

LAGUNA TOOLS

LAGUNA

Turner 3-Axis CNC Machine (Rich-Auto Programming)

Owner's Manual-

Safety, Specifications, Receiving & Unloading & setting up Machine, Machine Briefing, Introduction to the Turner 3-Axis CNC Machine, Assembly Operation, Turning "On" Machine, Do & Don'ts, Maintenance, Trouble Shooting, Warranties



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Turner 3-Axis CNC © 2021 Laguna Tools 3/01/2022



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Safety Rules & Information-

As with all machinery, there are certain hazards involved with the operation and use. Using it with caution will considerably lessen the possibility of personal injury. However, if normal safety precautions are overlooked or ignored, personal injury to the operator may result. If you have any questions relative to the installation and operation, do not use the equipment until you have contacted your supplying distributor. Read carefully before operating the machine.

- 1.) Keep the working area clean and be sure adequate lighting is available.
- 2.) Do not wear loose clothing, gloves, bracelets, necklaces, or ornaments. Wear face, eye, respiratory and body protection devices as indicated for the operation or environment.
- 3.) Be sure that the power is disconnected from the machine before tools are serviced or an attachment is to be fitted or removed.
- 4.) Never leave the machine with the power on.
- 5.) Do not use dull, gummy or cracked cutting tools.
- 6.) Be sure that the keys and adjusting wrenches have been removed and all the nuts and bolts are secured.

Specification Sheet-

Spindle Motor	3HP 3 Phase Industrial Induction Spindle, Liquid Cooled
Spindle RPM	5,000 - 24,000 RPM Spindle
Controller	Laguna HHC (Hand Held Controller)
Volts	One phase machine 220v /30 amp
Ball Screw on Vertical Axis	Yes
Rack and Pinion on Horizontal Axis	Yes
Maximum Diameter	8"
Maximum Travel Length	46" or 72"
Machine Foot Print	73"L x 24"D x 65"H

RECEIVING YOUR MACHINE-

Note: It is probable that a third party will deliver your machine. Before you unpack your new machine, you will need to first inspect the packing, invoice, and shipping documents, supplied by the driver. Ensure that there is no visible damage to the packing, or the machine. You need to do this prior to the driver leaving. All damage must be noted on the delivery documents and signed by you, and the delivery driver. You must then contact the seller, [Laguna Tools] within 24 hours.

Introduction to CNC Lathe-

The CNC Lathe is designed to give you years of safe service. Read this owner's manual in its entirety before assembly or use. The advantage of the CNC machine is that it can, in most cases, fully machine the complete job without it being removed from the Lathe so that you have finished parts of high accuracy that are repeatable. It can also produce intricate carvings with the purchase of the relevant software. It is possible to reduce the number of different machines in the shop, as the CNC Lathe will perform a multiple of functions and is necessary for serious woodworkers.

Unpacking the Machine:

Unpacking the machine will require tin snips (to cut banding), a knife and an adjustable wrench. Follow the steps below:

- 1.) Using the tin snips, cut the banding that is securing the machine to the pallet (if fitted).
- 2.) **WARNING:** EXTREME CAUTION MUST BE USED BECAUSE THE BANDING CAN SPRING AND COULD CAUSE INJURY.
- 3.) Remove the box from the CNC machine (if fitted) and any other packaging material. The parts ordered with the machine will be packed on or inside the machine. (Please note, the machine is heavy, and it is recommended that professional assistance [rigging] be used for unloading and placing the machine.).
- 4.) Use a forklift with sufficient lifting capacity and forks that are long enough to reach the complete width of the machine before attempting to lift the machine.
- 5.) Remove the securing bolts that attach the machine to the pallet (if fitted).
- 6.) Approaching the machine from the side, lift the machine on the frame, taking care that there are no cables or pipes around the forks.
- 7.) Move the machine to the required position and install the leveling feet.
- 8.) Then lower the machine gently to the floor.
- 9.) Level the machine so that all the supporting feet are taking the weight of the machine and no rocking is taking place.

Unloading Requirements-

- 1.) When the Crate containing your newly purchased Smartshop® MT is delivered, it will be delivered “Curbside,” in other words the Machine will be delivered in front of the Driveway of one’s Garage/Shop or Workspace. (****It is the Purchasers responsibility of moving the Machine into His or Hers Garage/Shop or Workspace.****)
- 2.) One should obtain a Crane: Hydraulic crane / crane (10T or above, 4 groups of 10T rings, 2 10M long, 10T straps).
- 3.) One should obtain a Forklift: The forklift can fork items weighing 10T or more.
- 4.) To Open Crate-Acquire some standard tools for taking apart the Crate.

a.) Hammer.



b.) Pry Bar.



Unloading Requirements (Cont'd.)-

c.) Wire Cutters.



d.) Cordless Drill.



5.) Cut all straps only on the Crate.



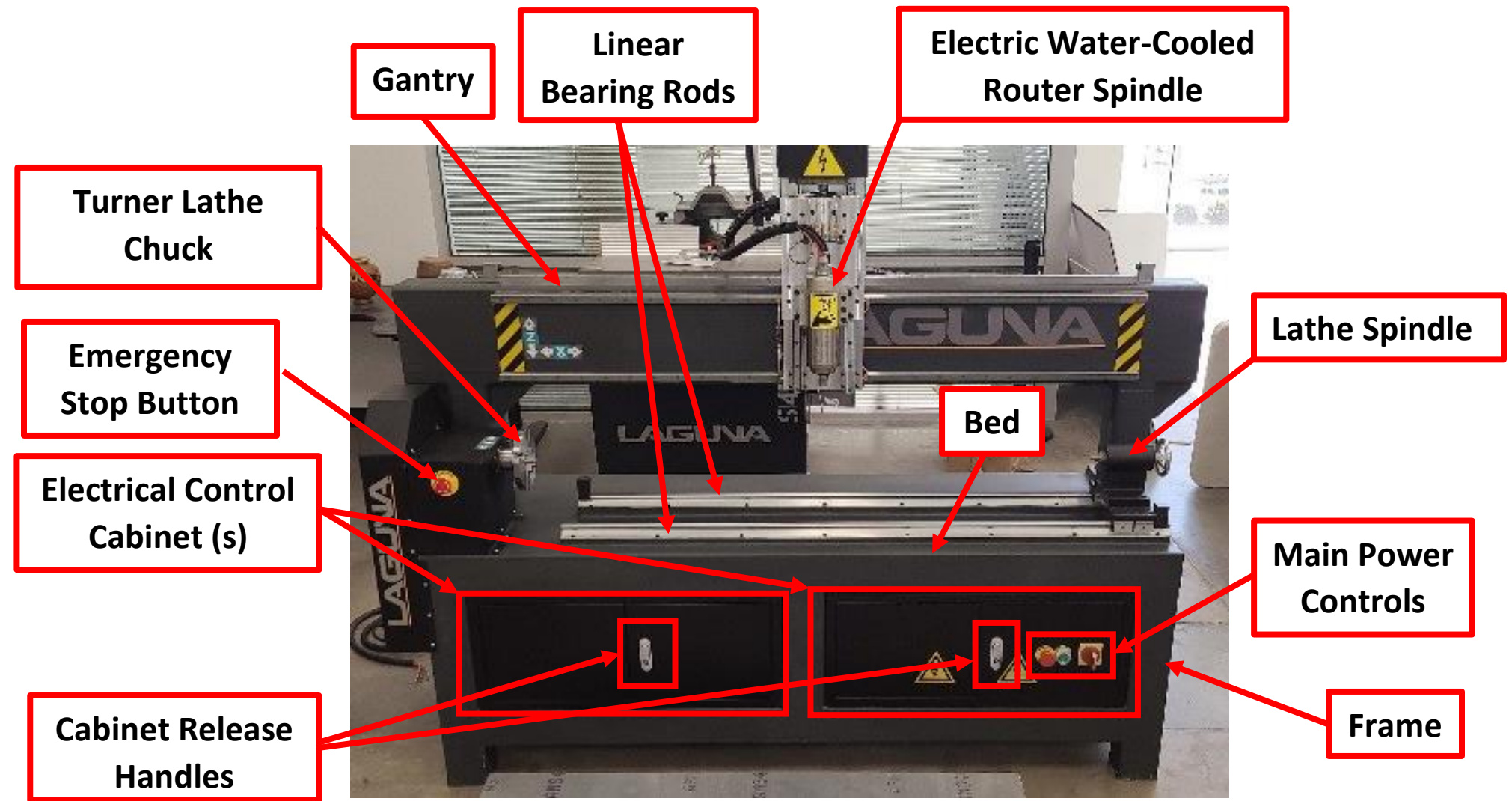
Laguna CNC Turner 3-Axis CNC Damage Notification-

- 1.)The Machines are thoroughly tested before leaving any or our Laguna Tools Facilities, but that does not mean the Machines would not experience any damage in transit.
- 2.) Before one Signs the Bill of Lading (See Example Below) when the Trucking Company drops off the Machine, **visually inspect the entire crate and check for any damage.**

SHIP FROM		SHIP TO		THIRD PARTY FREIGHT CHARGES BILL TO				
Laguna Tools 744 Refuge Way Suite #200 Grand Prairie, TX 75050 SID No.:		[Name] [Street Address] [City, ST, ZIP Code] CID No.:		[Name] [Street Address] [City, ST, ZIP Code] CID No.:				
Bill of Lading Number:		Carrier Name:		SCAC:				
BAR CODE SPACE		Trailer number: Serial number(s):		Pro Number:				
Special Instructions:		Freight Charge Terms (Freight charges are prepaid unless marked otherwise): Prepaid <input type="checkbox"/> Collect <input type="checkbox"/> 3rd Party <input type="checkbox"/>		<input type="checkbox"/> Master bill of lading with attached underlying bills of lading.				
CUSTOMER ORDER INFORMATION								
Customer Order No.	# of Packages	Weight	Pallet/Slip (circle one)	Additional Shipper Information				
			Y N					
			Y N					
			Y N					
			Y N					
Grand Total								
CARRIER INFORMATION								
Handling Unit		Package				LTL Only		
Qty	Type	Qty	Type	Weight	HM (X)	Commodity Description	NMFC No.	Class
						<small>Commodities requiring special or additional care or attention in handling or stowing must be so marked and packaged as to ensure safe transportation with ordinary care. See Section 2(a) of NMFC Item 300.</small>		
Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property as follows: "The agreed or declared value of the property is specifically stated by the shipper to be not exceeding _____ per _____."						COD Amount: \$		
						Fee terms: Collect <input type="checkbox"/> Prepaid <input type="checkbox"/> Customer check acceptable <input type="checkbox"/>		
Note: Liability limitation for loss or damage in this shipment may be applicable. See 49 USC § 14706(c)(1)(A) and (B).								
<small>Revised, subject to individually determined rates or contracts that have been agreed upon in writing between the carrier and shipper, if applicable, otherwise to the rates, classifications, and rules that have been established by the carrier and are available to the shipper, on request, and to all applicable state and federal regulations.</small>						The carrier shall not make delivery of this shipment without payment of charges and all other lawful fees.		
Shipper Signature/Date		Trailer Loaded:		Freight Counted:		Carrier Signature/Pickup Date		
<small>This is to certify that the <u>above material</u> materials are properly crated, packaged, marked, and sealed, and are in proper condition for transportation according to the applicable regulations of the DOT.</small>		<input type="checkbox"/> By shipper <input type="checkbox"/> By driver		<input type="checkbox"/> By shipper <input type="checkbox"/> By driver/pallets said to contain <input type="checkbox"/> By driver/pieces		<small>Carrier acknowledges receipt of packages and required placards. Carrier certifies emergency response information was made available and/or carrier has the DOT emergency response guidebook or equivalent documentation in the vehicle. Property described above is received in good order, except as noted.</small>		



Series-Turner 3-Axis CNC Machine- Parts



*****Note:** Some of the photographs in the manual may not be identical to your machine, but the principle that they show is the same for your machine. Laguna Tools operates a constant improvement program, and changes to machines are ongoing.



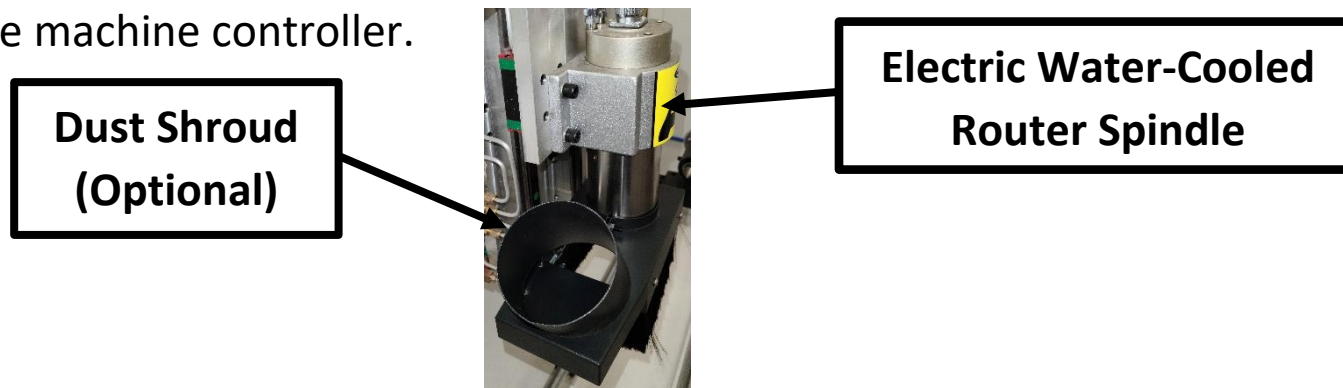
Series-Turner 3-Axis CNC Machine- Parts (Cont'd.)

Bed: The bed of the machine consists of a heavy steel frame that supports linear bearing rods. The tail stock slides along the rods and can be clamped in any position to suit the job at hand.

Gantry: The gantry runs along the back of the lathe and supports the linear bearing rods. The router spindle moves along the rods on linear bearings. It is moved along the length of the gantry rack and pinion that is controlled by the machine controller.

Frame: The frame is a heavy welded construction that supports all the other parts of the machine.

Router Spindle: The router spindle is moved vertically by a precision ball screw system that is controlled by the machine controller.



Note: If the spindle is run without cooling, it could be damaged and fail.

Note: Running the Router Spindle without the cooling pump running can lead to spindle bearing failure.



Series-Turner 3-Axis CNC Machine- Parts (Cont'd.)

Caterpillar Track: The caterpillar track runs at the back of the lathe and contains all the electrical cables, and the motor water pipes.

Electrical Cabinet(s): The Electrical Cabinets is located at the Back & Front of the lathe and contains all the control equipment.

Water Pump: The water pump provides coolant for the router spindle motor.

Note: Running the Router Spindle without the cooling pump running can lead to spindle bearing failure.

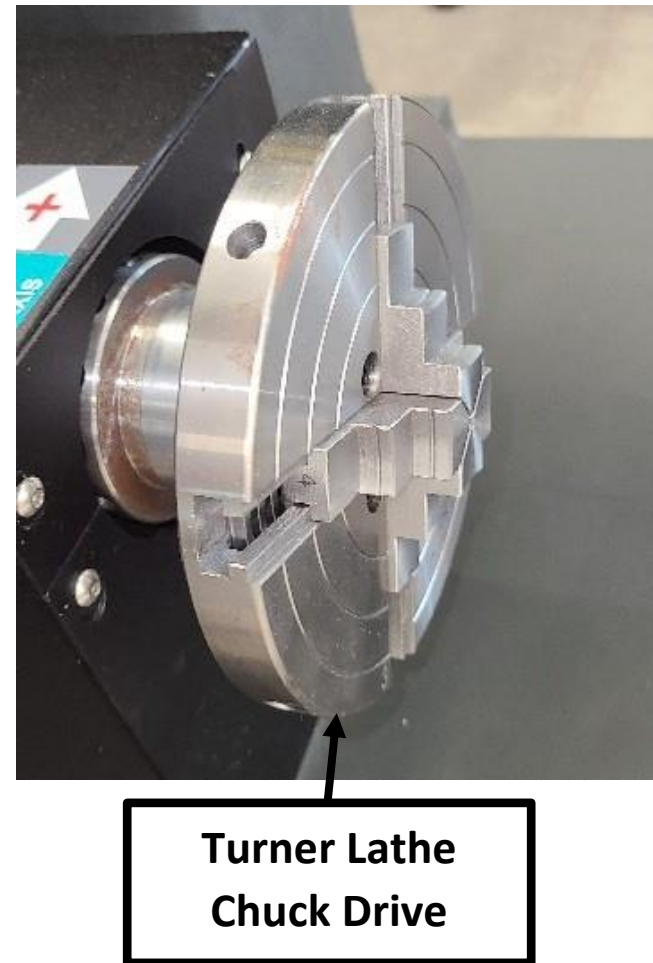
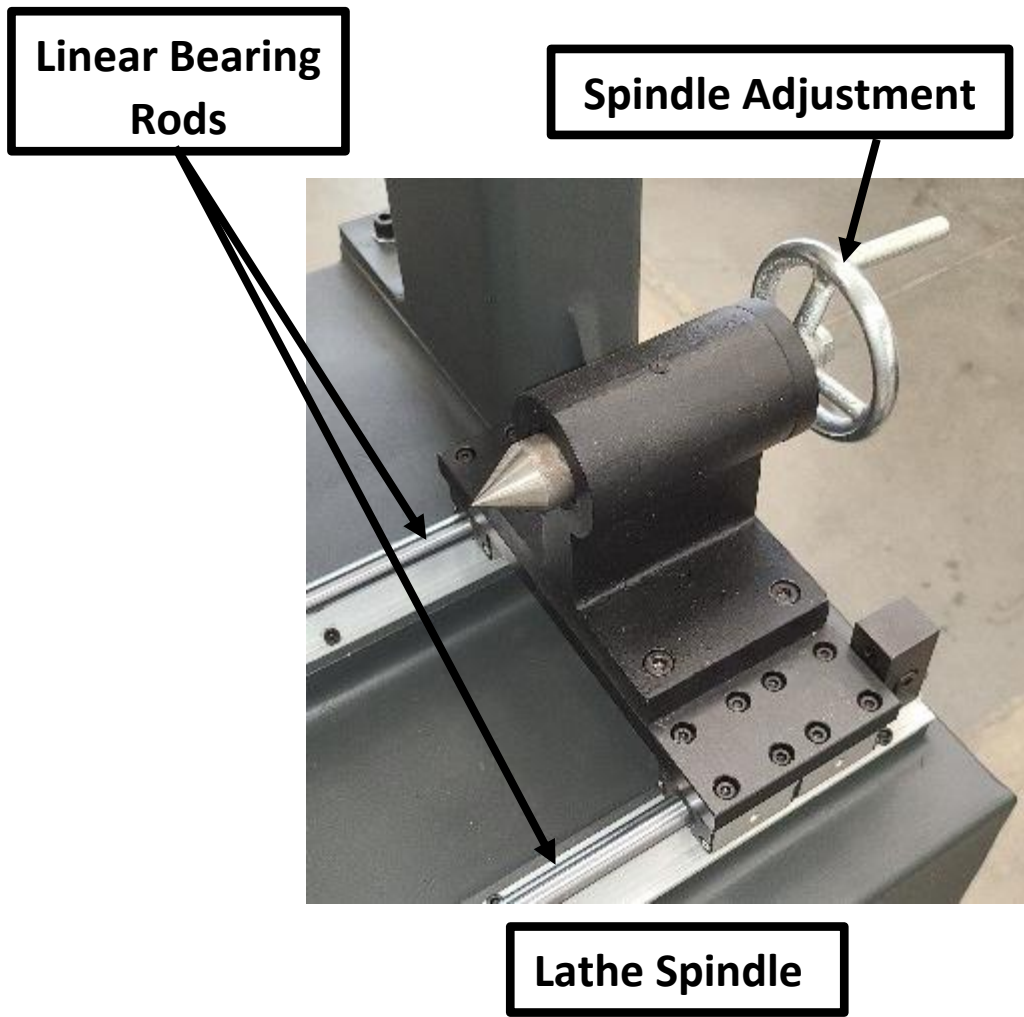
Tail Stock: The tail stock runs on liner bearing rods. The tail stock slides along the rods and can be clamped in any position to suit the job at hand.

Lather Chuck Drive: The chuck is driven through a right-angled drive and is under the control of the on-board computer.

Spindle Vertical Movement: The spindle is moved vertically by a motor that rotates a precision ball screw. The vertical movement is limited by a home proximity switch.



