plate marker is active.
- Always follow the safety instructions described in the operating manual of your machine.
- There is no need to remove the torch assembly to install the plate marker.
- The pneumatic lubricator is not filled with oil for pneumatic tools before shipment. **Fill the pneumatic tool with oil before use.**



### Unpacking:

Take the plate marker out of the packaging and check the contents:

- Assembled marker.
- Pneumatic connection assembly.
- Pneumatic oil (approximately 0.12 litre).
- 4 socket head assembly screws (use the screws supplied with the machine)

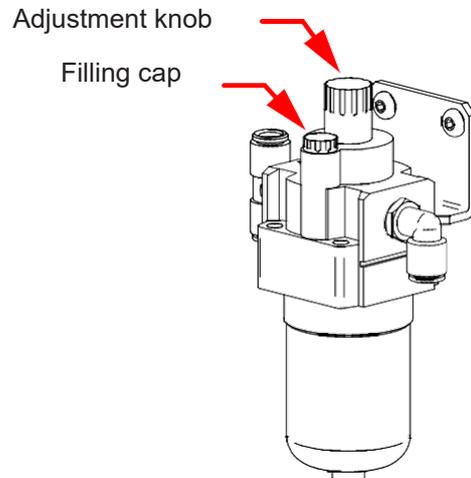
### Tools required:

- Allen key
- Flat-blade screwdriver
- Thread sealant.

### Filling the pneumatic lubricator:

The online pneumatic lubricator will dispense the appropriate quantity of lubricant to the internal components of the stylus. Use oil for pneumatic tools available in the market.

1. Locate the pneumatic lubricator at the rear of the marker assembly.
2. Take off the filling plug.
3. Add 0.02 to 0.04 litres of oil
4. Put back the filling plug
5. Turn the adjustment knob fully clockwise. Then give the screw head 1 to 2 turns. That will apply the appropriate lubrication to the stylus. If oil leaks out of the stylus tip, give the screw head 1 turn.

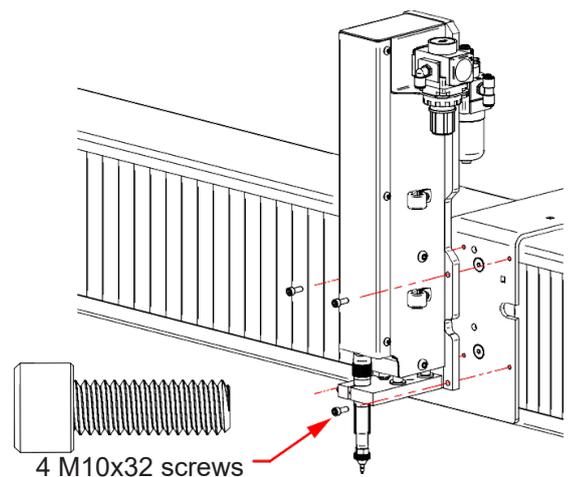


Step 1

Move the gantry forward and switch off the power to the **Accumove**. Disconnect the air fitting at the rear of the plasma supply. Switch off your air compressor and purge the air pipes.

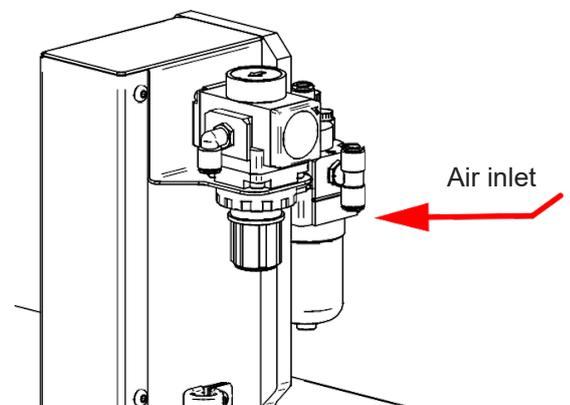
Step 2

To the right of the cutting torch, there are 4 holes for assembling the marker. Line the marker with the 4 holes and fasten the assembly with the 4 screws (use thread sealant). You should start fastening the marker from the bottom right corner.



