

# LC SERIES CNC MACHINE OPERATOR MANUAL

Techno  
**CNC**  
Systems



## LC SERIES

THE NEW GENERATION

**TECHNOCNC.COM**

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Ronkonkoma, NY 11779

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# TECH SUPPORT & ON-SITE SERVICE

Techno CNC Systems provides a variety of technical support services with the purchase of any CNC router or plasma table. The following is a brief outline of available support options. On-site service is available for additional fees. To receive an immediate quote for an on-site visit, please inquire at [technocnc.com](http://technocnc.com) or call us at **631-648-7481**



## PHONE SUPPORT

Speaking with a professional and certified Techno CNC technician is quick and easy. Simply call us at 631-648-7481. Our support team is available Monday – Friday 8:30am – 5:00pm Eastern Standard Time. Techno CNC Systems will make every effort to handle phone calls in a timely manner, but due to the nature of machine diagnosis and the varying capabilities of different machine operators, we cannot guarantee hold times for phone-in support. Technical support includes troubleshooting, machine configuration and assembly, tooling recommendations, parts inquiries, and quality related issues.

**OPERATIONAL TRAINING IS NOT INCLUDED IN OVER THE PHONE SUPPORT**



## EMAIL

Techno CNC Systems will return e-mails sent to the [support@technocnc.com](mailto:support@technocnc.com) e-mail address within 24 hours Monday – Friday.



## TECHNO UNIVERSITY

Techno CNC Systems provides a number of software and machine training opportunities at our Long Island, New York facility. Please call 631-648-7481 for details.



## OUR VIDEO TUTORIALS

Get started learning all the basics for your Techno CNC machine using our video tutorials listed for each machine. For access to the video tutorials, please visit us at [www.technocnc.com/technical-support](http://www.technocnc.com/technical-support)



## TECHNO CNC ONLINE SHOP - PARTS & TOOLING

A variety of consumables, accessories, and cutting tools can be quickly and easily purchased through the Techno CNC Shop. Visit [www.technocncshop.com](http://www.technocncshop.com) to learn more and start filling your cart.





# SAFETY INSTRUCTIONS



It is your responsibility to thoroughly read, understand, and follow all the safety and machine guidelines. Failure to follow these guidelines can result in serious injury or death.

**WARNING: IMPROPER OR UNSAFE OPERATION OF MACHINE WILL RESULT IN PERSONAL INJURY AND/OR DAMAGE TO MACHINE AND EQUIPMENT.**



## SAFETY

- DO NOT remove any of the warning or safety labels mounted on the machine.
- DO NOT disable, bypass, or remove any safety devices equipped with or around your Techno CNC Machine.
- The operation of any Techno CNC machine while under the influence of alcohol or any narcotics is strictly prohibited.
- You should not operate the machine while, or after taking any prescription, or over the counter medication.
- Remove any jewelry while operating the machine.
- Ensure that excess hair is tied back and protected while operating the machine.
- DO NOT wear loose clothing while operating the machine.
- The machine's work bed is not intended as a workbench. Do not use the machine as a workbench or hammer the tabletop.
- Stay clear of the machine while it is in operation.
- DO NOT remove any material while the machine is running.
- DO NOT attempt to stop the machine with your hands or any foreign object.
- Any repairs or service done to the machine should only be conducted by qualified persons.
- Opening the electrical cabinets while the machine is powered can result in high voltage shocks or electrocution.
- Protective eyewear, headgear, clothing, and ear protection should be worn by all personnel working in the vicinity of the CNC machine.
- Keep chemicals and flammable materials away from any of the machine's electronics.
- Always have a suitable and inspected fire extinguisher in the machining area.
- Stay clear of any moving parts when the machine is in operation.
- Keep the work area clean and free of work materials or material byproducts.
- Ensure that the work area is clear of loose parts, work pieces, tools and other items before operating the machine.
- Ensure all cutting tools are in good working order before using them on the machine.
- Disconnect power to the machine when it is not in use or prior to servicing.
- Ensure that the proper power voltage is supplied to the machine. Consult with a certified Techno CNC Systems technician for specification.
- Ensure that the machine is grounded to a 10 ft ground rod using the ground lug provided on the back of the machine frame.
- DO NOT attempt to exceed the limits of the machine.
- DO NOT attempt to use the machine for anything other than it intended use.
- Feeds and speeds should be properly calculated. Failure to do so may result in fire, melting, or air born cutting tools.
- Ensure all tooling is properly secured in the machine spindle.
- DO NOT operate the machine while it is unattended.
- Routine maintenance is required. Keep machine mechanics properly lubricated and replace consumable items as needed. Machine cables and cords should be inspected regularly.
- Ensure that all controls are clean and dry.
- Stay alert at all time while operating or working in the vicinity of the machine.



# MACHINE GUIDELINES

- Ensure that all operators have read and understand all the safety instructions, machine connections, and operating instruction provided in this manual.
- Read, understand, and comply with the warning labels and safety instructions.
- Ensure anyone near the machine knows how to perform an emergency stop.
- Only authorized personnel should enter the working area while the machine is in operation.
- Verify that the machine is in good working condition before every use.
- Ensure that all cutting tools, knives, and/or engraving tools are sharp and in good working condition.
- Always ensure that any substrate being processed is securely held to the machine table.
- Stay clear of all moving parts while the machine is in operation.
- All users should complete a training course, read the machine manual, and/or review all tutorials prior to operating the machine.
- All users should be knowledgeable about basic design, operation, cleaning, and maintenance of the machine.
- All users should be knowledgeable regarding materials the CNC Router can cut.
- Operators should have knowledge regarding the proper cutting tools for cutting specific materials.
- Programmers and operators should understand how to properly calculate feeds and speeds.
- Operate the CNC machine in a safe manner according to the safety guidelines.

## PROTECTIVE GEAR



### Hearing Protection

Wear hearing protection when the machine is in operation. Hearing protection should also be used when a vacuum pump and dust collector are running.



### Gloves

After processing is complete, materials may have sharp edges or be hot to touch. Cutting tools are also sharp and may be hot once processing is complete. Wear suitable gloves to protect your hands.

**ALL OPERATORS & PERSONNEL WORKING AROUND OR NEAR THE MACHINE MUST WEAR PROTECTIVE EQUIPMENT BASED ON THE MACHINE CONFIGURATION & THE MATERIALS BEING PROCESSED**



### Clothing

Wear appropriate clothing to prevent injury from sharp edges or hot materials and cutting tools. Wearing loose clothing should not be worn to prevent clothing from getting caught in linear mechanics.



### Mask/Respirator

Some materials will create airborne toxins. Wear the appropriate mouthwear while processing these materials. Refer to the SDS or MSDS for specific information.



### Eye Protection

Eye/face protection must be always worn during machine operation.

# MAINTENANCE GUIDELINES

## MAINTAINING YOUR LC MACHINE

Depending on the usage and type of materials you will be routing it is very important to **maintain the ball screw drives on all 3-axes**. As the machine routes it can *cause a rooster tail of dust and debris to escape from the dust hood and some of this can collect on the ball screw*. As the machine traverses back and forth this can be collected and accumulate on the ball screw. These should be inspected every day before starting the machine. If it is observed that the ball screw or nut has a buildup of debris, this should be wiped clean.



## GENERAL LUBRICATION

**X&Z axis ball screw and nut maintenance:** It is important to maintain your drive mechanics by keeping them clean and properly lubricated. We recommend this be completed every 40-60 hours of use. It is recommended to use a general-purpose low viscosity grease. Techno sells a kit P/N: H90Z00-LUBEKIT2 which includes grease and grease gun with needle insertion fitting

To start clean, all the rails and ball screws thoroughly. For cleaning the ball screws it's recommended to use a clean rag and shimmy the screw dry and clean to a polish. Pay attention to the ball nut to see if there is a buildup of gunk near the ball nut flange and opposing side. Use WD-40 to clean these tight areas. The X and Z-axis have zerk fittings located on the ball nut (see fig #1). Using the needle tip press on the zerk fitting and give 2-3 pumps of grease to the ball nut (See Fig 1).

**Y-axis ball screw and nut maintenance:** It is important to maintain your drive mechanics by keeping them clean and properly lubricated. We recommend this be completed every 40-60 hours of use. It is recommended to use a general-purpose low viscosity grease. Techno sells a grease tube P/N: HL5600-299031 for this purpose.



FIG 1  
Page 6

# MAINTENANCE GUIDELINES

To start, clean the ball screws thoroughly. For cleaning the ball screws it's recommended to use a clean rag and shimmy the screw dry and clean to a polish. Pay attention to the ball nut to see if there is a buildup of gunk near the ball nut flange and opposing side. Use WD-40 to clean these tight areas. The y-axis ball nut is a rotational drive nut and does not have zerk fittings (see fig 2 and 3 below). Once this is complete apply a small amount of grease (see fig 2 and 3 below) about 2 inches long in front and back of the ball nut, and spread it out over a 6" area. Jog the machine back and forth over this area a number of times. If observed that the grease is turning black or dirty, this indicates it is flushing the ball nut clean of very fine particulates that have entered the ball nut chamber. It is recommended to repeat this procedure until it is observed that the grease is clear. Once complete, shimmy the ball screw dry. Residual grease left on the ball screw becomes a magnet for dust to adhere too thus impeding the ball screw accuracy, performance, and longevity.

## Hiwin Rails Linear Bearing Maintenance:

Maintaining the linear guide rails and bearings. Hiwin specifications indicate that a small amount of grease needs to be applied to the rails after 4 months of use. The picture below indicates the location of a grease fitting. Techno recommends a multi-purpose mobil EP2 (Part #: HL5600-M-EP2)

**Note: There are 4 bearing carriages per axis.**



FIG 2



FIG 3

# MATERIALS SUITABLE FOR CUTTING



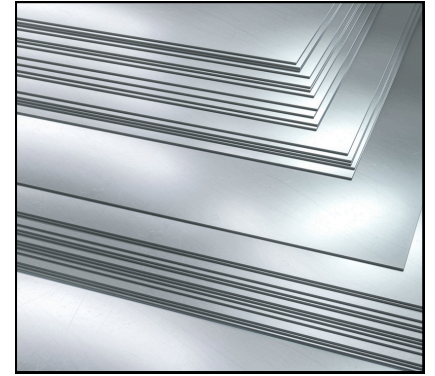
## WOOD

Most natural types of wood, and wood-based materials, including MDF, plywood, veneered wood, particle board, and other composite boards.



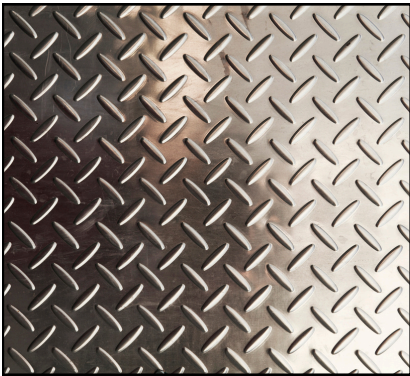
## PLASTICS

All plastics, including “hard” and “soft” plastic. These include cast and extruded acrylic, UHMW, as well as polycarbonate.



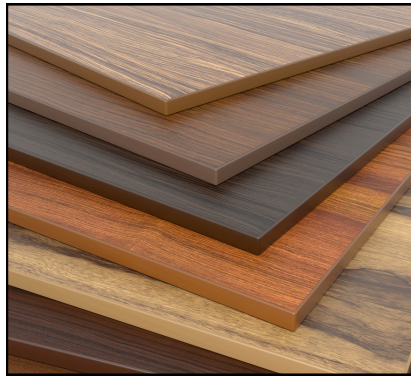
## ACM

Most types of ACM including those made with aluminum.



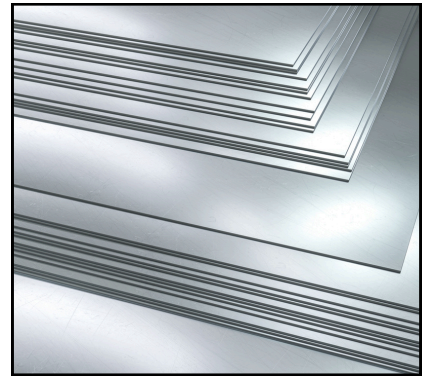
## NF METALS

These include aluminum, brass, copper, and derivatives.



## COMPOSITES

Most composites and laminates.



## FOAM & RUBBER

Hard and soft rubber, as well as neoprene. Most foam-based materials.

**AND MORE:  
CORK, STITCHED RUBBER,  
CARBON FIBER, G10, ETC.**

# THE OPPORTUNITIES ARE ENDLESS

# PROCESSING MATERIAL

**IT IS IMPORTANT TO UNDERSTAND THE POTENTIAL HAZARDS ASSOCIATED WITH PROCESSING VARIOUS MATERIALS. READ, UNDERSTAND, AND COMPLY WITH THE FOLLOWING INFORMATION CONCERNING THESE VARIED CONDITIONS.**



## Combustibles

When processing materials such as wood, MDF, cardboard and other flammable products, the risk of fire exists. Ensure all operators have access to a suitable fire extinguisher.



## Dust Explosion

Processing materials such as MDF or other wood products creates dust. The risk of a dust explosion exists. When collecting chips from non-ferrous metals, hot chips collected can cause an explosion. Consult with a dust collection specialist for a suitable dust collection system for each application.



## Toxic Fumes/Dust

Processing materials such as MDF, plastics, and some composites can expose the operator and others in the vicinity to toxic fumes, gases, or dust. Ensure a proper respirator is worn when using these materials and working around the machining area.



## Sharp Edges/Chips

Metal materials, natural wood, and composites may have sharp edges and/or chips that can cut or pierce your skin. Ensure all personnel in the vicinity of the work area wear cut-resistant gloves and protective clothing.



## Hot Materials/Waste

Processing plastic materials and metals generates heat in both the material being cut and the chips produced from cutting. This increases the risk of skin burns. Ensure that heat resistant gloves, clothing and face protection are worn when processing these materials.



## Heavy Sheets of Material

While loading/unloading heavy, large, or awkward sheets of material, use a helper. It is also advised that the use of appropriate lifting and rigging are used to prevent injury or death.

# MACHINE SITE PREPERATION

**WHEN INSTALLING THE TECHNO CNC SYSTEMS LC SERIES MACHINE IN YOUR SHOP, THERE ARE NUMEROUS FACTORS THAT INFLUENCE THE POTENTIAL PRODUCTIVITY, EASE OF USE, AND SAFETY OF THE OPERATOR. THE MAIN FACTORS BEING DISCUSSED INCLUDE, BUT ARE NOT LIMITED TO, THE PHYSICAL LAYOUT AND PLACEMENT OF THE MACHINE IN THE SHOP, AVAILABILITY OF POWER, AN EMI GROUND, COMPRESSED AIR, AND VENTILATION.**

- When preparing to install the LC Series CNC Router; provide sufficient space all the way around the machine. It is recommended that a 3 ft (914mm) workspace be obstacle free around the entirety of the machine.
- Forklift/load material to be processed opposite the cable carriers only. It is recommended that the gantry be parked towards the back of the machine while loading and unloading material.
- A dedicated earth ground must be provided and should be installed in a manner so that there is no trip hazard. It is recommended that the ground be secured to a copper 10 ft earth ground rod.

**NOTE:**  
 1. CUSTOMER IS RESPONSIBLE FOR ALL DISCONNECTS AND TO MEET LOCAL ELECTRICAL CODES. ALL WIRING SHOULD BE PERFORMED BY A LICENSED ELECTRICIAN.  
 2. VACUUM PUMP ELECTRICAL REQUIREMENTS (OPTIONAL EQUIPMENT):  
 - FOR 208-230V, 3PH 40AMP CIRCUIT IS RECOMMENDED.  
 - FOR 440V-480V, 3PH 20 AMP CIRCUIT IS RECOMMENDED.  
 - THREE SPACED POSITIONERS ARE FOR EACH INDIVIDUAL AC MOTOR.  
 3. THE MACHINE CONTROLLER REQUIRES A 208/230V 3-PHASE, 50 AMP DEDICATED CIRCUIT.  
 4. A 5 FOOT GROUND ROD SHOULD BE INSTALLED AND CONNECTED TO CONSOLE CHASSIS.  
 5. A CLEAN DRY NON-FLUORINATED SOURCE AIR SOURCE IS REQUIRED.

MACHINE SIZE	A	B	C
52" X 102" X 70"	159	92	
48" X 98" X 70"	131	70	
48" X 48" X 70"	84	70	

NO.		DATE	DESCRIPTION
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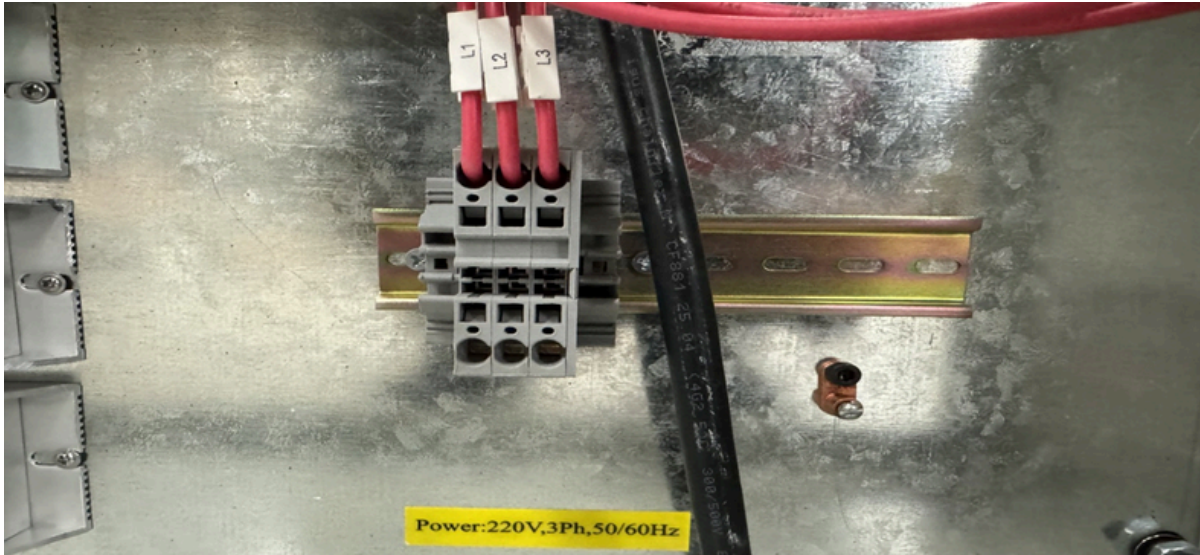
**NEW GENERATION LC SERIES**

MAT. BREAK CORNERS & EDGES .015		QTY REQ'D	ORIG. DATE	DRAWN BY:
UNSPECIFIED TOLERANCES		UNITS:	SCALE:	CHECKED BY:
FRAC. +/- 1/32	.XX +/- .010			
ANGLE +/- 1/2°	.XXX +/- .005			
PART NO.			DWG. NO.	