Series-Turner 3-Axis CNC Machine- Parts



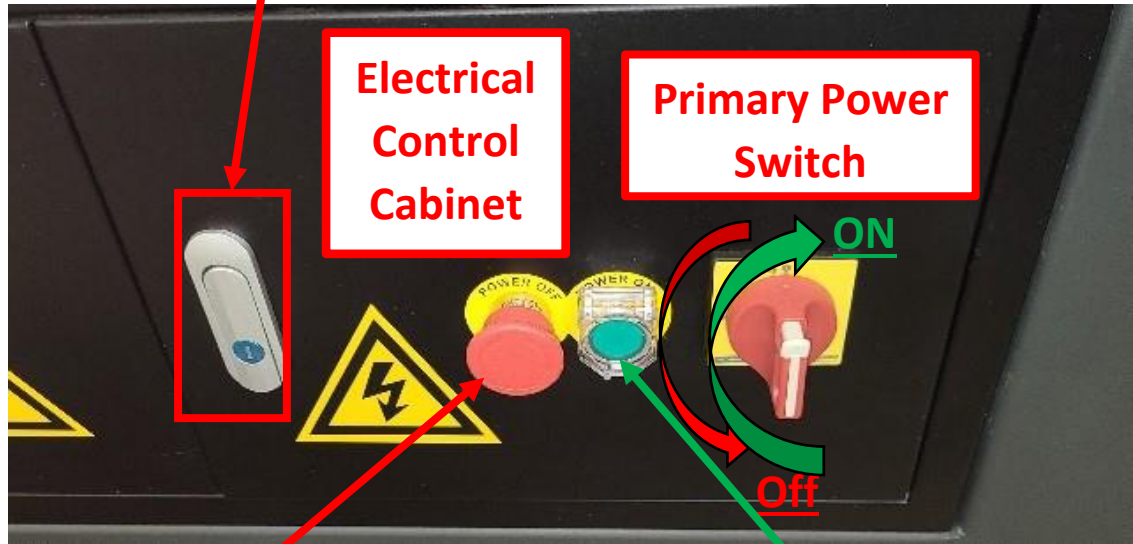


Series-Turner 3-Axis CNC Machine- Parts



Rear Oil Reserve

Cabinet Release Handle



Electrical Control Cabinet

Primary Power Switch

Emergency Stop Button

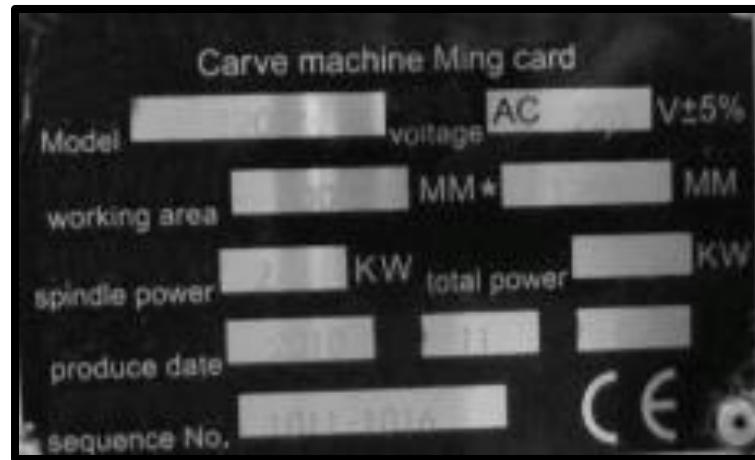
Main Power Controls

Power "On" Button



Series-Turner 3-Axis CNC Machine- Parts

Machine Data Plate: The Machine Data Plate is located at the back of the machine and contains all the machine information.



Hand-held Controller: The handheld controller controls all functions of the lathe.

Note: See Separate Manual for the Operation of the Handheld Controller.

Additional Instructions for the use of the CNC:

Like all machines, there is danger associated with the machine. Injury is frequently caused by lack of knowledge or familiarity. Use this machine with respect. If normal safety precautions are overlooked or ignored, serious personal injury may occur. As the CNC lathe is under the control of the onboard machine controller, it is important that you are clear of the cutter when operating the machine.

Machine Briefing & Special Features-

Our CNC 3-Axis Turner can make incredibly detailed spindles. The resolution is 0.0003. Our CNC Turner is powered by a Liquid-Cooled 3HP spindle capable of running very long run times without overheating.

The Turners use our Laguna Hand-Held Controller. The design software is not included.

Design Software Used: Laguna Tools uses Rhino CAD/CAM.

Features:

- 220v 1 Phase /30 Amp
- 3 HP Very Quiet Liquid Cooled Spindle
- 3 Phase Industrial Induction Spindle, Water Cooled (Can Be Wired Single or 3 Phase)
- 5,000 – 24,000 RPM Spindle
- Laguna HHC (Handheld Controller)
- Maximum Diameter: 8"

Machine Briefing & Special Features (Cont'd.)-

Available Spindles- Length, Weight, Dimensions:

1.) 46" Turner

Shipping Weight: 1500 lbs.

Shipping Dimensions (W x L x H): 42.3in x 49in x 43in

2.) 60" Turner

Shipping Weight: 1700 lbs.

Shipping Dimensions (W x L x H): 60in x 60in x 60in

3.) 72" Turner

Shipping Weight: 1925 lbs.

Shipping Dimensions (W x L x H): 60in x 60in x 60in

4.) 96" Turner

Shipping Weight: 2295 lbs.

Shipping Dimensions (W x L x H): 60in x 60in x 60in

Introduction to the CNC-

The CNC is designed to give you years of safe service. Read this owner's manual in its entirety before assembly or use. The advantage of the CNC machine is that it can, in most cases, fully machine the complete job without it being removed from the table so that you have finished parts of high accuracy that are repeatable. If the relevant software is purchased and installed, it can also produce intricate carvings. Nesting is also a valuable feature of CNC machining that saves on waste and costs. It is possible to reduce the number of different machines in the shop as the CNC will perform a multitude of functions and meet the needs for cabinet makers and serious woodworkers.

CAUTIONARY STATEMENT-

Like all machines, there is danger associated with the machine. Injury is frequently caused by lack of knowledge or familiarity. Use this machine with respect. If normal safety precautions are overlooked or ignored, serious personal injury may occur. As the CNC is under the control of the onboard machine controller, it is important that you are clear of the cutter when operating the machine.

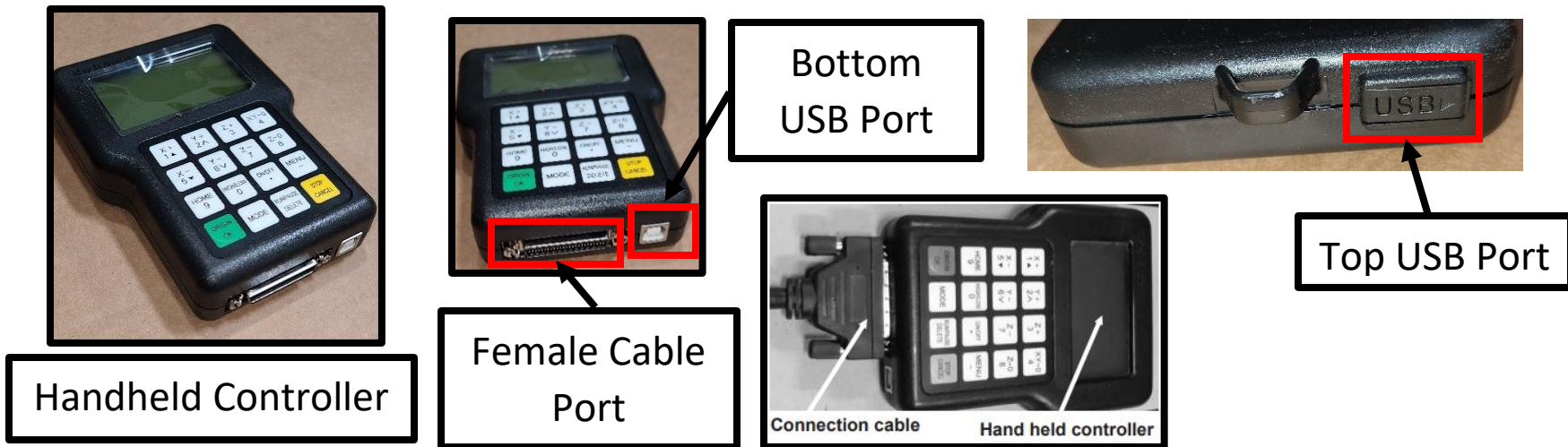
Assembly and Operation-

Cleaning the machine Clean off any protection grease with WD40 or something similar. The machine has steel parts that if not protected will Rust, Lubricate with WD40 or Wax.

Use 30W Motor Oil or Lithium White Grease lubricant or equivalent to lubricate the ball screws. Wipe off any excess to reduce dirt and dust acumination.

Assembling the Hand-Held Controller-

Note: See separate manual for the operation of the Handheld Controller.



Fit the cable to the controller and ensure that the screws are finger tight.

The USB printer cable port is used to connect the controller direct into your computer.

Note: The connection port socket and plug only fit one way, so ensure that the plug is the correct way up prior to assembling

Assembly and Operation-the Hand-Held Controller (Cont'd.)-

Female Cable Port to
CNC Turner Computer



Connection Cable-Male

Electrical Connections for the Machine-

The main power cable and has no plug fitted, as it will be dependent on your installation. Ensure that when installing the electrical supply to the machine, 220V single phase is supplied.

It is recommended that you use a **30-AMP Breaker**.

Note: When wiring the machine to your electrical system, keep your cable as short as possible, and the cable should not be allowed to run along the floor, as this will cause a trip hazard.

The 2nd-Second Cable has a Female Electrical Socket for connection to the Water Pump.

Note: A qualified electrician must carry out the electrical installation.

Water-Cooled Spindles-

Water-Cooled Spindles will be provided with a **220-Volt Spindle-Cooling Pump**.

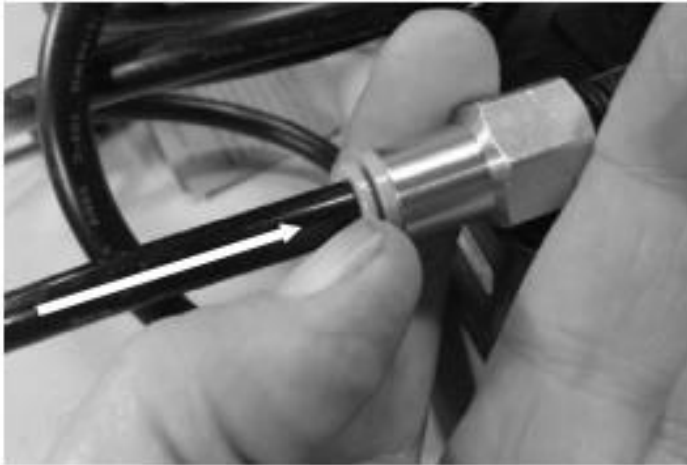
Assembly and Operation-Electrical Connections for the Machine (Cont'd.)-

The submersible pump needs to be submerged in a minimum 5-gallon reservoir of water (the bigger the water tank the better). Never run the spindle without cooling, or the spindle will be damaged or destroyed. **(WITHOUT WATER FLOWING THROUGH THE SPINDLE, THE SPINDLE WILL OVERHEAT AND FAIL.)**

Connecting the Water Pipes to the Machine-

There are 2-two water tubes that come out of the machine. These are used to provide cooling for the liquid-cooled router spindle.

Note: The Water Pump design may vary from the one shown.



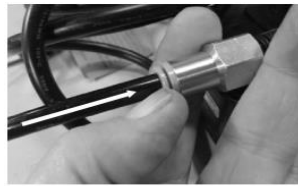
Fitting the water pipe



Water pump

Pipe fitting

Assembly and Operation-Connecting the Water Pipes to the Machine (Cont'd.)-



Fitting the water pipe



Water pump

Pipe fitting

Note: Never run the motor without the cooling being connected, or the motor could be damaged. You will connect one tube to the water pump, and the other will be placed in the water container for the return water. It is not important which pipe is used as the return.

Fit the pipe fitting to the pump.

Connect one of the coolant pipes to the water pump by pushing it into the connector. Lightly pull on the pipe to ensure that it is connected correctly. Fill a container about 3/4 full of clean water. If the pipe needs to be removed from the pump, press the outer ring into the fitting and gently pull the pipe out of the fitting.

Note: You will need to provide a coolant tank with a minimum capacity of 5 gallons. If the shop temperature is high, the tank size will need to be larger. If your shop is likely to be subject to freezing temperatures, antifreeze must be added to the cooling water. Lower the water pump into the container, ensuring that it is the correct way up (water inlet lowest) and place the water return pipe into the container. The logical position for the water container is close to the machine, as the water pipes exit the machine at the back. Once the assembly is complete and the water pump electrical connection has been made, lift the water return pipe up and check that the water is flowing.

Assembly and Operation-Connecting the Water Pipes to the Machine (Cont'd.)-

Note (Cont'd.):

Place the lid onto the container to keep dust and dirt out of the container. Check the container periodically, as the water will evaporate.

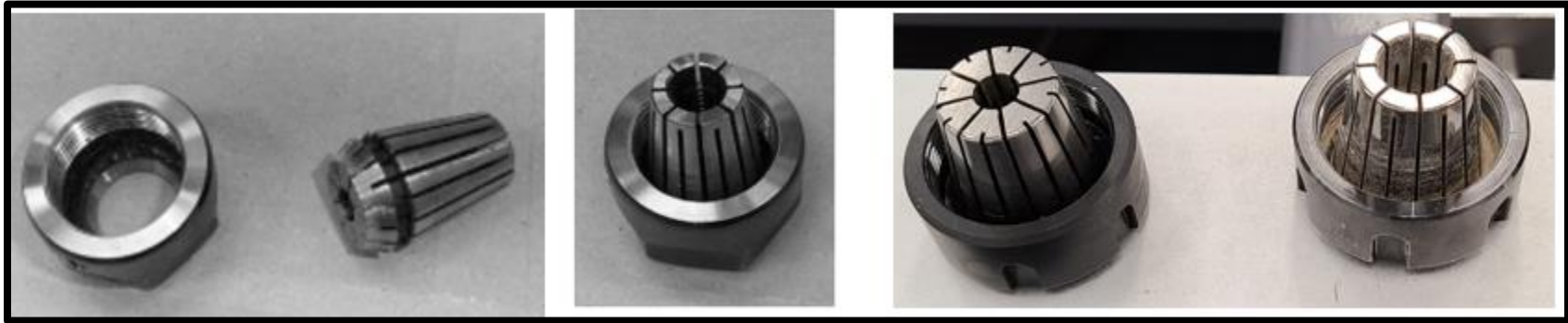
Note: If the spindle is run without cooling, it could be damaged and fail. It is strongly suggested that the water pump is run for at least 5 minutes after the spindle is switched off to remove residual heat.

Installing Router Bit-

Installing the Router Bit in the Tool Holder **Caution:** Before changing or fitting the router bit, always **disconnect the power to the machine.**

1.) Select a router bit and its relevant collet.

2.) Fit the collet into the spindle nut. Press the collet into the spindle nut until it snaps into place.



Note: The router bit must not be fitted into the collet until the collet has been fitted into the spindle nut. With the router bit fitted into the collet, the collet cannot compress and “snap” into the spindle nut. The face of the collet and the face of the spindle nut will be close to flush.

Note: To remove the collet, hold the spindle nut and press the collet on the side. The collet will compress and pop out. Do not try to remove the collet while a cutter is fitted, as the collet will not compress and pop out.

3.) Fit the spindle nut and collet assembly onto the tool holder spindle thread by hand.

Press the bit into the collet. Note that the flute of the router bit must not be inside the collet and should be a minimum of 1/16" outside the collet. Hold the toolholder with the supplied wrench and tighten the collet with a second wrench. **Do not over tighten.**

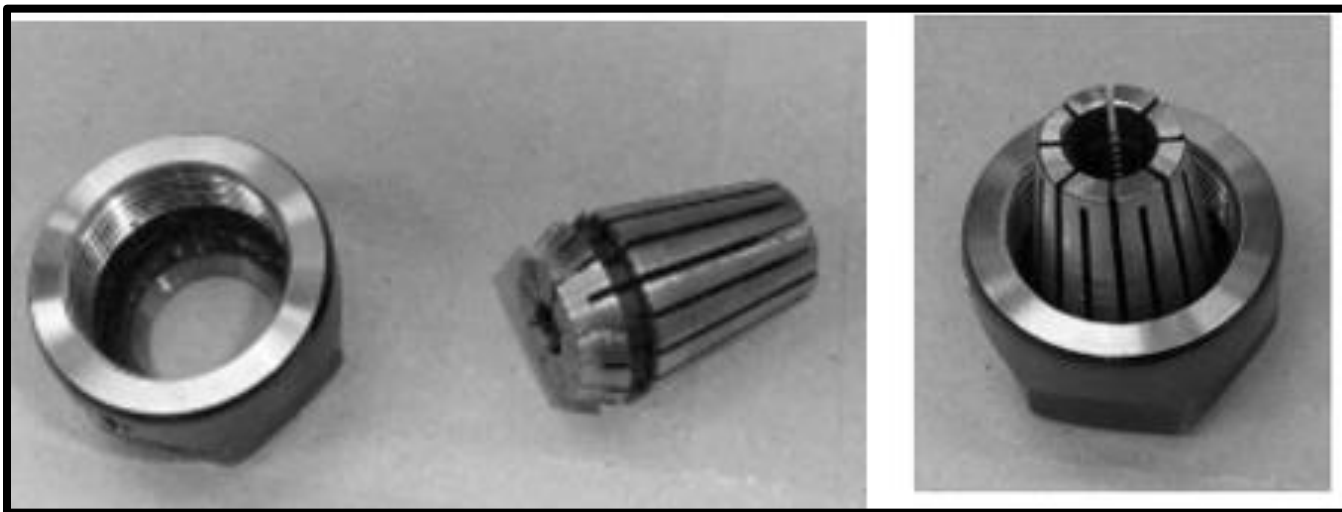
Installing Router Bit (Cont'd.)-

Note: Use this process to install each of the router bits into the tool holders, being careful to use the correct collet size for each router bit. Note: Keep the collets clean and blow all dust out of the slots. Fine dust accumulates and may affect the clamping action.

Fitting the Router Bit into the Router Head-

Note: Before changing or fitting the router bit, always disconnect the power to the machine. Note: Collets and spindle collet hole must be cleaned regularly. Ensure that the slots in the collets are free of sawdust, as sawdust builds up and will stop the collet compressing. If the collet or spindle hole is not clean, the router bit may not run true, and this will affect the performance of your machine.

- 1.) Select a pointed router bit and its relevant collet.
2. Fit the collet into the spindle nut. Press the collet into the spindle nut until it snaps into place.



Installing Router Bit (Cont'd.)-

Tightening the Spindle Nut.

Note: The router bit must not be fitted into the collet until the collet has been fitted into the spindle nut. With the router bit fitted into the collet, the collet cannot compress and snap into the spindle nut. The face of the collet and the face of the spindle nut will be close to flush. Note: To remove the collet, hold the spindle nut and press the collet on the side. The collet will compress and pop out. Do not try to remove the collet while a cutter is fitted, as the collet will not compress and pop out.

3.) Fit the spindle nut and collet assembly onto the spindle thread by hand.

4.) Press the bit into the collet but note that the flute of the router bit must not be inside the collet and should be a minimum of 1/16" outside the collet. Hold the router spindle with the supplied wrench and tighten the collet with a second wrench. **Do not over tighten!**

Note: Use this process for all other router bits that you need to fit but you will have to change the collet if the shank of the router bit is a different size.



Selecting the Correct Router Bit-

Types of router bits There are 5-five basic types of Router Bits: Straight, Up-Shear, Down-Shear, Combination (also called “Compression”), and Form Tools (Vortex Tool or Amana, etc.).



Straight Router Bits: These are the standard router bits that are commonly used with handheld routers and are readily available at home centers. They will work but will generally not produce the edge finishes that are available with the spiral designed router bits.



Up-Shear Router Bits: These bits have flutes that are spiraled upward (a standard twist drill is an example of this type of bit). This bit design removes the chips from the kerf but tends to chip the top surface, especially on veneers or melamine surfaces.

Selecting the Correct Router Bit (Cont'd.)



★★★★★
1385
3/4" x 3 1/2" DE DC FINISHER

★★★★★
1365L
1/2"x 2 1/8" DE DC FINISHER

★★★★★
1355L
1/2" x 1 1/2" DE DC FINISHER

★★★★★
1349
7/16" x 1" DE DC FINISHER

Down-Shear Router Bits: These bits are like the up shear but with an opposite spiral that tends to pack the chips into the kerf. These bits prevent chipping the material surface, especially with veneers or melamine surfaces.



Combination (Compression) Router Bits: These bits combine the advantages of both up shear and down shear designs. The top section of the tool is down shear to prevent chipping the top surface of the material, and the lower part of the bit is up shear to prevent chipping the bottom surface of the material. Combination Router Bits are the preferred configuration for machining veneered plywood as well as melamine-surfaced product. A variation of the bit is called the “mortising compression” router bit. With this bit, the up-shear portion of the bit is less than 1/4" in length so that the bit can be used on 1/4" veneered plywood and for dados.