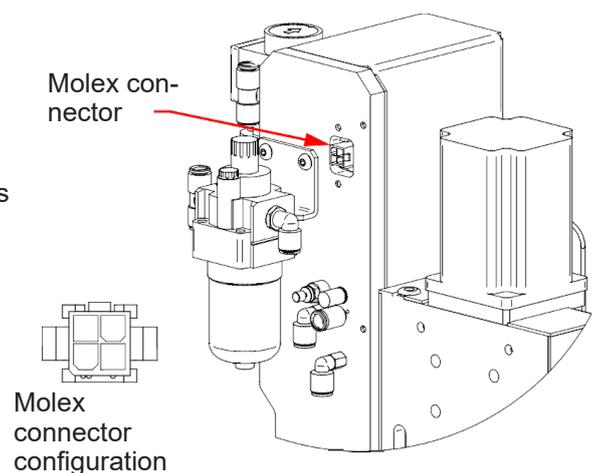
Step 3

Connect the pneumatic supply to the tee connector.



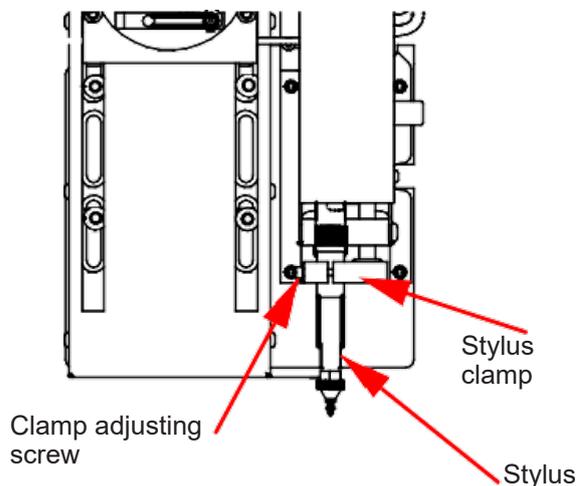
Step 4

Locate the Molex 2x2 cable at the exit of the cable drag chain. Connect the cable in the connector till it clicks in place. Careful! The connector can only be inserted in one way. **Do not apply force on the connector.** When it is correctly lined up, the connector ought to go in easily.



**Step 5**

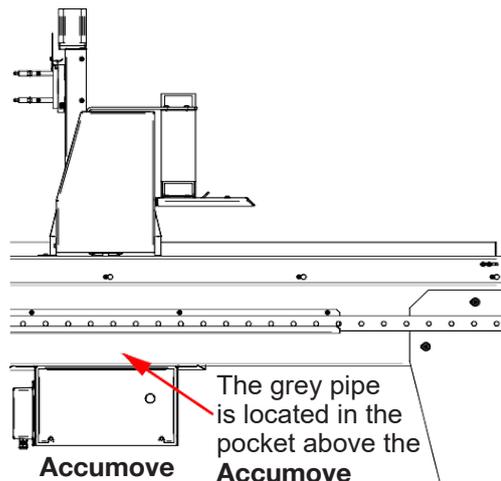
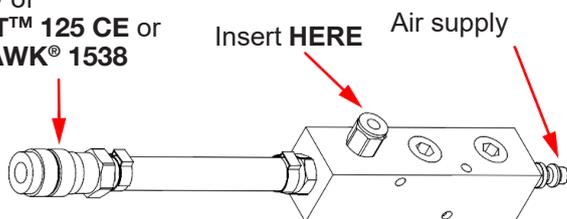
Check that the stylus is fastened in the clamp. If the stylus is loose, tighten the adjusting screw.



**Step 6**

Under the machine, above the **Accumove**, you will find the cable drag chain of the machine. Locate the compressed air hose and connect it to the machine air inlet.

