QOMOLANGMA®

QOMOLANGMA 51in x 98in 1325 Multifunctional CNC Router with Vacuum System

USER MANUAL

CATALOG

Introduction

We are very excited to have you as one of our valued customers.
This manual will help walk you through basic set-up of the machine and how to use your control handle.
Please be sure to read the manual in its entirety prior to operating the machine, this will ensure a better understanding of the machine and how it works. We understand that there can be a learning curve like with any new piece of machinery but with some effort and patience you will be running your new router with confidence and speed in no time!

SAFTEY

Important Warning Labels

These warning labels can be found all around your machine, it is important that you pay attention to these warning labels and adhere to them. These labels are put in place for the safety of the machine and the operator. If these warnings are not followed, it could cause serious damage to the machine and possible injuries to the operator.

Installation Safety

An electrician must read and understand the electrical schematics prior to connecting the machine to the local power system. Connecting the wrong voltage power will void the warranty. All switches should be turned to the OFF position before power is connected. The main disconnect switch should always be locked in the OFF position if the machine is left unattended. When the machine is installed, the electrician or customer should be sure that all motors rotate in the correct direction.

Work Area Safety

Fire extinguishers should always be readily accessible, and operators should always familiarize themselves with the fire prevention recommendations for each component of the CNC system. It is important to always keep the work area clean and uncluttered. Oil, debris, or water on the floor can cause unsafe conditions. Customers should be sure that all work areas are free of hazardous obstructions and that all tools and other equipment are returned to their proper storage place when not in use. Operators should never leave the machine unattended during the cutting sequence.

Cutter Safety

Cutting tools are very sharp and should be handled accordingly. Machine operators should inspect tools before each use and discard any defective tools. Failure to properly handle tooling can result in serious injury

User notice

1. The operator should have relevant technical training received, or supervised by specially assigned person.
2. Before starting the work, the working place should be made neat and clean. All levels of voltage should be considered equally dangerous. Even the voltage levels, which cannot produce electrical shock, should also not be ignored. We shall first confirm the circuit is dead before touching it for installation and maintenance.
3. We have to switch off, isolate and properly earth the circuit before doing any work with the circuit.
4. When the machine is working, it is forbidden to put the hand or other parts of the body on the platform.
5. It is forbidden for non-training personnel to change blades, and it is forbidden to replace blades in the power-on state.
6. It is forbidden to disassemble machine parts privately.

CHAPTER 1 Glossary of Terms

Ball End Milling Cutter: A milling cutter that has a rounded cutting diameter at its end that is equal to the cutting diameter.

DXF file: Drawing exchange Format file that was created as a standard to freely exchange 2 and 3 dimensional drawings between different CAD programs. It basically represents a shape as a wire frame mesh of x, y, z coordinates (vectors).

Encoder: Typically an optical device that consists of a disk with 100 to 1000 holes on its periphery. The most common is the incremental encoder that has a small LED light source on one side of the disk with a diode detector on the other to allow the disk rotation to be monitored in discrete incremental steps. Hence, a full revolution can be broken up into 100's or even 1000's of position steps.

G-Code: The standard machine tool language around the world. It generally consists of specifying the x, y, z (and a, b or c) coordinates that the machine is to move to. Such movement can be linear, circular or even special drilling operations. It is the universal language of all modern machine tools (mills, lathes, edm machines etc.)

M-code: The standard machine tool codes that are normally used to switch on the spindle, coolant or auxiliary devices. They can also be used for G-code program control such as repeating the program or ending it.

Servo Motor: A motor that is typically a brush or brushless DC Type with an optical encoder attached to it. It is used in what is called a Servo Loop system where positioning information is constantly tracked by minimizing the error between the commanded and real position.

Step Motor: A motor that derives its motion by receiving input signals (pulses) in a very specific sequence. The most common type is one that rotates 1.8 degrees for each input pulse. This provides a very simple way of controlling motion very precisely with the use of common digital logic circuitry.

STL file: Stereo Lithography file format that has traditionally been associated with Stereo Lithography prototyping machines, but is now also being used to represent 3D surfaces for CNC tool path generating programs.

Tool Path: A series of vector coordinate positions that define a cutting path. This cutting path can be a simple 2D or sophisticated 3D (even 4D or more) path used to machine out the shape of a desired part.
Vector: A line that has both length and direction. It is usually specified by a starting x, y, z coordinate position and ending x, y, z coordinate position.
DRO: Digital Read Outs shows the axis positions in the interface.
MDI: Manual Data Entry, used for entering commands manually, line by line.
CAD: Computer Aided Design, the using of computers to assist and develop design.
CAM: Computer Aided Manufacturing, the use of computers to assist in manufacturing.
CNC: Computer Numerical Control.
Command: A signal or series of signals that initiates one step or series of steps in the execution of a program.
H. M. I: Human Machine Interface.
O.I.T: Operator Interface Terminal.

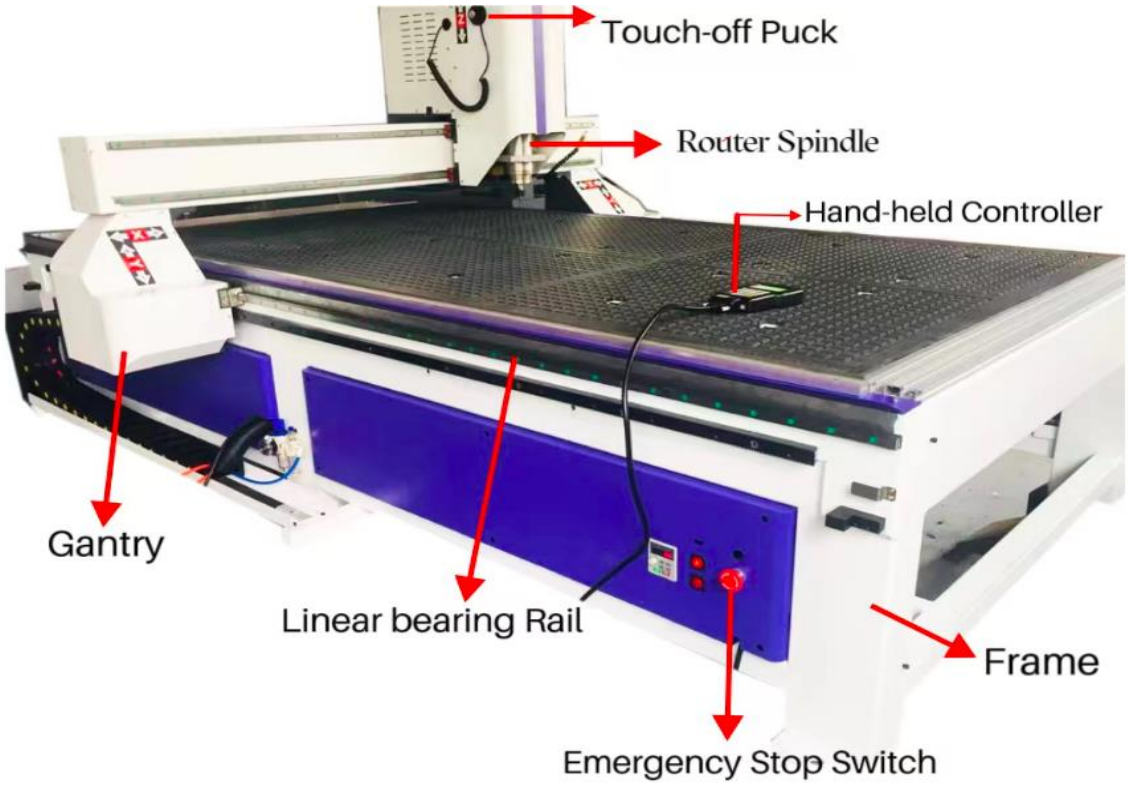
CHAPTER 2 MACHINE OVERVIEW and SPECIFICATIONS