Selecting the Correct Router Bit (Cont'd.)



★★★★★

115058

15MM X 70MM LH CT BRAD
POINT SKU 9472



★★★★★

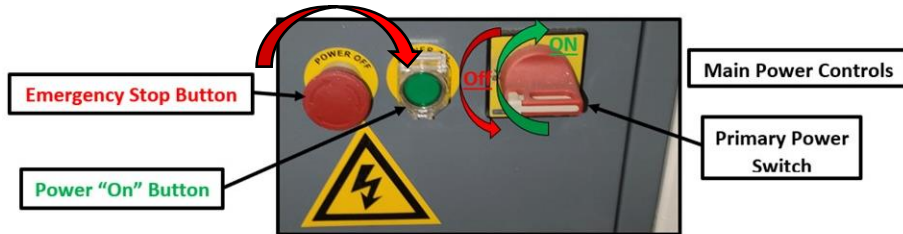
2265

1/2" x 2 1/8" DE UC
BALLNOSE

Form Router Bits: Form Router Bits typically are available in standard profiles such as round over, ogee, etc. Router bits that have a shape associated with them would be classified with this group.

Turning “ON” the Turner CNC Machine-

Note: Before you turn on the machine, remove all tools and other objects from the machine. Release the **“Emergency Stop Button”** by twisting clockwise a 1/4 of a turn, and it will pop out.



Turn the “Primary Power Switch” to the **“ON”** Position.

Press the **“Green on Button”** that will turn power on to the machine.

Pressing the **“Green on Button”** will also power the controller and the display will light up. The screen will display “All Axis Home” Make sure that the machine is clear of obstructions and **“Press the Green Origin/OK Button.”**

Note: The router head will move to the home position.

Note: Home is a mechanical position that is a constant that is determined by switches on each of the axis.

Turning “On” the Turner CNC Machine (Cont’d.)-

X+ = Across (from left-to-right when standing in front of the machine).

Y+ = Length (from front-to-back when standing in front of the machine).

Z+ = Vertical (Up).

Turning on the Turner CNC Machine (Cont'd.)-

By pressing **HIGH LOW / 0** and **MENU / -** the display will change to AX=0, AY=0, and AZ=0.

Note: you cannot set an origin if the display is at AX, AY, AZ).

When the X, Y and Z have an A in front, this denotes that the dimensions displayed are in reference to the machine's home position. When the X, Y, and Z values are displayed with a number (1-9), this indicates the dimensional relationship of the machine from the machine origin.

Engraving Machine Motion Control System (Rich-Auto) Programming: 3-Axis Mechanical Carving-

Cautions:

- 1.) Use of this product is strictly prohibited in the strong interference、 strong magnetic field environment. Operating ambient temperature 0-70 °C, working environment humidity 0-90% (non-condensing).
- 2.) Insert U disk in the correct direction. Do not pull out 50-pin cable when system run.
- 3.) Perform processing U disk file process, do not pull out the U disk to prevent the interruption of data transmission.
- 4.) Strictly prohibited metal, dust, and other conductive substances enter the controller.
- 5.) The machine shell should connect the ground wire to ensure the safety of the work and to prevent interference.
- 6.) Prohibited unauthorized disassembly, no internal user repairable parts.
- 7.) For long periods of time, please pay attention to the power outage, and retain.
- 8.) Pay attention to water, dust, fire when using it.
- 9.) Do not use the corrosive chemical solvents to clean the equipment.
- 10.) Spindle motor bearing life and its speed is inversely proportional.

Engraving Machine Motion Control System (Rich-Auto) Programming: 3-Axis Mechanical Carving (Cont'd.)-

11.) Graver is very sharp. Do not touch when it is running, to avoid injury; Do not use handkerchiefs, scarves contact it to prevent embroiled damage.

Important Notice: The Company shall not be responsible for any loss caused by improper using or breaking the correct operating procedures.

System Introduction:

Rich Auto is CNC motion control system and can be widely applied to machinery, advertisement, woodworking, mold engraving machine, laser, flame, plasma cutting machine, and so on in the machine control field.

Rich Auto make DSP as the core control system High-speed processing operation is the microcontroller, PLC systems cannot match, use embedded structure, High degree of integration Strong stability easy to installation and operation disk support Removable storage card reader With USB Interface High speed transfer, Plug and play the full realization of all work offline.

Characteristics:

1.) System deploys standard X, Y, Z-Axis motion control method, Support the rotation axis (C-Axis) control, and enables to switch the processing of surface and processing of rotation; up extended to X, Y, Z, C, 4-Axis Motion Control, Implementation 4-Axis Interlocking Control.

Engraving Machine Motion Control System (Rich-Auto) Programming: 3-Axis Mechanical Carving (Cont'd.)-

- 2.) Multi I/O Point Control there is eight input and output signals in every basic I/O signal node
Expansion I/O Nodes can be expanded to 32 input and output signals.
- 3.) Support the standard G-Code, PLT Format instructions; support domestic and international mainstream CAM Software, such as the following: Type-3, Art Cam, UG, Pro/E, Master CAM, Cimatron, Wentai etc.
- 4.) Provide with power-down protection. Instantaneous power processing system to automatically save the current processing of information (file name, current line number processing, processing speed, spindle threshold), when power again machine moves back, the system automatically prompts the user to restore the processing before power down, the processing operations become more humanity.
- 5.) Support breakpoint memory, file selection, processing. Save 8 different breakpoint processing information.
- 6.) Multi-coordinate memory function. Provide nine working coordinate system, the user can switch among the 9 coordinate, each coordinate system can save a process origin information.
- 7.) Support online adjusts spindle operating frequency. The spindle frequency from 0 to maximum frequency is divided into 8 thresholds; #1 - #8 threshold can be processed directly adjust up and down without suspend processing.

Engraving Machine Motion Control System (Rich-Auto) Programming: 3-Axis Mechanical Carving (Cont'd.)-

- 8.) Support adjusts speed ratio online. Users can adjust the speed ratio, to adjust the processing speed and empty running speed, speed ratio values from 0.1-1, Ascending or descending per 0.1 numerical.
- 9.) Simply manual operate mode. In manual mode, the system provides three kinds of sports concluding continuous, step (Crawl), distance, manual operation became simpler and more convenient.
- 10.) Identifies M-Code, F-Code, and other development commands can open a special code based on user needs.
- 11.) Built-In 512-M Memory.
- 12.) Unique handheld form factor with one hand to hold. Own liquid crystal display and 16-Button Buttonboard , operate intuitive and flexible, no longer dependent on the computer, the full realization of full offline operation
- 13.) Comes with USB communications port, file transfer efficiency can be directly read U disk, card reader file, Plug and Play.
- 14.) Self-Test Function, the system comes with I/O port signal detection capabilities, ease of remote maintenance.

Engraving Machine Motion Control System (Rich-Auto) Programming: 3-Axis Mechanical Carving (Cont'd.)-

15.) Processing with high-speed and smooth, support high subdivides, make sure processing with high accuracy and high speed.

16.) Unique in Chinese English to show double interface, can be realized in switching Chinese and English show online.

17.) Multi-language display. Support for Simplified Chinese, Traditional Chinese, English, Russian, French, and other languages, can be customized according to user needs.

18.) System can support automatic dynamic upgrades, convenient to remote operation, remote maintenance.

1.2.2 Interface board

Engraving Machine Motion Control System (Rich-Auto) Programming: 3-Axis Mechanical Carving (Cont'd.)-

1.) Rich Auto System Composition-

1.1.) System composition Rich Auto Control System Contains the following parts:

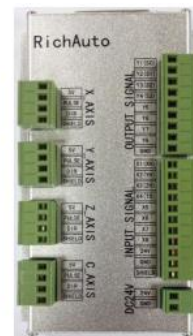
- A Hand-Held Motion Controller (Handle).
- Line Adapter Board (Interface Board).
- 50-Pin Data Transmission Cable.
- USB Communication Cable.

Rich Auto Accessories Schematic Diagram

RichAuto accessories schematic diagram



Hand- held motion controller



Interface board



50-pin data transmission cable



USB communication cable

Engraving Machine Motion Control System (Rich-Auto) Programming: 3-Axis Mechanical Carving (Cont'd.)-

1.2.) Description of Each Component-

1.2.1.) Handle-

As shown below, including (6) Parts:



1.) **LCD Screen**: 128*64 resolution LCD Display, to display the machine motion, system settings and other information.

2.) **Keyboard**: Contains 16-Buttons to input system parameter information and operate the machine.

3.) **U-Disk Interface**: The Port of U-Disk (FAT16/32) and the Memory Card.

4.) **50-Pin Data Cable Port**: The port of 50-pin data cable, it connects the handle with the interface board to realize controlling the machine.

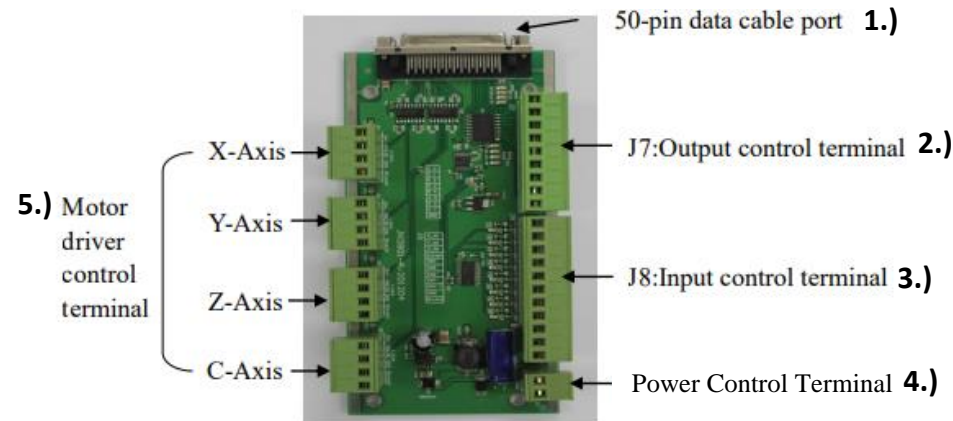
5.) **The Company's LOGO**.

6.) **USB Communication Port**: The port of USB communication cable. It is used to connect the handle with your computer.

Engraving Machine Motion Control System (Rich-Auto) Programming: 3-Axis Mechanical Carving (Cont'd.)-

1.2.2) Interface Board-

Including (5) Parts:



1.) **50-Pin Data Cable Port:** Connect Handle with Interface Board.

2.) **J7-Output Control Terminal:** Including Spindle On/Off Signal, Work & Alarm Led Signal etc..

3.) **J8-Input Control Terminal:** Including Machine Origin Detection Switch, Tool Setting, Driver Alarm, Hard Limit Switch, and E-Stop Signal.

4.) **Power Control Terminal:** (DC24V,3A 5).

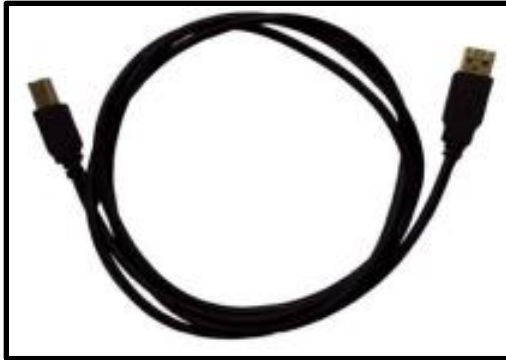
5.) **Motor Driver Control Terminal.**

1.2.3.) 50-Pin Data Transmission Cable-

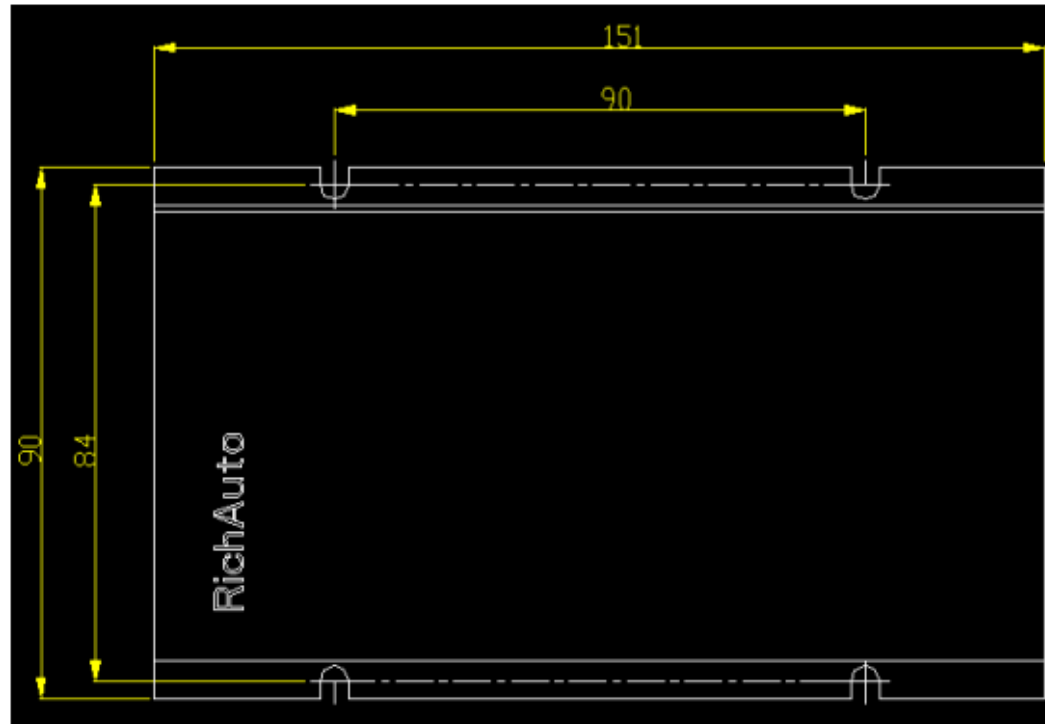


Engraving Machine Motion Control System (Rich-Auto) Programming: 3-Axis Mechanical Carving (Cont'd.)-

1.2.4.) USB Communication Cable-



- 1.3 Interface Board Shell Size-



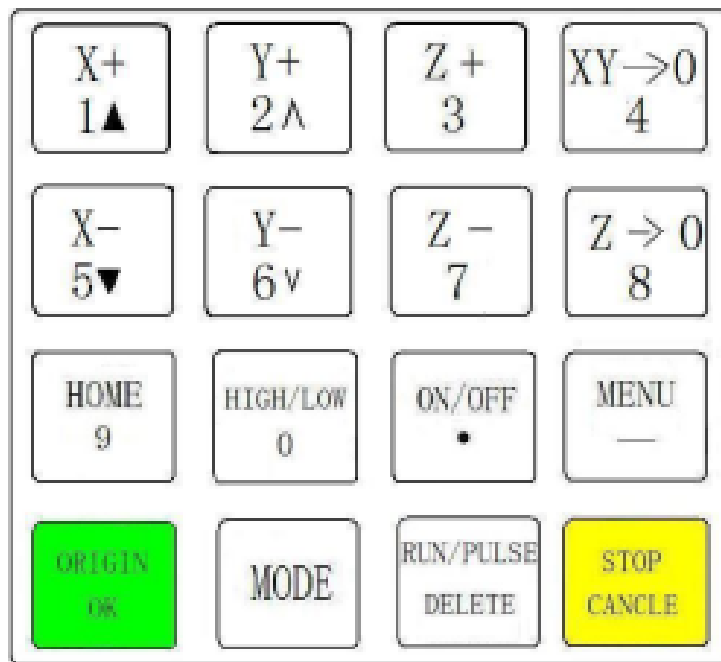
Scale: 1:1, Unit: mm

Engraving Machine Motion Control System (Rich-Auto) Programming: 3-Axis Mechanical Carving (Cont'd.)-

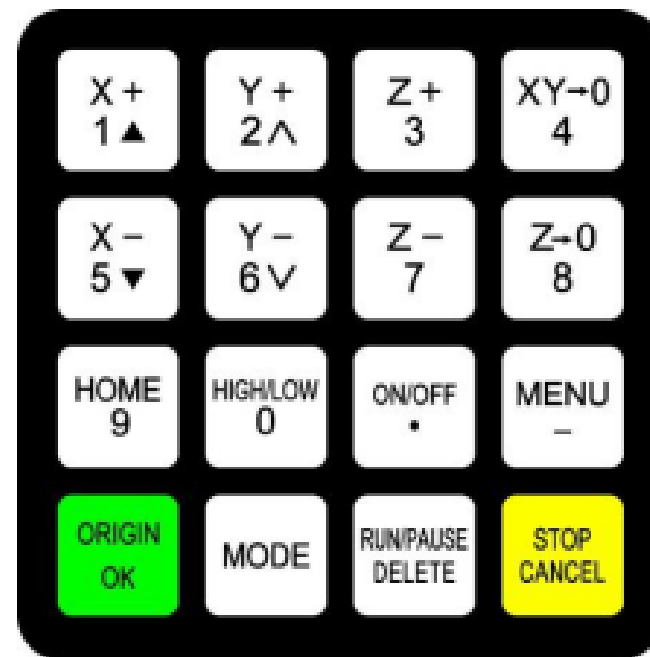
2.) Handle Button Introduction-

2.1.) Button's Introduction-

Rich Auto Motion Control System defines 16-Buttons according to functional requirements. Each button has one or more functions under different work status.



16-button layout



buttons picture

Engraving Machine Motion Control System (Rich-Auto) Programming: 3-Axis Mechanical Carving (Cont'd.)-

2.2.) Usage Mode-

Rich Auto Motion Control System provide 2 Modes of Button's Operations, including One-Touch Button & Combination Button.

- **One-Touch Button:** Press one button on handle.
- **Combination Button:** Press two buttons at the same time to achieve the operation.




















The Operation Step: Press one main function button and meanwhile press a second accessibility button, and then release the two buttons at the same time to realize the combination button operation.

List of Combination Buttons: (List Starts on Page 44)

Engraving Machine Motion Control System (Rich-Auto) Programming: 3-Axis Mechanical Carving

(Cont'd.)-

















List of Combination Buttons:

	<u>Combination Button (s)</u>	<u>Function</u>
1	 + "0-9" Number Buttons	Switch the Coordinate System: (0 for the mechanical coordinate system , 1 - 9 for the work coordinate system).
2	 + 	Start Z-Axis Automatic Tool Setting.
3	 + "1-8" Number Buttons	Start the Breakpoints processing (support number 1 - 8)
4	 + 	Start Advanced Processing.
5	 +  + 	To Switch Gear Shaft under Manual Mode.
6	 + 	Repeat last time Processing.
7	 + 	Set Stop Position.
8	 + 	System Upgrade.
9	 + 	Operate machine by entering coordinates parameters.
10	 + 	Quit Buttons Check.