Air supply of **FLEXCUT™ 125 CE** or **TOMAHAWK® 1538**



**Step 7**

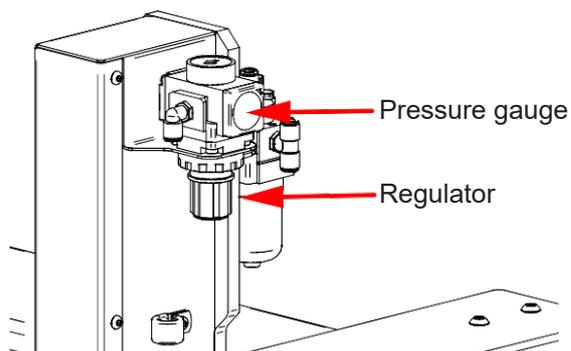
Connect the air pipes

**Step 8**

Switch on the air compressor and check that there is no air leak. **The air pressure may not exceed 8.3 bar.**

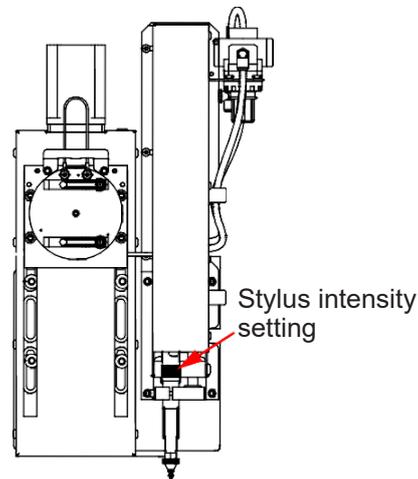
**Step 9**

Adjust the marker regulator with pressure between 0.34 and 0.69 bar. That pressure must be readjusted when the Offset is adjusted later on in the adjustment process.



**Step 10**

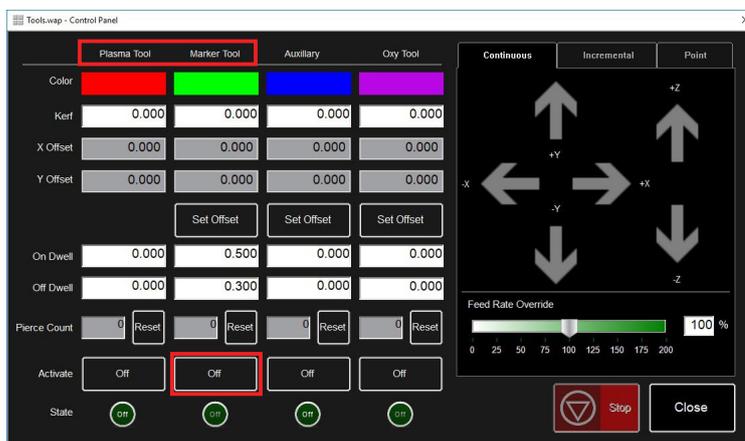
Set the stylus intensity to the Stop position.



**Step 11**

Switch on the **Accumove** and start the VMD software on the machine computer. Press DATUM and move the torch on the table. Click on the Tool Library button. This action will call up a new menu showing two tools:

- Plasma tool
- Marker tool



**Step 12**

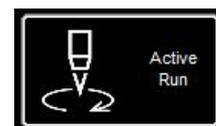
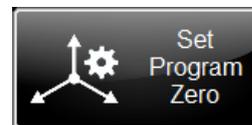
Click on the marker activation button

**Step 13**

Enable and disable the marker 3 to 4 times to make sure that the marker is operating correctly. Set the appropriate movement and speed using the regulator.

**Step 14**

Define the parameters of the **FLEXCUT™ 125 CE** or **TOMAHAWK® 1538** and machine to suit the material used. Move the torch on the plate and click on "Set Program Zero". That will put the **LINC-CUT® S 1020w-1530w** into the machine zero position and will align the marker for the subsequent stages. Check that "Active Run" is displayed or that the torch will not be set off.



### Step 15

Click on the Activate plasma button. That will start the height check so that the plasma installation pierces the plate. Once the plate is pierced, deactivate plasma to switch off the torch.



