OPERATOR'S MANUAL

Wood Working

Book 1 of 2

ROUTER TABLE

MODEL: WR-84V-ATC

Baileigh Industrial, Inc.
P.O. Box 531
Manitowoc, WI 54221-0531
Phone: 920.684.4990
Fax: 920.684.3944
sales@baileigh.com

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THANK YOU & WARRANTY

Thank you for your purchase of a machine from Baileigh Industrial. We hope that you find it productive and useful to you for a long time to come.

Inspection & Acceptance. Buyer shall inspect all Goods within ten (10) days after receipt thereof. Buyer's payment shall constitute final acceptance of the Goods and shall act as a waiver of the Buyer's rights to inspect or reject the goods unless otherwise agreed. If Buyer rejects any merchandise, Buyer must first obtain a Returned Goods Authorization ("RGA") number before returning any goods to Seller. Goods returned without a RGA will be refused. Seller will not be responsible for any freight costs, damages to goods, or any other costs or liabilities pertaining to goods returned without a RGA. Seller shall have the right to substitute a conforming tender. Buyer will be responsible for all freight costs to and from Buyer and repackaging costs, if any, if Buyer refuses to accept shipment. If Goods are returned in unsalable condition, Buyer shall be responsible for full value of the Goods. Buyer may not return any special order Goods. Any Goods returned hereunder shall be subject to a restocking fee equal to 30% of the invoice price.

Specifications. Seller may, at its option, make changes in the designs, specifications or components of the Goods to improve the safety of such Goods, or if in Seller's judgment, such changes will be beneficial to their operation or use. Buyer may not make any changes in the specifications for the Goods unless Seller approves of such changes in writing, in which event Seller may impose additional charges to implement such changes.

Limited Warranty. Seller warrants to the original end-user that the Goods manufactured or provided by Seller under this Agreement shall be free of defects in material or workmanship for a period of twelve (12) months from the date of purchase, provided that the Goods are installed, used, and maintained in accordance with any instruction manual or technical guidelines provided by the Seller or supplied with the Goods, if applicable. The original end-user must give written notice to Seller of any suspected defect in the Goods prior to the expiration of the warranty period. The original end-user must also obtain a RGA from Seller prior to returning any Goods to Seller for warranty service under this paragraph. Seller will not accept any responsibility for Goods returned without a RGA. The original end-user shall be responsible for all costs and expenses associated with returning the Goods to Seller for warranty service. In the event of a defect, Seller, at its sole option, shall repair or replace the defective Goods or refund to the original end-user the purchase price for such defective Goods. Goods are not eligible for replacement or return after a period of 30 days from date of receipt. The foregoing warranty is Seller's sole obligation, and the original end-user's exclusive remedy, with regard to any defective Goods. This limited warranty does not apply to: (a) die sets, tooling, and saw blades; (b) periodic or routine maintenance and setup, (c) repair or replacement of the Goods due to normal wear and tear, (d) defects or damage to the Goods resulting from misuse, abuse, neglect, or accidents, (f) defects or damage to the Goods resulting from improper or unauthorized alterations, modifications, or changes; and (f) any Goods that has not been installed and/or maintained in accordance with the instruction manual or technical guidelines provided by Seller.

EXCLUSION OF OTHER WARRANTIES. THE FOREGOING LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED. ANY AND ALL OTHER EXPRESS, STATUTORY OR IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. NO WARRANTY IS MADE WHICH EXTENDS BEYOND THAT WHICH IS EXPRESSLY CONTAINED HEREIN.

Limitation of Liability. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER OR ANY OTHER PARTY FOR ANY INCIDENTIAL, CONSEQUENTIAL OR SPECIAL DAMAGES (INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR DOWN TIME) ARISING FROM OR IN MANNER CONNECTED WITH THE GOODS, ANY BREACH BY SELLER OR ITS AGENTS OF THIS AGREEMENT, OR ANY OTHER CAUSE WHATSOEVER, WHETHER BASED ON CONTRACT, TORT OR ANY OTHER THEORY OF LIABILITY. BUYER'S REMEDY WITH RESPECT TO ANY CLAIM ARISING UNDER THIS AGREEMENT IS STRICTLY LIMITED TO NO MORE THAN THE AMOUNT PAID BY THE BUYER FOR THE GOODS.

Force Majuere. Seller shall not be responsible for any delay in the delivery of, or failure to deliver, Goods due to causes beyond Seller's reasonable control including, without limitation, acts of God, acts of war or terrorism, enemy actions, hostilities, strikes, labor difficulties, embargoes, non-delivery or late delivery of materials, parts and equipment or transportation delays not caused by the fault of Seller, delays caused by civil authorities, governmental regulations or orders, fire, lightening, natural disasters or any other cause beyond Seller's reasonable control. In the event of any such delay, performance will be postponed by such length of time as may be reasonably necessary to compensate for the delay.

Installation. If Buyer purchases any Goods that require installation, Buyer shall, at its expense, make all arrangements and connections necessary to install and operate the Goods. Buyer shall install the Goods in accordance with any Seller instructions and shall indemnify Seller against any and all damages, demands, suits, causes of action, claims and expenses (including actual attorneys' fees and costs) arising directly or indirectly out of Buyer's failure to properly install the Goods.

Work By Others; Safety Devices. Unless agreed to in writing by Seller, Seller has no responsibility for labor or work performed by Buyer or others, of any nature, relating to design, manufacture, fabrication, use, installation or provision of Goods. Buyer is solely responsible for furnishing, and requiring its employees and customers to use all safety devices, guards and safe operating procedures required by law and/or as set forth in manuals and instruction sheets furnished by Seller. Buyer is responsible for consulting all operator's manuals, ANSI or comparable safety standards, OSHA regulations and other sources of safety standards and regulations applicable to the use and operation of the Goods.