Engraving Machine Motion Control System (Rich-Auto) Programming: 3-Axis Mechanical Carving

(Cont'd.)-

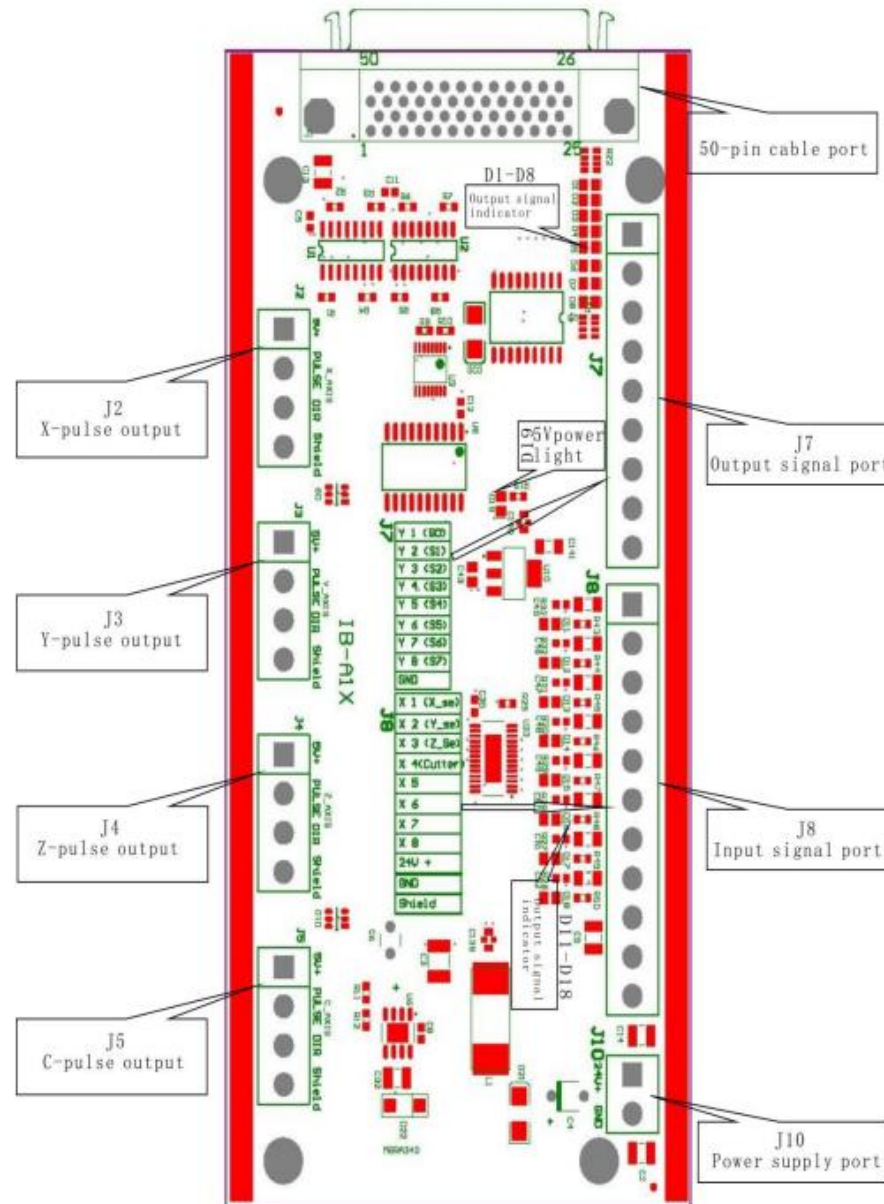
- 2.3 Detail Information for Buttons Function-

<u>Name</u>	<u>Function</u>
	Positive movement of X-Axis, Menu Upward, Figure 1-Inputting.
	Positive movement of Y-Axis, Speed-Up processing speed, Figure 2-Inputting.
	Positive movement of Z-Axis, Figure 3-Inputting, increase Spindle Speed during Processing.
	Set X-Axis and Y-Axis work origin, Figure 4-Inputting.
	Negative movement of X-Axis, Menu downward, Figure 5-Inputting.
	Negative movement of Y-Axis, slow down processing speed, Figure 6-Inputting different property selecting in Menu.
	Negative movement of Z-Axis, Figure 7-Inputting, reduce spindle speed during processing.
	Set Z-Axis work origin, Figure 8-Inputting.
	Machine back home, Figure 9-Inputting, *Check information during processing.
	High or Low Speed selection under manual mode, Figure 0-Inputting, change work coordinate & mechanical coordinate during processing.
	Spindle Start/Stop, decimal point inputting.
	Enter Menu setting, Negative Sign inputting, *Check information during processing.
	Back to Work Origin, confirm Motions/Inputting/Operating.
	Manual Mode, Continue/Step/Distance to select.
	Run or Pause processing, Delete inputting Data, different property selecting in Menu.
	High/Low Speed parameter adjust under Manual Mode, Quit Process Stop/Selections, Inputting and Operating Cancel.




Engraving Machine Motion Control System (Rich-Auto) Programming: 3-Axis Mechanical Carving (Cont'd.)-

3.) Wiring Instructions-

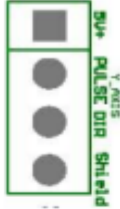
- 3.1.) Rich Auto Interface Board description Interface Board Schematic Diagram:



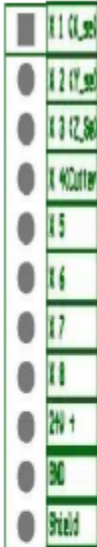
• 3.2.) Interface Board I/O Description-

Port label	Port definition	Pin Definition	Pin functions and parameters	Notes
J10 	System Main power	System main power supply port	System main power supply terminal, interface board give DC 5V for system.	Power area: DC10V~D C24V/3A~4 0V
J2 	X-axis pulse output port	5V signal output port	X-axis drive common anode power supply terminal 5V output	Do not impose voltage on this pin
		Pulse signal output port	X-axis drive pulse signal output port, the output voltage $\cong 3V$ drive current $\cong 8mA$	
		direction signal output port	X-axis direction of the drive signal output port output voltage $\cong 3V$ drive current $\cong 8mA$	
		Shield connection port	X-axis drive signal output voltage line terminal shield	Do not impose voltage on this pin
J3 	Y-axis pulse output port	5V signal output port	Y-axis drive common anode power supply terminal 5V output	Do not impose voltage on this pin
		Pulse signal output port	Y-axis drive pulse signal output port, the output voltage $\cong 3V$ drive current $\cong 8mA$	
		direction signal output port	Y-axis direction of the drive signal output port output voltage $\cong 3V$ drive current $\cong 8mA$	
		Shield connection port	Y-axis drive signal output voltage line terminal shield	Do not impose voltage on this pin
Port label	Port definition	Pin Definition	Pin functions and parameters	Notes
J4		5V signal output port	Z-axis drive common anode power supply terminal 5V output	Do not impose voltage on

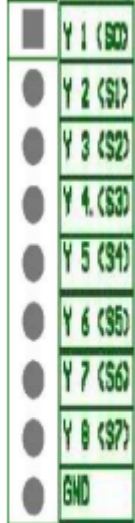
• 3.2.) Interface Board I/O Description (Cont'd.)-

Port label	Port definition	Pin Definition	Pin functions and parameters	Notes
	Z-axis pulse Output port			this pin
		Pulse signal output port	Z-axis drive pulse signal output port, the output voltage \cong 3V drive current \cong 8mA	
		direction signal output port	Z-axis direction of the drive signal output port output voltage \cong 3V drive current \cong 8mA	
		Shield connection port	Z-axis drive signal output voltage line terminal shield	Do not impose voltage on this pin
J5	C-axis pulse Output port	5V signal output port	C-axis drive common anode power supply terminal 5V output	Do not impose voltage on this pin
		Pulse signal output port	C-axis drive pulse signal output port, the output voltage \cong 3V drive current \cong 8mA	
		direction signal output port	C-axis direction of the drive signal output port output voltage \cong 3V drive current \cong 8mA	
		Shield connection port	C-axis drive signal output voltage line terminal shield	Do not impose voltage on this pin




• 3.2.) Interface Board I/O Description (Cont'd.)-

Port label	Port definition	Pin Definition	Pin functions and parameters	Notes
J8		X1:X_se: X origin sensor Signal Input	X origin sensor signal	Input low level signals
	Input control signal terminal		input terminal	
		X2:Y_se: Y origin sensor Signal Input	Y origin sensor signal input terminal	Input low level signals
		X3:Z_se: Z origin sensor Signal Input	Z origin sensor signal input terminal	Input low level signals
		X4:CutterTool-setting sensor signal input	Tool-setting sensor signal input terminal	Input low level signals
		X5 : Driver alarm signal input	Driver alarm signal input terminal	Input low level signals
		X6:Hard limit signal input	Hard Limit signal input terminal	Input low level signals
		X7 : E-stop signal input	E-stop signal input terminal	Input low level signals
		X8 : Definable signal	Definable signal input terminal	Input low level signals
		24V+: Sensor power input	X, Y, Z sensor isolate circuit power supply positive input terminal	Sensor isolate circuit supply voltage range DC10V~DC24V
		GND: GDN input	X, Y, Z sensor isolate circuit power supply negative input terminal	
		Shield: Shield input	Sensor signal cable shield input terminal	Do not use this port as a negative use of the sensor isolation circuit power

• 3.2.) Interface Board I/O Description (Cont'd.)-

Port label	Port definition	Pin Definition	Pin functions and parameters	Notes
J7		Y1(S0):	Connect to	Output Low level signal
	Output signal Control terminal	Spindle ON/OFF	FWD of inverter	Output Low level signal
		Y2(S1): speed 1	Connect to inverter to control speed	Output Low level signal
		Y3(S2): speed 2	Connect to inverter to control speed	Output Low level signal
		Y4(S3): speed 3	Connect to inverter to control speed	Output Low level signal
		Y5(S4): Alarm LED	Light when there is something wrong with system	Output Low level signal
		Y6(S5) : Work LED	Light when system works	Output Low level signal
		Y7(S6): definable	user-defined signal	Output Low level signal
		Y8(S7): definable	user-defined signal	Output Low level signal
		GND:Output GND		GND connect to this terminal in control inverter speed mode

• **3.2.) Interface Board I/O Description (Cont'd.)-**

Port label	Port definition	Pin Definition	Pin functions and parameters	Notes
	D19	Power LED	Interface board 5V indicator indicate the interface and internal power supply status moderators	Lights after power
	D11	Status indicator	X origin status indicator	Light after power. Input low level signal, the lights will be put out. Release the signal, the lights will be bright again
	D12	Status indicator	Y origin status indicator	
	D13	Status indicator	Z origin status indicator	
	D14	Status indicator	Tool-setting Status indicator	
	D15	Status indicator	Driver alarm status indicator	
	D16	Status indicator	Hard Limit status indicator	
	D17	Status indicator	E-stop status indicator	
	D18	Status indicator	Definable signal status indicator	
	D1	Status indicator	output terminal Y1 status indicator	Output low level signal when the system works
	D2	Status indicator	output terminal Y2 status indicator	
	D3	Status indicator	output terminal Y3 status indicator	
	D4	Status indicator	output terminal Y4 status indicator	
	D5	Status indicator	output terminal Y5 status indicator	
	D6	Status indicator	output terminal Y6 status indicator	
	D7	Status indicator	output terminal Y7 status indicator	
	D8	Status indicator	output terminal Y8 status indicator	

- **3.3.) Hardware Wiring-**

Installation Requirements: Power (24V, 3A), it is better to add a filter to prevent the electric field interference. If origin detecting switch are different power supply type, the special testing switching power is needed, (24V origin detecting switch is the best choice).

Rich Auto Motion Control System realizes its control through the connection between the interface board and CNC machine. Interface Board Terminal can be divided into Input terminal and Output Terminal:

Input Terminal:

J8 (Input Control Terminal).

J10 (Main Power Terminal).

Output Terminal:

J2 (X-Axis Pulse Signal Output Terminal).

J3 (Y-Axis Pulse Signal Output Terminal).

J4 (Z-Axis Pulse Signal output terminal).

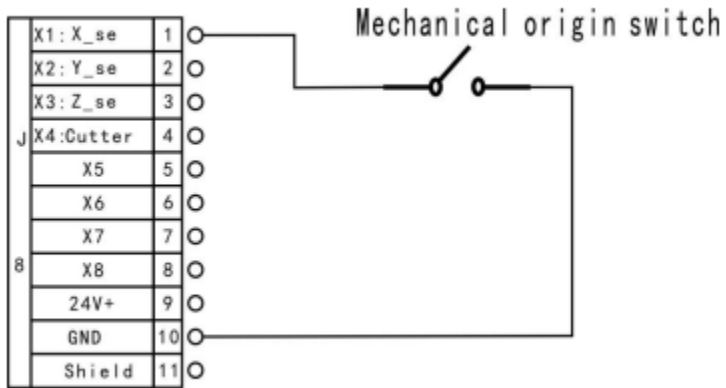
J5 (C-Axis Pulse Signal Output Terminal).

J7 (Output Control Terminal).

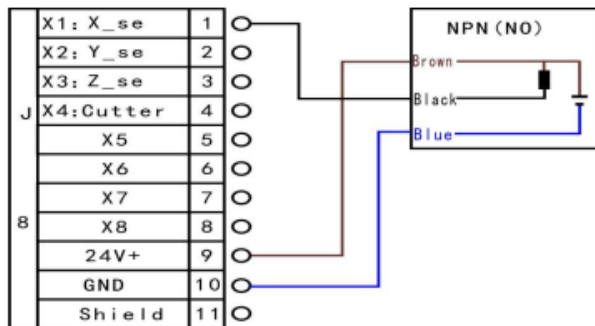
Input Signal Terminal-

J8-

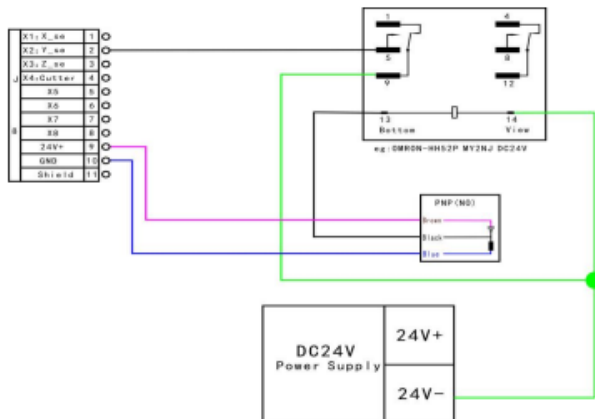
1. sensor input: a) Mechanical: Y and Z are the same as X



- b) NPN(NO): Y and Z are the same as X

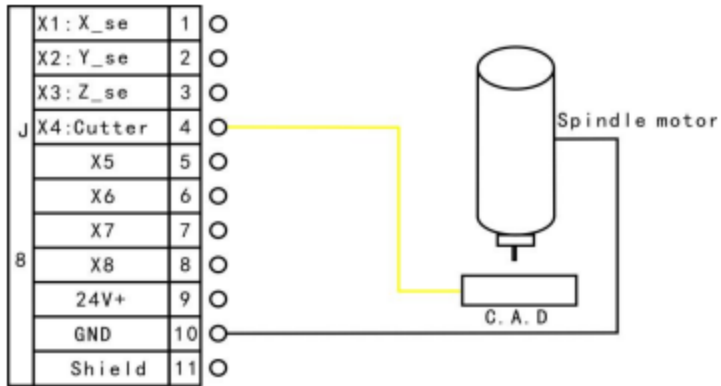


- c) PNP(NO) : X and Z are the same as Y

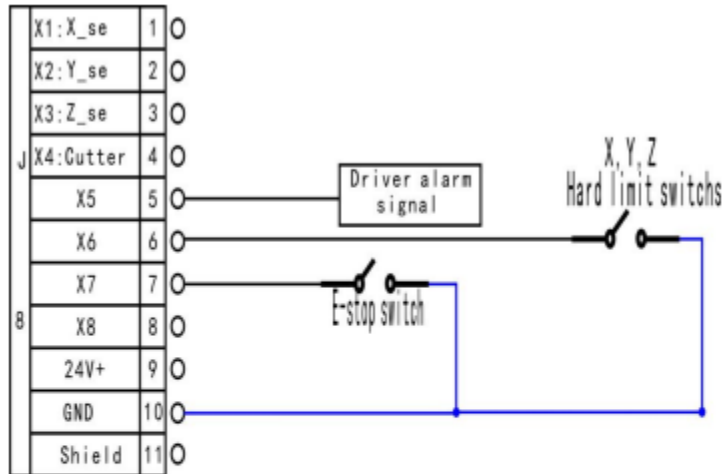


Input Signal Terminal (Cont'd.)-

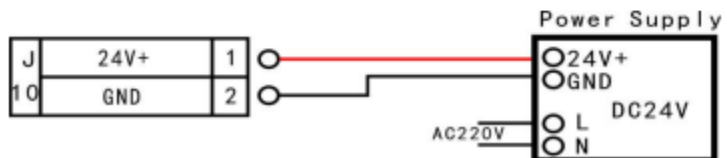
2. Tool-setting input: Tool-setting detecting wiring:



3. X5-X8 Driver alarm, Hard limit, E-stop signal



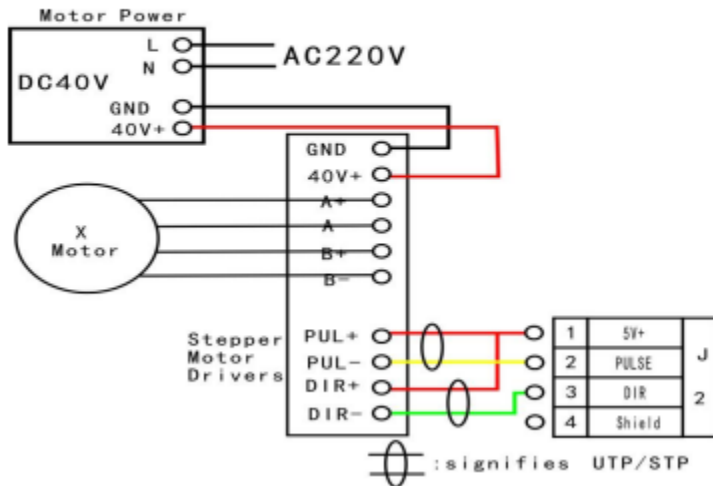
J10 Main power wiring:



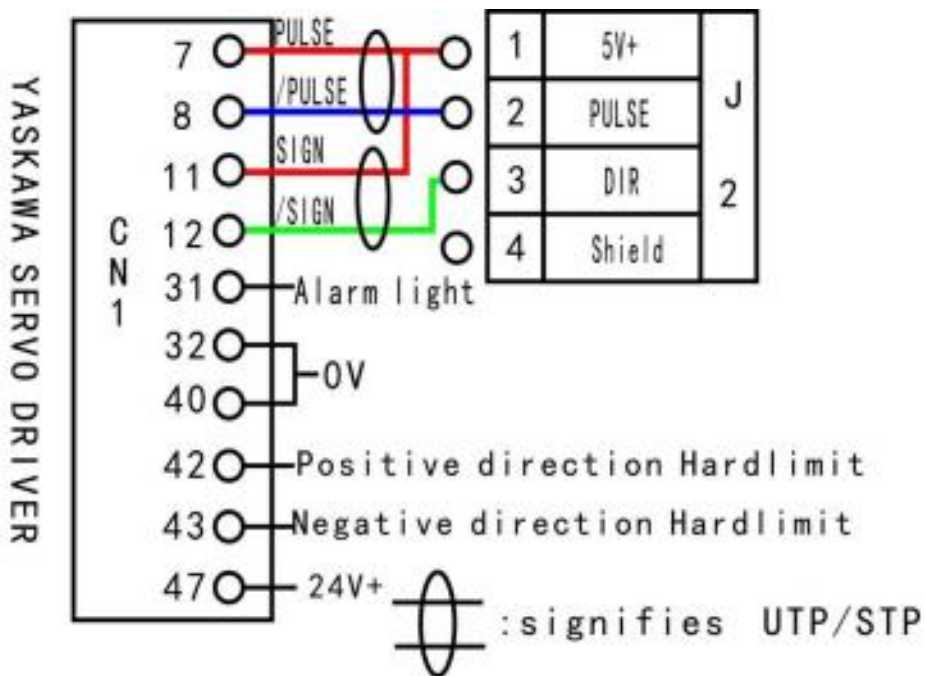
Output Signal Terminal

J2 X pulse signal wiring: Y and Z are the same as X

Stepper driver:



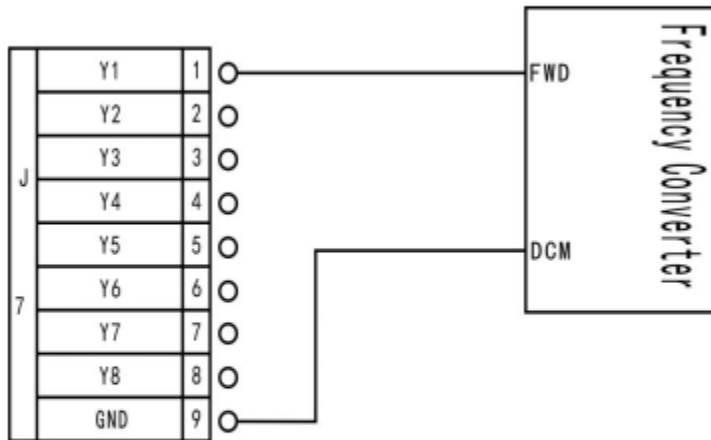
Servo Driver:



Servo Driver (Cont'd.):

J7 Spindle output

2 status : spindle start/stop



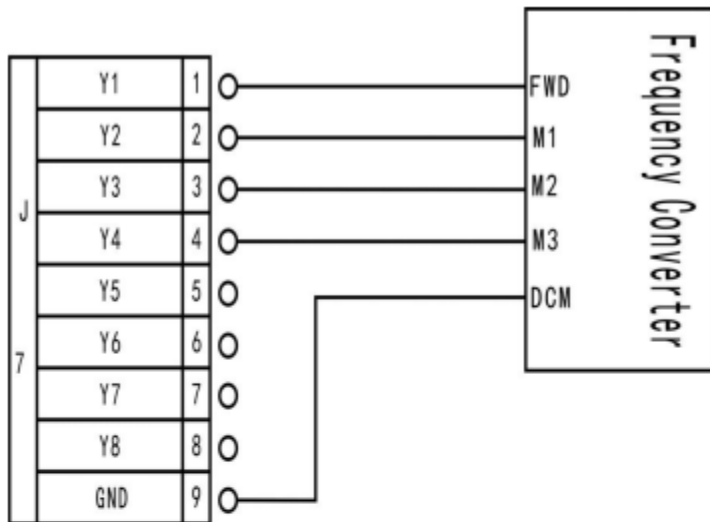
the corresponding spindle setting is:

1 Shift	↓
2 Shift	↑

Servo Driver (Cont'd.):

8 Status: Spindle Start---S1—Speed 1, S2—Speed 2, Sn—Speed n, when Spindle Stop, the Screen Displays Fn—the Speed before Spindle Stop.