### Step 16

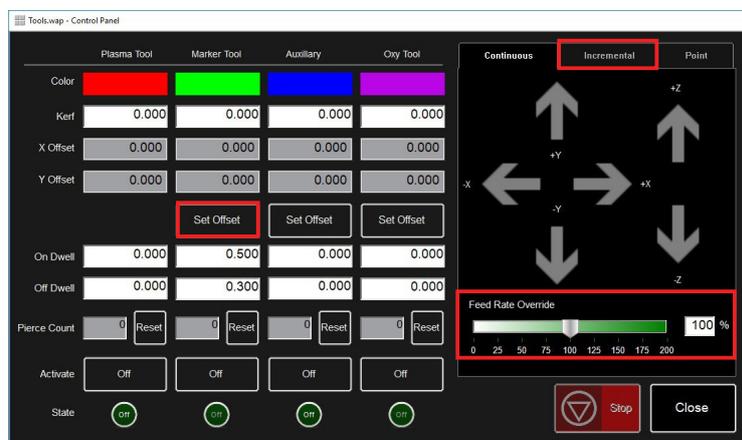
Position the marker on the hole that has been made. Adjust the location using the VMD scrolling keys. Once the stylus is close to the hole location, change the jog mode from Continuous to Incremental. That will allow finer adjustment. With the scrolling keys, adjust till the stylus drops into the hole.



In incremental mode, the machine will move the gantry at a definite incremental pitch every time the scrolling keys are pressed.

### Step 17

Once the tip of the stylus has fallen into the hole, click the Set Offset button located in the row of markers. That will automatically define the offset between the marker and the body of the plasma torch. When working with multiple tools, the controller will move the offset before activating the marker. The machine will store the tool offset data until it is reset to the factory settings.



### Step 18

Disable the marker. The marker will go to the home position.

This will cover the most basic operational faults you might encounter with your **LINC-CUT® S 1020w-1530w** machine.

### **Machine errors:**

<b>Problem</b>	<b>Solution</b>
A motor will not engage when the machine goes into DATUM mode (Machine zero point)	Log on as ADMIN. Reload your configuration. Press OK. Run the machine DATUM. If that does not solve the problem, contact Customer Support.
The beam binds while working on parts.	Lubricate the rail glides. If that does not solve the problem, contact Customer Support.
Cuts are not coming out square or degraded cut quality.	Check the plasma torch consumables, and also the settings in the cut chart. Check that the torch is square to the plate on the table.

**Software faults:**

Problem	Solution
<p>During initial height sensing (IHS), the ohmic detection indicator does not indicate a yellow detection status when the torch touches the material.</p>	<p>Check that the orange ohmic wire is connected to the torch lug.</p> <p>Check that the surface of the material is free from rust or corrosion, which could prevent electrical contact with the shield.</p> <p>See the ohmic detection troubleshooting guide.</p>
<p>During initial height sensing, the torch does not come down and sense the material, but rather fires the torch in the air.</p>	<p>Remove the CTP cap from the torch body and inspect/clean the consumables of any debris, and replace after cleaning.</p> <p>In the Job Setup, check that ohmic detection has been activated.</p> <p>In the Job Setup, check that the IHS mode is set to Always.</p>
<p>Error "IHS Failure: Check VFC Ground"</p>	<p>Check that the orange ohmic wire is connected to the torch lug.</p> <p>Check that the surface of the material is free from rust or corrosion, which could prevent electrical contact with the shield.</p> <p>See the ohmic detection troubleshooting guide.</p>
<p>Error "IHS Failure: Clear dross from consumables" error with the torch not contacting the material surface.</p>	<p>Remove the CTP cap from the torch body and inspect/clean the consumables of any debris, and replace after cleaning.</p> <p>Replace the consumables with new ones, including the CTP cap.</p> <p>Check the orange ohmic wire for connection to the earth.</p>
<p>The torch pierces the material, but no motion occurs.</p>	<p>Check that the speed set in the ISO code and the speed overrun percentage are correct.</p> <p>Check that the torch has enough material at the pierce point to enable the plasma to establish a full power cutting arc.</p> <p>Check that the Aux input cable is plugged into the back of the <b>Accumove</b> controller.</p>