2.1 Standard parts

Please check the number of the following parts.
Please contact with us if any item is omitted.

Name	Specification	Quantity
Cutter Tool	Ø3.175, Ø4, Ø6, Ø8, Ø12.7	1
Vacuum Pump	7.5kw	1
Dust Collector		1
Z-Probe		1
Software	Ucancam V10	1
Water tank		1

2.2 Parts of the Machines



Linear bearing rail

There is a bearing rail on both sides of the frame. The bearing rails guide the gantry as it travels along the frame of the machine.

Router spindle

The router spindle is very high precision and water-cooled. The router spindle is moved in the three axes by precision ball screw system that is controlled by the machine controller.

Gantry

The gantry straddles the bed and carries the router spindle motion system. It is moved along the length of the bed by the ball screw and is guided by the linear bearing rails. The gantry is controlled by the machine controller.

Frame

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

2.3 Specification

Model	CNCR-N1-1325V
Table Size	1440 x 2630mm (56.7" x 103.5")
Working Size	1300 x 2500 x 200mm (51" x 98.4" x 7.87")
Max.Material Height	200mm (7.87")
Spindle Power	Water Cooling 3.0kw / 4HP
Gross Power	≤13KW 60A
Speed RPM	0-24000rpm
Driver	Stepper Subdivided
Software	Ucancam V10
File Format	G Code or HPGL
Table Top	PVC Vacuum Table (30mm thickness)
Vacuum Pump	7.5kW (AC220V Three-Phase Electricity)
Size	2050 x 3060 x 1650mm (80.7" x 120" x 65in)
Weight500KG (1100ibs)	

CHAPTER 3 UNPACKING & SETTING UP YOUR MACHINE

Your new router will be delivered in a large wooden crate like the one pictured in Figure 1. Please be sure to have the necessary tools on hand when unpacking the crate, we recommend a hammer and a pry bar, as well as some type of metal cutter or tin snips that will allow you to remove the bands from the crate. Our crates will have pallet feet, this allows for a forklift or pallet jack to be used so you can move the crate with ease.

While majority of our machines arrive safe and sound, we urge you to inspect the crate upon delivery to ensure that no damage has occurred while in transit. Damage can include pierced wood, smashed sides, or an open portion of the crate, if there seems to be any damage to the crate, take pictures prior to removing the bands. If no damage is visible on the outside, proceed to the opening of the crate. If there is damage to the crate, contact your sales representative and send them pictures so we can report that damage to the carrier. The machine is insured for its full value while in transit and if it is damaged to the point of needing parts or replacement; the carriers are very good at covering those costs. But the damage must be reported within 24 hours of delivery.

3.1 Placement

Prior to removing the machine from the packaging, decide the operating location of the machine. The floor space can refer to: 4080 x 2380 x 2050mm (161" x 94" x 81")

1. There should be sufficient area at the front of the machine to allow you to work on it comfortably.
2. There should be sufficient area at the back of the machine to allow access for adjustments and maintenance to be conducted.
3. Adequate lighting. The better the lighting the more accurately and safely you will be able to work.
4. Solid floor. You should select a solid flat floor, preferably one made of concrete or something similar.

5. Locate it close to a power source and dust collection or fume extraction.

3.2 Unboxing

Once in place, carefully use a crow bar to remove the lid of the crate.
When you open the crate, usually the machine is packed with rainproof film, oilpaper film and stretch film, which can be cut with scissors or blades. Then put the various accessories in the right place.
Be careful not to use any part of the plywood interior as a focal point for the pry bar, stay on the outside framing to ensure that you will not pierce the plywood and damage the machine.

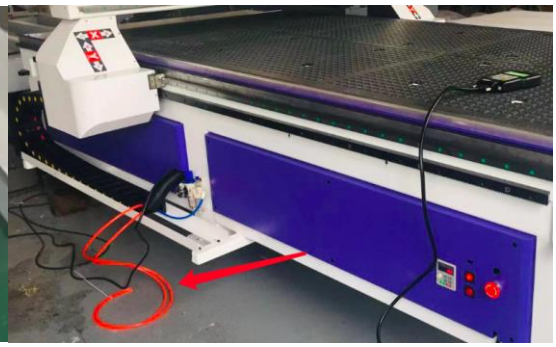
CHAPTER 4 INSTALLATION

1. Machine Installation

The machine is moved to the right place, landed, locked and fixed.
Place the machine on a flat surface, and adjust and level the four corners of the CNC machine body. It is recommended to use a level to adjust the table to level.
Raise the main bed, Place the anchor bolt. Place the level ruler on the Y-axis guide rail, adjust the anchor bolt to the horizontal position (The bubble is in the center)