3 lines,8 status



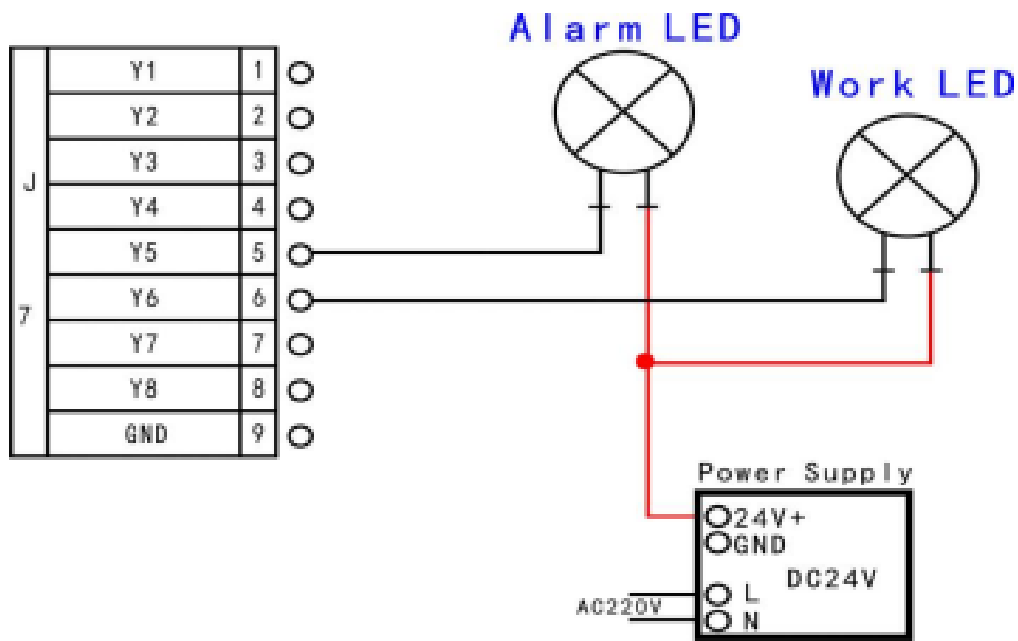
the corresponding spindle setting is:

1 Shift	↓	↓	↓
2 shift	↑	↓	↓
3 shift	↓	↑	↓
4 shift	↑	↑	↓
5 shift	↓	↓	↑
6 shift	↑	↓	↑
7 shift	↓	↑	↑
8 shift	↑	↑	↑

PS: FWD and DCM has Connected in Parallel in some inverters, please do not need to connect Y1 (S0) in such situations, you only need to connect DCM with GND of interface board, without having to reset the spindle gear.

Servo Driver (Cont'd.):

J7 Output port Y5-Alarm LED and Y6-WORK LED:



You can connect the machine with the control system when the above setting is over.

- **3.4.) Commissioning of the Machine and Control System-**

- 1) After turn on the power, users can manually move each axis and confirm the direction. If the movement direction and definition direction are opposite, users can change the motor phase sequence.
- 2) According to the original location of the machine coordinates, users can enter into menu-machine setup-home setup- home direction to reset it.
- 3) Double-press “menu”-manual voltage setup (the upper arrows stand for input voltage) to check whether the home switch is working.

The machine is in good connection if all the above setting is ok.

- 4.) Menu Description-

- 4.1.) Menu Category-

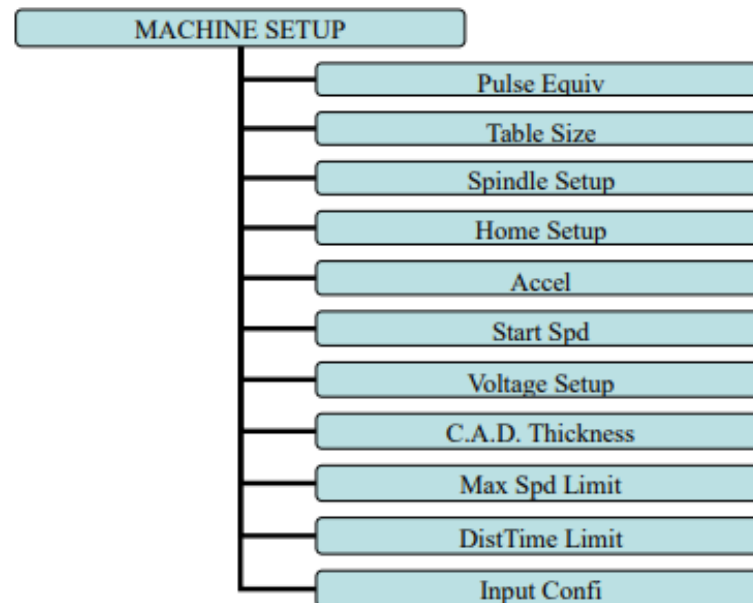
According to menu function, Rich Auto System menu divided into: MACHINE SETUP, AUTO PRO SETUP, SYSTEM SETUP, OPERATE FILE, VERSION VIEW. Every main menu has some submenus.

- 4.2.) Menu Details-

- 4.2.1.) Machine Setup-

Users can set the parameters about machine hardware under "Machine Setup." Machine producer sets it according to device type. If machine hardware parameter is not changed, this parameter should also not change. If machine users need to change, please consult machine producer.

Machine Setup Chart-



1.) Pulse Equiv. (Pulse Equivalent)-

The number of pulses of the system needs to send when machine moves every 1mm.

Unit: pulse/mm.

1.) Stepper Driver-

Formula = Pulses per Revolution/Distance per Revolution, Pulses per Revolution Formula:
(360 °/stepper angle)* Driver subdivision.

Some Stepper drivers mark pulse number directly.


Distance/r formula:

Screw Drive Machine = Screw Pitch * Mechanical Transmission Ratio.

Rack Drive Machine = Rack Module * Gear Teeth Number* π * Mechanical Transmission Ratio.

So Stepper Motor System Formula:

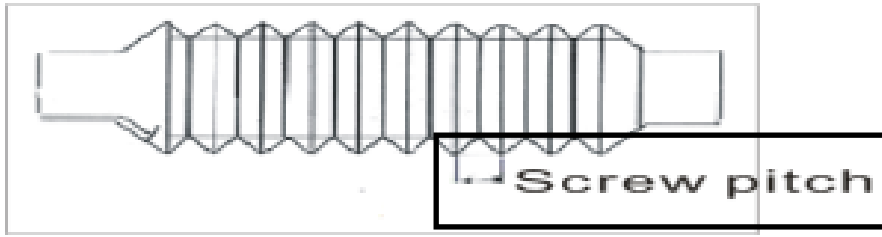
Screw Drive:


$$\text{pulse} = \frac{360^\circ}{\text{Stepper angle}} * \text{Driver subdivision} \\ \text{Screw pitch} * \text{transmission ratio}$$

Screw Drive (Cont'd.):

Formula Description: Step Angle is the angle of the motor parameters, motor rotation step walk.

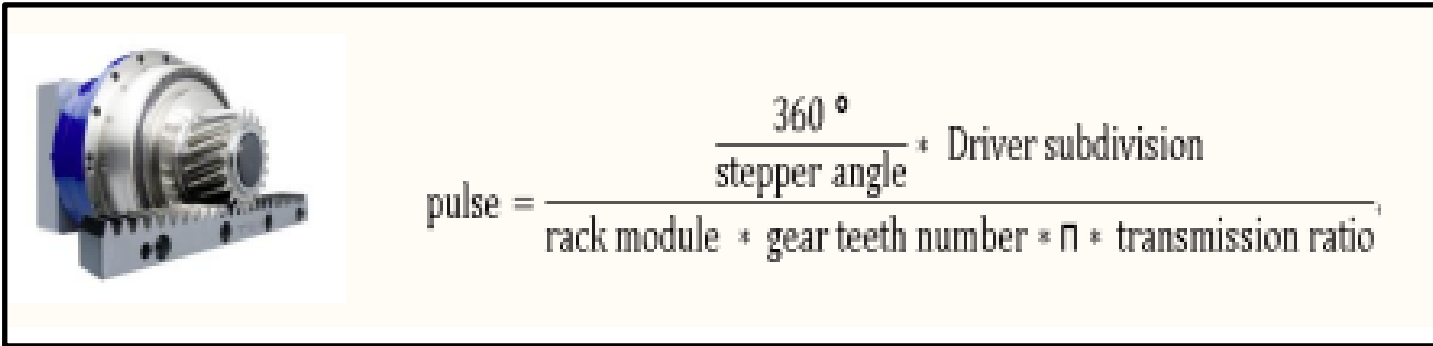
Driver Subdivision: is the parameter set by the driver.



Screw Pitch (Above Picture): The distance that the nut moves when the ball screw makes one rotation.

Transmission Ratio: The speed ratio or angular velocity ratio of the capstan and the driven wheel.

Rack Drive:



Formula Description: Step Angle is the angle of the motor parameters, motor rotation step walk.

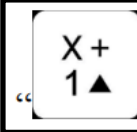




Driver Subdivision: Is the parameter set by the driver.

Rack Module and Gear Teeth Number: Are gear parameters.

rack module * gear teeth number * π equals the perimeter of the reference circle.

Transmission Ratio: The speed ratio or angular velocity ratio of the capstan and the driven wheel.

Setting:

Enter "pulse equiv.," cursor is in the X-Axis pulse equivalent position, Press   to move cursor to where users want to modify. Press "", input the new number, and press "" to save, cursor auto move to next line, the same operation to change, press "" to save all value.

2.) Servo Driver-

The pulse equivalent factory default X,Y,Z, are 400, and set the electronic gear ratio in the servo drive according to the pulse equivalent.

The numerator of the electronic gear ratio represents encoder pulse number, users can search it in servo driver manual. The denominator of the electronic gear ratio:

Screw Drive: Handle pulse equivalent $(400) * \text{screw pitch} * \text{mechanical transmission ratio}$.

Rack Drive: Handle pulse equivalent $(400) * \text{rack module} * \text{gear teeth number} * \pi * \text{mechanical transmission ratio}$.

2.) Table Size: Rich Auto System make the table size as the soft limit values, to prevent machine move over travel, machine size must be less than or equal to the value of the actual motion displacement machine.

Setting: Enter **“Table Size,”** Press “X+ 1▲”/“X- 5▼” to move cursor to where users want to modify. Press “RUN/PAUSE DELETE”, input the new number, press “ORIGIN OK” to save, cursor auto move to next line, the same operation to change, Press “ORIGIN OK” to save all value.

3.) Spindle Setup:

Spindle Delay: Unit: MS; including start delay and stop delay.

Spindle State: Used to set system using multi-speed or only on/off 2 status, the corresponding system parameters. System default “3-line 8-state”, if users need “1-line 2-state (On/Off)”, users can change the number of lines is 1; See detailed settings at J7 spindle output wiring.

4.) Home Setup:





Home Speed: Every axis movement speed when back home, system default speed X.Y: 3000 MM/Minute, Z: 1800 MM/Minute.

Home Order: Every axis movement order when back home Including:

- ❖ Z,X and Y Z,X,Y Z,Y,X
- ❖ Z only X and Y,Z X,Y,Z
- ❖ Y,X,Z XY home X,Y home
- ❖ Y,X home None home X home only XZ and Y

4.) Home Setup (Cont'd.):



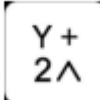


Home Direction: Every axis movement direction when back home, this direction depends on the position where home switch is on the machine. If home switch installed in the positive direction, so home direction should be “**positive**”, and vice versa.

Setting: Enter “**home dir,**” press “”/“” to move cursor to where users want to modify. Press “” to change home direction, press “” to save the change.

5.) Accel (Acceleration): Unit: mm/s²-The maximum acceleration value during acceleration and deceleration movement, improve (including straight and curved motion) processing capabilities. If acceleration is too large, it may cause the motor losing steps, jitter and even whistle, if too small, it will lead to accelerated slowly and reduce the operating speed of the entire graph. System default: linear acceleration is 800 mm/s², curve acceleration is 1000 mm/s², the proposed curve acceleration is 1-1.5 times the linear acceleration value.

6.) Start Speed: Unit: mm/minute-The speed of axis started directly from standstill. Not starting from zero speed, but starting directly from a certain speed, so it can shorten the overall processing time, but do not set this speed too high. Set too high, it will cause the motor losing steps, jitter and even whistle; Set too small, it will reduce the operating speed of the entire graph. If the inertia of motion axes (axis heavier), users can set a smaller start speed, if the inertia of motion axes smaller (lighter shaft), users can set it bigger.

7.) Voltage Setup: Set input and output signal terminal status, “↓” means normal open, “↑” means normal closed. Including two rows of arrow: The upper arrow indicates the Input level: Set input voltage signal terminal status. The top four: 0, 1, 2, 3 positions correspond X-Axis back home, Y-Axis back home, Z-Axis back home, tool setting signal, 5-7: 4, 5, 6 positions correspond driver alarm ,hard limit E-stop Signal. The under arrow indicates the output level: Set output voltage signal terminal status. The top four: 0, 1, 2, 3 positions correspond spindle On/Off, multi-speed 1, multi-speed 2, multi-speed 3 signal, 5, 6:4, 5 positions correspond alarm LED, work LED signal.

Setting: Press “”/“” to move around, Press “”, “” to move up and down, press  to change the direction of the arrow.

8.) C.A.D. Thickness: Unit: mm- This thickness should input by actual, if it is bigger than the actual thickness, Z axis may cut too much; if smaller, Z axis cannot touch workpiece. This parameter can only take effect when user use auto tool setting function.

9.) Max. Speed Limit (Max. Speed Limit): Unit: mm/minute-Set machine top speed, it only takes effect during processing, system default max speed X,Y is“60000000 mm/minute”, “Z+” is “1800 mm/minute”, “Z-” is “3000 mm/minute”.

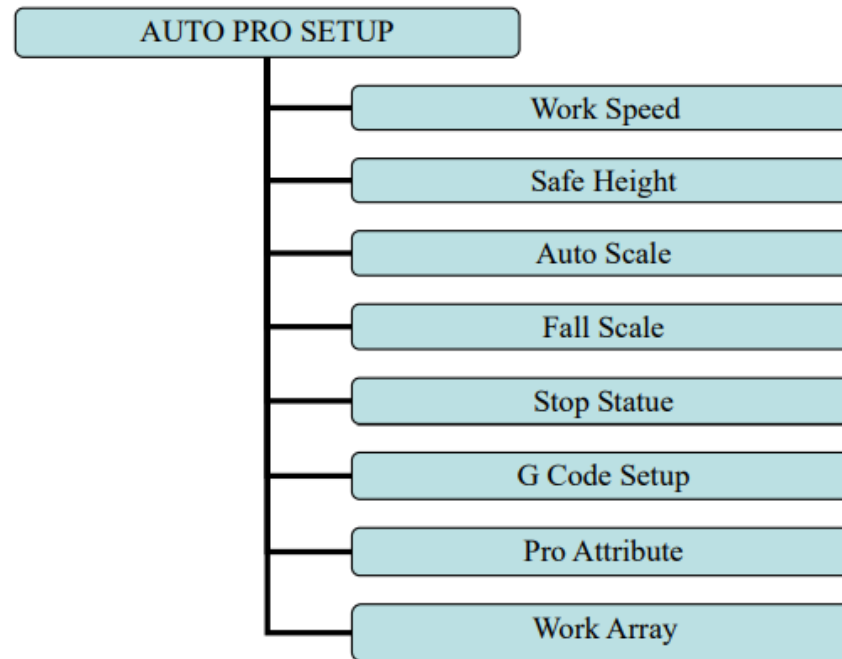
10.) DistTime Limit: Unit: second Users select distance mode, and if the machine does not move in a certain period of time(system default is 30 seconds),the system will go back to continuous mode to prevent Z-axis collision risk because of the customer forgot to switch back to continuous mode and set a large distance value.

11.) InputConfi (Input Port Configuration): To open or prohibit input signal, if the interface board does not connect X5-X8 signals, users can prohibit X5-X8 signals.

4.2.2.) Auto Pro Setup-

Users can set processing parameters,G code attributes etc.under this menu.

Auto Pro Setup chart



1. Work Speed: Unit: mm/minute

Including work speed and fast speed,system default is 3000 mm/minute.

2. Safe Height: Unit: mm

The height of Z axid rise during processing. system default is 40.000 mm.

3. Auto Scale:

Actual processing speed=work speed*auto scale, system default auto scale does not affect the fast speed.

4. Fall Scale:

Fall scale , system default is 0.200.fall speed=fast speed*fall scale , the

4.2.2.) Auto Pro Setup (Cont'd.)-

maximum fall speed is Z axis negative limit speed*fall scale.



Fall height, system default is 5.000mm, fall down scale takes effect when the spindle falls to the fall height.



5.) Stop Statue:


Setup stop position after auto processing.

Work stop state	
FinAct	Pickup
XCoordnt	0.000
YCoordnt	0.000
ZCoordnt	0.000

(Coordnt=coordinate)



Set stop position: Press “” / “” to move cursor to where users

want to modify. Press “”, input the new number, press “” to save.

Press “” to enter finish action list:

FinAct	
Pickup	
	Z
Back To Work Org	
Back Home	
Back Position	
None move	

(FinAct=Finish Action, Org=Origin)

Press “” / “” move cursor to where users want to modify, press

“” to save.

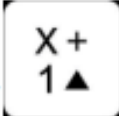

6.) G-Code Setup:



Set special G code attribute, according to the actual need to make changes.

Attribute Of G Code	
F Read	Ign F/Read F
AbsCntr	Off/On
T Read	Ign T/ Read T
Spindle	NTLLG/FORCE/INSTR
FilterJD	None/ Adj Z Filter
S Read	Ign S/ Read S
Read G54	Ign G54/ Read G54
Read G49	Ign G49/ Read G49
Read G40	Ign G40/ Read G40
CodeHead	Skip/NoSkip
Input TO	-1

(Ign=Ignore, Adj=Adjt=Adjust, AbsCntr= Absolute center)


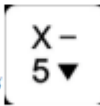


PS: Blue parts indicate system default attributes.

Setting: Press “”/“” move cursor to where users want to modify,

press “” to select the attribute users want, press “” to save.

7.) Pro-Attribute:

Work attribute	
Adj Z	Adj Z/Rev Z
Adjust WP	None/Adj
Ignore Z	Read Z/ Ign Z
CirLmt	55.556
StepWork	Contns/Single
ATC Spld	Auto/None

Setting: Press “”/“” move cursor to where users want to modify,
press “” to select the attribute users want, press “” to save.