**Software faults: (continued)**

<b>Problem</b>	<b>Solution</b>
<p>When the torch moves for the first cut, the torch tip comes into contact with the material and stops the machine.</p>	<p>Check that the Cut height is set to the correct value.</p> <p>Check that the AVHC Auto/Manual mode is set to Auto.</p> <p>Check that the Sample voltage mode is set to ON.</p> <p>At the place where the machine stops, check if the machine crosses a previous cut or collides with dross from a previous cut.</p>
<p>When the cut is executed, the torch retracts to a sufficient distance from the material and the arc is stretched or extinguished.</p>	<p>Check that the Cut height is set to the correct value.</p> <p>Check that the AVHC Auto/Manual mode is set to Auto.</p> <p>Check that the Sample voltage mode is set to ON.</p> <p>Check the connection of the arc voltage measurement cable between the VFC box and the plasma source.</p>
<p>The torch traces the part out but does not fire.</p>	<p>Check that the Dry Run/Active Run button shows Active Run.</p> <p>Check that OK to Move is enabled in the machine control panel.</p> <p>If the OK to Move option is disabled, check the errors indicated on the plasma source.</p>
<p>The VMD screen displays “Accumove Controller Not Connected” for more than 30 seconds.</p>	<p>Shut down the VMD software completely, and shut down the Accumove controller for at least 30 seconds.</p> <p>Then power on the Accumove controller, wait another 30 seconds and open the VMD software.</p> <p>Make sure that the red Ethernet cable is plugged into the computer and the Accumove controller</p> <p>Also verify that the red Ethernet cable is plugged into the right or outermost port on Accumove 2 controllers.</p>

**Software faults: (continued)**

Problem	Solution
<p>The breakaway (torch impact safety) indicator shows as Yellow and Not Connected, even though the torch is in the correct position.</p>	<p>Check that the breakaway capture leash and any dross on the magnet are not keeping the torch from sitting fully in position.</p> <p>Check contact points for any signs of corrosion, clean and oil to keep the breakaway functioning normally.</p> <p>Verify the breakaway cable is connected at the breakaway, and at the back of the <b>Accumove</b> controller, reseat if necessary.</p>
<p>When the machine goes to the zero point in Datum mode, the motors “growl” as it moves up to the mechanical stops.</p>	<p>Check that the input bundle is plugged in fully at the rear of the (<b>Accumove 2</b>) controller.</p>
<p>The torch does not retract when moving between cuts, but stops automatically.</p>	<p>Jog the Z axis all the way to the end of its travel and click on Reset Z, then click on Run Job.</p> <p>Verify that the retract height value is set to the desired retract height in between cuts.</p>
<p>A limit is exceeded on the X or Y axis midway through a program.</p>	<p>While running a program, the system will determine whether the next line of g-code keeps the machine within its normal operating envelope. If this message occurs, that means that the program is too large for the machine based on its current initial zero position.</p> <p>Check the initial Program Zero position. Use the view panel to see if the part extends beyond the machine limits, and adjust the zero position and/or program accordingly</p>
<p>The torch transfers to the plate, but does not pierce fully through it and no movement occurs.</p>	<p>Check the plasma cutter work lead connection to the machine.</p> <p>Check that the material is in contact with the expendable plates of the table and nothing is preventing the connection.</p> <p>Make sure that the pierce height is at recommended values and no higher, both in the settings and visually on the machine.</p>