2. Water Tank Set-Up

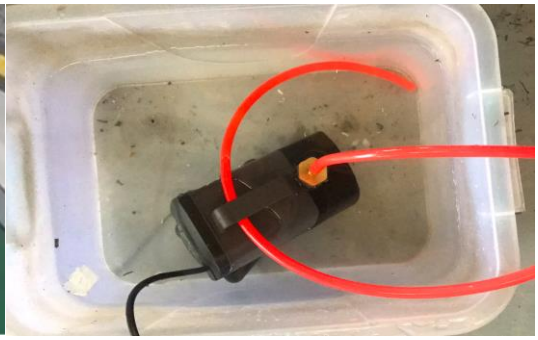
The spindle cutting motor is cooled by water, so we need to install a water tank so that it is filled with water from the water inlet.
2.1 Please prepare the water tank and find two pipes on the side of the machine, as shown in the picture below, as shown below

2.2 Please install the outlet of the water pump according to the figure below




2.3 Put the water pump into the water tank, connect one water pipe to the water pump, and fix the other in the water tank. Add 3/4 of pure water to the water tank (note: if it is in an environment where the temperature is lower than freezing point, it is recommended to add an appropriate amount of antifreeze)

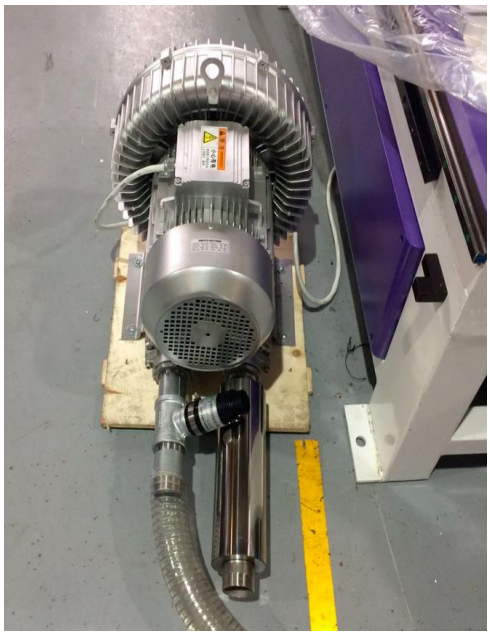



2.4 The water pipe connected to the water pump should be connected to the water inlet and outlet of the machine

3. Vacuum Pump Set-Up

The vacuum pump occupies a very important position in the engraving machine, it helps the engraving machine to firmly adsorb the material on the table. When we use a wood working engraving machine, if we are not using a vacuum pump, but a fixture, then the material is likely to shift during the engraving process, resulting in engraving errors. So the vacuum pump is very important.

The vacuum pump is usually placed at the rear of the machine. The connection of the vacuum pump, the air inlet is on the left, install the exhaust valve and the connector, and connect the adsorption tube on the machine to the connector. The air outlet is on the right, just connect the muffler to it. (Note that the vacuum pump will heat up and make a lot of noise when it is running). As follows:



If you do not have 220V three-phase electricity, had to wait for electrician to come and figure out how to convert 220v 3 phases to 220v single phase.

For the power connection of the vacuum pump, you may need a converter.

Operation procedure of vacuum pump

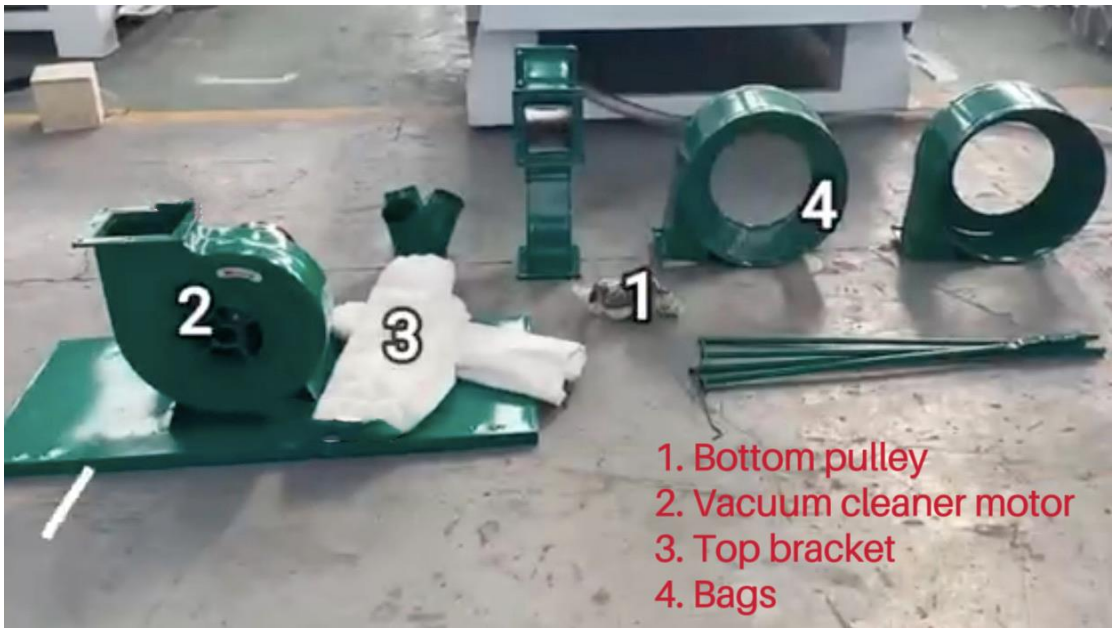
1) Connect the filter and stainless steel muffler.
2) Connect the pipe from the machine to the vacuum pump
3) Connect the circuit and test the rotation direction of vacuum pump. Rotate clockwise is the correct rotation direction. If the direction is wrong, adjust the positions of any two wiring
4) Block the adsorption port in the unused area

5) Use sealing strips to close the adsorption ares according to the size of the material.
6) Turn on the adsorption area switch

4. Vacuum Cleaner Set-Up

4.1 Working principle

When the dusty gas enters from the inlet of the woodworking dust collectors, it enters each unit room through the diversion pipe. Under the effect of the diversion device, the large particle dust will fall into the ash hopper after separation, and the rest of the dust enters the filter bag in the filter area evenly with the airflow. When the dusty gas passes through the filter bag, the dust will be adsorbed on the filter bag, and the purified gas will be discharged from the filter bag.