8.) Work Array:

Set array parameter, including column count, Rowcount, Columnspace, Rowspace, Interval (unit: ms)

Columnspace: File spacing of X direction

Rowspace: File spacing of Y direction Total Processing times= columncount*

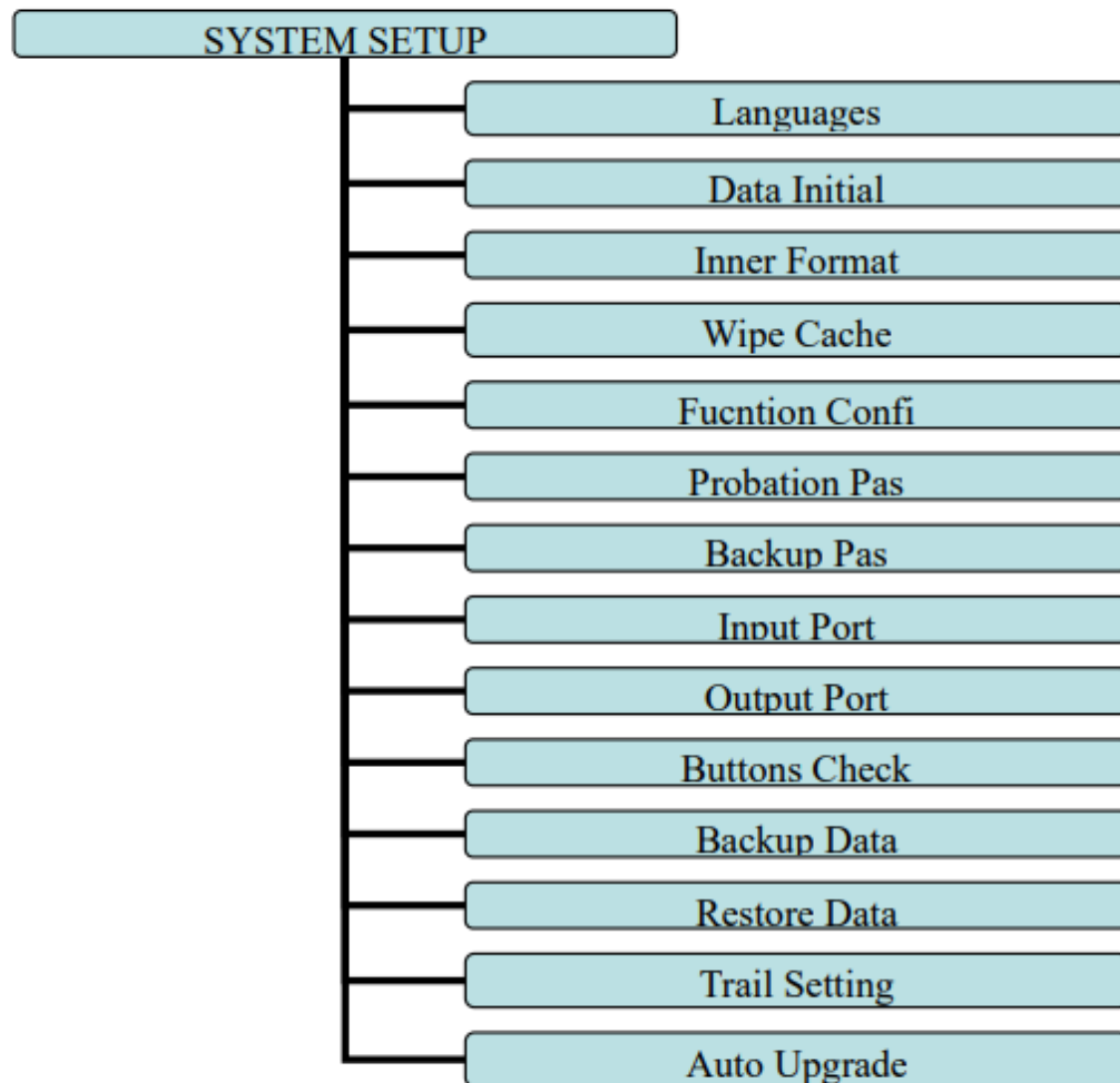
Rowcount Interval: System default 0, it means no wait. During processing, if users need to change processing materials after completion of each processing, you need set time interval a negative number. When the first-time processing is completed, the screen prompt: waiting for the next

8.) Work Array (Cont'd.):

array processing, press any key to start the next array processing currently, if not press, system keep waiting.

4.2.3.) System Setup-

System Setup Chart



4.2.3.) System Setup (Cont'd.)-

1. Languages:

Change system display language, users can choose Chinese and English.

2. Data Initial:

After data initial system parameters will restore to factory setting.

3. Inner Format:

Wipe the internal files, it will not damage the system parameters.

4. Wipe Cache:



Users need to do this after functional upgrade, such as change four-axis program to three-axis program, users must do this operation. After this operation, users need to restart the system.



5. Function Confi (Function Configuration):

Set whether the system retain a function or not, change it according to the actual application in accordance with the practical application of changes. After the operation users need to restart the system.

Set function	
PausePkup	NoPick/Pickup
ScaleFast	None/Affect
Manual	Step/Trad
Pretrt	Parse/None
QuryPara	Query/None
StrtHome	Query/Auto/ZOnly/None
CopyWork	Off/On
RetOrgPZ	Pick Z/Z Stop
TolstAct	Pickup/Origin
PauseRstr	All/only Z

PS: Blue parts indicate system default function.


Setting: Press “”/“” move cursor to where users want to modify,


press “” ,and then select the function users want, press “” to save.

4.2.3.) System Setup (Cont'd.)-

6. Probation Pas (Probation Password):

If engraving machine manufacturers setting some kinds of passwords before shipment(including probation password and backup password, etc.), if you forget the original password, you can connect our company and tell us 20-digit here, our company will provide you a new 20-digit password, you need enter the new 20-digit password, and then all the passwords will be cracked.

Setting: Press "" to enter "Probation Password", input the new password,

and then press "" to save.

7. Backup Pas (Backup Password):

Prevent users overwritten the original correct parameters in the parameter backup disorder or misuse case. To cancel, you do not input any number when you are

prompted to enter a new password, press "" to save.

8. Input Port(Input Port List):

1-3:X,Y,Z home signal 4: Tool setting input signal

5-7:Driver alarm,Hard limit,E-stop signal

9. Output Port(Output Port List):

1: Spindle On/off signal 2-4: Spindle speed signal 5: Driver alarm signal

6: Work LED signal

10. Buttons Check:

Users can check buttons are valid or not under this menu.Enter "Buttons Check", press every button, if it is valid, the screen will highlight.Exit "Buttons

Check", press "" + ".

4.2.3.) System Setup (Cont'd.)-

11. Backup Data :

Backup system parameters to U disk or inner, format system can't effect this. File format: **data.bak**.




12. Restore Data:


Restore backup data from U disk or inner to system.



13. Trial Setting:

Including Four levels password, password and using time can be set in every level respectively. Password can be setted to be 1-8 digits; using time unit: hour, system default 1. The password work according to top-down order, if you do not set trial 1 password , only set trial 2-4, it will work according to 2-4 order.

The operation of Data Initial、 Inner Format、 Wipe Cache should not crack the password.


Setting: Press “” to get into “**Probation Set**”, press “”, “”

to move cursor to which you want to choose. Press “” to get into, and then press

“”, input the new number, press “” to save. The screen display:



There is a mark “*” before every level password, if not, the password will not work normally.

If you have setted all passwords, press “”, the screen will display:


You must restart the system after setting trial password.

13. Trial Setting (Cont'd.):

When password expires, the screen will display:


The system is out of testing time, please contact the factory to get more testing time or unlock!

ORIGIN
OK

Connect engraving machine manufacturers to get password, press “”, the screen will display:

Please input trail 1 password:



ORIGIN
OK

Enter the password, press “” to save. The screen will display:

The time password is updated successfully, please restart the control system.

Restart the handle, and system will work normally.


NOTE: If engraving machine manufacturers forgot all password, you can contact our company and tell us 20-digit original password under “SYSTEM SETUP-Probation pas”, we will provide the new 20-digit password, entered the new number, and press

 “” to confirm.

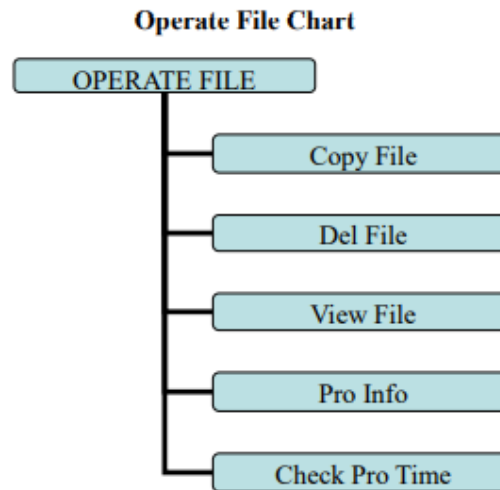
After Cracking Password, restart the handle, and then you can work normally.

14. Auto Upgrade:

If the system has new function, our company will provide upgrade file (extension ***** .PKG & shown as rz-xxxx), users can upgrade through the U disk, specific steps in Appendix 1. It will not damage the original parameters.

File format:  P1_1025(普通三轴雕刻[3寸单色屏][USB1]).pkg

4.2.4.) Operate File-



1. Copy File:

Copy files from U disk to Inner.

2. Del File (Delete File):

Delete files of inner.

3. View File:

View the files and G codes of U disk or inner.

4. Pro Info (Processing Information):



System power on, it will statistical the times of successful processing by file name, if system power off, the data will disappear.



4.2.4.) Operate File (Cont'd.)-

5. Check Pro Time (Check Processing Time):



Calculate processing time by system work speed, after reading G-Code, the screen will display the processing time, different work speed corresponding to different processing time.


Operation Method: Press , enter **“Check Pro Time”**,


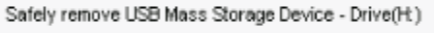
press   to select “Udisk/Internal/Recent File,”


press , to enter, and then select the file press , after reading G-Code, the screen will display the processing time.

PS: Please pull out the U-Disk correctly after copying files from computer, if not, the controller may not recognize the U-Disk.

1.) Win7 (32 bit) system: after copying files, please press , and then the display will show , choose the device

to be shut down. When the display show , the U-Disk pull out from computer successfully.

2.) Win XP system: after copying files, please press , and then the display will show , choose the

device to be shut down. When the display show , the U-Disk pull out from computer successfully.

4.2.5) Version View-

Users can view information about the system hardware and software, including:

- Update Version eg : P1.409/rz-xxxx/q10-82
- Product ID eg: A0020112
- Soft Version eg: A1.1936
- Emergency Version eg: A1.1920
- Soft type: 3-Axis carving
- Hardware Type: Support 3-Inch Screen Flash Disk Mode

5.) Machine Operation-

- 5.1.) Return “Home”-

It will display “all axis home,” “Z Home Only,” “none axis home” after starting up the DSP handle. Choose any one you want. Machine return home can correct the coordinate of system. In some cases, such as after normal power off, reboot and continues last operation, user no need to reset machine, just choose “none axis home.” That is because system auto save coordinate value when system quit.

- **5.2 Import Processing Files-**

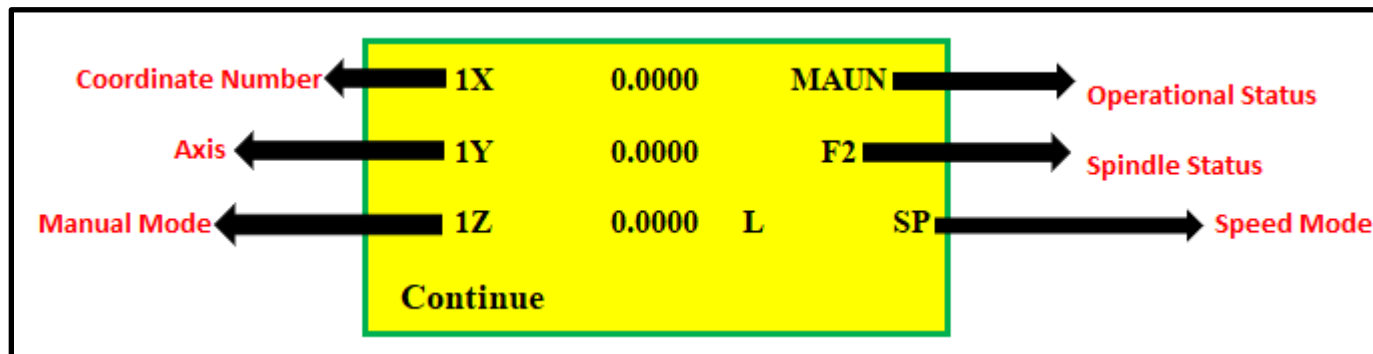
Before processing, generally we should import files. Rich Auto System has 2 ways for processing: U-Disk file processing, inner file processing.

- 1.) Directly import the processing file into U disk, then run the handle.
- 2.) Copy the process file to inner memory space via U-Disk.


- **5.3 Manual Processing Operation-**

Manual Processing Operation refers to controlling of the machine tool through keyboard. User can change the operate speed and set the grid under manual processing operation. System will enter Manual Operation state after returned home, and the screen displays:

Manual Control State Initial Interface:

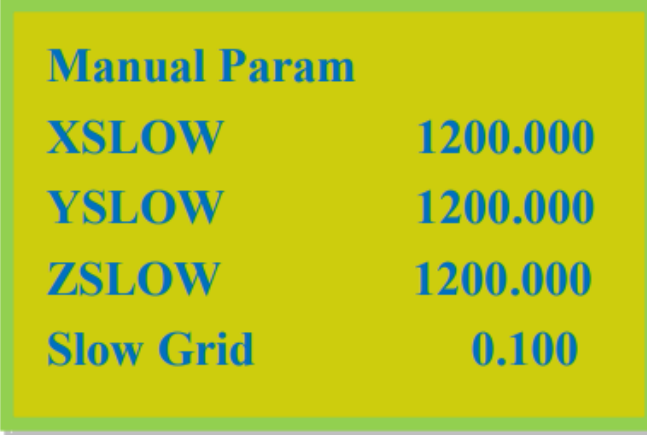


5.3.1.) Manual Operation Speed Switching and Adjusting-







1.) Speed Modes switching There are two speed modes: high speed and low speed. We can change mode by Press “  ”. The Speed Mode you choose will decide the processing speed.

2.) Speed Adjusting:

In Manual Mode, Press “  ” to set the current speed mode. If the current speed is low speed, it displays as follow:



Manual Param	
XSLOW	1200.000
YSLOW	1200.000
ZSLOW	1200.000
Slow Grid	0.100

Press “  ”, “  ” to move the cursor, then press “  ” button to modify the value, Press “  ” to save, press “  ” to quit. If input a wrong number, press “  ” to delete the last number.

To ensure the accuracy of processing and debugging, the system introduces the concept of grid which also called minimum feed. Its range is 0.05mm-1.0mm. When user change mode to “step,” machine will move by grid distance. High speed mode setting is the same as low-speed mode.

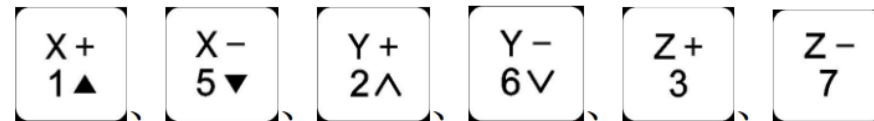
5.3.2.) Manual Processing Mode-

To meet different situation of manual movement, the system provides 3 kinds of Motion Modes:

- Continue.
- Step.
- Distance.

We can change mode by pressing “MODE” and the bottom of screen will display what the current Manual Mode is.

1.) Continuous motion mode This mode has no value control. In continuous mode, machine will



follow when press the direction button. Its motion speed is decided by current speed mode.

Note: If users release the button immediately after pressing the button(shorter than 0.5s), machine will automatically move to the nearest grid point. It always stops on grid point when the motion mode is over. Continuous Mode suitable for crude regulation of machine coordinate situation.

2.) Step motion mode This mode is always move in low speed, move 1 grid per 0.5 second. The grid distance is decided by current speed mode. This motion mode is suitable for tool adjusting or precise adjustment of the location of the mechanical coordinates.

5.3.2.) Manual Processing Mode (Cont'd.)-

3.) Distance motion mode In this mode, it runs according to the setting of distance. Machine will move by the set distance when user press direction button

X+	X-	Y+	Y-	Z+	Z-
1▲	5▼	2▲	6▼	3	7

.


Note: Grid unable to affect the distance motion mode. Machine will move by set distance, cannot move to grid point. If user wants to change distance, please change to distance mode, and re-enter the distance value.

5.3.3 Manual Testing Input and Output-


In the initial boot interface, which is screen displays as follow:




1X	0.000	MAUN
1Y	0.000	F2
1Z	0.000	L SP
Continue		

5.3.3.) Manual Testing Input and Output (Cont'd.)-

Press “  ” twice, the screen will display two rows of arrows which are defaults to all arrows are downwards “↓.”

Upper arrows represent input signal: the former 4 numbers 0, 1, 2, 3 corresponding to X-zero, Y-zero, Z-zero, and tool setting gauge. 4, 5, 6 corresponding to driver alarm, hard limit and emergency stop input signal.

Manual trigger the corresponding signal switch by Pressing “  ” and the corresponding arrow flip so the signal is normal. Bottom row represents output signal: the former 4 number 0,1,2,3 corresponding to spindle on/off multistep rotational speed one multistep rotational speed two, multistep rotational speed three output signal. 4, 5 corresponding to alarm lamp, running lamp output signal.

Press “  ” button can change the arrow direction, so it can control the output of corresponding port. For example, Press “  ” to flip the arrow upwards under 0, it is equivalent to start the spindle. Press “  ” again, the arrow flip downwards that is equivalent to stop the spindle.

5.3.4.) Manual Testing Input and Output-

Including **Machine Coordinate System** and **Work Coordinate System**.

Machine coordinate system is fixed, the origin of coordinates is always a fixed position relative to the machine; Its coordinates is called mechanical values, the origin of coordinates is the origin of the machine or reference point. so that at any time, one point of space can be confirmed by machine coordinate system. Because of reference point is the calculation basis of machine coordinates movement, powered on or remove all abnormal states, you need back to zero. Work coordinate system used more greatly than other coordinates system in processing. Usually in processing, we describe a processing position is always relative to a certain point on the workpiece, whereas the workpiece on the machine tool's position relative to the mechanical origin is often change, so it is necessary to introduce a set of more convenient coordinate system during processing, this is work coordinate system. The origin of work coordinate system is a fixed-point relative to the workpiece, but relative to the origin of machine coordinate system is floating.

RichAuto-A11 provide a machine coordinate system and eight work coordinates system,

Press “” + “” can switch machine coordinate system and work coordinate system,

“” + “No. Button 1-8” can switch machine coordinate system and eight work coordinates system.

Coordinates System:

AX	0.000	MAUN
AY	0.000	S 2
AZ	0.000	L SP
Continuous		

Machine coordinate system

1X	0.000	MAUN
1Y	0.000	S 2
1Z	0.000	L SP
Continuous		

Work coordinate system1

2X	0.000	MAUN
2Y	0.000	S 2
2Z	0.000	L SP
Continuous		

Work coordinate system2

8X	0.000	MAUN
8Y	0.000	S 2
8Z	0.000	L SP
Continuous		

Work coordinate system8

NOTE: You cannot set work origin under machine coordinate system, switch to work coordinate system to set work origin.

- **5.4.) Automatic Processing Operation-**

Auto processing refers to the system runs the file in U disk or inner storage space according to the instruction, it also called file processing. Before auto processing, user must set the machine tool parameters and all the system parameters correctly.

Auto Processing Steps:

5.4.1.) Determine the Origin of the Workpiece-

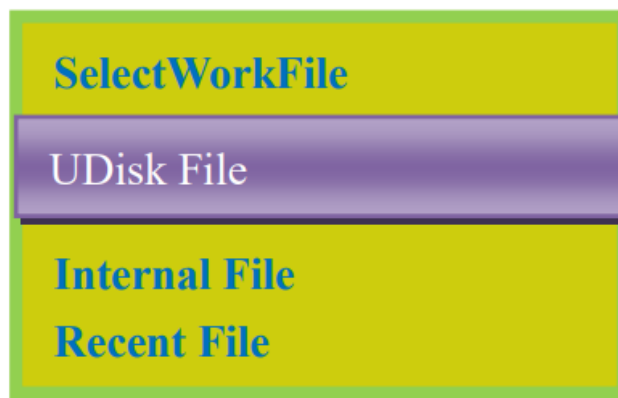
The origin coordinates of X, Y and Z in the processing program is the origin of the workpiece . Before operation, we should pay attention to this position as well as the real position.

Operation is as follows:









Move X, Y and Z to the position which will start to process the file on workpiece. Afterwards, press zero clearing “ $\begin{matrix} XY \rightarrow 0 \\ 4 \end{matrix}$ ” can set the origin of X,Y-Axis. Press Zero clearing “ $\begin{matrix} Z \rightarrow 0 \\ 8 \end{matrix}$ ” to set the origin of Z-Axis. It should be noted that if user have already used the tool setting function which combination Button is $\begin{matrix} \text{MENU} \\ - \end{matrix}$ + $\begin{matrix} \text{ON/OFF} \\ \cdot \end{matrix}$, will no need to Press the “ $\begin{matrix} Z \rightarrow 0 \\ 8 \end{matrix}$ ” button.

5.4.2.) Choose Processing Files-

After determined the workpiece origin, press “ $\begin{matrix} \text{RUN/PAUSE} \\ \text{DELETE} \end{matrix}$ ” will appears a dialog frame:

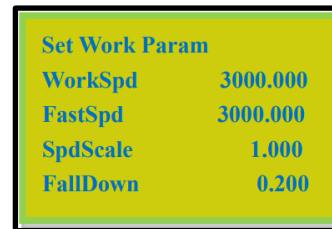


5.4.2.) Choose Processing Files (Cont'd.)-





Press “”, “” to move the cursor and choose, press “” to enter the list, the screen will display three file name, choose the file by Pressing “”, “”. Press “”, “” to turn to the next page. Press “” to exit.


5.4.3.) Processing Parameters Setting-


After choosing the processing file please Press “”, enter processing parameters setting, it includes work speed-WorkSpd, travel speed (or Fast Speed-FastSpd), speed scale-SpdScale (speed ratio), fall speed-FallDown (or Z down ratio).



Set Work Param	
WorkSpd	3000.000
FastSpd	3000.000
SpdScale	1.000
FallDown	0.200

Press “” and “” to move cursor, Press “” to set the value (next value setting is the same as this one), then Press “” to save, the system will check the processing code and start to process when checking finished.

The system code checking is auto mode, user can Press “” to skip the checking and start running file immediately. System will remember the checking only when the previous checking is a complete and correct checking. So that the system will not check the same code again next time.