- 6 Leveling feet are included with the LC Series CNC Router. Remove these from one of the boxes included with the machine and install onto all 6 base legs of the machine.

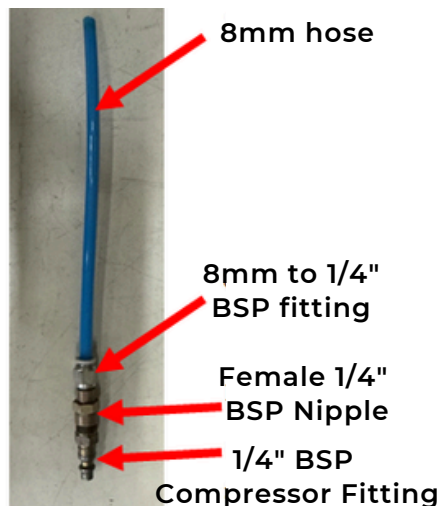
# MACHINE SITE PREPERATION CONTINUED

- The power requirements for a standard LC Series machine is a 220V 3phase power source connected to its own 50A circuit. Single phase power and 380V – 440V power arrangements can be accommodated. Please contact your sales associate, or Techno CNC Systems' support team for more information.
  - The main power terminals are in the back of the control cabinet, towards the bottom left corner of the rear interior.
  - Connect the live legs of power to L1, L2, and L3 (Labels may vary). Connect the Ground to the copper ground lug provided.



- The LC Series Router utilizes a high frequency, air cooled, 12hp automatic tool changing spindle. This advanced and powerful spindle, along with other accessories, requires a constant flow of dry, compressed air. The air pressure requirements to run these components is 90 PSI. The other standard accessories that are equipped on the Titan Series include:
  - Pop-up alignment pins.
  - Dust hood.

In the back of the machine are a series of regulators and flow control components. Connect an air hose supplying at least 90 PSI to the first 8mm air fitting provided. The fitting should be labeled "Air In". An adapter similar to the one below can be made up using parts available at most hardware stores, or you can call in to purchase one directly from Techno CNC to better fit a female compressor hose.



## CAUTION

CNC machines and associated electronics are sensitive to unstable incoming power. If you think there may be electrical issues (e.g. dirty power, fluctuations, surges, spikes, etc.) in your building or shop, have an electrician evaluate for necessary adjustments or equipment to maintain proper voltage and power.

# MACHINE SITE PREPERATION CONTINUED

- Before beginning to power on the machine and operate its controls, it is important to free up the gantry from any obstructions. Make sure to unload all boxes laid on top of the machine bed, and carefully go through each one to remove any tools, tool boxes, and other accessories that may have been included or purchased.

Labels in drawings: 6" DUST COLLECTION PORT, CNC CONTROL CABINET LOCATED ON LEFT SIDE OF MACHINE, POWER INPUT (SEE QUOTE FOR DETAILS) SEE NOTES, LEVEL FEET, COMPRESSED AIR MUST CONNECTION SEE NOTE #5, VACUUM TABLE CONNECTION, GND.

MACHINE SIZE	A	B	C
5FT X 15FT	150	92	
4FT X 8FT	131	73	
4FT X 4FT	84	70	

**Techno CNC Systems**

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**NEW GENERATION LC SERIES**

MAT.			
BREAK CORNERS & EDGES .015		QTY REQD:	ORIG. DATE
UNSPECIFIED TOLERANCES		DRAWN BY:	
FRAC. +/- 1/32	.XX +/- .010	UNITS:	SCALE
ANGLE +/- 1/2°	.XXX +/- .005	CHECKED BY:	
PART NO.			DWG NO.

NO.	DATE	DESCRIPTION

NOTES:  
 1-CUSTOMER IS RESPONSIBLE FOR ALL DISCONNECTS AND TO MEET LOCAL ELECTRICAL CODES. ALL WIRING SHOULD BE PERFORMED BY A LICENSED ELECTRICIAN.  
 2-VACUUM PUMP ELECTRICAL REQUIREMENTS (OPTIONAL EQUIPMENT):  
 -FOR 208-230V 3PH 40AMP CIRCUIT IS RECOMMENDED.  
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 THESE SPECIFICATIONS ARE FOR EACH INDIVIDUAL AC MOTOR.  
 3-THE MACHINE CONTROLLER REQUIRES A 208-230V 3-PHASE 50 AMP DEDICATED CIRCUIT.  
 4-A 6 FOOT GROUND ROD SHOULD BE INSTALLED AND CONNECTED TO CONSOLE CHAIRS  
 5-A CLEAN DRY NON-FLUCTUATING 90PSI AIR SOURCE REQUIRED

# CONTROL CABINET BUTTONS & FUNCTIONS

IT IS IMPORTANT THAT ALL OPERATORS AND PERSONNEL THAT WORK WITH THE CNC MACHINE LEARN AND UNDERSTAND ALL THE MACHINE CONTROLS AND FUNCTIONS. THIS SECTION WILL SUMMARIZE THE CONTROLS MOUNTED ON THE CONTROL CABINET AND THEIR FUNCTIONS.



**A.) USB Slot** – The USB slot is where the operator will connect their usb drive. The usb drive should contain the .nc g-code files that will be run on the machine. Files put on this usb can be loaded and copied onto the machine’s controller.

**B.) Emergency Stop** – The E-stop button will cut power to the controls and drives of the system. To disengage the emergency stop, rotate the switch clockwise. The machine will not power on with the e-stop button engaged.

**C.) Power On/Off** – The power on/off button will power on and shut down the system when pressed in and out.

**D.) VFD Display** – The VFD display shows a digital read out of the real time spindle speed. The display will show 0.0 until the spindle is initiated manually, or through running a programmed file. The VFD is preprogrammed prior to delivery. It is not advised to adjust any parameters before speaking with a certified Techno CNC Systems’ technician.

## POWER DISCONNECT:

The power disconnect applies power to the rest of the system. Though power may be live at the cables secured to the main power terminal inside of the cabinet, the power disconnect prevents power from getting to the rest of the electronics until it is rotated to the on position. It is highly recommended that the power disconnect be turned off when the machine is not in use. This device is used to protect the sensitive electronics inside of the control cabinet.



**DISCONNECT OFF**



**DISCONNECT ON**

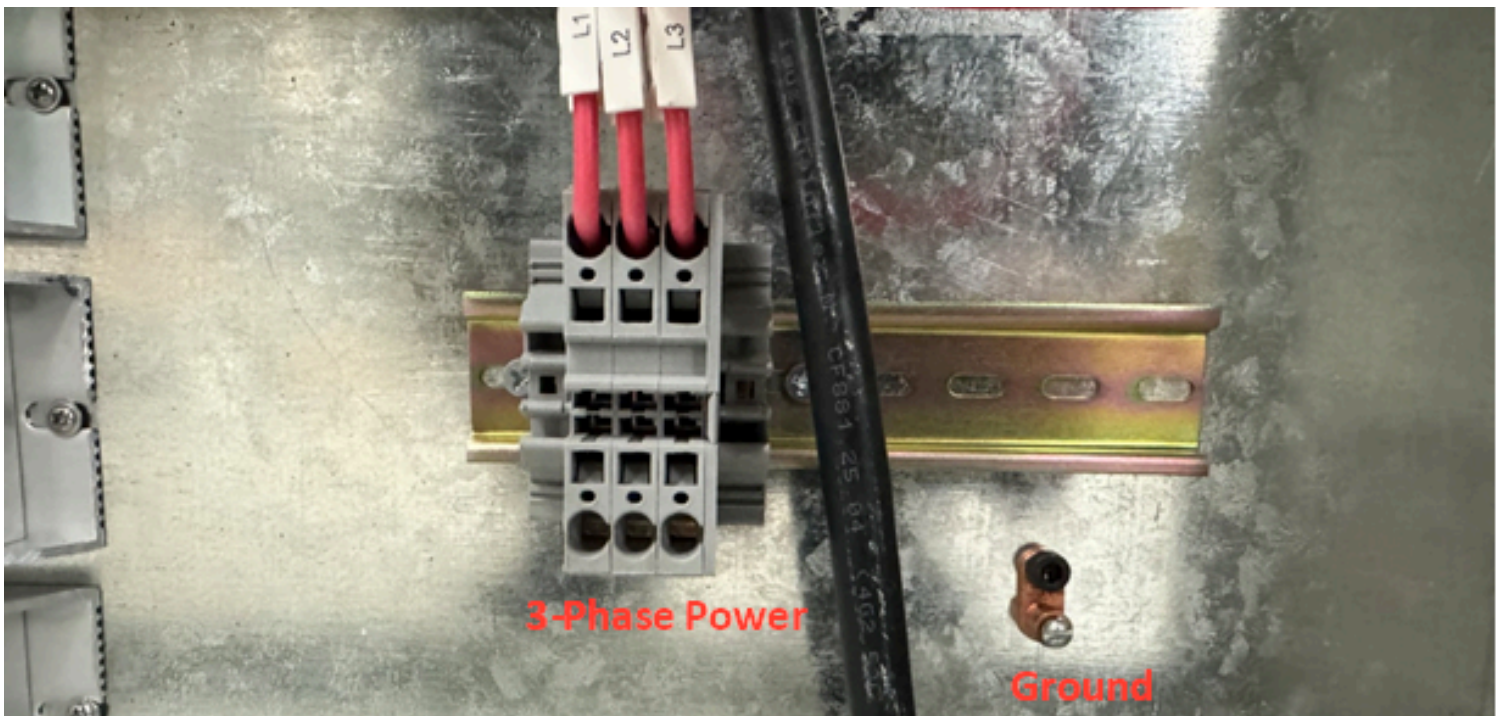
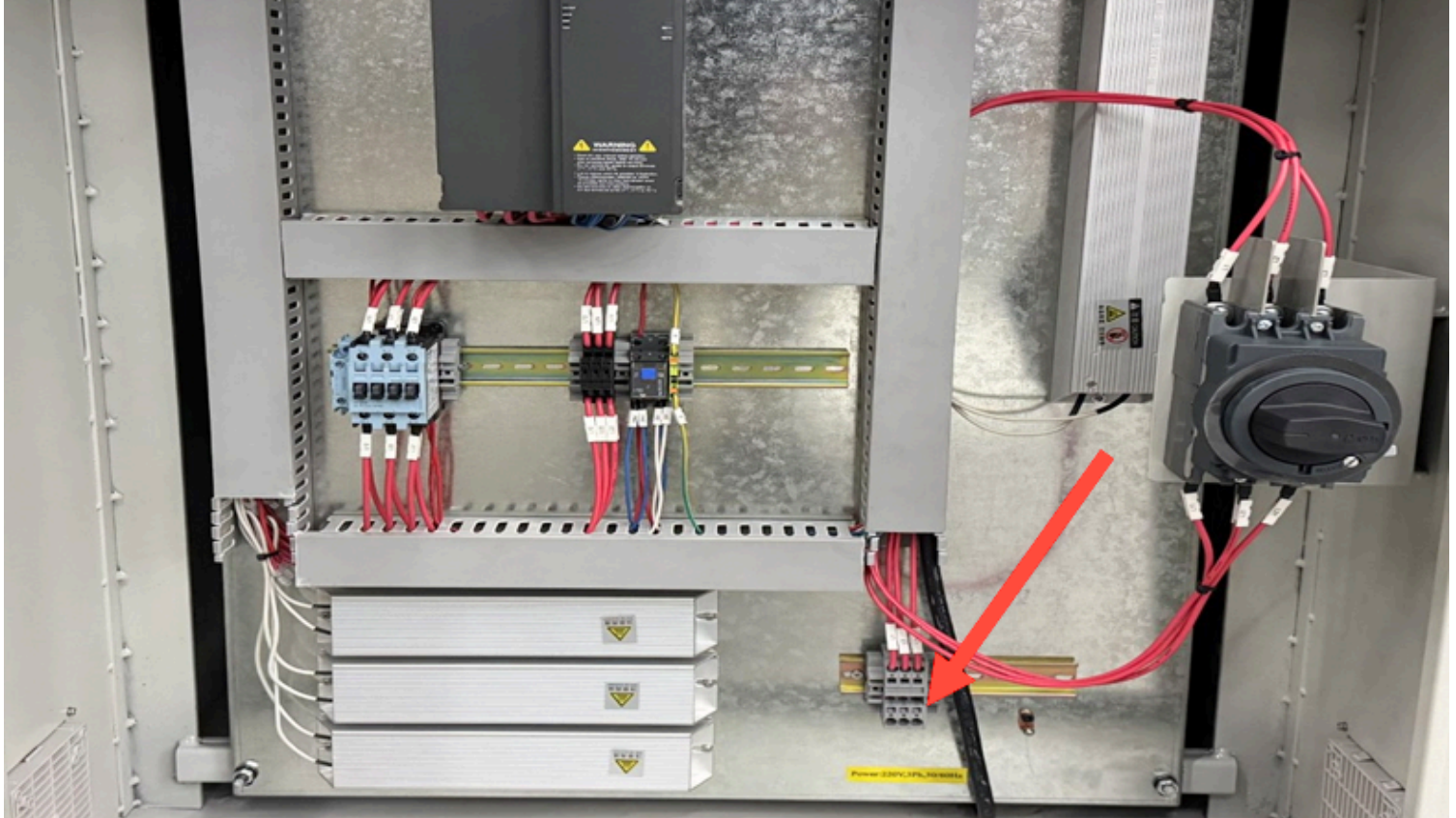
# POWER & AIR REQUIREMENTS

THE LC SERIES IS A HIGH VOLTAGE MACHINE EQUIPPED WITH VARIOUS ACCESSORIES THAT REQUIRE COMPRESSED AIR. THIS SECTION WILL GIVE AN OVERVIEW OF THE VOLTAGE AND AIR REQUIREMENTS AS WELL AS THE CONNECTION POINTS FOR EACH.

## 1. Power Requirements:

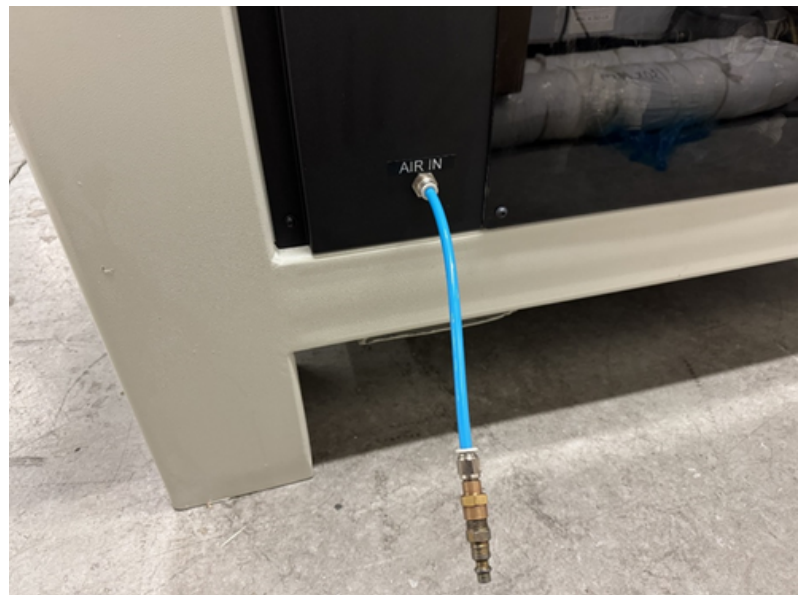
- The machine runs off a **208V – 230V AC power source**. All electrical connections should be installed by a **LICENSED ELECTRICIAN**
  - The machine is rated to be connected to a dedicated 50A circuit. Failure to power the machine off of a dedicated circuit can cause internal damage to the various electronics installed on the machine.

- The main power connection is located in the front of the control cabinet.
  - Crimped connectors should be used when supplying high voltage power. It is not recommended to connect bare wire to any of the terminals. Failure to do so may cause unexpected shorts, causing excessive damage to the machine's electronics.
  - Connect the 3 live legs to the terminals labeled L1, L2, and L3. The ground connection should be secured to the ground lug provided next to the 3-phase bridge.



## 2. Air Requirements:

- The LC Series requires a constant flow of clean, dry, compressed air.
  - If an air dryer is not inline with the air source for the machine, it is recommended one be installed. Failure to do so will result in premature spindle failure.
- It is recommended to use a constant 90 PSI source. The machine is equipped with its own regulators, so bringing a larger amount of air directly to the regulator is ok. The machine's regulators will then only allow the spec'd air pressure through out the system.
- The fitting that feeds the main regulator can be found at the back of the machine. The fitting provided is spec'd to fit an 8mm air hose. An adapter or special fitting can be made up using products found at all hardware stores if needed. Please re-read the machine site prep section of this manual for further details.