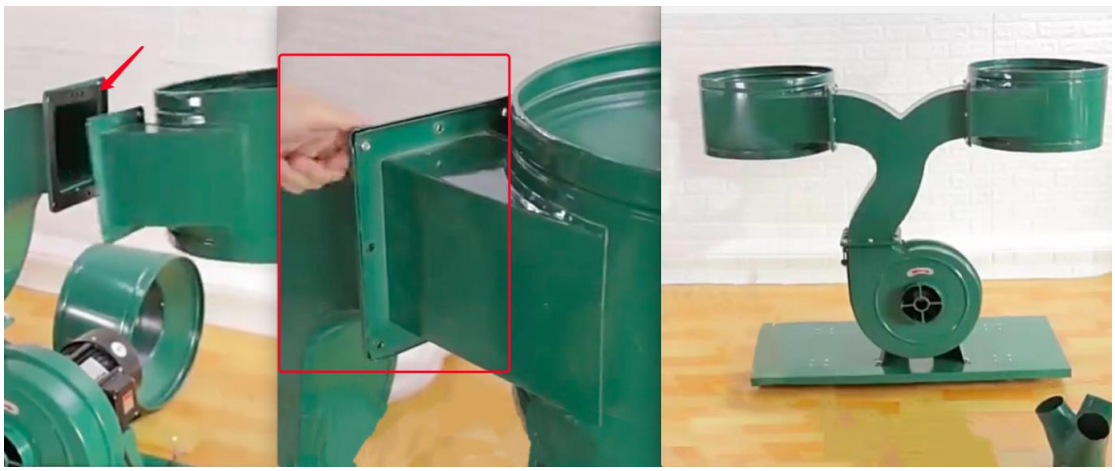
1. Place the bottom surface of the bottom plate upward, and fix the four universal wheels with screws on the corresponding holes (screws with nuts)

2. Place the bottom plate on which the universal wheel is installed face up, and install the fan on the corresponding hole on the bottom plate with screws. Then put a sealing rubber gasket on the air outlet for the next installation. Pay attention to the direction of the fan, the motor on the fan faces the inside.

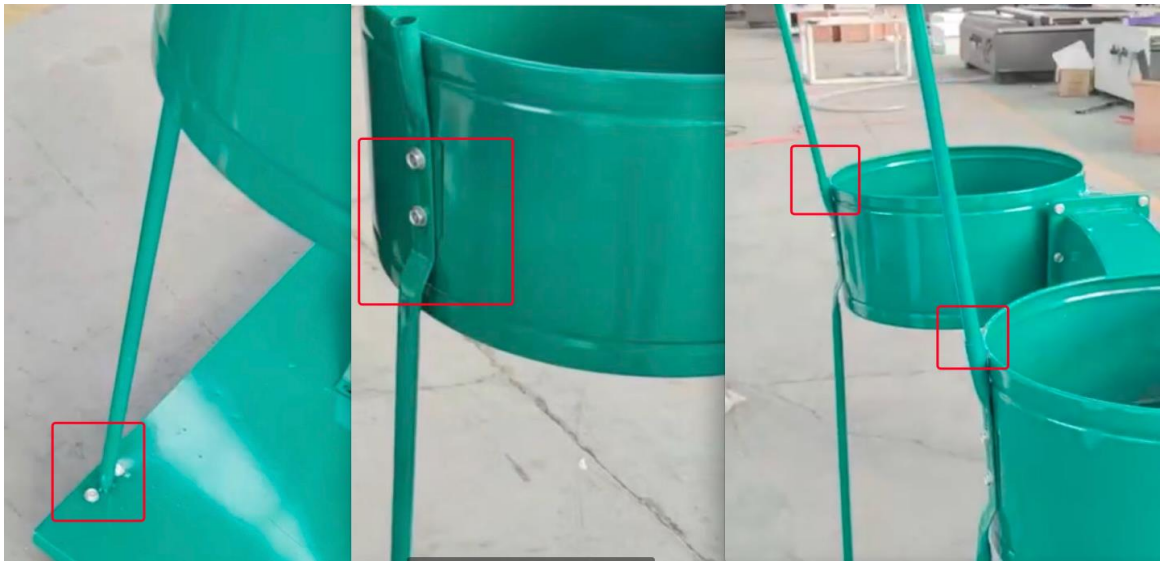
3. Install the dust collection channel on the corresponding hole on the motor with screws.

Note: When installing the dust collection channel, add a sealing rubber pad to the air outlet.

4. Cover the two air outlets on the bracket with sealing rubber pads, then install the fixing rings on both sides and fix them with screws.



5. Secure the bracket to the base plate and retaining ring with screws



6. Install the dust bag, and finally install the suction tube

CHAPTER 5 RICHAUTO SYSTEM

The router can use files created from popular G Code and HPG in the industry.