In the process of processing, the screen scrolling display real-time processing speed, operation time, current line number. We can switch these options by Pressing “”.

- 5.5.) During Processing Operations-

5.5.1.) Speed Ratio & Spindle Grade Adjusting-

1.) Adjust Speed-

Ratio In process of processing, Press $\left[\begin{array}{c} Y+ \\ 2\wedge \end{array} \right]$, $\left[\begin{array}{c} Y- \\ 6\vee \end{array} \right]$ can directly change speed ratio, current speed= set speed * ratio, each push on $\left[\begin{array}{c} Y+ \\ 2\wedge \end{array} \right]$ or $\left[\begin{array}{c} Y- \\ 6\vee \end{array} \right]$ the Speed Ratio will go up or down drop 0.1. Speed Ratio: max 1.0, min 0.1, the displayed speed will be corresponding to the changing of speed ratio, but time will not change.

2.) Adjust Spindle Grade-


If user has set multistep speed, the DSP handle can change the multistep speed in process of processing. Press $\left[\begin{array}{c} Z+ \\ 3 \end{array} \right]$ and $\left[\begin{array}{c} Z- \\ 7 \end{array} \right]$ to change spindle grade. Each push of $\left[\begin{array}{c} Z+ \\ 3 \end{array} \right]$ and $\left[\begin{array}{c} Z- \\ 7 \end{array} \right]$ will go up or down drop 1 grade till to S8 or S1.

5.5.2.) Pause & Adjust Position-

Press $\left[\begin{array}{c} \text{RUN/PAUSE} \\ \text{DELETE} \end{array} \right]$ pauses processing. The right upwards of screen will change from “MAUN” to “PAUZ” and machine paused processing except the rotating of spindle, **Shown Below:**

1X	7.000	PAUS
1Y	8.000	S2
1Z	-2.000	H SP
User will start		




5.5.2.) Pause & Adjust Position (Cont'd.)-

At this moment, the user is allowed to adjust the position of X, Y and Z-Axis. The system default motion mode is STEP. So that user can fine adjust each axis distance. Machine moves one low or high-speed grid distance every step. Meanwhile, user can change the speed mode to high mode just press .

When the adjustment is finished, Press  again, screen shows below:




1X	7.200	PAUS
1Y	41.300	S2
1Z	-0.200	H SP
Restore Position?		

The system asks the user whether save the modified position. Press  /  the system will start processing in modified position, Press , System will back to the position before modifying.







5.5.3.) Breakpoint Processing & Power Down Protection-

1.) Breakpoint Processing-

If user presses  during process of processing, the screen shows below:





If we want to save breakpoint, Press , the screen displays break list (totally 8),

Press ,  to choose the save position and then press  to save, system auto go to standard interface. If we want to continue processing from the breakpoint, we can choose the combination button  + "1-8". First Press  and not release it, at the same time press number button (1-8), then release together, the system will start processing from the breakpoint. For example: You want to start processing from the breakpoint 1, then you should use the combination button  + "1", system will restore processing from breakpoint 1.

The screen shows here:

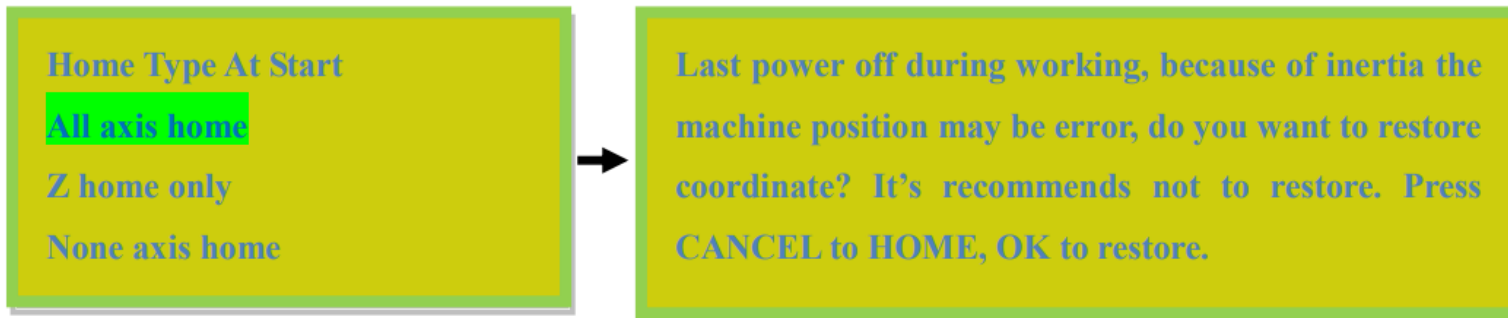




5.5.3.) Breakpoint Processing & Power Down Protection (Cont'd.)-

If you want to go backwards from this breakpoint, Press  and input the line No., and then Press , system will work from the new line number.





2.) Power off protection When there is a sudden power failure during processing, system will save current coordinate and parameters, while power restart, process continue. Before that, system must have a home motion. Shown as below:



Press  to continue unfinished processing, it will display stop line No, and the line number can be chosen. Press  cancels the power off protection.

5.6.) Advanced Processing-

Advanced processing is designed for some special requests, it contains Array Work, Resume Work, Tool Changing, Part Work, Calculate Bound, Mill Plane, Step Work File, Calculate Work Time, Find Break “NO.” The combination button is  + , shown below:

Advanced Work

Array work

Resume work

Tool changing

Part work

Calc bound

Mill plane

Calc work time










Find break no

Scale work









5.6.) Advanced Processing (Cont'd.)-

1.) Array Work-

Steps are as below:



- 1.) Press  ,  to move cursor to the Array work, Press  , Press  or  to select different files list.
- 2.) Press  to enter file list, then rest  ,  move the cursor to choose object file.
- 3.) Set processing parameters, also can modify the array parameters in this step, or you can go to **“AUTO PRO SETUP**, choose **“Work Array”** and modify the array parameters. The rest steps are like the normal processing. System will start to work according to the user’s setting.
- 4.) In the processing of array work, you can view current row number, volume number etc. by pressing  .

2.) Resume Work-

Steps are as follows: Press  ,  to move cursor to resume work, Press  to enter, then Press  or  to select different break points, and then Press  , system will restore processing from the break point. **If you want to go backwards from this breakpoint, Press  and input the line No., and then Press  , system will work from the new line number.**

5.6.) Advanced Processing (Cont'd.)-





3.) Tool Changing-





It achieves manually change the tools at the position you set. Press  to enter the setup and Press  back to work origin.

4.) Part Work-

Part work means user can select start line and stop line, so part of the processing file can be processed. The steps are as follows:

1.) Press  to set, press  and  to move the cursor to select different file list.

2.) Press  to enter, Press  and  to select a file, then Press , system start to read the file.








3.) After reading the file, Press  the screen display line 1 of the code, Press , prompted "input start number: displays total lines", input number of start line and Press , to confirm, if input wrong number, just Press  to delete it.

4.) Press  again, to set the end line, the screen displays "input end number," Press  the screen save the changed start line number, Press , Input end line in cursor, Press  to confirm, Press  to modify.

5.) Set processing parameters.

5.) Calculate Bound-

Calculate bound means user can check the size of processing, To avoid unnecessary waste of materials and processing errors. The steps are as below:

- 1.) Press  to enter, then press  or  to select file list.
- 2.) Press  gets into the file list, and then press  or  to choose file.
- 3.) Press , system start to read the file, after reading the file, the system will calculate the area.

6.) Mill Plane-

Include 2-Two Types:



- Scan Mill.
- Encircle Mill.


Steps are as follows:





- Scan Mill-

Scan mill set	
Scan type	X Scan
Width	100.000
Height	100.000
Diameter	10.000
Depth	0.100
Z Step	0.100
T Ratio	0.800

6.) Mill Plane (Cont'd.)-



1.) Press  or  to move cursor to choose the mill type.


2.) Press  to enter the scan mill set, it includes, Scan Type, Width, Height, Diameter, Depth, Z- Step, T-Ratio.





3.) Press  and  to move cursor on the option which need modify, Press  to choose mill type (X-Scan or Y-Scan), also Press this button to modify the parameters. Press  after modified all the parameters to save them.

• Encircle Mill-

Scan mill set	
Scan Type	AC
Width	100.000
Height	100.000
Diameter	10.000
Depth	0.100
Z Step	0.100
T Ratio	0.800

1.) Press  or  to move cursor to choose the mill type.




2.) Press  to enter the scan mill set, it includes Scan Type, Width, Height, Diameter, Depth, Z-Step, T-Ratio.

3.) Press  and  to move cursor on the option which need modify, Press  to choose mill type(AC or C), also press this button to modify the parameters. Press  after modified all the parameters to save them.

7.) Calculate Work Time-


Calculate the processing time according to the system processing speed. After pre-read processing file, the system will display total processing time. Different processing speed will correspond to different processing time.

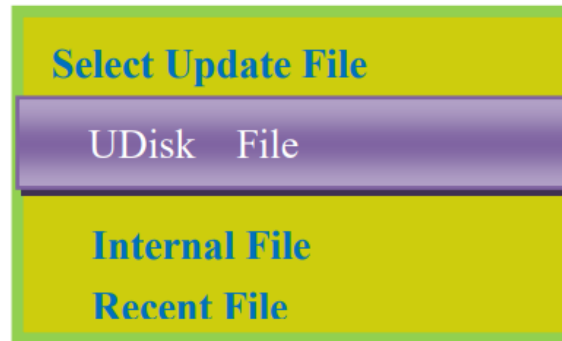
8.) Find Break No-

Look for position line number. If accidentally cutter break and user has not saved the break point, reboot system and replace the cutter. After that, user can manually move X, Y-Axis to the nearest point where the cutter was broken (recommend moving a little further), Press , enter "Find break no.," afterwards choose the previous processing file, the system will prompt "searching current position." System will start processing after finished the searching, the system will prompt "Press  start processing using Press  to view current position of line number."

9.) Scale Work-

If the actual processing requires different sizes of the same file, you can select the scale work, you need to enter an enlargement or reduction ratio for processing.

Step: Press  to get in "Scale Work"-



9.) Scale Work (Cont'd.)-

Choose Processing file, input correct parameters:

Scale	work	param
X	scale	1.000
Y	scale	1.000
Z	scale	1.000

and then Press



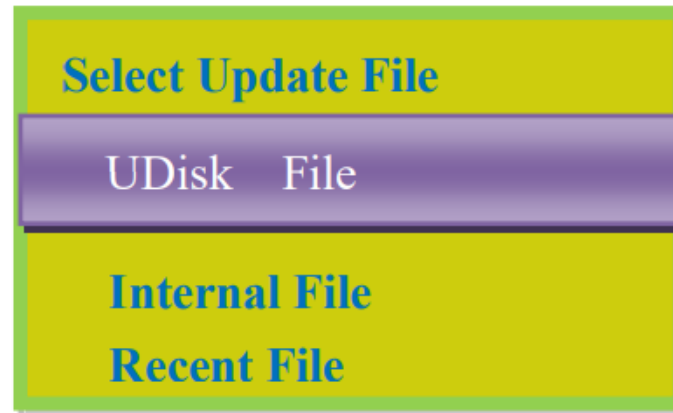
to start processing.

- **PS1. System Upgrade-**

Copy upgrade file to U -Disk and insert U disk into handle,
File Format: Extension *****. PKG & shown as rz-xxxx.

U-Disk Upgrad Method 1-

1.1.) Press “MENU” and then select “System Setup,” Press “ORIGIN OK” to enter, Press “X+ 1▲”、“X- 5▼”, select “Auto Upgrade.” The screen display:



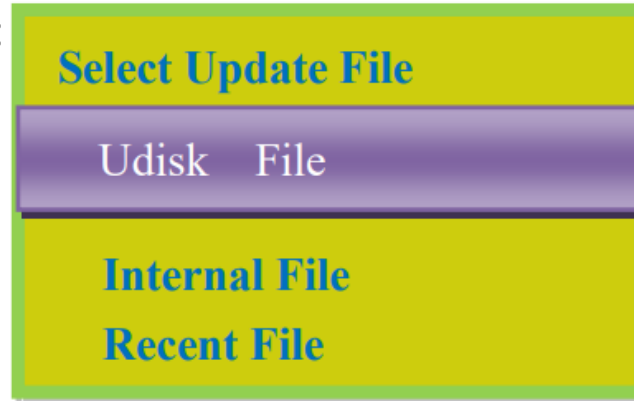
1.2.) Press “ORIGIN OK” to enter, select “Udisk File,” then select upgrade file, Press “ORIGIN OK” system will auto upgrade.

1.3.) After upgrade completed, restart the handle.

U-Disk Upgrade Method 2-

2.1.) Copy upgrade file to U-Disk and insert U-Disk into handle.

2.2.) Press “MENU” + “ORIGIN OK”, screen display:





2.3.) Repeat Method 2 Operation 1.2 & 1.3.

- **PS2. Operations of Handle Communicating with Computer-**

Users can copy file from computer to handle after “**Product ID:A010XXXX & Update Version rz-1967**” version. Connect handle and computer by USB cable, users can find portable storage device on the computer , and then copy processing files from computer to handle inner. This function can ensure that if USB port of the handle is broken or there is no U disk , the machine can still work normally.

- PS2. Operations of Handle Communicating with Computer (Cont'd.)-

Operation Step:

- 1.) Press any two buttons at the same time (for example:  + ).
- 2.) Connect handle and computer by USB cable, it means that the handle is powered by computer, loosen the buttons after the power supply.

3.) Handle Screen Display :



Flash disk mode

Connect Successfully.

- 4.) Open “My Computer ”, and you will find portable storage device, A0101203(H:): Handle, Users can copy processing files to handle inner.
- 5.) Connect handle and machine, Choose internal file to start processing. **NOTE:** Users can check hardware type in Version View: “FlashDiskMode” is necessary, if not, users can not copy processing files from computer to handle inner.

- **PS3. Common Problems and Troubleshooting-**

Solutions of the faults display on the screen-

1.) Indefinite Screen flicker or Automatically Restart Analysis and Solutions:

- Power supply is insufficient. Check power supply if there are problems and change high-quality power supply to solve the problems.
- The local power grid unstable. Check local grid voltage instability or increase the regulator filter device.
- There is something wrong with the power chip of the handle. This phenomenon also appears when the handle is powered through the USB cable to the computer, please return the handle to our company.

2.) Cannot set working origin Analysis and Solutions:

- You may get into the mechanical coordinate system. Press the button "menu" + "1" to back to the first work coordinate system.
- The buttons are broken. Menu-system setup- buttons check, to check the buttons are normal or not.

Faults in Practical Operation-

1.) The file size does not match the size of the actual set Analysis and solutions:

- Pulse equivalent is wrong.
- You do not select the right tool.

2.) The screen displays “beyond limit” when processing file Analysis and solutions:

- The machine is not carried back to zero, the system is not able to confirm the actual position. Make the machine back zero.
- After setting the working origin, the reserved range is less than the actual file size .Determine the actual file size and set correct working origin.
- You set the wrong working origin in the file. Check the path of the file, and re-export the correct file.

3.) Z-Axis (Spindle) fall abnormally (too fast) during processing Analysis and solutions:

- Working speed beyond the fastest speed of Z-Axis. " Machine Setup " - " Max Speed Limit ", set the speed to the safe speed.
- Coupling is losing or transmission slippages. Re-adjustment the connecting parts.
- The lines connect the interface board with the motor drivers has disruption. Re-adjust the lines.
- Processing file error. Check processing file, try to download the correct processing file to U disk or handle internal.
- There is something wrong with the lines connecting Z axis motor and motor driver. Replace the lines.

Faults in Practical Operation (Cont'd.)-

4.) Each time repeating the same processing file after backing to the machine origin , Z axis depth is not the same Analysis and solutions:

- Machining countertop is uneven or processing object not firmly fixed, re-milling countertop adjust the flatness.
- Z-Axis origin detection switch repeat positioning accuracy error, causing each Z axis homing error. Replace a high-quality detection switch.
- Too much interference in the Z-Axis homing process to form a false origin. Re-adjust the line.

5.) Back to the Origin, the machine cannot stop Analysis and Solutions: Double press on the "Menu" button input signal (origin detection switch signal) self-testing, whether the detection signal is triggered or connect normally.

- The origin detection switch is damaged. Replace a new one.
- The distance of the origin detection switch detection sheet beyond the detection range of the switch, adjust the position of the test piece.
- The origin detection switch to the interface board wiring aging or loosening. Again check the connections.
- The interface board is broken. Depot Repair.
- 50-pin data cable is broken. Replace it with a new data line.

Faults in Practical Operation (Cont'd.)-

6.) Back to the machine origin, machine move to the reverse direction Analysis and Solutions :

- The origin detection switch types do not match with the definition of the corresponding level. Modify the level. (Normally open type corresponds to a level defined the direction of the arrow down, normally closed type corresponds to the level defined arrow up).
- The origin detection switch is damaged. replace a new one.
- The origin detection switch connects interface board not well. Refresh the line to determine the wiring is correct.
- Too much interference, resulting in the illusion of the detection switch has been triggered. Recalibrated the whole circuit.
- The interface board is broken. Depot Repair.
- 50-pin data cable is broken. Replace the data line.

7.) Abnormally working when processing file or the actual file is different from theoretical file
Analysis and solutions:

- The program disorder.
- External interference is too large. Refresh connection. (separate strong electric from weak current, "GND" of inverter separated from the other components).

Faults in Practical Operation (Cont'd.)-

8.) Start automatic tool setting, the tool does not stop after touching feeler block Analysis and Solutions:

- "Cutter" signal line connects "Cutter" terminal not well.
- The "GND" terminal of interface board does not connect with spindle shell or connect not well.

9.) Handle LCD digital changes, the machine does not move Analysis and Solutions: If one axis is not moving, it may be a connection problem. Change another normal terminal to this terminal, if it is ok, the motor driver is ok. Maybe there is something wrong with interface board, 50-pin cable. If it is still not moving, it is necessary to detect the corresponding drive and motor. If all axes are not moving, firstly check if there are problems in the 50-pin cable and interface, secondly check the power supply of the motor drivers. Lastly, you must check the mechanical part .

10.) It is normal to the move from one location to another location, but when return from that position to the original position is not normal Analysis and Solutions:

- Mechanical Problems, screw may install not well.

Electrical Components and Wiring Problem-

1.) An axis or multi-axis only one-way movement after handle power-on Analysis and Solutions:

- There is something wrong with the lines connect the interface board with the motor driver, check the connection.
- Interface board is damaged. Replace the interface board. 3、 The motor driver is damaged. Replace the driver.

2.) The certain axis motor does not move after handle power-on Analysis and Solutions:

- Operator makes pulse line and direction line oppositely rewiring it.
- 5V common anode end of the motor driver disconnected, check the connection.
- The motor driver is damaged, operator can promote motor after handle power-on.
- The chip of the interface board damages, no pulse signal output.

3.) Screen is not bright after handle power-on and connected handle to computer with a USB cable the screen displays normal Analysis and solutions:

- The handle does not connect to power supply. Check DC24V power supply output normal or not, if normal please check the cable from the power supply to the interface board.
- The 50-pin cable is damaged, or the interface is broken.

Electrical Components and Wiring Problem (Cont'd.)-

4.) Screen is not bright after handle power-on, and connect the handle to computer by USB cable, the screen is also not bright Analysis and Solutions:

- This phenomenon may be due to the handle shocked by external force or fall on the ground, causing the crystal processor damaged, Depot Repair.
- Users connect high voltage power supply, Depot Repair.

5.) The screen display “spindle on”, actually the spindle off, the screen display “spindle off”, actually the spindle on Analysis and Solutions:

- There is something wrong with wires. organize your wires.
- The output level definition is wrong. Modification correct output level definition.

6.) Screen is not bright after handle power-on Analysis and Solutions:

- The power supply voltage is too big, or the chip is broken because operator makes positive and negative of the power oppositely, Depot Repair.
- The power supply is damaged, Replace the power supply.
- 50-pin data cable damaged, Replace the data line.
- Handle 50-pin interface damage, Depot Repair.

DO'S AND DON'TS on the Turner CNC Machine-

- 1.) DO verify water level in the spindle reservoir.
- 2.) DO lubricate all ball screws & linear guilds every 8 hours of run time. Use 30W Motor Oil or Lithium White Grease Lubricant or equivalent to lubricate the ball screws. Wipe off any excess to reduce dirt and dust acumination.
- 3.) DO keep your collets clean, as fine dust builds up and they get tight.
- 4.) When doing carving work, it is necessary to use a much larger volume of water for the spindle-cooling reservoir & lubricating the Z-Axis more often.
- 5.) DO NOT ever, under any circumstances, reach over the table or obstruct the movement of the gantry while the machine is powered or running a program.
- 6.) ALWAYS Turn off main power prior to changing tooling or working on the spindle.
- 7.) ALWAYS remove main power prior to working on or servicing the spindles water pump and or reservoir.
- 8.) The E-STOP button MUST be disengaged before turning on the main power (twist to the right, ¼ of a turn and it will pop out).