## Software faults: (continued)

Problem	Solution
The controller will not turn on ( <b>Accumove 2</b> ).	<p>Make sure that the 24 VDC power supply is plugged in and shows a blue LED light.</p> <p>Make sure that the power supply is plugged into the rear of the <b>Accumove 2</b> controller.</p> <p>Check that the emergency stop is not active.</p>
An indicator on the controller is flashing ( <b>Accumove 2</b> ).	An input is shorted to the earth; disconnect the breakaway, height control and input bundle and identify which connection causes the blinking light condition. Eliminate the short circuit.
The VMD screen displays a “Please update the firmware” error message.	<p>The firmware currently uploaded into the controller is not the correct version for the software.</p> <p>Log in as an Admin and load the firmware under the Machine Settings - Advanced tab by following the onscreen instructions</p>
One of the machine motors does not move when you try to start the DATUM mode or move the machine	<p>Shut down the <b>Accumove</b> controller and make sure that all the connections of the motor cable are in place at the rear of the <b>Accumove</b>, controller and on each motor.</p> <p>Activate the Accumove controller and open the VMD software after 30 seconds.</p> <p>Open a session as the administrator, click the machine configuration button, then select Load configuration. Select the appropriate configuration file for your machine, then click OK. Reset the controller and VMD software.</p>

**Software faults: (continued)**

Problem	Solution
<p>The job appears at an angle or rotated on the screen of the work surface.</p>	<p>Check that the plate is correctly aligned according to the zero point of the program in the bottom left corner, then select Align Corner, move the Positive Y axis forward over a small distance and click Align edges. The machine will go back to the zero position. Go back to Select Job and open the job once again.</p> <p>If the piece is not displayed correctly, the problem is located in the g-code file (ISO code) itself and it must be created correctly once again.</p>
<p>While using line and column nesting in VMD, the recovery value is not adjusted correctly.</p>	<p>Put the machine back into Datum position, shut down the VMD software and switch off the <b>Accu-move</b> controller for 30 seconds.</p> <p>Switch on the <b>Accumove</b> controller, wait for 30 seconds and open VMD.</p>
<p>The Execution Error External Pause error appears when you click the Run Job button.</p>	<p>Make sure that the breakaway (torch impact safety) indicator on the main screen shows Not Connected and is yellow.</p> <p>Reinstall the torch on the breakaway till the indicator is grey and shows Connected.</p> <p>Check that the breakaway cable is in place in the unit itself and at the rear of the <b>Accumove</b> controller.</p>
<p>The Execution Error Overtravel Detected error occurs when you click the Run Job button.</p>	<p>If operating near the limits of the machine, reset the program zero and move the material further away from machine limits.</p>
<p>The Limit Exceed in Z-axis error occurs when running a job.</p>	<p>Jog the Z axis all the way to the top of its travel and click on Reset Z, then click on Run Job to continue.</p> <p>If the ohmic detection indicator comes on when clicking Run Job briefly before the error is displayed, remove the consumables and clear them of any dross.</p>
<p>The torch does not purge air or fires after completing ohmic detection, the Stop button is illuminated and the Plasma indicator light is lit up green on the VMD dashboard.</p>	<p>Make sure that there are no error codes on the front panel of the <b>FLEXCUT™ 125 CE</b> power source and no error codes on the LED indicators of the front of the <b>TOMAHAWK® 1538</b>.</p> <p>Make sure that the CNC interface cable is connected between the power source and the <b>Accumove</b> controllers and VFC unit.</p>

**Software faults: (continued)**

<b>Problem</b>	<b>Solution</b>
The torch retracts up fully after ohmic detection of the material, and the Run Job button becomes available.	Clear the surface of the material from any corrosion that could hinder ohmic detection.  Check that 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 plate deflecting it before stopping and retracting.
The torch collides with the material after 2 cm of cut.  The torch cuts too high above the plate to cut.	Check that the pierce and cut height are set to the recommended values.  Check that the height control mode is set to Auto and not Manual.  Check that the Sample voltage function is set to ON.  Check for dross near the piercing points that may interfere with the torch sensing the plate.
The torch does not appear to maintain a consistent cut height with the material, which warps.	Check that the height control mode is set to Auto and not Manual.  Check that the Sample voltage function is set to 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 6.35.