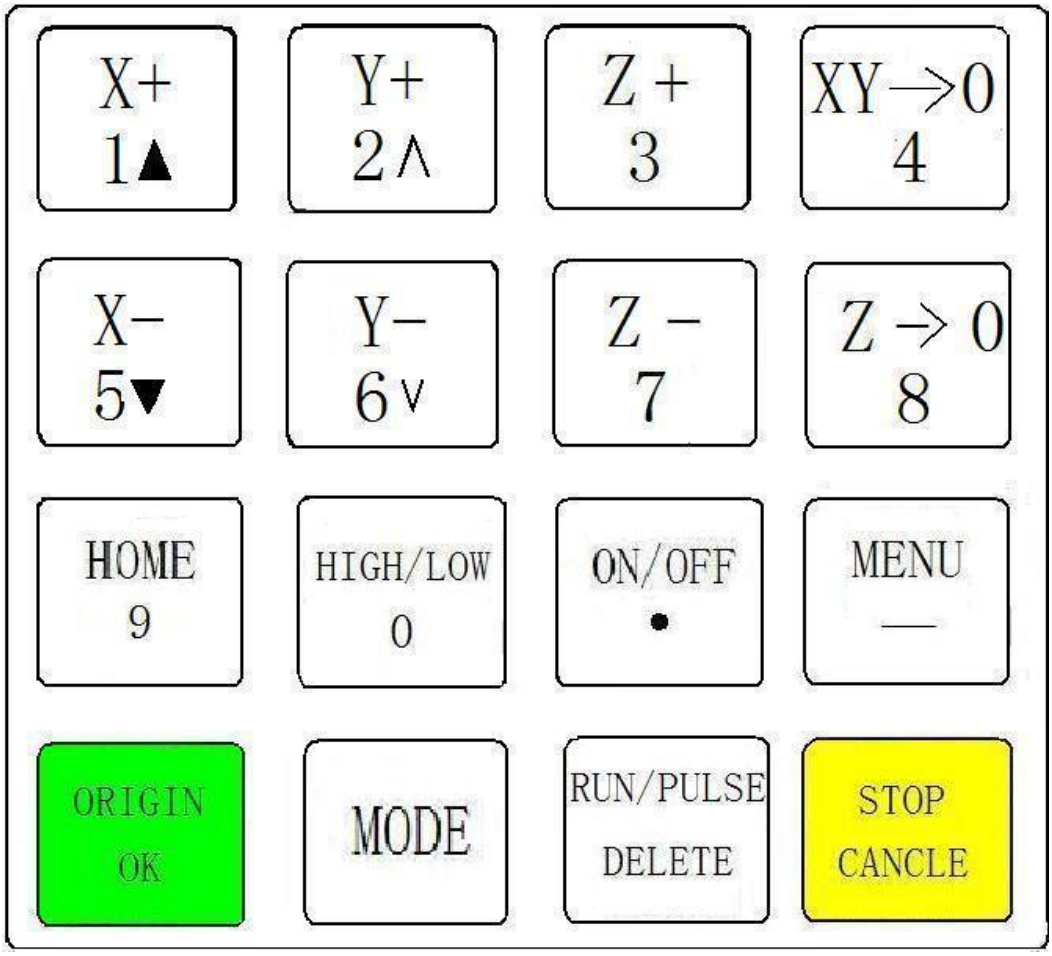
5.1 Handle

As shown below including 5 parts:

1) Key Board: Contains 16 buttons to input system parameter information and operate the machine.
2) U Disk Interface: The port of U disk (FAT16/32) and the memory card.
3) LCD Screen: 128 x 64 resolution LCD display, to display the machine motion, system settings and other information.
4) 50-pin Data Cable port: The port of 50-pin data cable, it connect the handle with the interface board to realize controlling the machine.
5) USB Communication Port: The port of USB communication cable. It is used to connect the handle with your computer.

5.2 Buttons introduction

RichAuto motion control system defines 16 buttons according to functional requirements. Each button has one or more functions under different work status.



5.3 Usage mode

RichAuto motion control system provides two modes of buttons' 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:

	Combination button	Function
1	"MENU —"+"0—9"Number Buttons	Switch the coordinate system (0 for the mechanical coordinate system, 1 - 9 for the work coordinate system)
2	"MENU —"+"ON/OFF •"	Start Z-axis automatic tool setting

3	MENU – "+"1—8" Number Buttons	Start the breakpoints processing (support number 1 - 8)
4	RUN/PAUSE DELETE "+" HIGH/LOW 0 "	Start advanced processing
5	ON/OFF • " +" Z + 3 / Z – 7 "	To switch gear shaft under manual mode
6	RUN/PAUSE DELETE "+" HOME 9 "	Repeat last time processing
7	MODE "+" Z→0 8 "	Set stop position
8	MENU – "+" ORIGIN OK "	System upgrade
9	MENU – "+" MODE "	Operate machine by entering coordinates parameters
10	ORIGIN OK "+" STOP CANCEL "	Quit buttons check

5.4 Detail information for buttons function

Name	Function
X + 1▲	Positive movement of X axis, menu upward, figure 1 inputting
Y + 2∧	Positive movement of Y axis, speed-up processing speed, figure 2 inputting
Z + 3	Positive movement of Z axis, figure 3 inputting, increase spindle speed during processing
XY→0 4	Set X axis and Y axis work origin, figure 4 inputting
X – 5▼	Negative movement of X axis, menu downward, figure 5 inputting

Y – 6 ∨	Negative movement of Y axis, slow down processing speed, figure 6 inputting different property selecting in Menu
Z – 7	Negative movement of Z axis, figure 7 inputting, reduce spindle speed during processing
Z→0 8	Set Z axis work origin, figure 8 inputting
HOME 9	Machine back home, figure 9 inputting, check information during processing
HIGH/LOW 0	High or low speed selection under manual mode, figure 0 inputting, change work coordinate & mechanical coordinate during processing
ON/OFF •	Spindle start/stop, decimal point inputting
MENU –	Enter menu setting, negative sign inputting, check information during processing
ORIGIN OK	Back to work origin, confirm motions /inputting/operating
MODE	Manual mode, continue/step/distance to select
RUN/PAUSE DELETE	Run or pause processing, delete inputting data, different property selecting in menu
STOP CANCEL	High/low speed parameter adjust under manual mode, quit process stop/selections, inputting and operating cancel

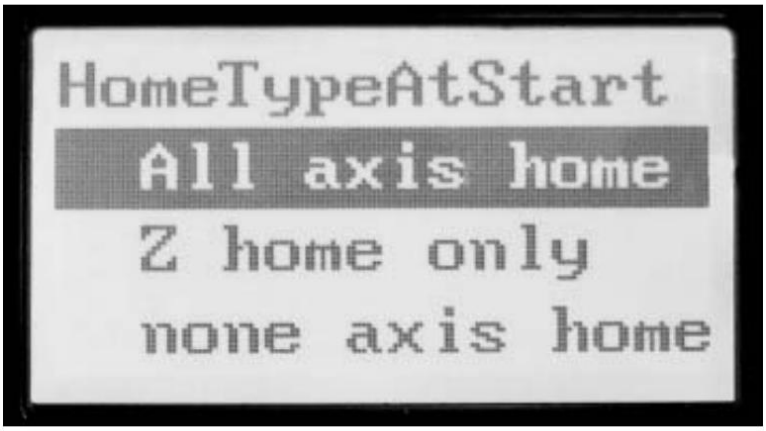
Note: Before you turn on the machine remove all tools and other objects from the machine table.

5.5 HOME position (machine origin)

Switch on the main isolation switch.

Release the emergency stop by twisting clockwise and it will pop out. Pressing the power switch button will also power the hand held controller and the display will light up.

The screen will display "Go to Home? "



Home position is determined by actual limit switches on the machine, and will not change. However, it is important that the machine be homed before each distinct operation to ensure that settings and limit switches are properly functioning. All movements are based upon these Home position limit switches.

1. Press HOME 9. Spindle will move to Home position, generally front left corner of table.
2. Press ORIGIN OK and spindle will move to work origin. (See sect. 5.10 to set work origin).

After normal shut-down of the machine, if you start up and continue the previous operation, homing will not be necessary as the system will have saved the last coordinate values. Select “none axis home.

5.6 To Move the Router Head

There are 3 different methods of moving the router head.