Maintenance-

As with any machine, to ensure optimal performance you must conduct regular maintenance.

Daily Preventive Maintenance Checks-

- 1.) Clean the machine and lubricate unpainted surfaces with a wax or WD40. Wipe off any excess and buff with a dry polishing cloth. This will reduce the likelihood of rust forming.
- 2.) Check cutter teeth for chips and dullness.
- 3.) Generally, inspect the machine for damage and loose or worn parts.
- 4.) Collets and spindle collet hole must be cleaned regularly. Ensure that the slots in the collets are free of sawdust, as sawdust builds up and will stop the collet compressing. If the collet or spindle hole is not clean, the router bit may not run true, and this will affect the performance of your machine.

Weekly Preventive Maintenance Checks-

- 1.) Clean the cutters.
- 2.) Check cutter teeth for chips and dullness.
- 3.) Generally, inspect the machine for damage and loose or worn parts.
- 4.) Check the dust extraction for blockages and any large bits that could cause blockages.

Troubleshooting-

Machine Will Not Start-

- 1.) Check that the start switch is being pressed full in.
- 2.) Check that the red stop switch is fully out.
- 3.) Check that the electrical power cord is plugged into the power outlet.
- 4.) Check that the electrical supply is on (Reset the Breaker).
- 5.) With the power disconnected from the machine, check that the wiring to the plug is correct. Check that the rubber insulation is stripped enough and is not causing a bad connection. Check that all the screws are tight.

The Machine Will Not Stop-

This is a very rare occurrence, as the machine is designed to fail-safe. If it should occur and you cannot fix the fault, seek professional assistance. The machine must be disconnected from the power and never run until the fault has been rectified.

- 1.) Internal Breaker Faulty. Replace the Breaker.

Motor tries to Start, but will not turn-

1. With the power disconnected from the machine, try to turn the spindle by hand. If the spindle will not turn, check the reason for the jamming.
2. Motor faulty. Replace the motor.
3. Spindle was run without coolant. Replace the motor.

Troubleshooting-

Motor Overheats-

The motor is designed to run hot, but should it overheat, it has an internal thermal overload protector that will shut it down until the motor has cooled, and then it will reset automatically. If the motor overheats, wait until it has cooled and restart. If the motor shuts down consistently, check for the reason. Typical reasons are dull cutting tools, no water in the coolant tank, blockage in the coolant pipe and excessive ambient temperature.

Squeaking Noise-

1. Check the Bearings.

Spindle Slows Down during a Cut-

1. Dull cutting tools. Replace the tool or have it re-sharpened.
2. Feeding the wood too fast. Slow down the feed rate.

Machine Vibrates-

- 1.) Machine not level on the floor. Re-level the machine, ensuring that it has no movement.

Delivery Protocol-

- Most large machinery will be delivering on a tractor trailer 48'-53' long. Please notify Sales Representative with any Delivery Restrictions.
- Customer is required to have a forklift (6000lb. or larger is recommended) with 72" forks or fork extensions and operator.
- Note any visible damage, torn packaging, scuffs or any abnormal marks on the delivery receipt or Bill of Lading (BOL).

SHIP FROM		SHIP TO		FREIGHT CHARGES BILL TO					
Name: Address: City/State/Zip:		Name: Address: City/State/Zip:		Name: Address: City/State/Zip:					
Bill of Lading Number : 145787446		Carrier Name: Estes Express		SCAC: EXLA					
FOB: <input type="checkbox"/>		Pro number:		Freight Charge Terms: (freight charges are prepaid by Worldwide Express unless indicated otherwise)					
Master Bill of Lading: with attached underlying Bill Of Lading		WWE Number: W709699351		SPECIAL INSTRUCTIONS: For assistance, please call 833-8WE-SHIP					
Handling Instructions: RMACR11096		Pickup Instructions:		Delivery Instructions: RMACR11096					
Pickup Service(s): Liftgate Pickup, Residential Pickup									
REFERENCE NUMBER INFORMATION									
REFERENCE	# PKGS	REFERENCE	# PKGS	Total # of Pkgs					
CARRIER INFORMATION									
HANDLING UNITS		PIECES		WEIGHT	H.M. X	COMMODITY DESCRIPTION		LTL ONLY	
QTY	TYPE	QTY	TYPE			NMFC#	CLASS		
1	PLT			385		machine, 48(L) x 48(W) x (H) DO NOT STACK			77.5
1				385		Grand Total			
Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of property as follows: The agreed or declared value of the property is specifically stated by the shipper to be not exceeding _____ per _____				COD Amount: \$		Fee Terms: 3 rd Party WWE		Remit Address:	
Note: Liability limitation for loss or damage in this shipment may be applicable. See 49 U.S.C. B14706(c)(1)(A) and (B)				Acceptable Forms of Payment:		Bank Certified Check <input type="checkbox"/>		Customer Check <input type="checkbox"/>	
RECEIVED, subject to individually determined rates or contracts that have been agreed upon in writing between the carrier and Worldwide Express Operations, LLC, a registered motor carrier broker, pursuant to 49 USC 14101(b) and all applicable state and federal regulations.				Personal Check <input type="checkbox"/>		Money Order <input type="checkbox"/>		CARRIER SIGNATURE / PICKUP DATE	
SHIPPER'S SIGNATURE / DATE		Trailer Loaded:		Freight Counted:		Carrier acknowledges receipt of packages and required placards. Carrier certifies emergency response information was made available and/or carrier has DOT emergency response guidebook or equivalent documentation in vehicle. Property described above is received in good order, except as noted.			
<input type="checkbox"/> By Shipper <input type="checkbox"/> By Driver		<input type="checkbox"/> By Shipper <input type="checkbox"/> By Driver/pallet said to contain <input type="checkbox"/> By Driver/Pieces		(Signature) _____ (Date) _____					
(Signature) _____		(Date) _____							

Bill of Lading Number : 145787446

SPECIAL INSTRUCTIONS: For assistance, please call 833-8WE-SHIP

Handling Instructions: RMACR11096

Pickup Instructions:

Delivery Instructions: RMACR11096

Pickup Service(s): Liftgate Pickup, Residential Pickup

Laguna Tools Warranty-

Dealer Machinery Warranty

- New woodworking machines sold by Laguna Tools carry a two-year warranty effective from the date of dealer invoice to customer/end-user. Machines sold through dealers must be registered with Laguna Tools within 30 days of purchase to be covered by this warranty. Laguna Tools guarantees all new machine sold to be free of manufacturers' defective workmanship, parts, and materials. We will repair or replace, without charge, any parts determined by Laguna Tools, Inc. to be a manufacturer's defect. We require that the defective item/part be returned to Laguna Tools with the complaint. The end-user must request an RMA (return material authorization) number from Customer Service and include the (RMA) number with all returned parts/components requesting warranty coverage.* Any machines returned to Laguna Tools must be returned with packaging in the same way it was received. If a part or blade is being returned it must have adequate packaging to ensure no damage is received during shipping. In the event the item/part is determined to be damaged due to lack of maintenance, cleaning or misuse/abuse, the customer will be responsible for the cost to replace the item/part, plus all related shipping charges. This limited warranty does not apply to natural disasters, acts of terrorism, normal wear and tear, product failure due to lack of maintenance or cleaning, damage caused by accident, neglect, lack of or inadequate dust collection, misuse/abuse or damage caused where repair or alterations have been made or attempted by others.

****NOTE: Issuing an RMA number is for referencing materials and issues, it does NOT indicate warranty acceptance/conformity.**

Laguna Tools Warranty-

CNC Limited Warranty

New CNC machines sold by Laguna Tools carry a one-year warranty effective from the date of shipping. Laguna Tools guarantees all new machine sold to be free of manufacturers' defective workmanship, parts, and materials. We will repair or replace without charge, any parts determined by Laguna Tools, Inc. to be a manufacturer's defect. We require that the defective item/part be determined to be damaged due to lack of maintenance, cleaning or misuse/abuse, the customer will be responsible for the cost to replace the item/part, plus all related shipping charges. This limited warranty does not apply to natural disasters, acts of terrorism, normal wear and tear, product failure due to lack of maintenance or cleaning, damage caused by accident, neglect, lack of or inadequate dust collection, misuse/abuse or damage caused where repair or alterations have been made or attempted by others.

Laguna Tools, Inc. is not responsible for additional tools or modifications sold or performed (other than from/by Laguna Tools, Inc.) on any Laguna Tools, Inc. woodworking machine. Warranty maybe voided upon the addition of such described tools and/or modifications, determined on a case-by-case basis. Software purchased through Laguna Tools, Inc., is not covered under this warranty and all technical support must be managed through the software provider. Normal user alignment, adjustment, tuning, and machine settings are not covered by this warranty. It is the responsibility of the user to understand basic woodworking machinery settings and procedures and to properly maintain the equipment in accordance with the standards provided by the manufacturer.

Parts under warranty are shipped at Laguna Tools, Inc.'s cost either by common carrier, FEDEX ground service or a similar method. Technical support to install replacement parts is primarily provided by phone, fax, e-mail, or Laguna Tools Customer Support Website. The labor required to install replacement parts is the responsibility of the user. Laguna Tools is not responsible for damage or loss caused by a freight company or other circumstances not in our control. All claims for loss or damaged goods must be notified to Laguna Tools within twenty-four hours of delivery.

***Please contact our Customer Service Department for more information. Only NEW machines sold to the original owner are covered by this warranty. For warranty repair information, call 1-800-332-4094. Copyright 2013 Laguna

Tools, Inc. ****Warning – no portion of these materials may be reproduced without written approval from Laguna Tools.**

WARRANTY & REGISTRATION

THANK YOU!

Welcome to the Laguna Tools® group of discriminating woodworkers. We understand that you have a choice of where to purchase your machines and appreciate the confidence you have in the Laguna Tools® brand.

Through hands-on experience, Laguna Tools® is constantly working hard to make innovative, precision products. Products that inspire you to create works of art, are a joy to operate, and encourage your best work.

Laguna Tools®
Imagination, Innovation, and Invention at Work

WARRANTY & REGISTRATION

Every product sold is warranted to be free of manufacturers' defective workmanship, parts, and materials. For any questions about this product, the intended use or what it was designed for, customer service, or replacement parts, please contact our customer service department:

Laguna Tools® Customer Service
2072 Alton Parkway, Irvine, California 92606, USA
1-800-332-4049
customerservice@lagunatools.com
www.lagunatools.com/why/customer-service/
8AM. to 5PM PST, Monday through Friday

For warranty claims or to report damage upon receiving – please reach out to our warranty department:

Laguna Tools® Warranty Service
2072 Alton Parkway, Irvine, California 92606, USA
1-949-474-1200
customerservice@lagunatools.com
www.lagunatools.com/policies/warranty
8AM to 5PM PST, Monday through Friday

REGISTRATION

To prevent voiding this warranty, all products sold must be registered within thirty (30) days of receiving the product. Registering the product will enable the original purchaser to receive notifications about important product changes, receive customer service, and be able to file a warranty claim against defective workmanship, parts, or materials.



WHO IS COVERED

The applicable warranty covers only the initial purchaser of the product from the date of receiving the product. To file such claims, the original purchaser must present the original receipt as proof of purchase.

WHAT IS COVERED

The warranty covers any defects in the workmanship of all parts and materials that make up the machine unless otherwise specified. Any part, determined by Laguna Tools®, to have a defect will be repaired or replaced (and shipped), without charge. The defective item/part must be returned to Laguna Tools® with the complaint and proof of purchase in the original packaging that it was received in. In the event the item/part is determined to be not covered by this warranty, the customer will be responsible for the cost to replace the item/part and all related shipping charges.

WARRANTY LIMITATIONS

This limited warranty does not apply to natural disasters, acts of terrorism, normal wear and tear, product failure due to lack of maintenance or cleaning, damage caused by accident, neglect, or lack-of inadequate dust collection. The warranty may be voided against proof of misuse/abuse, damage caused where repair or alterations have been made or attempted by others, using the product for purposes other than those described as intended use (unless with consent by Laguna Tools®), modification to the product, or use with an accessory that was not designed for the product. It is the responsibility of the user to understand basic woodworking machinery settings and procedures and to properly maintain the equipment in accordance with the standards provided in this manual.

LENGTH OF WARRANTY

All new machines and optional accessories sold through an authorized dealer carry a two-year warranty effective the date of receiving the product. Machines sold for either commercial or industrial use have a one-year warranty. Wearable parts like throat plates, bandsaw guides, etc., have a ninety-day warranty.

Table A-1 Warranty Lengths

2 Year – New Machines Sold Through an Authorized Dealer
2 Year – Accessories Sold as Machine Options (excluding blades)
1 Year – Machines Sold for Commercial or Industrial Use
1 Year – Blades and Accessories outside of Machine Options
90 Days – Wearable Parts

Aside from being free of defects upon receiving, consumable parts, like cutters and abrasives, are not covered by this warranty unless otherwise stated by Laguna Tools®. These parts are designed to be used at the expense of the operator and are available for replacement or inventory purchase. The determination of a consumable part will be made on a case-by-case basis by Laguna Tools®.

SHIPPING DAMAGE

Laguna Tools® is not responsible for damage or loss caused by a freight company or other circumstances not in the direct control of Laguna Tools®. All shipping-related claims for loss or damage goods must be made to Laguna Tools within twenty-four hours of delivery.

HOW TO RECEIVE SUPPORT

To file a warranty-claim please contact the warranty department at 1-949-474-1200. To receive customer service or technical support please contact the customer service department at 1-800-332-4094. Parts, under warranty, are shipped at the expense of Laguna Tools® either by common carrier, FedEx ground services or similar method. Technical support to install replacement parts is primarily provided by phone, fax, email, or the Laguna Tools Customer Support Website.



Laguna Tools Warranty-

No Modifications Allowed or Sold.

Laguna Tools, Inc. is not responsible for additional tools or modifications sold or performed (other than from/by Laguna Tools, Inc.) on any Laguna Tools, Inc. woodworking machine. Warranty maybe voided upon the addition of such described tools and/or modifications, determined on a case-by-case basis. Normal user alignment, adjustment, tuning, and machine settings are not covered by this warranty. It is the responsibility of the user to understand basic woodworking machinery settings and procedures and to properly maintain the equipment in accordance with the standards provided by the manufacturer. Parts, under warranty, are shipped at Laguna Tools, Inc.'s cost either by common carrier, FEDEX ground service or a similar method. Technical support to install replacement parts is primarily provided by phone, fax, e-mail, or Laguna Tools Customer Support Website. The labor required to install replacement parts is the responsibility of the user. Laguna Tools is not responsible for damage or loss caused by a freight company or other circumstances not in our control. All claims for loss or damaged goods must be notified to Laguna Tools within twenty-four hours of delivery. Please contact our Customer Service Department for more information. Only new machines sold to the original owner are covered by this warranty.

For warranty repair information, call 1-800-332-4094.

Dealer Machinery Warranty

****Any machines returned to Laguna Tools must be returned with packaging in the same way it was received. If a part or blade is being returned it must have adequate packaging to ensure no damage is received during shipping. In the event the item/part is determined to be damaged due to lack of maintenance, cleaning or misuse/abuse, the customer will be responsible for the cost to replace the item/part, plus all related shipping charges.**

We require that the defective item/part be returned to Laguna Tools with the complaint. The end-user must request an **RMA (Return Material Authorization) Number** from Customer Service and include the (RMA) number with all returned parts/components requesting warranty coverage.

Laguna Tools Packaging/Laguna Tools RMA Example-

RMA #

**RTN. AUTH. #
CR10979**

12/1/2020 Return Authorization - NetSuite (Laguna Tools, Inc)

Return Authorization

CR10979 PENDING RECEIPT

Edit Back Receive Close Actions

CUSTOMER	CREATED FROM	Summary
DATE	SALES EFFECTIVE DATE	SUBTOTAL
CURRENCY	EST. EXTENDED COST	DISCOUNT
SUBSIDIARY	EST. GROSS PROFIT	GST/HST
RTN. AUTH. # CR10979	EST. GROSS PROFIT PERCENT	PST
DEPARTMENT Sales	PROMISE DATE	TOTAL
LOCATION Laguna Texas Demo / Returns	<input type="checkbox"/> DEPOSIT RECEIVED	
SALES REP	<input type="checkbox"/> ACCOUNTING APPROVAL	
PARTNER	COMMENTS	
LEAD SOURCE	RETURN REASON Manufacturers Warranty Defect	
PO # PO-981	SHIP IMMEDIATE	
MEMO	SPLIT SHIP	
	<input type="checkbox"/> REVISED INVOICE	
	ORDER HOLD REASON	

SHIPPING COMMENTS

Items Promotions Address Messages History Workflow Custom Partners Sales Team Additional Information OzLINK Pacejet SPS

EXCHANGE RATE RATE

DISCOUNT

ITEM	RETURNED	REFUNDED	QUANTITY	UNITS	INVENTORY DETAIL	PRICE DESCRIPTION	LEVEL	UNIT PRICE	AMOUNT	TAX CODE	TAX RATE	PST	OPTIONS	GIFT CERTIFICATE	DROP CLOSED	SHIPMENT	COI ESI TYF
																	Iter De Co

Edit Back Receive Close Actions

Laguna Tools Packaging/Laguna Tools BILL of LADING Example-

SHIP FROM		SHIP TO		FREIGHT CHARGES BILL TO	
Name: Address: City/State/Zip:		Name: Address: City/State/Zip:		Name: Address: City/State/Zip:	
Bill of Lading Number : 145787446		Carrier Name: <u>Estes Express</u>		SCAC: EXLA	
FOB: <input type="checkbox"/>		Pro number:		Freight Charge Terms: (freight charges are prepaid by Worldwide Express unless indicated otherwise)	
SPECIAL INSTRUCTIONS: For assistance, please call 833-8WE-SHIP		Master Bill of Lading: with attached underlying Bill Of Lading		WWE Number: W709699351	
Handling Instructions: RMACR11096		Pickup Instructions:		Delivery Instructions: RMACR11096	
Pickup Service(s): Liftgate Pickup, Residential Pickup		REFERENCE NUMBER INFORMATION		CARRIER INFORMATION	
REFERENCE	# PKGS	REFERENCE	# PKGS	Total # of Pkgs	
HANDLING UNITS					
QTY	TYPE	QTY	TYPE	WEIGHT	H.M. X
1	PLT			385	
1				385	
COMMODITY DESCRIPTION					
machine, 48(L) x 48(W) x (H) DO NOT STACK					
Grand Total					
Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of property as follows: The agreed or declared value of the property is specifically stated by the shipper to be not exceeding _____ per _____			COO Amount: \$		Acceptable Forms of Payment:
Note: Liability limitation for loss or damage in this shipment may be applicable. See 49 U.S.C. B14706(c)(1)(A) and (B)			Fee Terms: 3 rd Party WWE		Bank Certified Check <input type="checkbox"/>
RECEIVED, subject to individually determined rates or contracts that have been agreed upon in writing between the carrier and Worldwide Express Operations, LLC, a registered motor carrier broker, pursuant to 49 USC 14101(b) and all applicable state and federal regulations.			Remit Address:		Customer Check <input type="checkbox"/>
SHIPPER'S SIGNATURE / DATE			CARRIER SIGNATURE / PICKUP DATE		Personal Check <input type="checkbox"/>
Trailer Loaded:			Carrier acknowledges receipt of packages and required placards. Carrier certifies emergency response information was made available and/or carrier has DOT emergency response guidebook or equivalent documentation in vehicle. Property described above is received in good order, except as noted.		Money Order <input type="checkbox"/>
By Shipper <input type="checkbox"/>			(Signature) _____		
By Driver <input type="checkbox"/>			(Date) _____		
Freight Counted:					
By Shipper <input type="checkbox"/>					
By Driver/pallet said to contain <input type="checkbox"/>					
By Driver/Pieces <input type="checkbox"/>					

Bill of Lading Number : 145787446

SPECIAL INSTRUCTIONS: For assistance, please call 833-8WE-SHIP

Handling Instructions: RMACR11096

Pickup Instructions:

Delivery Instructions: RMACR11096

Pickup Service(s): Liftgate Pickup, Residential Pickup

Laguna Tools is not responsible for errors or omissions. Specifications subject to change. Machines may be shown with optional accessories.

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Manual Revision Record

<u>Date of Change</u>	<u>Revision#</u>	<u>Engineering/Design Change Description</u>
6/16/2021	1	New Manual for the Turner CNC Machine.
12/23/2021	2	Incorporated Engraving Machine Motion Control System (Rich Auto): 3-Axis Mechanical Carving-Pg. 33-109. Changed Photos to current Assembled Machine.

Comments/Notes