## Spare parts

### Ordering procedure:

Almost all the parts of a machine or installation are referenced in the photographs and sketches.

The descriptive tables contain three types of item:

- items normally held in stock: ✓
- items not held in stock: ✗
- articles upon request: no reference

(For such parts, please complete the list of parts page and send us a copy. In the Order column, state the number of parts required and indicate the type and number of your equipment.)

For items referenced in the photographs or sketches but not included in the tables, please send us a copy of the relevant page and highlight the relevant reference.

Example:

Ref.	Part no	Stock	Order	Description
E1	W000XXXXXX	✓		Machine interface board
G2	W000XXXXXX	✗		Flow meter
A3	P9357XXXX			Printed front plates

✓	normally held in stock.
✗	not in stock
	upon request.

While ordering parts, please indicate the quantity and note the number of your machine in the box above.

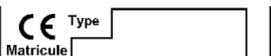
 Type <input type="text"/> Matricule <input type="text"/>	→	TYPE:
	→	Number:



✓	normally held in stock.
✗	not in stock
	upon request.

Ref.	Part no	Stock	Order	Description
1	AS-CS-07007220	✓		Transverse geared motor
2	AS-CS-07007200	✓		Longitudinal geared motor
3	AS-CS-07007164	✓		<b>LINC-CUT® S 1020w-1530w</b> bellows (x2)
4	AS-CS-101-2000-00	✓		Generation 2 tool holder - XLR connector
5	AS-CS-101-5000-14	✓		Generation 2 torch impact safety (breakaway) system for <b>LC100M</b> torch
	AS-CS-101-5000-15	✓		Generation 2 torch impact safety (breakaway) system for <b>LC125M</b> torch
6	AS-CS-101-4000-00	✓		Laser pointer
	AS-CS-101-4005-00	✓		Lens without screen - M16x1.5
7	AS-CS-101-1100-04	✓		Torch impact safety interconnecting cable + Z axis limit switch
8	BK1250-200050	✓		<b>Accumove 2</b> controller
	AS-CS-400-0003-02	✓		Power supply, 24VDC - 160W, for <b>Accumove</b>
9	BK1250-200013	✓		<b>LINC-CUT®</b> PC (depending on the version: the PC does not have a switch)
	AS-CS-103-0005-02	✓		SHUTTLE PC (depending on the version: the PC has a switch)
10	AS-CS-07007331	✓		HDMI cable
11	AS-CS-400-0014-00	✓		12 VDC PC power supply
12	AS-CS-101-1100-05	✓		Height regulation unit
13	AS-CS-07007316	✓		22" touch screen
14	AS-CS-181-2015-00	✓		Inductive sensor
15	TMS-181-2037	✓		<b>LINC-CUT® S 1020w</b> octopus bundle
	AS-CS-07007310	✓		<b>LINC-CUT® S 1530w</b> octopus bundle
16	K4401-15	✓		<b>Accumove</b> - power source interface cable - 5 metres
17	AS-CS-213-1000-12	✓		Pneumatic marker (optional)
18	BK-TMS-213-1000-02	✓		Pneumatic marker tip (optional)
19	AS-CS-07007145	✓		Plasma arc protection system
20	AS-CS-07007167	✓		Safety curtain
	AS-CS-07007140	✓		Set of 2 bearings for <b>LINC-CUT® S</b> beam rail
	AS-CS-07007141	✓		Set of 4 bearings for <b>LINC-CUT® S</b> longitudinal beam rail
	AS-CS-07007360	✓		<b>TOMAHAWK® 1538</b> automatic
	AS-CS-07007361	✓		<b>LC100M</b> torch - 7.5 metres for <b>TOMAHAWK® 1538</b>

While ordering parts, please indicate the quantity and note the number of your machine in the box above.

	TYPE:
	Number:

The business of **Lincoln Electric**<sup>®</sup> is manufacturing and selling high quality welding equipment, consumables, and cutting equipment.

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