1. Continuous mode: Press the mode button until Continuous is displayed. The display will show [bottom row of the screen] the changing location of the router head as it moves location. By holding X+ 1▲ button down the machine will move constantly until the button is released. This is the same for X− 5▼, Y+ 2∧, Y− 6∨, Z+ 3 and Z− 7. The "HIGH/LOW 0" button determines the speed of the jogging moves.

2. Step mode: Press the mode button until step is displayed. With step selected, each time X, or Y button is pressed it will move the router head by 0.5mm in high setting and 0.1mm in the low setting.
3. Distance mode: Pressing the MODE button a third time and Distance is displayed.

This allows you to input a position into the controller that you want the router spindle to move to. As an example, if you want to move the router spindle 100mm from the home position in the X or Y-axis.

1. Press the mode button until Distance is displayed.
2. Type in 100 and press OK
3. Pressing the X+= button will now move the router 100mm in the X+ axis. The router head also move the set distance in the X+, X-, Y+ and Y- depending on the button that is pressed.

To move the router head in the Z-axis press the Z+ 3 [UP] or the Z− 7 button [DOWN]. By pressing any of the other X, Y or Z+ or - buttons the router head will move 100mm in the selected direction.

5.7 Jogging Speed

You can select between a Low and High speed. By pressing the HIGH/LOW 0 button you can toggle between the two speeds. The High-speed jog setting is approximately 4 times the speed of Low speed jog setting.

Speed ratio adjustment

Speed ratio can be changed during processing. [Current speed = set speed x ratio.]

1. Press Y+ or Y- to select.
2. Each Y- click decreases speed ratio by 0.1. (Maximum ratio = 1.0, minimum ratio = 0.1.)
3. Screen will display corresponding ratio change, but operating time will not change.

5.8 Setting the Work Envelope [Factory Set]

Note: This comes factory set and should not need adjustment.

The Work Envelope is a volume that defines the movement limits of the router spindle. The X0, Y0 corner of the work envelope is determined by the machine's Home Position. The X+ and Y+ limits of the work envelope are determined by the Table Size: Settings (MENU/MACHINE SETUP/TABLE SIZE) and provide the "soft limits " for the machine. The Table Size settings prevent the possibility of the spindle assembly/gantry from being jogged into the machine's frame.
Insure that the controller display is indicating the "Machine Coordinates ". Those numbers correspond to the machine Home position that is determined by physical limit switches. Machine Coordinates are indicated on the screen by the designation "AX, AY, or AZ ". I the Machine Coordinates are not being displayed depressing the HIGH/LOW 0 and MENU – buttons together will toggle between the machine coordinates and ORIGIN coordinates (e.g.1-9)

1. Select Low Speed by pressing the HIGH/LOW 0 button. Select Continuous by press the mode button until "Continuous " is displayed. The display will show the position of the router head as it changes at the bottom of the display.
1. Move the router spindle to the home position by pressing the Home button.
2. Move the router head to the max X position by pressing X + 1▲ button until the router spindle stops and note the displayed AX= value.
3. Press the Y + 2^ button and hold until the router gantry stops moving, note the displayed AY value.
4. Typically on the Laguna IQ CNC machine the work envelope is 24½" x 35½"
5. Machining can only be performed if the tool path centerlines fall within the work envelope.

If an error message is displayed while trying to execute a program indicating an over travel error in one of the Axes, executing the program would require that a tool path fall outside of the machine's Work Envelope. PLEASE NOTE THAT THE SELECTION OF THE "ORIGIN "ALSO EFFECTS PLACEMENT OF THE PROGRAM WITHIN THE WORK ENVELOPE.

5.9 Resetting the Origin Point

1. Bring the router head to the origin point by pressing origin button.
2. Lower the router bit by pressing Z so that it is just above the spoil board.
   Note the position of the tip of the router bit point and you will probably find the origin point will have to be adjusted.
3. Jog the point over so that it lines up with the edge of the spoil board in the X-axis.
4. Jog the point over so that it lines up with the edge of the spoil board in the Y-axis.
5. Reset the origin point by pressing the top right hand button 

this will set the origin and the machine has a new datum point.

5.10 Setting work origin

Work origin establishes the zero point from which the router will perform the cutting process, and is dependent upon size and design of work piece. Work origin should match the zero point of your uploaded part drawing.

CAUTION:

Work origin must be set before operation, unless repeating the same operation. Failure to properly set Z-axis origin may result in damage to router table and cutting tool.

1. Make sure cutting bit is secured within collet.
2. Move spindle to desired location using X and Y buttons.
3. Press 

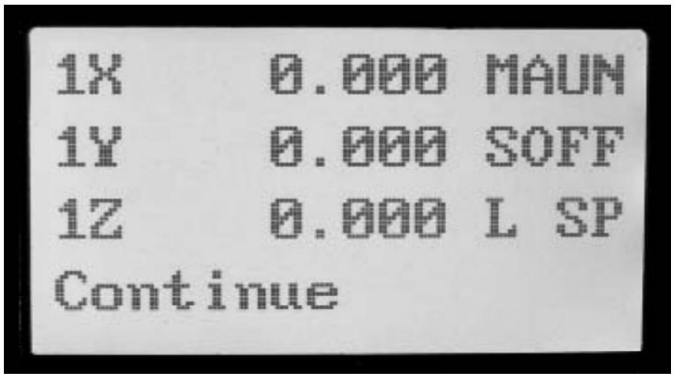
to set origin at this location for X and Y-axes.
4. Set Z-axis origin with provided tool touch-off puck, as follows:

5. Center puck under cutting tool, on top of work piece.

CAUTION:

Z-axis origin must be set relative to top of work material to prevent cutting through worktable.

6. Press MENU – and ON/OFF •, spindle will slowly lower until it contacts puck, then will return to raised position. Z-axis origin is now stored in system. (System automatically deducts the 1- inch thickness of puck when registering touch point.)
7. Controller display will now show work origin zero on three axes. Shows parameters stored in MENU – and 1 location, as follows:



5.11 Manual Z Origin Point [tool touch off]

1. Fit a flat bottom router bit to the spindle.
2. Jog [Z] the tip of the tool down so that it is just above the top of the spoil board using the CONTINUOUS button.
3. Step down in slow mode [0.1mm0.004"each time the button is pressed] while turning the router collet by hand in the reverse direction. As you feel pressure, stop jogging down.
   Note: Do not turn the router bit by hand, as it is sharp and could cause injury. Only turn the collet.
4. Select the distance mode and enter 0.0254mm [0.0001"] Press Z+[UP] and rotate the cutter in the reverse direction until the cutter is free to move and there is no drag. The cutter is now within 0.001" above the spoil board.
5. Once the router bit is at Zero press the Z-0/8 button to set the zero point.
6. Jog the router bit up or press the origin button to move the router bit up and to the origin point.