# TOOLING & COLLETING

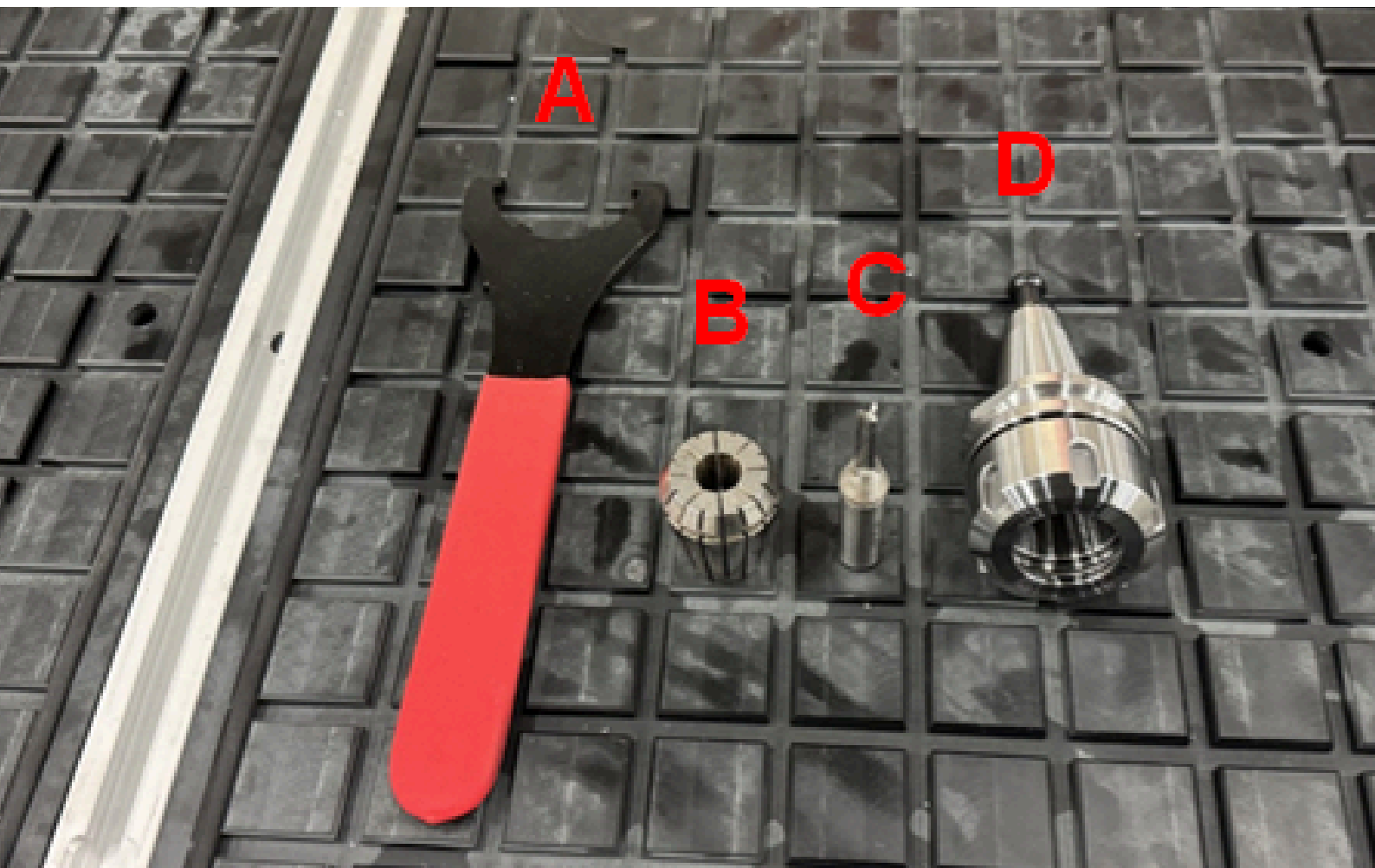
THIS SECTION WILL COVER THE PROPER TOOLS AND COLLETS TO USE WITH THE LC SERIES CNC ROUTER AS WELL AS AN OVERVIEW ON HOW TO PROPERLY LOAD TOOLS INTO THE AUTOMATIC TOOL CHANGING SPINDLE'S TOOL HOLDERS. IN ADDITION, THE PROCESS AND PROPER POSITIONING OF TOOL HOLDERS IN THE AUTOMATIC TOOL CHANGING RACK WILL BE COVERED.



**DO NOT ATTEMPT TO RUN CUT FILES OR AUTOMATIC TOOL CHANGES WITHOUT FIRST REVIEWING AND UNDERSTANDING THIS PROCESS. FAILURE TO DO SO WILL RESULT IN DAMAGE TO THE MACHINE'S MECHANICS, HARDWARE, TOOLS, AND SPINDLE.**

## 1. Parts Overview:

- When using the LC Series machine, there are several parts to assembling a tool to be run:





## A. ER32 COLLET WRENCH

This is a wrench specifically designed for use on tool holders that utilize ER32 collets. This is the standard for the LC. Techno provides the wrench with any LC Series machine purchased. For information regarding replacements, please see the “Parts and Accessories” section of the manual.



## D. ISO30 TOOL HOLDER

A. This is the device that is loaded into the LC Series’ automatic tool changing spindle. Collets and router bits are tightly secured into these tool holders, allowing for the machine to drop off tools in the tool changin rack and pick up others for multi-step cutting files. The ISO 30 tool holder has a few components associated with it. At the top of the conical shape is our pull stud. These are threaded into the top of the tool holder body and should be secured tight. Always ensure the pull stud is tight before using the machine. At the bottom of the conical shape is going to be the threaded collet nut. This nut comes on and off the tool holder when changing out collets. For additional, or replacement tool holders, please see the “Parts and Accessories” section of the manual.



## B. ER32 COLLET

Collets are the spring steel devices that clamp around the cutting tool inside of the tool holder as you tighten down on the collet nut. These tools are considered consumables and should be replaced annually when working in a production environment. Failure to do so may result in tools coming loose during cutting, broken tools, damage to the vacuum table, or serious injury. These collets come in all standard sizes for most router bits. For replacements, please see the “Parts and Accessories” section of the manual.



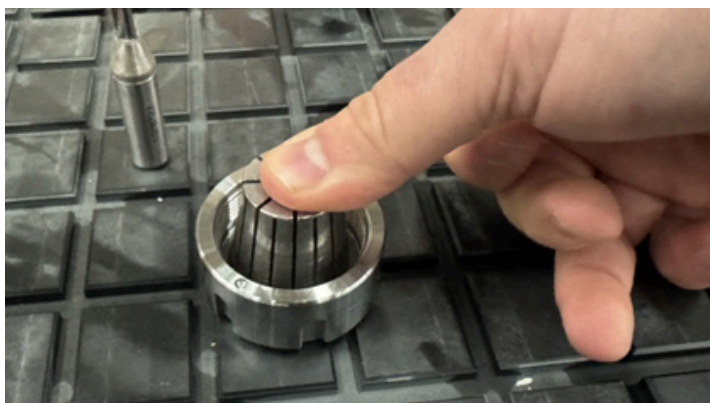
## C. ROUTER BIT

A. The router bit is what makes all the magic happen during the cutting process. There are endless options for cutting tools, all specifically aimed around cutting a particular type of material. For cutting tool recommendations based on application, please contact one of our support engineers at 631-648-7481 or visit our online Techno Shop.

## 2. Loading Collets and Tools

To begin, first make sure you have an empty ISO 30 tool holder, along with a router bit, and an ER32 collet that has the same dimensioned opening as the shank diameter of the router bit.

**A.** Unthread the collet nut from the tool holder and insert the large face of the collet into the tool holder, pushing down to ensure it is secured. You should be able to flip the assembly upside down while the collet remains secure. If the collet falls out, re-secure and check.



**B.** Begin threading the assembled collet and collet nut onto the ISO30 tool holder body. Once a few threads have been established, carefully install the shank of the router bit so that the collet is positioned about 0.25" – 0.375" away from the cutting edge on the router bit. Once in position, finish hand tightening the assembly.



**C.** Bring the assembly and the ER32 collet wrench to the tool vice located on the back side of the machine frame. Insert the tool holder, cutter side up, on the vice. Make sure to line up the flat edges of the tool holder with the flat edges of the vice. Once secured, engage the ER32 collet wrench with the collet nut but sliding the wrench over top of the assembly and coming down on the grooves provided with the collet nut. Tighten the collet nut with the wrench to secure the tool inside the tool holder.

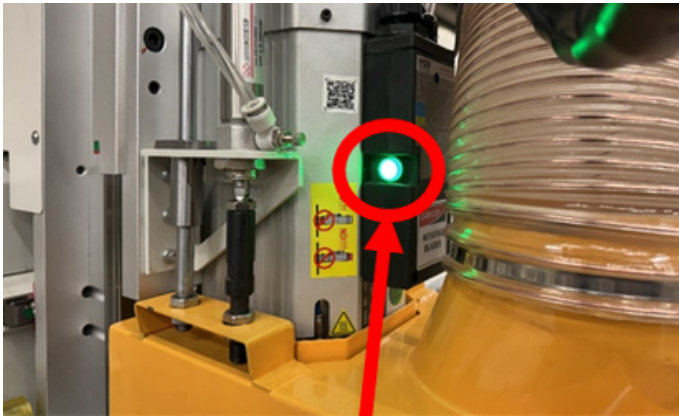


**Flat Edges**

Page 19

**D.** Once the tool is tight and secure inside its tool holder, load the tool into the spindle or the tool change rack.

- To load a tool into the spindle, press the green button located on the spindle harness, opening the spindle chuck. A stream of air will be released from the spindle cavity. Insert the tool while simultaneously keeping the green button pressed. Once the tool is inserted all the way into the spindle cavity, release the green button and the spindle chuck will grab hold of the pull stud and secure it tightly into the spindle. Once the process is completed, give the tool a small tug to ensure there is not any backlash or play in the tool. If there is, the machine will not run properly and will result in damage or serious injury.



Press and hold the green spindle chuck control button. While button is pressed in, the chuck is open. When it is released, the chuck will close.

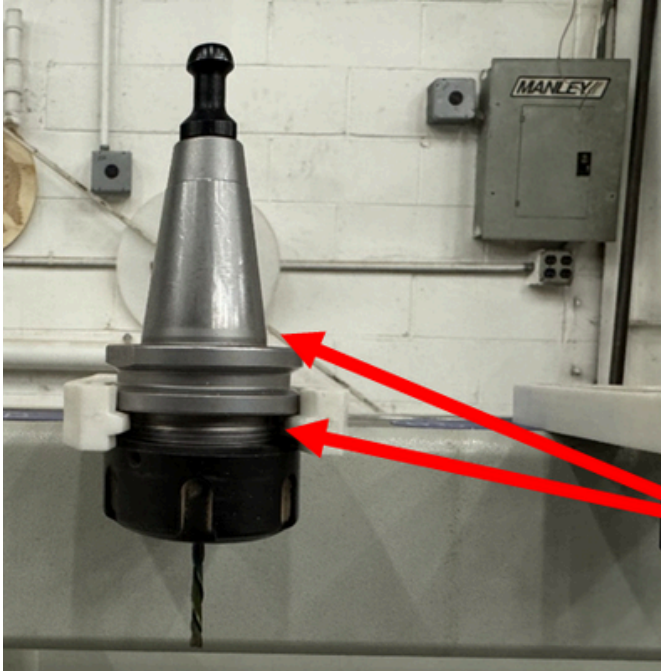


While pressing the chuck control button, insert the ISO 30 tool holder into the spindle. Release the chuck control button once the tool is fully insert into the chuck.



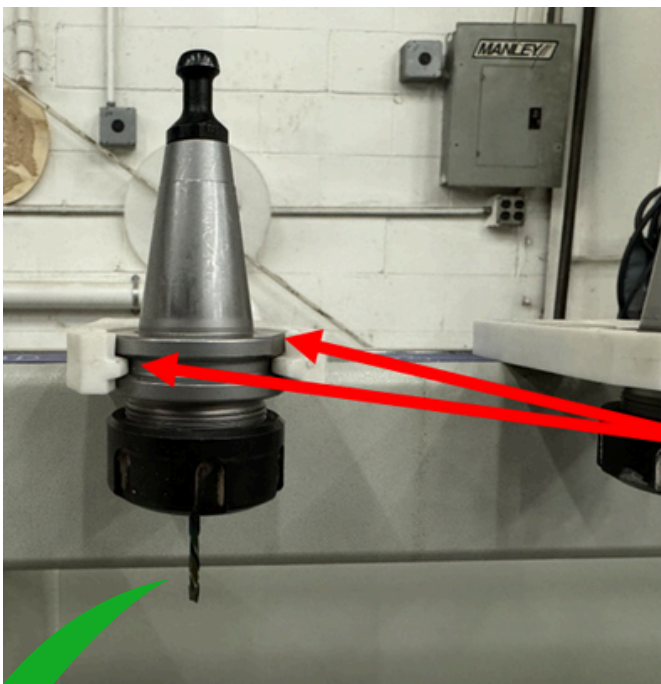
When the tool is loaded, there should not be any gap between the chuck opening and the top of the tool. There should also be no play in the tool, only rotational motion.

When loading a tool into the tool clip, line up the female notched section of the tool holder with the mating notched section of the white tool clip. Rotate and pull the tool back and into the tool clip. When the tool holder is loaded into the clip, the top of the notched section of the tool holder should be flush with the top of the clip. You do not want the threaded part of the tool holder to be sitting on the clip. This is incorrect. Failure to load a tool correctly into a tool clip will result in damage to the machine, tools, tool clips, and/or spindle.



**This is the incorrect way to mount a tool into the tool rack. The clip is encapsulating the threaded portion of the tool holder, and the top of the tool holder is sitting above the top of the tool clip. If the machine were to perform a tool change, damage would be imminent.**

**INCORRECT**

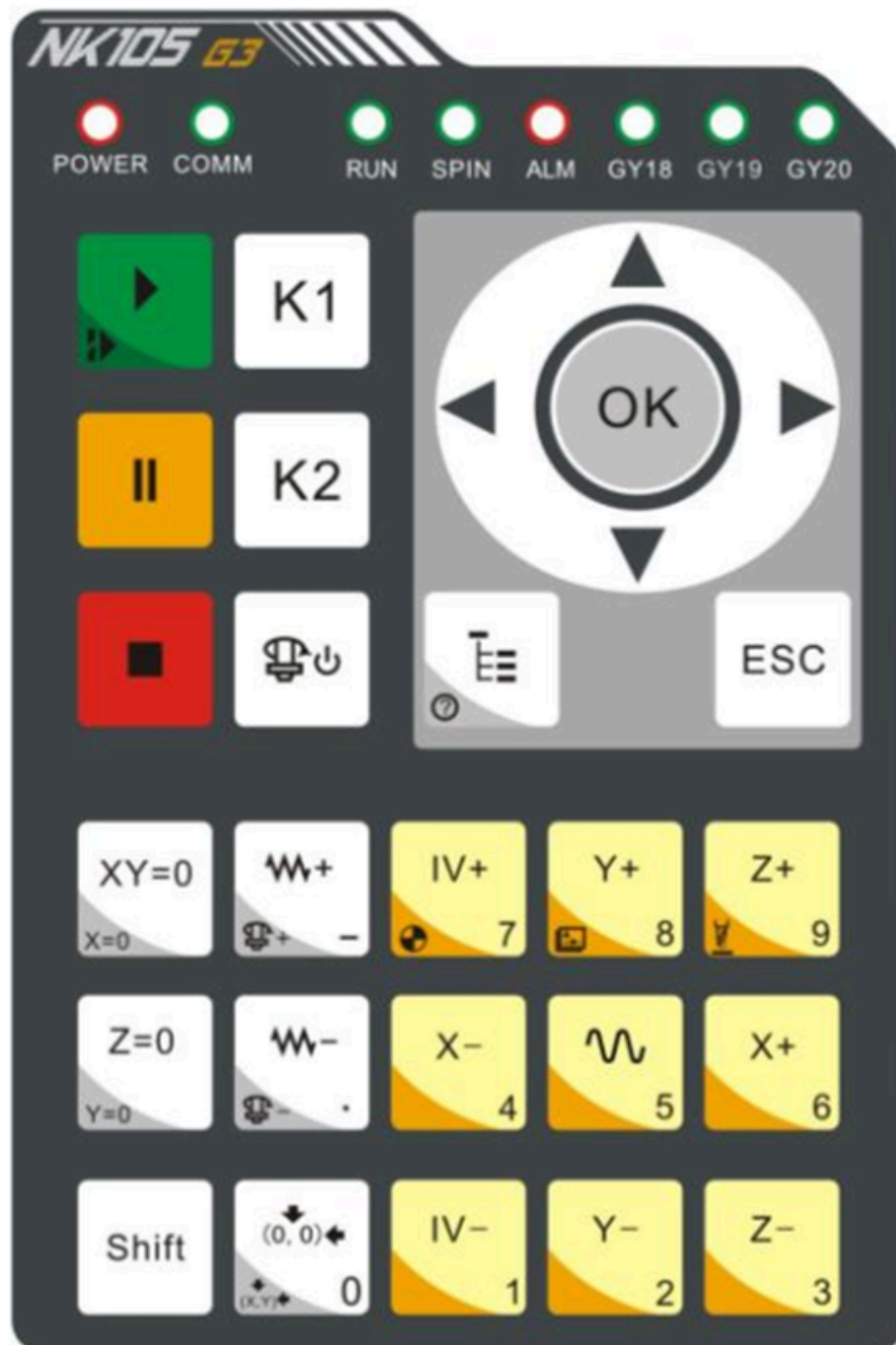


**This is the correct way to load a tool into the tool clips. The top of the tool holder is flush with the top of the tool clip, and the notched section of the tool holder mates perfectly with the notched section of the clip.**










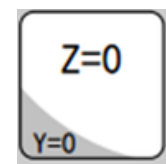
# HANDHELD CONTROLLER CHEAT SHEET

THIS SECTION DEFINES ALL THE BUTTON CONTROLS ON THE LC SERIES HANDHELD CONTROL DEVICE. REFER TO THIS SECTION AS YOU CONTINUE READING THROUGH THIS MANUAL TO REFERENCE ANY BUTTONS, OR COMMANDS BEING MENTIONED.