5.12 Machine Setup

Users can set the parameters about machine hardware under "Machine Setup".

Pulse Equivalent

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

Setting: Enter "pulse equiv ", cursor is in the X-axis pulse equivalent position press "X+ 1▲"/"X− 5▼" to move cursor to where users want to modify. Press "RUN/PAUSE DELETE", input the new number and press "ORIGIN OK" to save cursor auto move to next line the same operation to change, press "ORIGIN OK" to save all value.

Pulse equivalent as shown in figure:

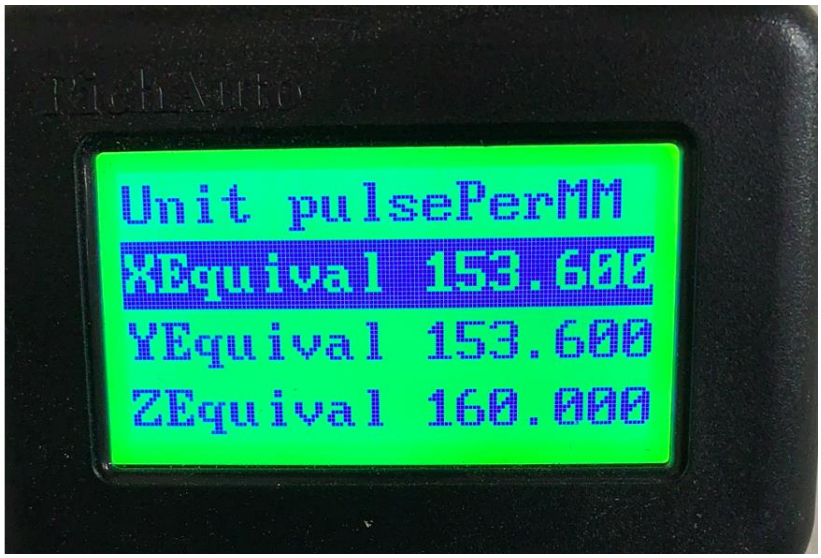
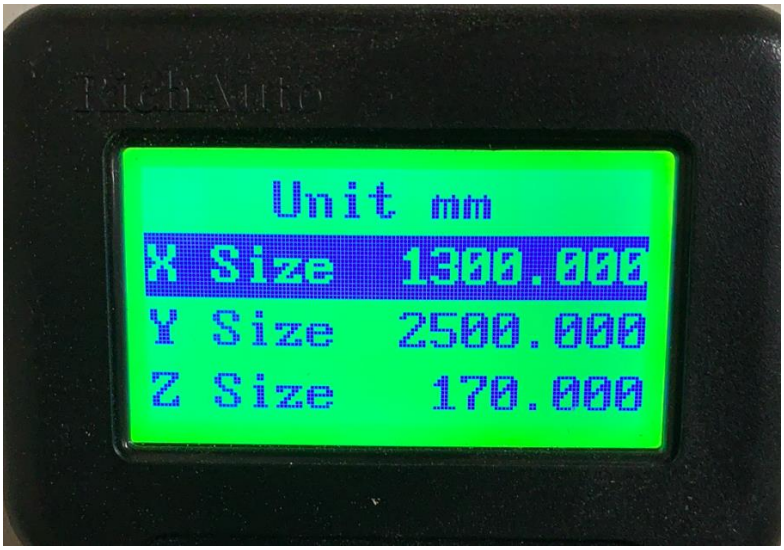


Table Size:

RichAuto system make the table size as the soft limit values, in order 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.

Table size as shown in figure:



5.13 Loading a Program into the Machine

The controller has a USB slot located to the top.

1. Load your program into your USB drive.
2. Fit the USB into the USB slot in the controller.
3. Press the button RUN/PAUSE DELETE. The display will show U disc.
4. Press the ORIGIN OK button. This will load onto the screen what is in the USB drive.
5. Use the arrow keys to select the file that you need to load into the controller
6. Select then press ORIGIN OK button.
7. Once the code/program has been down loaded the machine will start to operate.

   Note: Ensure that you are clear of the machine as the spindle will start to turn and could cause injury.
8. The router will just cut the surface of the spoil board the distance that you set in the design software, (We suggest 16mm[1/16"]) and cut the outline of the job. This will give you the location of the part on the spoil board.

5.14 Processing a file

IMPORTANT: After copying files from computer to a U-disk, always select "Eject " to safely remove disk from computer; otherwise controller may not recognize the U-disk when inserted.

1. Press RUN/PAUSE DELETE to select file.
2. Use or buttons to select either U Disk file or internal memory file.
3. Press ORIGIN OK to select. First three files will be displayed.
4. Use or buttons to move cursor (or Y+ 2∧ and Y− 6∨ to jump two lines). Select file.
5. The file parameters will be displayed. These are set in the CAD/CAM software, but can also be adjusted using the controller.

6. Press ORIGIN OK to begin process. After brief countdown, program will begin. (Spindle will start automatically on both models.)
7. During processing, screen will display current line, current speed, speed ratio and operating time. To switch these options, press MODE.

5.15 Getting Started

Note: Before you turn on the machine remove all tools and other objects from the machine table.

Release the emergency stop by twisting clockwise and it will pop out.

1. Have 220volts30 amps of 1 phase power wired to the machine.
2. Make sure the water reservoir is full and the submersible pump is circulating water through the spindle.
3. Make sure the E-stop button is released (twist to release) before turning the power on.
4. Power machine.
5. After the touch screen has fully booted it is required that the machine be homed before any other function is allowed.

Note: All measurements and actions are based on the home switch locations. Homing gives the machine a starting point reference.

CHAPTER 6 MAINTENANCE

Warning: Always disconnect power to the machine before performing maintenance. Failure to do this may result in serious personal injury.

1. Clean linear bearing rail of dust and debris. Use a brush for crevices. Lubricate after cleaning.
2. Clean dust from table surface, using brush, compressed air or vacuum.
3. Periodically inspect cable connections and fasteners for tightness.
4. Check for tightness in motor shaft couplers.
5. Inspect slots in collet – keep them free of dust and debris.