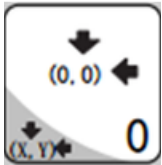
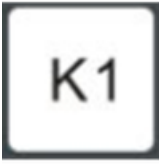


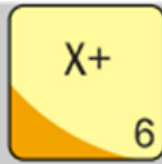
# SINGLE BUTTON

## COMMANDS AND DEFINITIONS

Button Icon:	Button Name:	Function:
	Start	Used to start a loaded g-code file after it has been loaded onto the controller.
	Pause	Pauses the machine during file execution. Will stop the spindle and lift the z just slightly above the material. Cannot move machine when a file is paused.
	Stop	Stops the machine during file execution. Will completely stop the machine and reset the g-code file.
	Spindle On/Off	Turns the spindle on and off manually.
	Menu	Allows the operator to enter the menu page of the controller. <b><i>DO NOT MAKE ANY CHANGES IN THE MENU UNLESS DISCUSSED WITH A TECHNO CNC SUPPORT ENGINEER.</i></b>
	Escape	Allows an operator to exit to a previous page on a menu, or clear an error message if conditions are met.
	Set XY0	Sets the XY0 position at the current coordinate location the machine is idling when the button is selected. The coordinates on the handheld will switch to 0.000 after selecting.
	Set Z0	Sets the Z0 position manually, at the current coordinate location the axis is idling when the button is selected. The coordinates the handheld will switch to 0.000 after selecting.






# SINGLE BUTTON

## COMMANDS AND DEFINITIONS CONTINUED









Button Icon:	Button Name:	Function:
	Shift	Switches the jog function from continuous jogging motion to incremental "stepping" motion.
	Feed rate Override +	Increase the programmed feed rate of a file in 10% increments. Can go as high as 120% of the programmed feed rate.
	Feed rate Override -	Decrease the programmed feed rate of a file in 10% increments. Can go as low as 0%.
	Go To Origin	Moves the machine to its XY0 location and moves the z-axis down and stops 0.25 inches above the Z0.
	K1	This button currently does not have an assigned function
	Shroud Control	Moves the dust shroud up and down
	X-	Moves the machine in the X negative direction
	X+	Moves the machine in the X positive direction

# SINGLE BUTTON

## COMMANDS AND DEFINITIONS CONTINUED






Button Icon:	Button Name:	Function:
	Y-	Moves the machine in the Y negative direction
	Y+	Moves the machine in the Y positive direction
	Z-	Moves the machine in the Z negative direction
	Z+	Moves the machine in the Z positive direction
	Switch Jog Speed	Moves the machine to its XY0 location and moves the z-axis down and stops 0.25 inches above the Z0.

# SHIFT COMMAND BUTTON COMBINATIONS

Button Icon:	Combo Name	Function:
	Breakpoint Resume	Resume a file from the point it left off after pressing the red stop button.
	Help Menu	Enter the help menu on the controller. This is the controller's version of a cheat sheet.
	Set X0	Sets the X-axis origin only.
	Set Y0	Sets the Y-axis origin only.
	Increase Spindle Gear	Increases the spindle gear by 1. The controller has 7 spindle gears total.
	Lower Spindle Gear	Lowers the spindle gear by 1. The controller has 7 spindle gears total.
	Go To XY0	Moves the machine to the XY origin location without moving the z-axis down.
	Back To Ref Point	Prompts the same message when first powering on the machine. The machine will seek its limits in the X, Y, and Z axes.

# SHIFT COMMAND

## BUTTON COMBINATIONS *CONTINUED*

Button Icon:	Combo Name	Function:
	Switch WCS and MCS	Switches the displayed coordinates on the handheld from WCS coordinates to MCS coordinates.
	Auto Z=0	Will prompt the z-axis to slowly descend in the negative direction until its tool touches on top of the Z0 touchpad.
	Jiggle Function	Allows the operator to step the machine in any axes before resuming a paused file.
	Pop Up Pins	Actuates the locating pop-up pins on the machine
	Measure Tool Height	Runs the automatic tool height measuring process.

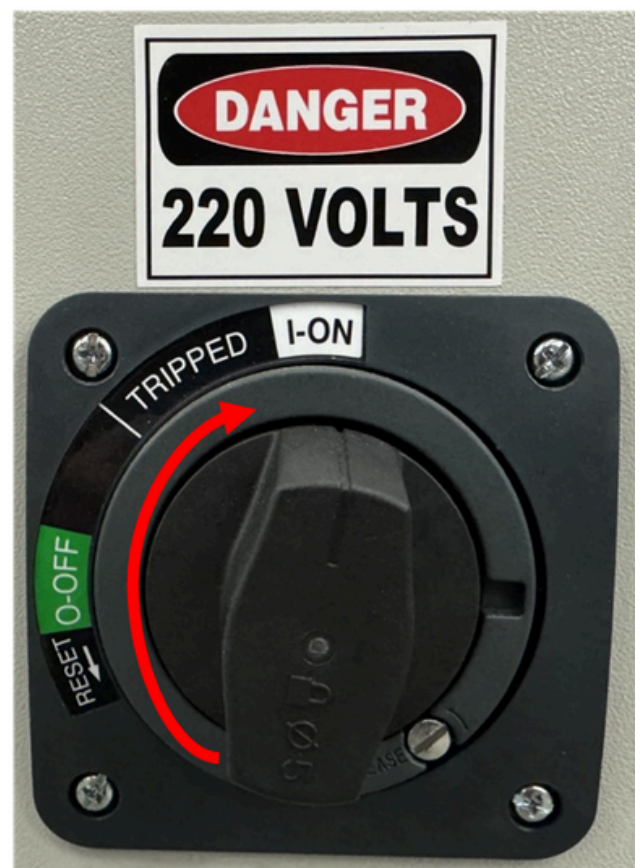
# START UP AND HOMING

THE LC SERIES MACHINE IS A SUPER EASY TO USE, LOW MAINTENANCE MACHINE. THIS SHORT SECTION REVIEWS THE PROPER START UP PROCEDURE FOR THE MACHINE AND PROPER HOMING TO ENSURE ACCURACY AND REPEATABILITY.

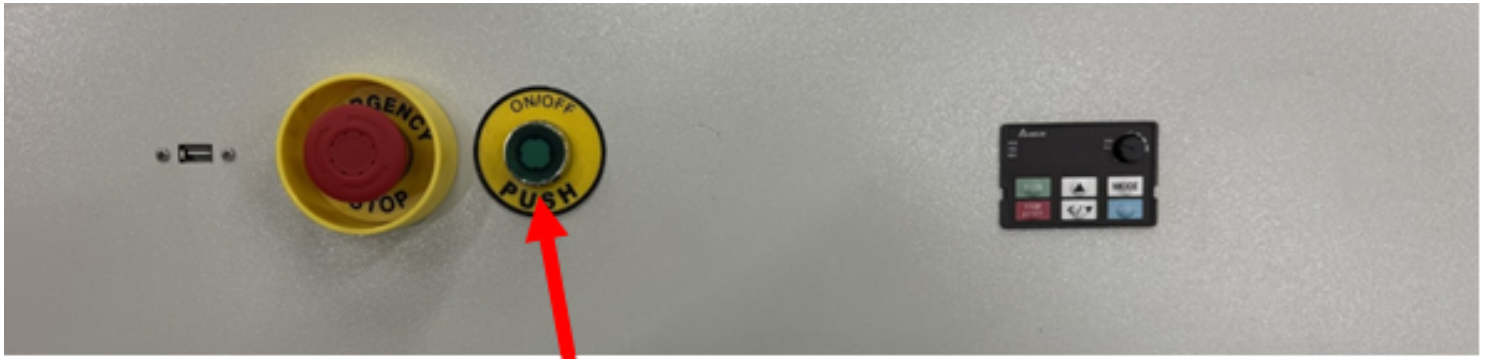
## 1. Powering on the Controller Cabinet

Before reading through this section, make sure that all safety, power, and air requirements have been met. For more information, please re-visit the safety, and power and air requirements sections of this manual.

2. Turn the power disconnect located on the front door of the controller cabinet to the ON position.



3. With the power disconnect in the on position, power is being distributed through the controller cabinet. Ensure all E-stop buttons are disengaged by rotating the buttons clockwise. Press the green power on button on the controller cabinet. The button will illuminate a green light, and the hand held controller will power on, and load.



**Press the power on button to turn the machine on**

When the system first powers on, the screen of the handheld controller will light up, and begin booting the system. This process takes about 30 seconds, and will proceed to the next prompt, asking to move back to the machine's reference position, or home position.

**Booting the system ...**

Once the system has booted, it will prompt the "Back to REF. Point?" message. This is indicating the machine would like to home itself or seek its limits before proceeding. This MUST be done during initial start-up. Failure to home the machine will prevent other operations from being ran.

**Back to REF.  
Point?**

**OK**

**ESC**

**4. When the machine prompts the “Back to REF Point?” message, press the OK button on the handheld controller.**

**a.** The machine will begin by moving its Z-axis to its highest or most positive position, then will follow with the X and the Y axes moving in unison to their most negative positions. When the machine completes homing, the spindle head should be positioned toward the front left-hand corner of the machine.

**b.** Once the homing process begins, the handheld screen should switch to its main coordinate display as shown below. If after homing, your handheld does not show all 0 values for X, Y, and Z, do not worry, this is normal. The coordinates being shown are work coordinates and are representing the distance the machine currently is from its last saved origin position.

<b>1X</b>	<b>0.000</b>	<b>Idle</b>
<b>1Y</b>	<b>0.000</b>	<b>SOff</b>
<b>1Z</b>	<b>0.000</b>	<b>Slow</b>
<b>Jog</b>		<b>100%</b>

**5. The start up and homing processes are complete. Continue to the next sections for further operating instructions.**

# MOTION CONTROL AND JOG MENU

THE LC SERIES HANDHELD CONTROLLER GIVES THE OPERATOR CONTINUOUS MOTION CONTROL OVER ITS 3 AXES AND ALLOWS OPERATORS TO EDIT THE SPEEDS AND DISTANCES THE MACHINE CAN TRAVEL. THIS SECTION COVERS THESE MOTION CONTROL FUNCTIONS AND HOW TO NAVIGATE TO THE JOG CONTROL MENU.

The LC Series machine is equipped with 3 independent axes, X, Y, and Z. As depicted in Fig. 11.1, the machine's X axis runs along the short length of the table, parallel with the gantry bridge. The Y-axis runs the longer length of the table, and the Z-axis drives the spindle motor up and down, perpendicular to the gantry bridge.

FIGURE 11.1

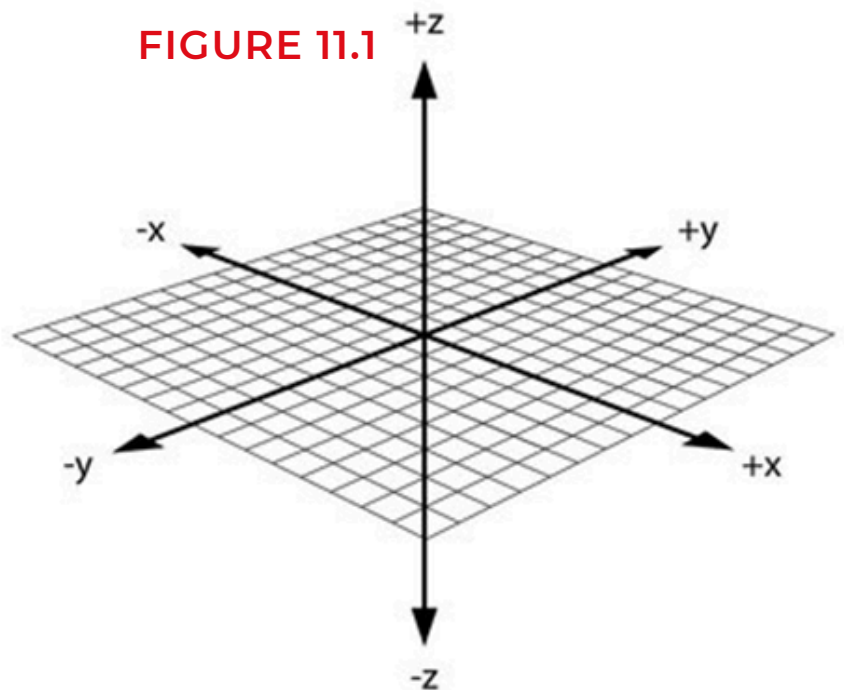
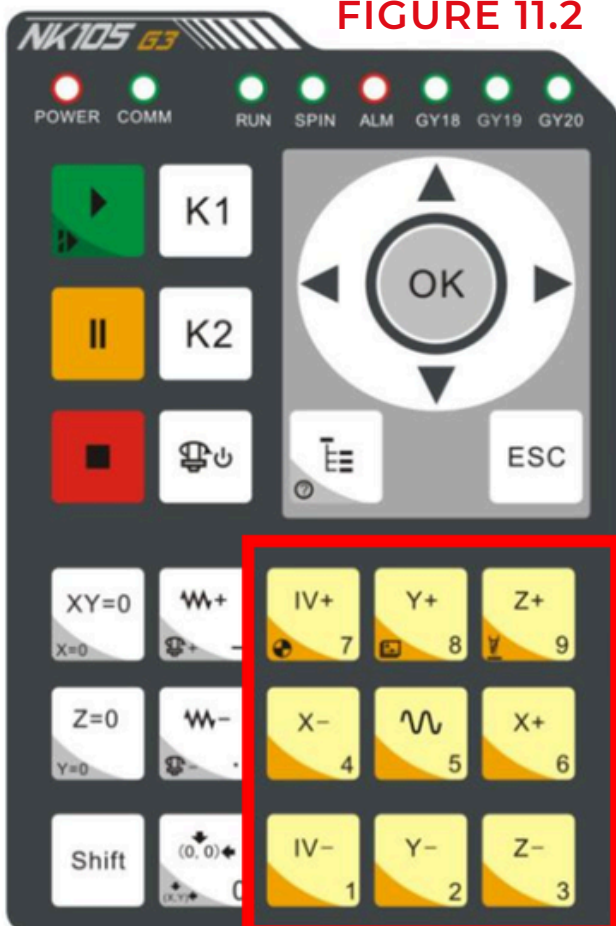


FIGURE 11.2



The handheld controller is color coded to make operations easier. All motion control keystrokes are colored in yellow as shown in Fig. 11.2. Each yellow button is labeled with an axis and a polarity. Select any of these labeled buttons and watch the machine move its corresponding axis in the commanded direction.

The #5 button on the keypad is labeled with a sin curve indicating a speed up or slowdown in axis feed. Toggle between High and Slow speed using this button.

# MOTION CONTROL AND JOG MENU

CONTINUED

When the machine is set in “Jog” mode, the operator can continuously move any of the three axes continuously and simultaneously, until the buttons are released.

FIGURE 11.3

1 X	0.000	Idle
1 Y	0.000	SOff
1 Z	0.000	Slow
<b>Jog</b>		<b>100%</b>



FIGURE 11.4

Use any of the directional keys shown in Fig. 11.4 to move the machine. The X-axis moves parallel with the gantry along the short length of the table, the Y-axis moves along the long length of the table, and the Z-axis moves the spindle up and down.

Use the SHIFT button to toggle between Jog mode and Stepping mode. Stepping mode is an incremental and precise move done by the CNC. By default, the step distance will be set to 0.005”. When the machine is in stepping mode, it will only move the set step distance for every pulse of the directional buttons.

1 X	0.000	Idle
1 Y	0.000	SOff
1 Z	0.000	High
<b>Stepping</b>		<b>100%</b>

FIGURE 11.5



FIGURE 11.6

Press the OK button on the handheld to access the jog and step menu of the controller as depicted in Fig. 11.6.

# MOTION CONTROL AND JOG MENU

CONTINUED

The Step and Jog menu allows you to adjust the slow and high jog speed of the machine as well as the incremental X, Y, and Z step distance.

Use the up and down arrow buttons on the handheld to navigate to a value that will be edited. Once highlighted, change the value, then press the OK button to save. If the value being applied is less than 1, a 0 will need to be input prior to the decimal.

Press the ESC button to exit the menu, back to the main control screen.

<b>MSpd</b>	<b>800/200</b>
<b>StepXY</b>	<b>0.005</b>
<b>Step Z</b>	<b>0.005</b>
<b>File</b>	<b>&lt;Techno CNC.nc&gt;</b>

FIGURE 11.7

**\*\*BE CAREFUL WHEN  
ADJUSTING THE STEP  
DISTANCE. IT IS ALWAYS  
ADVISED TO CHANGE THE  
STEP DISTANCE BACK TO  
0.005 AFTER ANY INITIAL  
CHANGE TO AVOID  
MISTAKES, OR CRASHES\*\***

# AUTOMATIC TOOL CHANGES & MEASUREMENTS

THE LC SERIES MACHINE IS EQUIPPED WITH A 12HP AUTOMATIC TOOL CHANGING SPINDLE. THIS ALLOWS USERS TO SET UP MULTI TOOL FILES AND RUN THEM AS A SINGLE FILE ON THEIR MACHINE. THE MACHINE EXECUTES EACH TOOL PATH AND WILL AUTOMATICALLY CHANGE ITS OWN TOOLS BASED ON TOOL NUMBERS SET IN THE G-CODE PROGRAM. EACH TOOL USED ON THE LC SERIES TOOL CHANGING RACK ALSO NEEDS TO BE MEASURED. THIS IS SO THAT THE MACHINE UNDERSTANDS HOW FAR EACH OF ITS TOOLS ARE STICKING OUT OF THE SPINDLE AND IS ABLE TO LOCATE ITS Z ZERO POSITION WITHOUT THE NEED TO RECALIBRATE IN BETWEEN. REVIEW THIS SECTION TO LEARN HOW TO USE THE AUTOMATIC TOOL CHANGER ON THE LC SERIES AND HOW THE MACHINE AUTOMATICALLY MEASURES THE TOOLS SET UP IN ITS TOOL CHANGING RACK.

## 1. Automatic Tool Change

Performing an automatic tool change with the LC Series machine is an easy task, but there are some things to take notice of before executing the function to avoid crashes and damage to the machine:

**FIGURE 12.1**

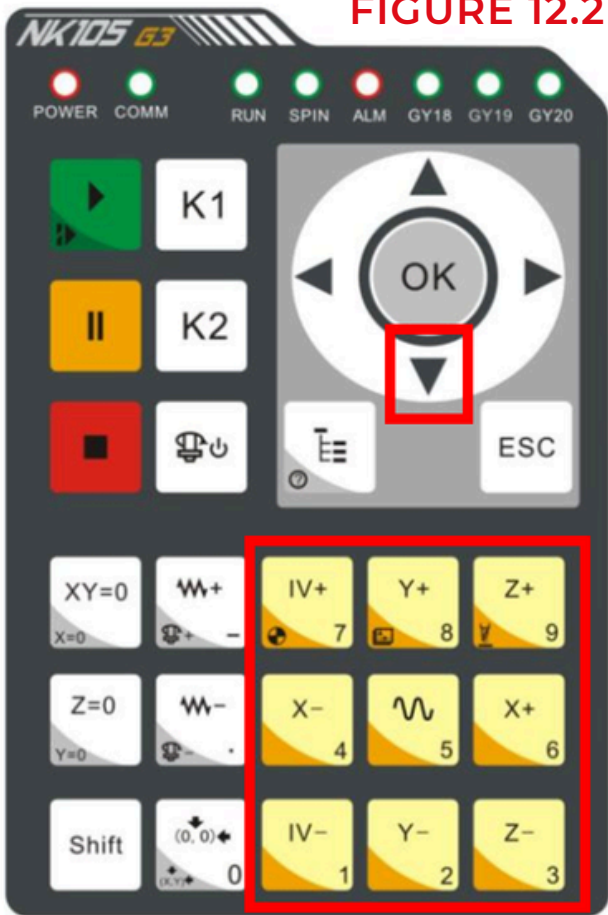
Before conducting a tool change, make sure a tool is first loaded into the spindle, and that the tool loaded is identified with the proper tool number. To check the current tool number, look in the bottom left corner of the control screen. Make sure that the number following the "T" is the correct tool number. This is the number of the tool slot that the machine will put its current tool away in, before proceeding to pick up the next tool.

1 X	0.000	Idle
1 Y	0.000	SOff
1 Z	0.000	Slow
Jog	T1	100%





**FIGURE 12.2**



To proceed with a tool change, press and hold the down arrow button on the handheld, then simultaneously, press the button number for the tool that will be picked up. For example: The spindle is currently holding tool #1, or T1. Tool number 1 at the back of the machine is empty, and the handheld controller is identifying T1 as the current tool number.

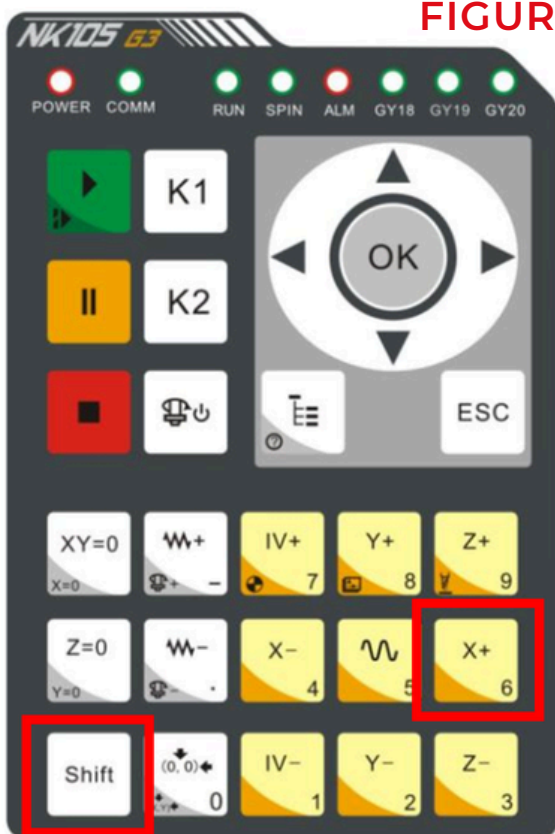
Next, the tool number, being changed to will be tool number 3. Press and hold the down arrow button, then select the #3 button, or Z- button on the handheld. The machine will then proceed to move towards the back of the machine, put tool #1 away in slot #1, then move over and pick up tool #3 from the tool change rack.

All ATC positions are pre-set by Techno CNC prior to delivery, so there is no need to perform any additional set up or set up tool stand positions. Techno CNC provides a state of the art machine, that is usable right out of the box. For more tech supplements on how to re-learn or set tool stand locations, please contact Techno CNC Systems' support department, or check out the LC Series section of the support website.

## 2. Tool Measurements:

After mastering the ability to conduct tool changes with the LC Series, it is time to move on to tool measurements. “Why do I need to measure tools?” you may ask yourself. The reason is simple:

When a zero position is established on the z-axis, the controller saves the z coordinate location for that surface, and references that coordinate while it is making depth cuts into the material. If a file uses two or more tools during the cutting operation, the tools that are used will not be protruding out of their tool holders the same distance, thus utilizing different z-axis coordinates to reach the zeroed surface. It is for this reason that tools **MUST** be measured. By measuring tools, the machine’s controller can calculate the correct z-axis coordinate to reach the material zero position as it transitions from one tool to the next.



**FIGURE 12.3**

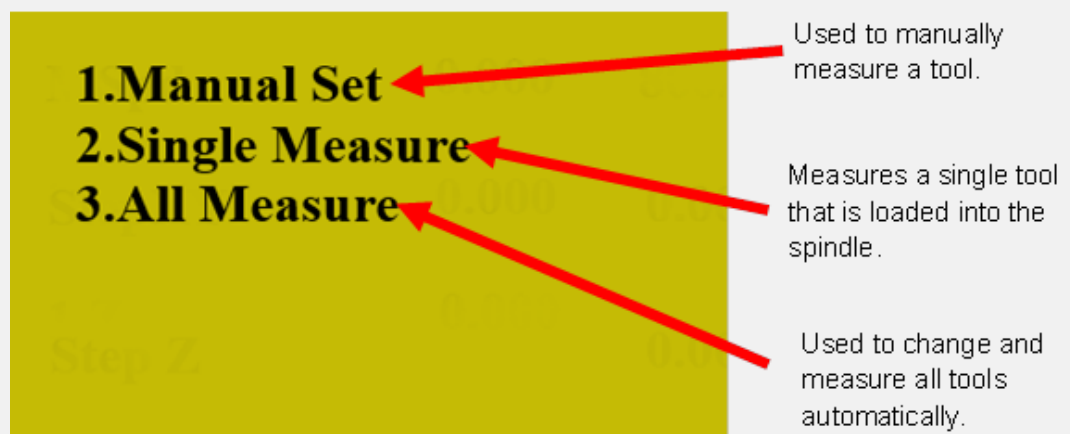
To enter the tool measurement menu, press and hold the shift button, then simultaneously press the #6, or X+ button on the handheld, shown in Fig. 12.3.

The following menu will appear, depicted in Fig. 12.4.

Highlight and select the “Single Measure” option. The machine will move up in the Z-axis, and rapid in X and Y to the touch probe located just behind the vacuum table, in front of the tool change rack. The Z-axis should then slowly descend in the negative direction, until the tool just touches the surface of the touch probe, followed by a rapid move in the Z+ direction, completing the measurement sequence.

Using the information provided in this section, you should now be capable of setting up the tool change rack with necessary tooling for the application.

**FIGURE 12.4**



Make sure to change to each tool, and measure them all prior to loading any jobs, or setting origin positions. Once all the tools have been measured proceed forward onto fixturing and establishing WCS locations to begin running cut files.

### 3. Manually Changing Tool Identity

Occasionally, the tool loaded into the spindle will not be identified correctly, where the tool number shown on the control screen does not match the empty tool slot at the back of the machine. When met with a small dilemma like this, there are two options:

1. Change the tool Identity on the controller
2. Re-arrange tools on the tool change rack

#### Changing the Tool Identity:

From the main screen of the handheld, select the menu button. Navigate to Operation Parameters, then Tool Change shown in Fig. 12.5 and 12.6.

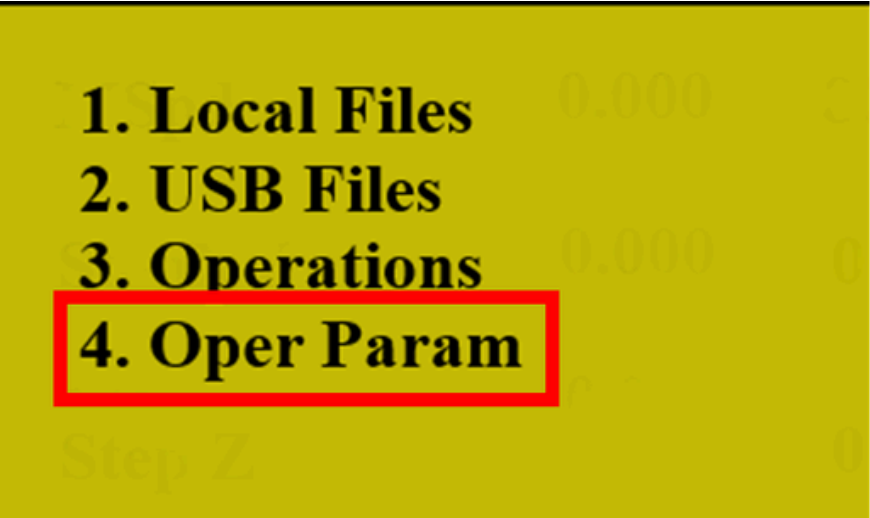
- 
1. Local Files
  2. USB Files
  3. Operations
  4. Oper Param

FIGURE 12.5

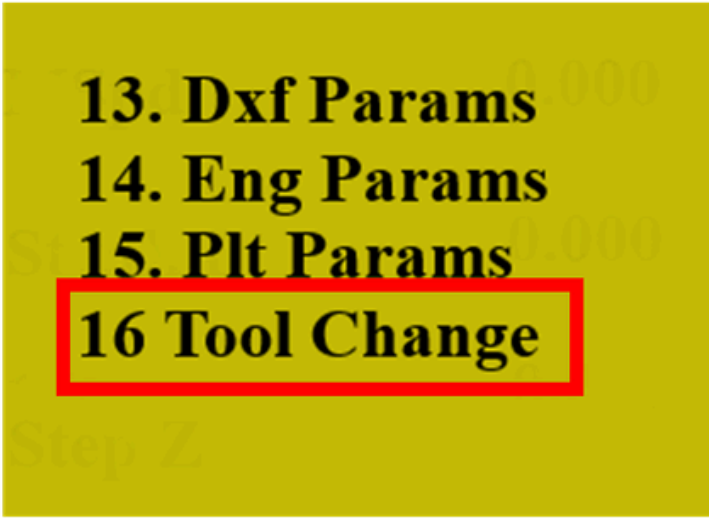
- 
13. Dxf Params
  14. Eng Params
  15. Plt Params
  - 16 Tool Change

FIGURE 12.6

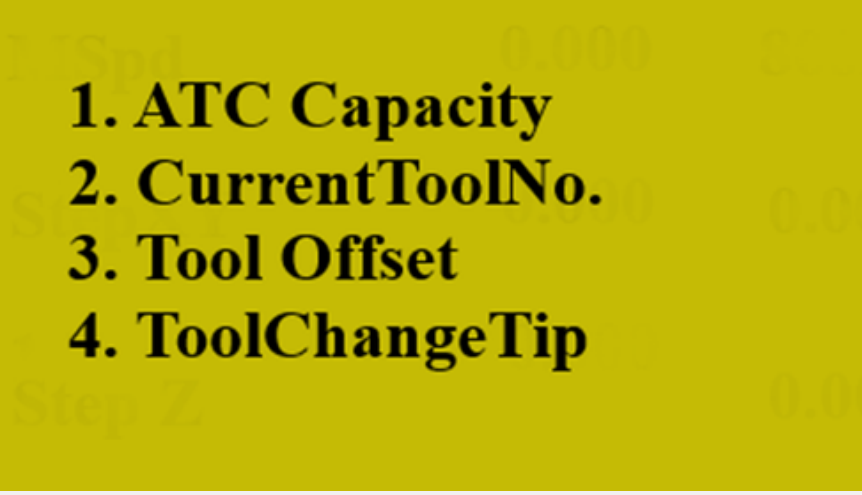
- 
1. ATC Capacity
  2. CurrentToolNo.
  3. Tool Offset
  4. ToolChangeTip

FIGURE 12.7

Fig. 12.7 represents the first four options of the tool change menu.

The #2 option, "CurrentToolNo." Represents the current tool identity in the spindle. Select this option to navigate to the next page, shown in Fig. 12.8.

**Spec.:**

**Set current tool No.**

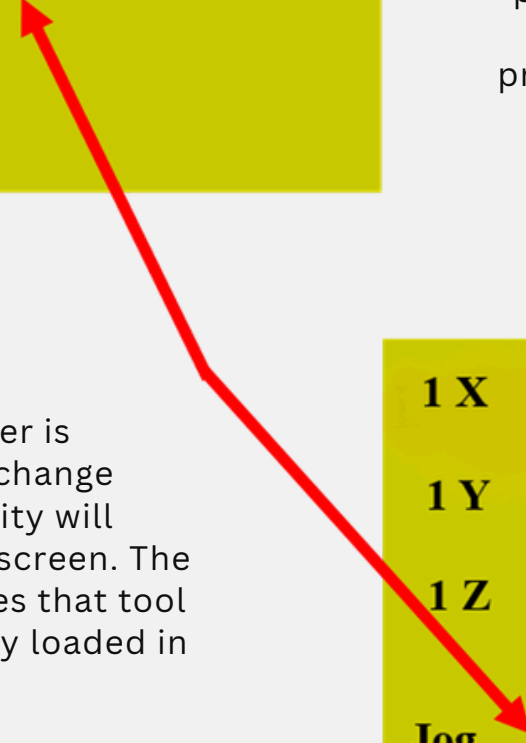
**Value:** 8

**Unit :**

To change the current tool ID, use the down arrow on the handheld until the Valuu option is highlighted. Type in the correct tool number and press the OK button twice. You will then be navigated back to the previous page. Press ESC to exit the menus.

**FIGURE 12.8**

When the tool number is changed in the tool change menu, the tool identity will change on the main screen. The machine now believes that tool number 8 is currently loaded in its spindle.



1 X	0.000	Idle
1 Y	0.000	SOff
1 Z	0.000	Slow
Jog	T8	100%

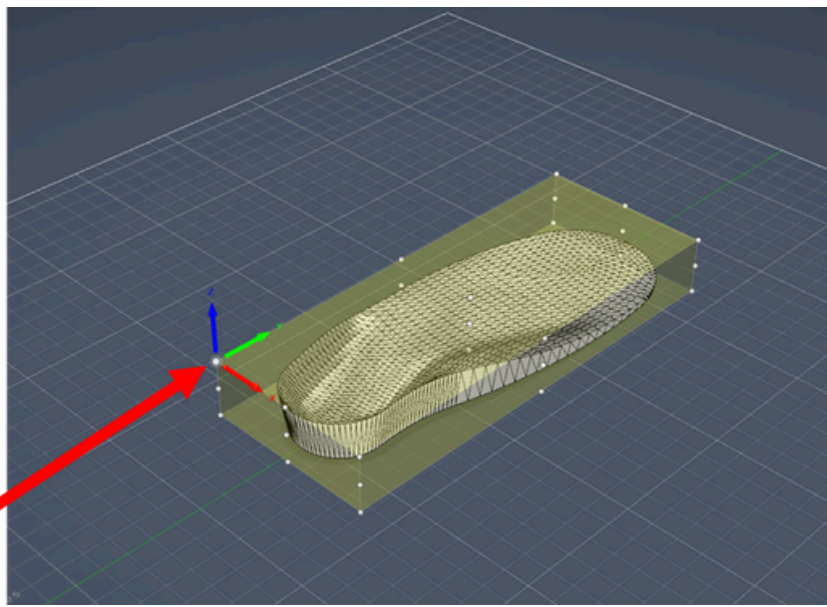
**FIGURE 12.9**

# SETTING A WCS ORIGIN

ALL MACHINES REQUIRE A SET ORIGIN, OR ZERO POSITION TO WORK FROM. THIS SECTION WILL COVER THE QUICK AND EASY METHODS FOR ESTABLISHING THESE ORIGIN POSITIONS AS WELL AS SETTING MULTIPLE WCS POSITIONS.

## 1. Setting an XY WCS Position:

Begin by locating the position on your substrate where your programmed WCS is located from your CAM software. Reference Fig 13.1 for an example of a WCS 0 position in CAM. In this example, the front left corner of the substrate will be used to set our XY0 position.



The position of the xy0 position

**FIGURE 13.1**



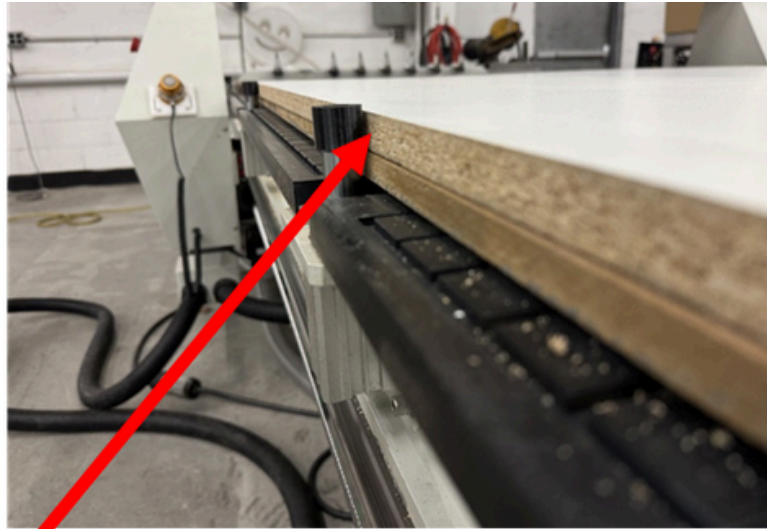
If a full or half sized sheet of material is being set up for a job, make sure to utilize the locating pins equipped with the LC Series machine (Shift+K2), to line up and square the sheet to the table. This is also very useful tool for ensuring that the sheets being cut on the machine are in the exact same position from job to job, minimizing the amount of set up required from sheet to sheet.