CHAPTER 7 TROUBLESHOOTING

WARNING: Some corrections may require a qualified electrician.

Symptom	Possible Cause	Correction
Controller display is blank or flickering.	Cable connections not tight.	Inspect and tighten connections on controller and server box.
	Insufficient power supply.	Have qualified electrician check incoming power supply.
	Fuse blown.	Inspect and replace.
	Interface damaged.	Replace damaged part.
	Controller damaged.	Replace controller.
Controller keeps restarting automatically.	Insufficient power supply.	Have qualified electrician check incoming power supply.
	Local power grid unstable.	Contact power company.
	Controller damaged.	Connect controller to computer via USB cable. If problem still occurs, replace controller.
Controller display reads “Beyond Limit”.	Controller in different origin coordinate system.	Verify that controller reads 1X, 1Y, and 1Z. If not, press MENU + 1 to return to original settings.
	Machine not returned to zero point, cannot confirm actual position.	Move machine back to zero point working origin.
Cannot set work origin on controller.	Viewing wrong coordinate system.	Press MENU + 1 to revert to first working coordinate system.
	Work origin less than actual drawing file size.	Set correct work origin based upon drawing file.
	Incorrect work origin in drawing file.	Revise drawing file and reload.
	Buttons not functioning.	Enter MENU/System Setup/Buttons Check to verify function. If buttons not working, replace controller.
	Work origin less than actual drawing file size.	Set correct work origin based upon drawing file.
	Working speed exceeds Z-axis maximum speed.	Set to safe speed in: MENU/Machine Setup/Max Speed Limit.

Z-axis fall is too fast during processing.	Loose coupling, or transmission slipping.	Tighten connecting parts.
	Connections between interface board and motor drivers are disrupted.	Check and readjust connections.
	Processing file error.	Check file, download corrected file to U-disk and retry.
	Connection between Z-axis motor and motor driver is disrupted or damaged.	Inspect and replace lines if needed.
Z-axis depth not consistent each time same file is processed and after machine homes.	Spoil board not flat.	Re-mill (fly cut) spoil board.
	Work piece is loose.	Tighten work piece to table.
	Z-axis origin detection switch is faulty.	Replace switch.
	Interference in Z-axis homing process is creating a false origin.	Readjust lines.
Processed work piece does not match file size.	Pulse equivalent incorrect.	Adjust pulse under: MENU/Machine Setup.
	Wrong cutting tool used.	Use proper tool for process.
Machine will not stop at work origin when returning.	Improper or loose connections.	Double click on MENU key, input signal self test, to determine if detection signal is properly functioning.
	Origin detection plate beyond reach of detection switch.	Inspect and adjust.
	Origin detection switch wire is loose or damaged.	Check connections.
	Origin detection switch damaged.	Replace.
	Interface board is broken.	Repair or replace.
	50-pin data cable is broken.	Replace date line.
Machine moves reverse direction when homing.	Faulty connection between origin detection switch and interface board.	Refresh line to determine if wiring is correct.

	Origin detection switch damaged.	Replace.
	Electrical interference causing false signal that limit switch has been triggered.	Recalibrate circuit. Repair or replace.
	Interface board is broken.	Repair or replace.
	50-pin data cable is broken.	Replace data line.
Router head does not stop after contacting tool touch-off puck.	Poor connection of “Cutter” signal line to “cutter” terminal.	Restore proper connection.
	Poor connection of spindle with “GND” terminal on interface board.	Restore proper connection.
Machine will not move after controller receives commands.	One axis not moving – may be poor connection.	Connect a different axis connection to this terminal to test. If it works, motor driver is okay. Check 50-pin cable connection to interface board. If machine still won’t move, determine corresponding drive and motor.
	All axes not moving.	First, check 50-pin cable connection to interface board. Then check power supply of motor drivers. Last check mechanical elements of axis system.
Machine moves to new position satisfactorily, but does not return correctly to original position.	Mechanical elements, such as ball screws, are loose or misadjusted.	Inspect and correct as needed.
	Program/drawing file is faulty.	Review program and reload to system.

Abnormal operation when processing.	Electrical interference.	Inspect connections; separate strong and weak electrical current, separate “GND” of inverter from the other components.
After controller powers on, one or more axes move only one direction.	Improper connection between interface board and motor drive.	Inspect connections.
	Interface board damaged.	Replace interface board.
	Motor driver damaged.	Replace driver.
After controller powers on, axis motor will not move.	Pulse line and direction line are switched.	Rewire pulse and direction lines.
	5V common anode end of motor driver is disconnected.	Check connection.
	Motor driver damaged.	Replace driver.
	No pulse signal output, interface board chip damaged.	Replace chip.
Controller screen is dim. (When connected to computer via USB cable, screen is bright.)	Not connected to power supply, or power supply damaged.	Check DC24V power supply output. If okay, check cable from power supply to interface board.
	50-pin cable is damaged, or interface is broken.	Replace.
Controller screen is dim. (When connected to computer via USB cable, screen is also dim.)	Crystal processor in controller is damaged.	Have controller repaired or replaced.
	Incorrect (high) voltage power supply applied to controller.	Have controller repaired or replaced.
Screen displays “Spindle On” when spindle is off, and displays “Spindle Off” when it is on.	Improper connection on interface board.	Rewire correctly.

CHAPTER 8 WARNING

New machines and accessories sold by Sign-in-Global.us carry a one-year warranty effective from the date of shipping.

All machines and accessories sold new are warranted to be free from manufacturer's defects in workmanship, parts and materials. We will repair or replace without charge any parts determined by Sign-in-Global.us. To be a manufacturer's defect. We require that the defective item/part be returned to Sign-in-Global.us with the complaint Any machines returned to Sign-in-Global.us must be returned with packaging in the same manner in which 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.

Software purchased through Sign-in-Global.us. Is not covered under this warranty and all technical support must be managed through the software provider. Software is non-refundable.

Normal user alignment, adjustment tuning and machine settings are not covered by this warranty. It is the responsibility of the user to understand basic machinery operation, settings and procedures and to properly maintain the equipment in accordance with the standards provided by the manufacturer.

Parts, under warranty, are shipped at Sign-in-Global.us 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 Sign-in-Global.us Customer Support Website. The labor required to install replacement parts is the responsibility of the user.

Sign-in-Global.us 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 Sign-in-Global.us within twenty-four hours of delivery. Please contact our Customer Service Department for more information.