**FIGURE 13.2**

Raise Pins



**FIGURE 13.3**

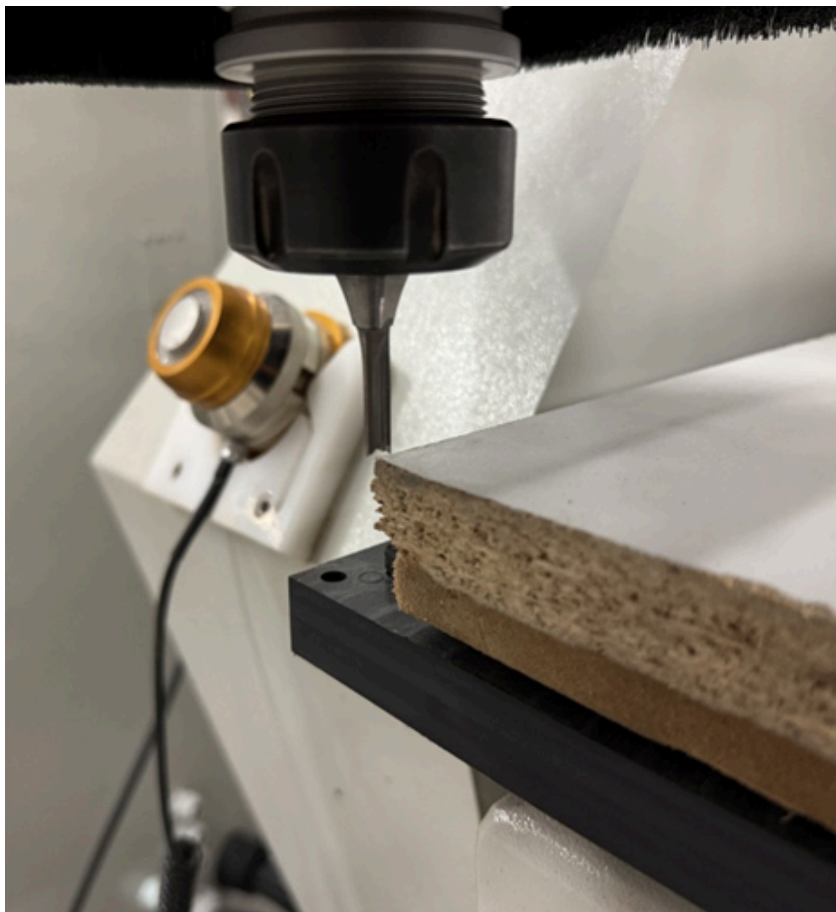


**FIGURE 13.4**


Push substrate up against alignment pins. Then select Shift+K2 to bring pins back down

Raise the dust hood on the spindle assembly by pressing the K2 button located at the top of the handheld.

Using the Jog and Step functions of the handheld, move the X and Y axes to the corner position of the material to be set as the zero position. Bring the z-axis down in the negative direction so it is easier to see where the tool is in reference to the edges of the board. With a tool in the spindle, try to position each axis, so that half the cutter is hovering over the material, and that half is not. This will ensure that the center of the tool is set on the corner of the material depicted in Fig. 13.5



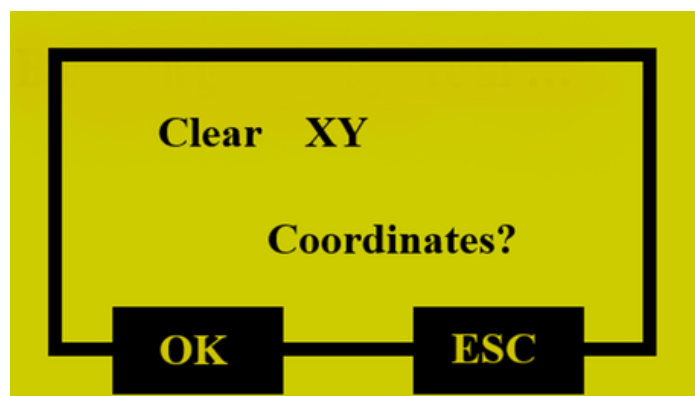
**FIGURE 13.5**

Select the  button on the handheld. A Clear XY Coordinates indicator will appear. Press the OK button, and the X and Y axes will be zeroed out on the handheld screen.

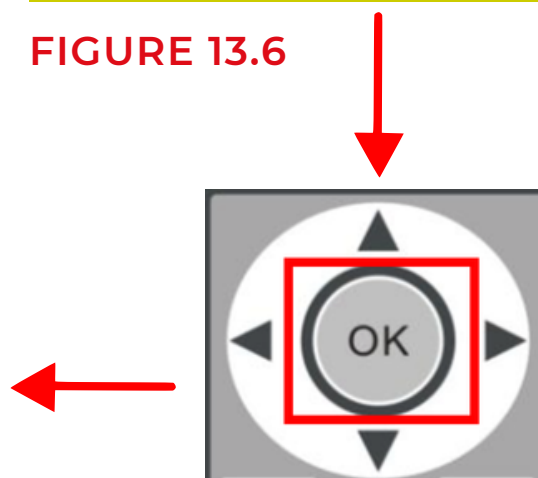
Which ever position the machine is in when the XY=0 button is pressed will be where its new zero position is set. Be sure to have the tool in the correct location before proceeding with pressing this button.

**FIGURE 13.8**

<b>1 X</b>	<b>0.000</b>	<b>Idle</b>
<b>1 Y</b>	<b>0.000</b>	<b>SOff</b>
<b>1Z</b>	<b>-9.239</b>	<b>Slow</b>
<b>Jog T2</b>		<b>100%</b>



**FIGURE 13.6**



**FIGURE 13.7**

## 2. Automatically Setting the Z WCS:

Before setting an origin position for the Z-axis, it is important to ensure that the material, or the zeroed surface is at its lowest position, or the same position it will be in during the machining process. Power on the vacuum pump connected to the machine's vacuum table and open the appropriate zones to the table, drawing your waste board and material down to the vacuum table surface.

FIGURE 13.9



Vacuum Pump ON

Vacuum Zones Open

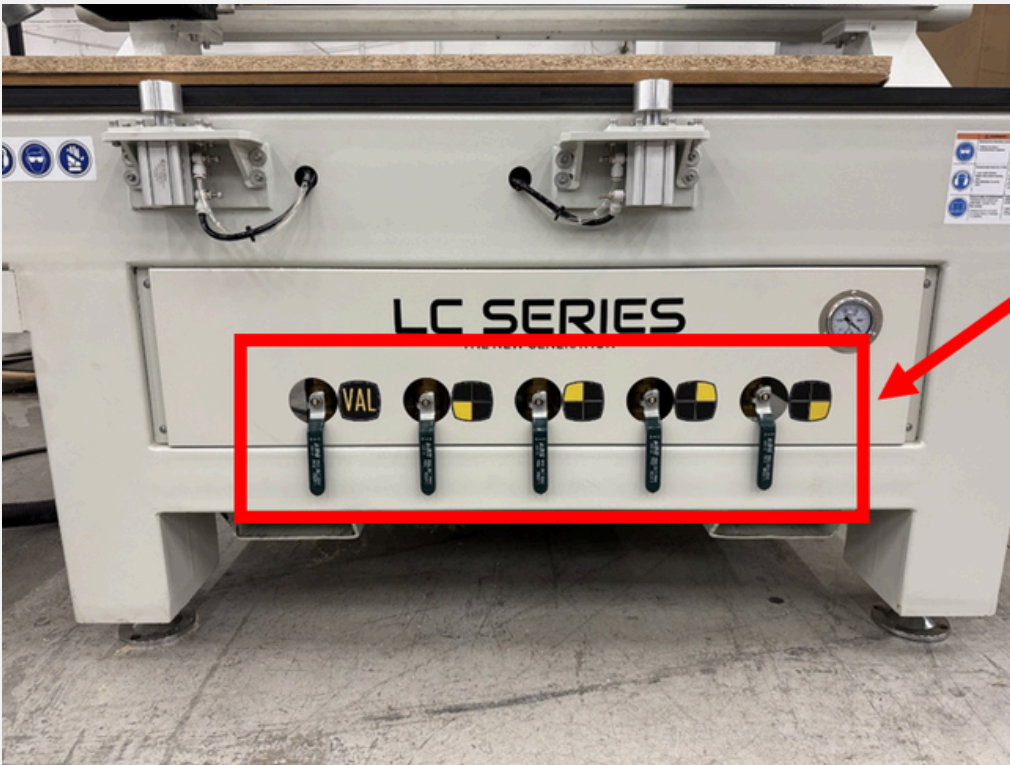
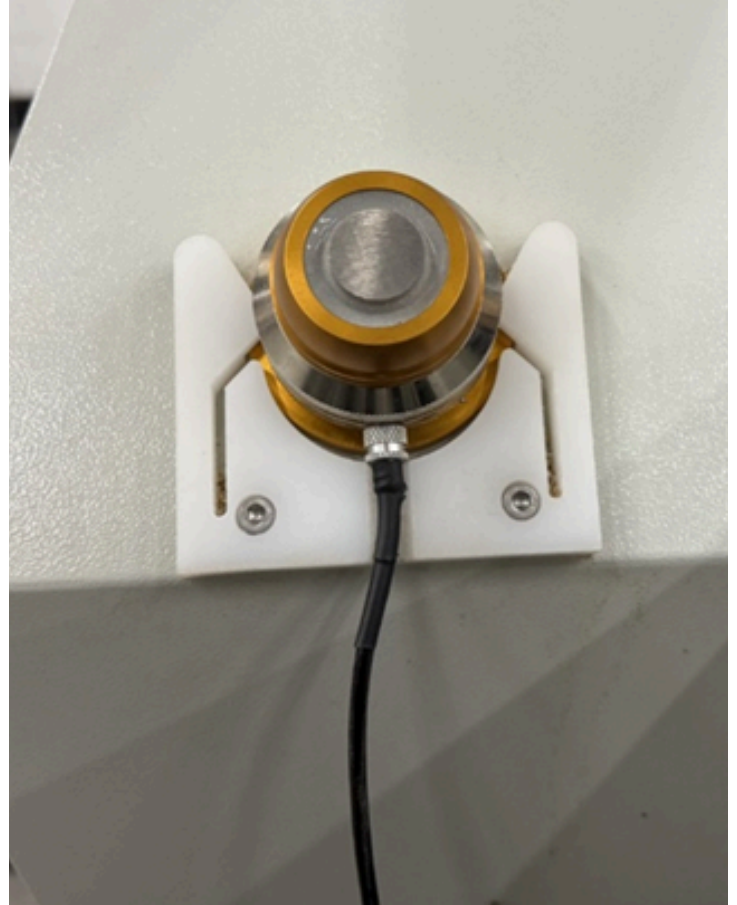


FIGURE 13.10

# SETTING A WCS ORIGIN CONTINUED

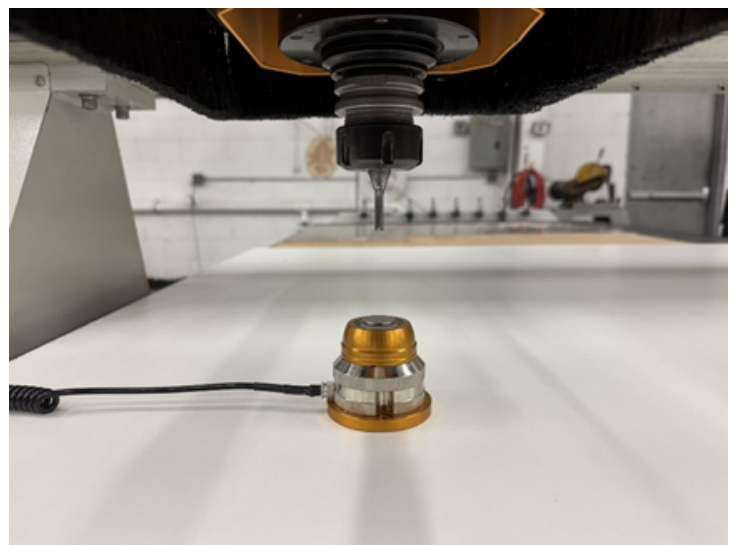
With the material being held down, place the Z0 touchpad onto the surface to be made the origin and bring the spindle head over to the same location so that the tool is hovering about 2 inches above the touch pad as shown in Fig. 13.12.



**FIGURE 13.11**



With the tool hovering above the touch pad, use the button combination, SHIFT + Z+ to begin the auto Z0 process. The z-axis will slowly descend until it touches the top surface of the touch pad. It will then raise up about 2 inches and then lower the dust hood. The Z-axis coordinates on the handheld should be positive, representing the Z-axis' current distance from its new WCS position.



**FIGURE 13.12**

# SETTING A WCS ORIGIN *CONTINUED*

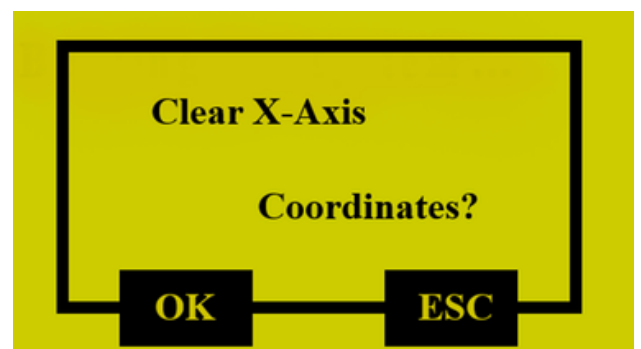
In the first part of this chapter, both the X and Y axes needed to be placed at its origin location before selecting the XY=0 option. The Z-axis was also set using a touch pad. The handheld controller that is equipped on the LC Series is also capable of setting each of these positions individually, and without the need for a touch pad. This process is not required, but rather an overview of the useful capabilities of the LC controls.

To set the X-axis origin, move the x-axis along a parts edge as shown in Fig. 13.13. On the handheld, use the shift combination, SHIFT + XY=0. An indicator will appear asking if the operator would like to clear the X-axis. Select OK on the handheld. The main operations screen will reappear with the X-axis coordinates showing 0.000.

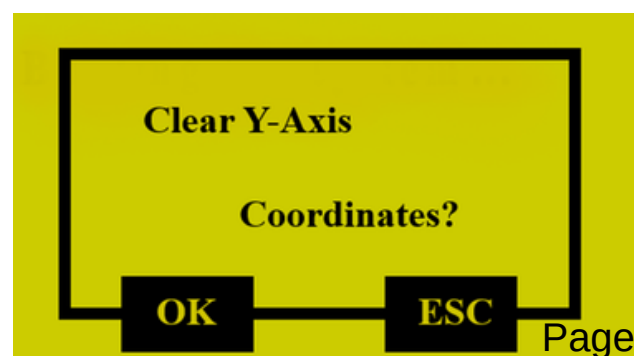


**FIGURE 13.13**

The process is similar for the Y-axis. When the machine is in the desired location in the y-axis, use the Shift combination, SHIFT + Z=0. The same indicator will appear asking the operator if they would like to clear the Y-axis coordinates. Selecting OK will navigate the operator to the main screen, showing 0.000 for the Y-axis coordinates

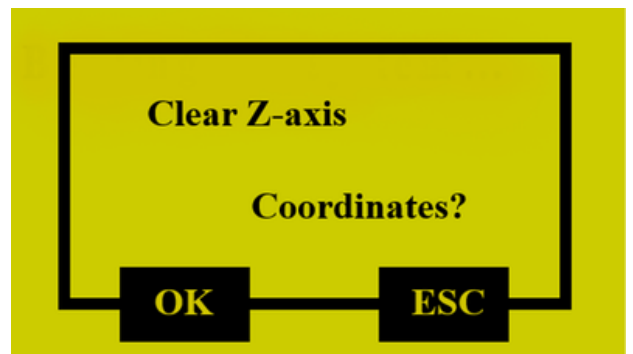


**FIGURE 13.14**



**FIGURE 13.15**

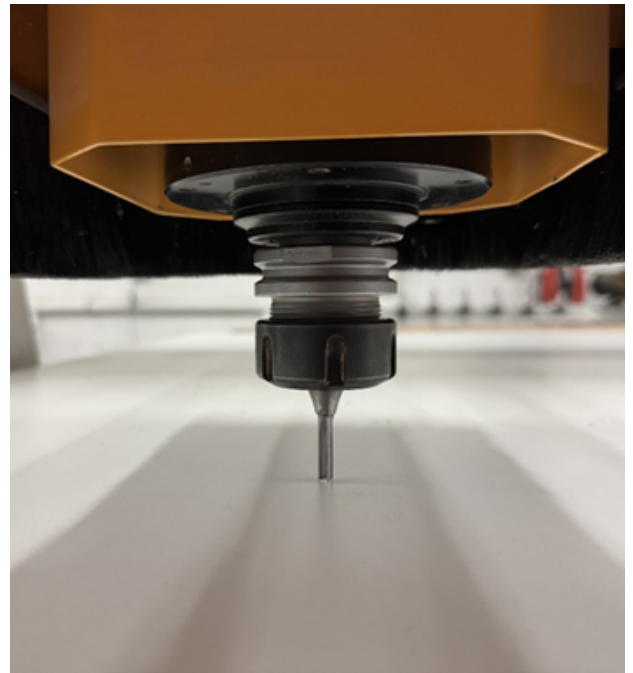
When setting the z-axis coordinate manually, the same conditions must be met as discussed previously when using the touch pad to set a Z0; the vacuum pump should be powered on, and the appropriate zones to the vacuum table should be open.



**FIGURE 13.16**

When these conditions are met, slowly and carefully, jog and step the Z-axis down to the desired Z0 surface as shown in Fig. 13.17.

When manually setting the Z-axis, it is useful to use a piece of paper while stepping the tool down. Once the paper is unable to move underneath the cutting tool, back the axis off until the paper is just free again, then back down one more step to ensure the tool is on top of the surface. Select the Z=0 button. The indicator shown in Fig. 13.16 will appear. Pressing OK will bring the main screen back into frame, showing 0.000 for the Z-axis coordinate.



**FIGURE 13.17**

#### **4. Setting Up Multiple WCS Positions:**

The LC Series handheld controller can set multiple origin positions and call on them manually through the controller, or within the g-code file being executed. The number of WCS positions available to save is limited to 5 positions. This capability gives users the flexibility to set up multiple fixtures on their table without losing other WCS locations that are used daily. This part of the manual will review activating and setting multiple work coordinate settings as well as their corresponding G code commands.

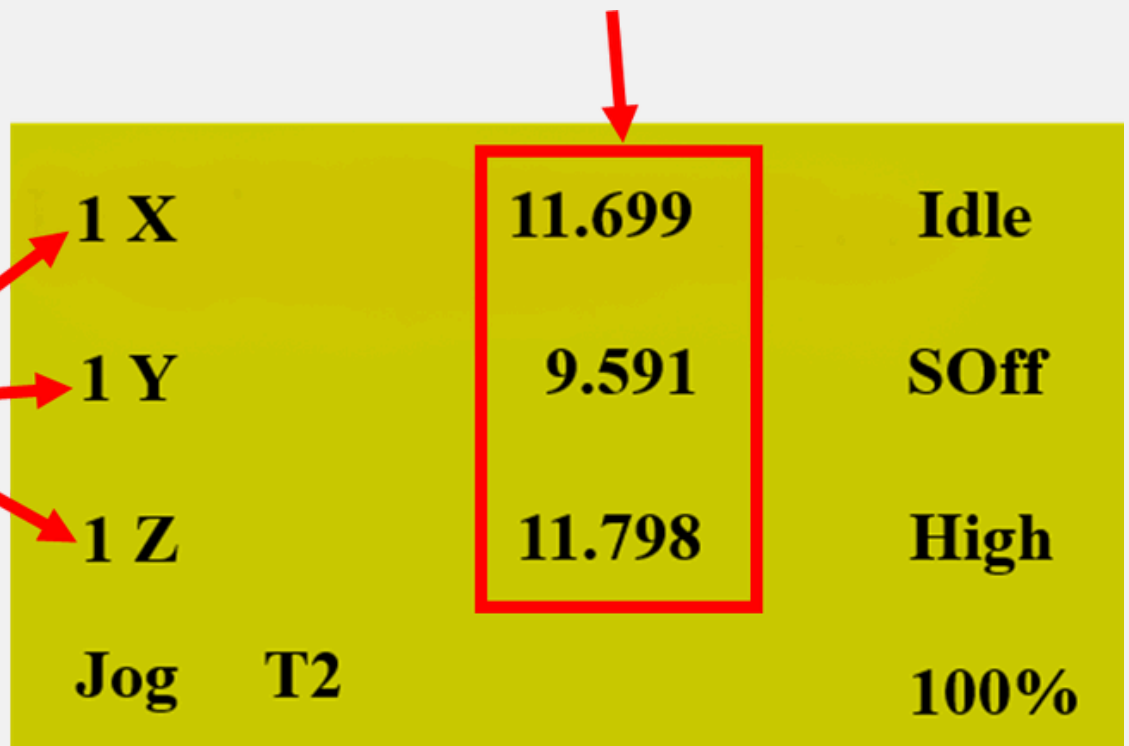
To begin, we'll discuss the numbered labels in front of each axis display on the main screen of the handheld.

The #1 that has been displayed throughout this manual, represents the first WCS position and the coordinates displayed on these axes represent the distance the machine is from the current WCS position. Reference Fig. 13.18 for a visual of the explanation

The coordinates corresponding to each WCS location represent the distance in the positive or negative direction the machine is currently sitting, relative to the WCS zero.

*For example,* using the coordinates provided in Fig. 13.18, the position of the machine in the X-axis is positive 11.699, meaning the machine is 11.699 inches from its WCS zero position. The x-axis would need to move -11.699 inches to reach its WCS location.

The number 1 represents the first of 5, WCS positions. Each number is also represented by a G code command that calls on the WCS location. #1 - #5 are represented by G54 - G59.

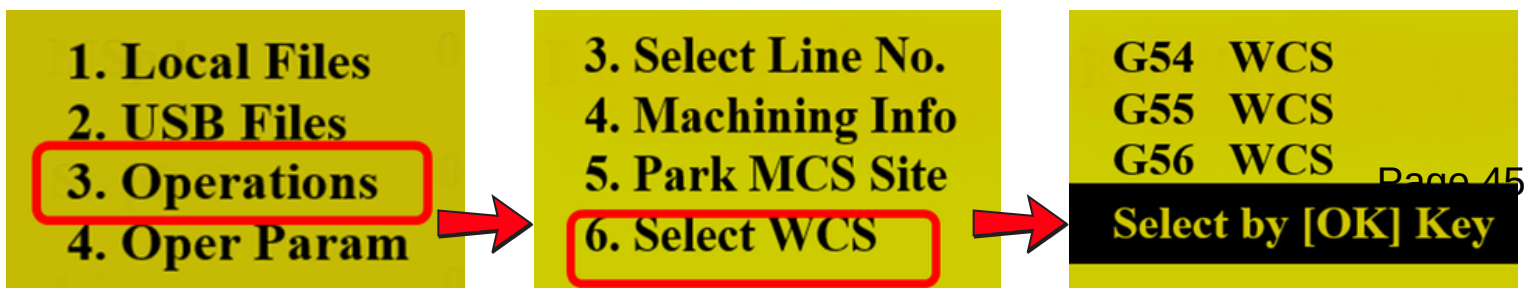


**FIGURE 13.18**

To set zero positions for multiple WCS positions, first, the correct WCS coordinate system must be active on the controller.

Thus far, all examples shown have been utilizing the G54 WCS, or the #1 WCS on the handheld. To switch between G54, and other WCS coordinates, the user must navigate through the handheld menu and activate each.

**To activate a new WCS coordinate system, go to Menu à Operations à Select WCS.**



### G54:

1 X	0.000	Idle
1 Y	0.000	SOff
1 Z	0.000	Slow
Jog T8		100%

Fig. 13.22

### G57:

4 X	0.000	Idle
4 Y	0.000	SOff
4 Z	0.000	Slow
Jog T8		100%

Fig. 13.25

### G55:

2 X	0.000	Idle
2 Y	0.000	SOff
2 Z	0.000	Slow
Jog T8		100%

Fig. 13.23

### G58:

5 X	0.000	Idle
5 Y	0.000	SOff
5 Z	0.000	Slow
Jog T8		100%

Fig 13.25

### G56:

3 X	0.000	Idle
3 Y	0.000	SOff
3 Z	0.000	Slow
Jog T8		100%

### G59:

6 X	0.000	Idle
6 Y	0.000	SOff
6 Z	0.000	Slow
Jog T8		100%

Fig 13.26

# LOADING A G-CODE FILE

WITH ALL OF THE MACHINE SET UP TAKEN CARE OF, IT IS SAFE TO LOAD A PROGRAMMED G-CODE FILE AND RUN IT ON THE LC SERIES MACHINE. IF YOU DO NOT HAVE PROGRAMMING SOFTWARE OR WOULD LIKE TO INQUIRE ABOUT THE PACKAGES THAT TECHNO CNC OFFERS, PLEASE CALL THE MAIN OFFICE FOR MORE INFORMATION AND FORMAL PRICING. CONTINUE READING FOR MORE INSTRUCTIONS ABOUT LOADING AND EXECUTING PROGRAMMED FILES.



FIGURE 14.1

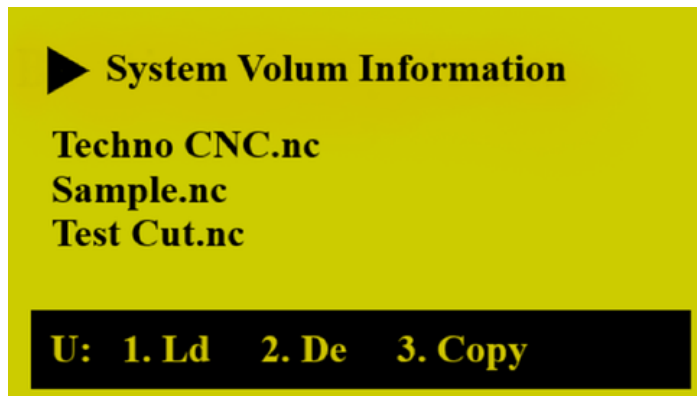
Begin by inserting the USB drive into the machine controller cabinet. Make sure that the programmed g-code file is saved onto this USB. After several moments, an indication screen will appear on the handheld as shown in Fig. 14.2. Select OK on the handheld to enter the USB.



FIGURE 14.2

After entering the USB drive from the controller, a list of loaded g-code files will be displayed as depicted in Fig. 14.3.

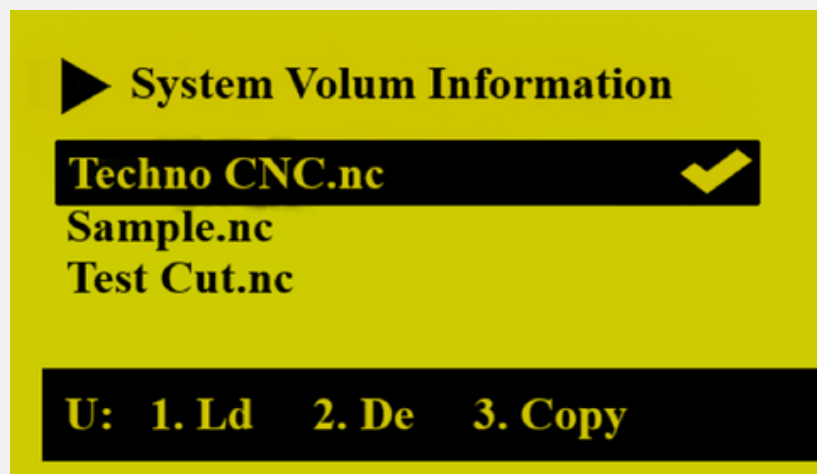
**NOTE:** at least one g-code file must be saved to the main directory of the USB. Other sub folders can be included and accessed, but only as long as the controller sees at least one g-code file from the main directory of the USB. Failure to include this will prompt a “process file not found” error. See the tech support supplement of the manual for more information.




**FIGURE 14.3**

To load a file, use the up and down arrows on the handheld controller to highlight the desired g-code file for machining. Once highlighted, select OK on the handheld.

A check mark will appear to the right of the file name, indicating the part program has been selected. Once selected, there are 3 options available: Load, Delete, and Copy. You cannot delete files from your USB through the controller. Only locally saved, or “Copied” files can be deleted. Whenever a file is loaded from a USB, always press the #1 button, or IV- button on the handheld. Once loaded, the controller will navigate back to the main screen and wait for the next command.



**FIGURE 14.4**

After completing the file loading process, it is time to execute the file. Press the green  button or start button on the handheld. The machine will begin by moving to its highest z position, and either conduct a tool change if the tool loaded is not the first commanded tool in the file or start the spindle to the programmed spindle speed and begin the cutting tool path.

# ADVANCED CONTROLS

THUS FAR, YOU HAVE BEEN GIVEN THE TOOLS AND INSTRUCTIONS FOR SETTING UP AND RUNNING JOBS ON YOUR LC SERIES MACHINES. THIS SECTION WILL COVER SOME “EXTRAS” THAT THE MACHINE’S CONTROLS ARE EQUIPPED WITH. REVIEW THIS PART OF THE MANUAL FOR A MORE IN-DEPTH UNDERSTANDING OF THE CNC CONTROLLER AND THE VARIOUS FUNCTIONS THAT IT OFFERS.

## File Skipping:

The controller on the LC Series machine can look ahead and skip portions of a file when desired. It is also capable of picking back up where it left off, or resuming, after it has been stopped mid cycle.

Whether you are skipping ahead in a file, or picking back up where you left off, the procedure will be the same.

To begin, make sure that the file is loaded onto the controller. If the file is being resumed, do not power down or load a different file onto the machine.

On the handheld, select the



Operations



Select Line No.

1. Local Files
2. USB Files
3. Operations
4. Oper Param

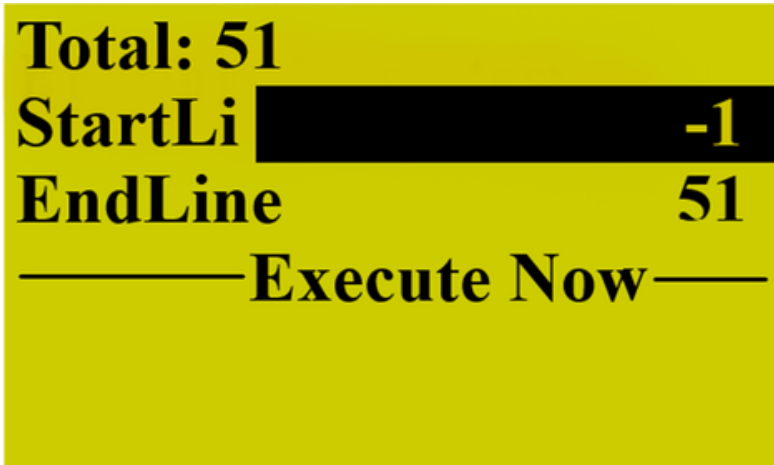
FIGURE 15.1

1. Back REF Point
2. Prog Wizard
3. Select Line No.
4. Machining Info

FIGURE 15.2  
Page 49

When time comes to resume the file, begin by loading the file onto the controller after the machine has been homed. Proceed by navigating to the Select Line No. option and highlight the start line variable. Input the recorded line number, press OK, then scroll down and select Execute now.

The machine will proceed to start the spindle, move to its cut position at the commanded line number, and descend in the z-axis to resume the cut.



In this menu, depicted in Fig 15.3, you will notice a start line and an end line.

If the file was stopped prior, the start line will be filled in with the last line number that was executed before the machine was stopped. If not, the start line should read 0 or -1.

**FIGURE 15.3**

In this menu, depicted in Fig 15.3, you will notice a start line and an end line. If the file was stopped prior, the start line will be filled in with the last line number that was executed before the machine was stopped. If not, the start line should read 0 or -1.

The end line should match the same number as the “Total” variable. When a file is being resumed, the start line will automatically be filled in with the last line number of the file that was executed. No change needs to be made to the start line. Use the down arrow to highlight the “Execute Now” option at the bottom. Select execute now using the OK button on the handheld.

The machine will automatically navigate to the main screen of the controller, start the spindle, and move the machine to the first XY cut position before descending in the Z and resuming its cut.

In some cases, the machine needs to be shut down prior to completing a file and resumed at a later time. To resume a file, or skip ahead in a file, prior to shutting down the machine, take note of the “Start Line” after stopping a cut file.

## Saving a File Locally

Files that are used often on the LC Series machine can be saved locally so they do not have to always be loaded from a USB drive. By saving files locally, an operator allows themselves to easily load and run a file at any time, with or without a USB.

All locally saved files start on a USB and are plugged into the machine. After selecting a file on the USB, instead of using the #1 button to load the file, use the #3 button to “Copy” the file.

Once the file is copied, the file can then be accessed from the “Local Files” option in the controller’s menu.

The same is true for copying over files locally to a USB. In the Local Files option, select the desired file, and use the #3 button to copy the file over to a USB that is connected to the machine.

1. Local Files
2. USB Files
3. Operations
4. Oper Param

FIGURE 15.4

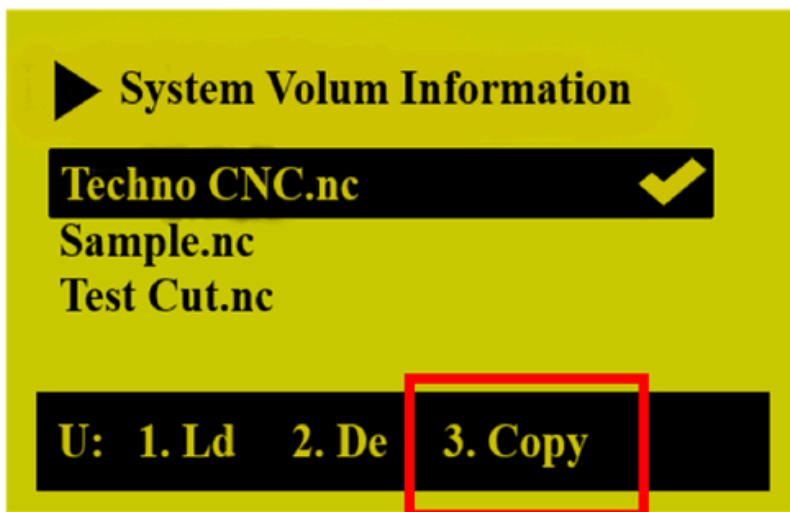


FIGURE 15.5

# ERROR MESSAGES & TROUBLESHOOTING

THIS SECTION WILL COVER SEVERAL ERROR MESSAGES THAT MAY BE EXPERIENCED AND HOW TO TROUBLESHOOT THEM. USE THIS CHART TO COME UP WITH A SOLUTION TO ANY ISSUES THAT MAY BE OCCURRING ON THE MACHINE. FOR MORE TECHNICAL SUPPORT, PLEASE SEE THE TECHNICAL SUPPORT SECTION OF THE MANUAL.

<b>PROBLEM:</b>	<b>SOLUTION:</b>
Air Alarm	<ul style="list-style-type: none"> <li>• Check that air is connected to back of machine.</li> <li>• Check that regulator is set to 90 PSI</li> <li>• Identify electronic regulator and with the machine powered off, jump the connection on the regulator. Turn the machine back on and see if the error is cleared. If it does, replace the electronic regulator.</li> </ul>
NC File Running Error	<ul style="list-style-type: none"> <li>• There is something wrong with the format or the code included with a g-code file.</li> <li>• Check programmed feed rates to make sure files are using inches/min units. Make sure feed rate does not exceed 800 inches/min</li> </ul>
Soft Limit Error	<ul style="list-style-type: none"> <li>• An indication the machine is at the end of travel in either the X, Y, or Z axis.</li> </ul>
The Spindle does not turn on when executing a programmed file	<ul style="list-style-type: none"> <li>• Check that the spindle can turn on/off manually from the handheld controller. If not, check if there are any error codes appearing on VFD display. Call technical support with error code.</li> <li>• Check programmed file for M3 commands. If there are none, then there is no command to turn the spindle on. Check the programmed spindle speed is within the machine's range. Spindle speed range is 6,000 RPM – 24,000 RPM</li> </ul>

One or more of the axes are not moving.  
The coordinates on the handheld change,  
but the machine does not move.

- Start by powering down the machine for 30 seconds, then restarting. Try to home the machine. If there is still no movement, press the red stop button to stop the homing cycle.
- Open the back door of the control cabinet and identify the servo drives inside the cabinet. If there are any with error codes being displayed, take a photo of the error and share it with [support@technocnc.com](mailto:support@technocnc.com)
- If there are no errors, check that there are lights illuminated on each drive, indicating they are powered on.
- If one or more of the drives do not have power, measure AC power at the terminal bridge, towards the bottom of the cabinet. High voltage lines should be labeled L13, L23, L33 (Same labels as are on the incoming power wires to the drive).
- If there is no voltage measured on the bridge, check continuity for the 3 power fuses on the front side of the cabinet. Wire labels should match labels on the terminal bridge. Replace fuses as needed.

When powering on the machine; Limit Release Error appears and navigates to the main screen of the controller without prompting a Back to REF Point message.

- The machine was powered on while a limit switch had been sitting on its limit, immediately enabling the limit switch.
- Identify the axis prompting the limit release error.
- Shut down the machine and physically push the axis off of its limit. This may require more than one person to accomplish. This process will not work for the z-axis.
- Switch the polarity of the limit through the controller, allowing the operator to manually jog the axis off its limit. To access the I/O menu, go to menu à Diagnosis à Port List. Once the machine is off its limit, it will again prompt a limit release error. Switch the input back to its original polarity state and exit to the main screen. All errors should be clear, and motion control should be re-established.

**INPUTS FOR AXIS LIMITS:**

GX06: Y-axis Neg. Limit

GX05: Y-axis Pos. Limit

GX02: X-axis Pos. Limit

GX03: X-axis Neg. Limit

GX08: Z-axis Pos. Limit

<p>Clamp Signal Not Detected; during an auto tool change sequence</p>	<ul style="list-style-type: none"> <li>• The spindle does not see that there is a tool in the spindle.</li> <li>• Check that the pull stud at the top of the tool holder is tight and now loose. A loose pull stud will change the position of the tool holder in the spindle and not prompt the necessary input to complete a tool change.</li> <li>• Check that there is no build up of rust forming on the tool holder. If there is, use scotch Brite to polish tool.</li> <li>• Replace the 24V relay in the back of the cabinet labeled KA8.</li> <li>• Replace the 24V relay in the back of the cabinet labeled KA7.</li> </ul>
<p>“Process File Not Found” When loading a usb drive onto the controller</p>	<ul style="list-style-type: none"> <li>• The machine recognizes the usb that is plugged in, but it does not see any g-code files contained within. Check that the files saved to the drive are g-code files.</li> <li>• If only sub folders are saved onto the drive, at least one g-code file needs to be saved to the main directory.</li> </ul>
<p>Udisk Not Found</p>	<ul style="list-style-type: none"> <li>• The controller does not see a USB drive being connected.</li> <li>• Try using a different USB loaded with programmed files to see if it is recognized.</li> <li>• Re-format the USB drive with all default settings.</li> <li>• Plug the USB directly into the CNC controller located inside the back of the control cabinet. If the USB is still not recognized, the controller needs to be replaced.</li> <li>• If the USB is recognized when plugged into the controller, the USB extension cord needs to be replaced.</li> <li>• For replacement parts, visit <a href="http://technocncshop.com">technocncshop.com</a></li> </ul>

## TECHNO CNC SYSTEMS LIMITED WARRANTY & COVERAGE

### Limited Warranty on Techno Brand Products

Subject to the terms and conditions set forth in this warranty document, Techno CNC Systems LLC (“Techno”) warrants its Techno brand products (“Product” or “Products”) to the original purchaser for a period of one (1) year against defects in material and workmanship under normal use and conditions (“Product Limited Warranty”). The Product Limited Warranty commences on the date of Product shipment from Techno facilities and expires one (1) year from the ship date (“Product Warranty Period”).

Spare or replacement parts (“Part” or “Parts”) for Techno Products are warranted to the original purchaser for a period of ninety (90) days against defects in material and workmanship under normal use and conditions (“Parts Limited Warranty”). A Parts Limited Warranty commences on the date of a Part shipment from Techno facilities and expires ninety (90) day from the ship date (“Parts Warranty Period”).

A Product Limited Warranty may be validly transferred to one additional party by the original purchaser provided that a reregistration fee is paid to Techno within seven (7) days of transfer of the Product and prior to the expiration of the Warranty Period. Reregistration of any Product warranty does not extend the Warranty Period. A Parts Warranty is not transferable.

Product Limited Warranty and Parts Limited Warranty are hereinafter referred to collectively as “Limited Warranty.” Product Warranty Period and Parts Warranty Period are hereinafter referred to collectively as “Warranty Period.”

### What Is Covered Under the Limited Warranty

During the Warranty Period, Products and Parts that Techno deems validly subject to a warranty claim will be repaired or replaced, in Techno’s sole discretion, without charge. Repaired items may include new or refurbished replacement parts. Replaced items may be new or may be manufactured from serviceable used parts. Items that have been repaired and/or replaced will be warranted only for the unexpired portion of the applicable Warranty Period to the original purchaser.

As a condition to this Limited Warranty, customers shall have read the operator’s manual and registered the Product or Part with Techno within 30 days of purchase.

### What Is Not Covered Under the Limited Warranty

Events that are not covered under this Limited Warranty include:

- \* Product/Part damage resulting from third-party parts, accessories or systems connected to or used in conjunction with the Product/Part that have adversely affected its operation, performance or durability.
- \* Product/Part damage caused by normal wear, accidents, improper maintenance, improper use or abuse, alterations, or failure to follow operation and maintenance instructions contained in the operator’s manual.
- \* Products/Parts purchased from any supplier, distributor or dealer not authorized by Techno.
- \* Labor costs including, but not limited to, such costs as the removal and reinstallation of a component or assembly.
- \* Insurance and packing costs for a defective items returned to Techno by the customer.
- \* Product/Part damage caused by electrical surges, improper venting, flooding, fire, freezing, corrosive atmospheric elements, abnormal external temperature, or any event of force majeure such as riot or act of war.
- \* Noise or vibration unless it is the result of defective material or workmanship of the Product/Part.
- \* Claims of defective Products or Parts not made in conformance with Techno’s return policy as set forth below.
- \* Transport costs for defective items that require more than one (1) shipping to remedy a claimed defect.



\* Claims for personal injuries, incidental or consequential damages, or economic loss (profit or revenue), however caused. i.e. any other incidental, consequential, indirect, special and/or punitive damages, whether based on contract, warranty, tort (including, but not limited to, strict liability or negligence), patent infringement, or otherwise, even if advised of the possibility of such damages. Some states do not allow the exclusion or limitation of certain damages, so the above exclusion or limitation may not apply to a particular customer depending on location.

\* Claims for Product components or Parts that are warranted separately by their respective manufacturer. Available warranties covering those components are furnished with each Product and Part. Techno CNC Systems does not assume any warranty obligation or liability for components covered exclusively by the stated warranty of a component's respective manufacturer(s).

Techno's Limited Warranty shall be void in the event of an occurrence of any of the following:

- \* Failure by the Original Purchaser to register the Product within thirty (30) days of its purchase.
- \* Where applicable, failure to validly reregister the Product within seven (7) days of transfer of the Product and prior to the expiration of the Warranty Period.
- \* Improper installation of the Product, including but not limited to, installation in violation of applicable rules, laws or building codes, and installation for non- recommended uses.
- \* Accident, abuse or misuse of the Product.
- \* Failure to follow or comply with the user's operational manual.
- \* Modification, alteration, addition of non-approved components, or misapplication of the Product or Part in any manner.
- \* Repairs and service conducted by personnel unauthorized by Techno.
- \* Modifications to, and tampering with, the Product or Part.
- \* Use of non-standard parts or accessories without prior written approval from Techno.
- \* Use of Product or part for purposes for which the item was not designed or intended.

#### ***Warranty Limitations***

Techno's maximum liability hereunder is limited to the original purchase price of the Product or Part.

Techno assumes no responsibility for the selection of any Product or Part for a specific application absent Techno's written approval of such application, and makes no general representations whatsoever in respect to any such selection.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED. ALL OTHER WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WHETHER EXPRESSED, IMPLIED, OR ARISING BY OPERATION OF LAW, TRADE USAGE, OR COURSE OF DEALING, ARE HEREBY DISCLAIMED. THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE DESCRIPTION ON THE FACE OF THIS WARRANTY DOCUMENT.

TECHNO SHALL NOT BE LIABLE FOR INDIRECT, INCIDENTAL, SPECIAL, CONSEQUENTIAL, PUNITIVE OR OTHER SIMILAR DAMAGES THAT MAY ARISE, INCLUDING LOST PROFITS, DAMAGE TO PROPERTY OR INJURIES TO A PERSON, LOSS OF USE, INCONVENIENCE, OR LIABILITY ARISING FROM THE INSTALLATION, SERVICE OR USE OF THE PRODUCT OR PART.

UPON THE EXPIRATION OF THE LIMITED WARRANTY PERIOD, TECHNO'S LIABILITY UNDER THIS WARRANTY SHALL TERMINATE.

Some states do not allow the contractual exclusion or limitation of incidental or consequential damages or personal injury, so the limitations set forth herein may not apply to all customers in all locations.

#### **How To Obtain Warranty Repair/Replacement**

All defective items covered under the Limited Warranty must be properly returned to Techno for inspection. Techno reserves the right to not accept returns unless the returned item is accompanied by proof of original purchase, a return authorization number ("RAN") from Techno, and shipped in accordance with packaging and

shipping instructions given to the customer by Techno. Claims and requests for a RAN must be made within seven (7) days of discovery of a defect. Proper packaging and insurance for transportation is solely the customer's responsibility. All returned items must be sent to the Techno facility located in Ronkonkoma, New York (or such other place as Techno specifically designates to the customer) with a statement of the problem and transportation prepaid. If, upon examination, Techno determines that a warranted defect exists, the returned item will be repaired or replaced in Techno's sole discretion at no charge, and shipped prepaid back to the customer. Return shipment will be by common carrier of Techno's choosing. If rapid delivery is requested by customer, then such transport expense shall be borne by the customer.

Warranty inspections and repairs are performed at Techno's New York facility, where all necessary diagnostic and repair equipment is available. This equipment is difficult to transport and field service is accordingly severely limited and will only be supplied at Techno's sole discretion. If field service is required, all service call expenses, including transportation, travel time, subsistence costs, and the prevailing cost per hour (eight hour minimum) are the responsibility of the customer.

In the event that support diagnostics of a covered Product or Part requires an item to be shipped more than one (1) time for any given claimed warranty defect, then the customer shall bear all transport costs.

If an out-of-warranty situation exists, the customer will be notified of the repair or replacement cost. At such time, the customer must issue a purchase order to cover the cost of the repair/replacement or authorize the item to be shipped back to the customer at the customer's expense. In all cases, a restocking charge of twenty (20%) percent will be charged to the customer on all items returned to stock.

Warranty claims will not be reviewed or remedied unless the warranty registration is received by Techno within thirty (30) days of the purchase date. All warranty issues must be handled through Techno.

Techno customer service can be reached by calling 6316487481

#### ***Additional Terms & Conditions***

TECHNO RESERVES THE RIGHT TO CHANGE DESIGNS, SPECIFICATIONS, PRICES AND ANY APPLICABLE DOCUMENTATION WITHOUT NOTICE TO THE CUSTOMER.

Techno is not liable for delay or failure to perform any obligation hereunder by reason of circumstances beyond Techno's reasonable control. These circumstances include, but are not limited to, accidents, acts of God, strikes or labor disputes, laws, rules, or regulations of any government or government agency, fires, floods, delays or failures in delivery of carriers or suppliers, shortages of materials, and any other event beyond Techno's control.

No legal action arising out of any claimed breach of this Limited Warranty may be brought by the more than one (1) year following date of purchase of a Product or Part. This Agreement shall be governed in all respects by the laws of the State of New York, United States of America. Any legal action brought by a customer against Techno must be brought in the state courts of the State of New York, Second Judicial Department. Some states do not allow the contractual limitation of time periods for bringing suit so the limitations set forth herein may not apply to all customers in all locations.

The terms and conditions contained herein shall constitute the entire agreement concerning the Limited Warranty described herein. No oral or other representations are in effect. No dealer, distributor, or individual is authorized to amend, modify, or extend this Limited Warranty in any manner and only the warranty expressed in this warranty document is extended herein by Techno. Statements made outside this warranty document, such as in dealer advertising or presentations, whether oral or written, do not constitute warranties by Techno and should not be relied upon.

Section headings contained in this warranty document are for informational purposes only and may not be used to limit the terms and conditions set forth in this warranty document.

***Form H1219***

# LC NEW GENERATION PARTS CATALOG

For easy re-ordering of parts, visit our website [www.technocncshop.com](http://www.technocncshop.com)



6MM Round Gasketing  
PN: HTXM-6MMR-15



LC New Generation ISO30  
Tool Holder  
PN: HGXMX-01040191



Rear Tool Offset Touch Pad



New Generation LC 750W XY  
Axis Servo Motor  
PN: HTXM-Y0308021304



New Generation LC 750W Z-  
Axis Servo Brake Motor  
PN: HTXE-Y0308021308



New Generation LC Servo  
Motor / Drive Power Cable -  
8M Length  
PN: HTXE-Y402020103



New Generation LC Servo  
Motor / Drive Encoder Cable |  
PN: HTXE-Y402020101



6" Dust Hood Metal  
Weldment Only  
PN: P0403029920



Dust Hood 65MM Long Brush  
| (4 PC)  
PN: HTXM-Y0203029947



Hiwen Bearing - xZ-Axis  
PN: HW25-xz



Omron Z-Axis Limit Switch  
PN: HTXE-Y0403090101



New Generation LC Spindle  
PN: HTXM-Y0314050111



BK X-Z Axis End Bearing  
PN: HTXM-Y131615



Pressure Sensor  
PN: HTXM-Y050301



Fan  
PN: HTXM-Y0404120103



Bumper  
PN: HTXM-P100205

# LC NEW GENERATION PARTS CATALOG

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8MM Flow Control Fitting  
PN: HTXM-Y05050404



Filter Regulator  
PN: HTXM-Y050203



Pressure Regulating Filter  
PN: HTXM-Y050208



Hiwen Bearing - Y Axis  
HTXM-HW25-Y



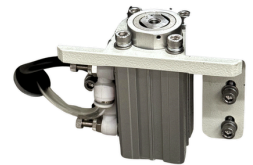
Pop-up Pin Solenoid Valve |  
PN: HTXM-Y050105



New LC 15HP Spindle Inverter  
PN: HGXEXX-3010302029



New LC Vacuum Valve  
PN: HTXM-Y08020201



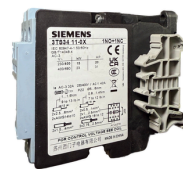
Side Pop Up Pin  
PN: HTXM-SPIN-R2



E Stop Button  
PN: HJXEXX-E-STOP



Z-Zero Touch Pad  
PN: Y0314500512



Siemens Motor Starter  
PN: HTXM-Y0401030110



LC Spindle Breaking Resistor |  
PN: HTXM-Y04030719



LC On Button  
PN: HTXE-Y0402010104



LC Ball Screw and Nut  
Choose Axis



LC Flow Control Fitting  
PN: HTXM-Y05050404



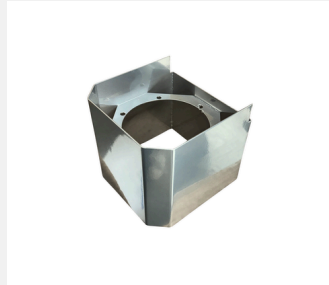
Hiwen Rail | Choose Axis

# LC NEW GENERATION PARTS CATALOG

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LC X and Y Proximity Homing Switch  
PN: HTXE-Y0402090153



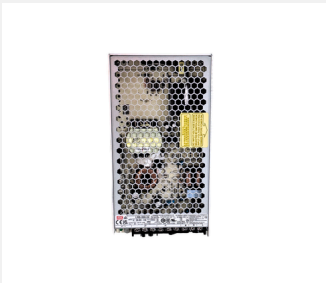
LC Sleeve  
PN: HTXM-P0704155-7



LC Phoenix Cube Relay 24V  
PN: HTXE-1032526



LC New Generation Controller  
PN: HTXE-CTRL-LC



LC New Generation Power Supply  
PN: HTXE-Y0404100108



New Generation LC Servo Drive  
PN: HTXE-Y040102021402



New Generation LC Handheld Pendant  
PN: HGXMXX-LCHH



Tool Clip  
PN: HGXMXX-01010023



Dust Hood Shaft - 12MM  
PN: HTXM-12MMSHFT



Dust Hood Linear Bearing  
PN: HGXMXX-01011603



Dust Hood Cylinder Read Switch  
PN: HTXE-Y05050404



Front Pop Up Pin



Dust Hood Cylinder  
PN: HTXM-Y05080218



New Generation Z-Axis Belt  
(5mm pitch, 57 teeth, 15mm width, 285mm length) REF: Y030624  
PN: HTXM-ZBELT-R0



New Generation X-Axis Belt  
(5mm pitch, 74 teeth, 15mm width, 370mm length) REF: Y030635  
PN: HTXM-XBELT-R0



New Generation Y-Axis Belt  
(5mm pitch, 15mm width, 440mm length) REF: Y030636  
| PN: HTXM-YBELT-R0

# LC NEW GENERATION

## PARTS CATALOG

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LC New Generation Touch  
Pad Clip  
PN: HTXM-Y0314500510

# Techno CNC Systems



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