Remedies. Each of the rights and remedies of Seller under this Agreement is cumulative and in addition to any other or further remedies provided under this Agreement or at law or equity.

Attorney's Fees. In the event legal action is necessary to recover monies due from Buyer or to enforce any provision of this Agreement, Buyer shall be liable to Seller for all costs and expenses associated therewith, including Seller's actual attorneys' fees and costs.

Governing Law/Venue. This Agreement shall be construed and governed under the laws of the State of Wisconsin, without application of conflict of law principles. Each party agrees that all actions or proceedings arising out of or in connection with this Agreement shall be commenced, tried, and litigated only in the state courts sitting in Manitowoc County, Wisconsin or the U.S. Federal Court for the Eastern District of Wisconsin. Each party waives any right it may have to assert the doctrine of "forum non conveniens" or to object to venue to the extent that any proceeding is brought in accordance with this section. Each party consents to and waives any objection to the exercise of personal jurisdiction over it by courts described in this section. Each party waives to the fullest extent permitted by applicable law the right to a trial by jury.

SUMMARY OF RETURN POLICY.

- 10 Day acceptance period from date of delivery. Damage claims and order discrepancies will not be accepted after this time.
- You must obtain a Baileigh issued RGA number PRIOR to returning any materials.
- Returned materials must be received at Baileigh in new condition and in original packaging.
- Altered items are not eligible for return.
- Buyer is responsible for all shipping charges.
- A 30% re-stocking fee applies to all returns.

Baileigh Industrial makes every effort to ensure that our posted specifications, images, pricing and product availability are as correct and timely as possible. We apologize for any discrepancies that may occur. Baileigh Industrial reserves the right to make any and all changes deemed necessary in the course of business including but not limited to pricing, product specifications, quantities, and product availability.

For Customer Service & Technical Support:
Please contact one of our knowledgeable Sales and Service team members at:
(920) 684-4990 or e-mail us at sales@baileighindustrial.com

INTRODUCTION

The quality and reliability of the components assembled on a Baileigh Industrial machine guarantee near perfect functioning, free from problems, even under the most demanding working conditions. However, if a situation arises, refer to the manual first. If a solution cannot be found, contact the distributor where you purchased our product. Make sure you have the serial number and production year of the machine (stamped on the nameplate). For replacement parts refer to the assembly numbers on the parts list drawings.

Our technical staff will do their best to help you get your machine back in working order.

In this manual you will find: (when applicable)

- Safety procedures
- Correct installation guidelines
- Description of the functional parts of the machine
- Capacity charts
- Set-up and start-up instructions
- Machine operation
- Scheduled maintenance
- Parts lists

GENERAL NOTES

After receiving your equipment remove the protective container. Do a complete visual inspection, and if damage is noted, **photograph it for insurance claims** and contact your carrier at once, requesting inspection. Also contact Baileigh Industrial and inform them of the unexpected occurrence. Temporarily suspend installation.

Take necessary precautions while loading / unloading or moving the machine to avoid any injuries.

Your machine is designed and manufactured to work smoothly and efficiently. Following proper maintenance instructions will help ensure this. Try and use original spare parts, whenever possible, and most importantly; **DO NOT** overload the machine or make any unauthorized modifications.

Note: *This symbol refers to useful information throughout the manual.*

IMPORTANT

PLEASE READ THIS OPERATORS MANUAL CAREFULLY

It contains important safety information, instructions, and necessary operating procedures. The continual observance of these procedures will help increase your production and extend the life of the equipment.

SAFETY INSTRUCTIONS

LEARN TO RECOGNIZE SAFETY INFORMATION

This is the safety alert symbol. When you see this symbol on your machine or in this manual, **BE ALERT TO THE POTENTIAL FOR PERSONAL INJURY!**

Follow recommended precautions and safe operating practices.

UNDERSTAND SIGNAL WORDS

A signal word – **DANGER**, **WARNING**, or **CAUTION** is used with the safety alert symbol. **DANGER** identifies a hazard or unsafe practice that will result in severe **Injury or Death**.

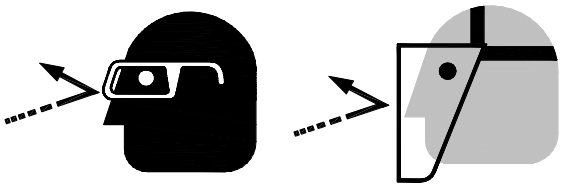
Safety signs with signal word **DANGER** or **WARNING** are typically near specific hazards.

General precautions are listed on **CAUTION** safety signs. **CAUTION** also calls attention to safety messages in this manual.

SAVE THESE INSTRUCTIONS.
Refer to them often and use them to instruct others.

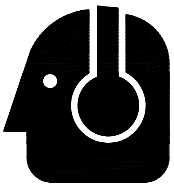
PROTECT EYES

Wear safety glasses or suitable eye protection when working on or around machinery.



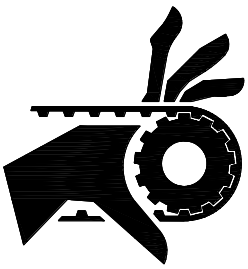
PROTECT AGAINST NOISE

Prolonged exposure to loud noise can cause impairment or loss of hearing. Wear suitable hearing protective devices such as ear muffs or earplugs to protect against objectionable or uncomfortable loud noises.



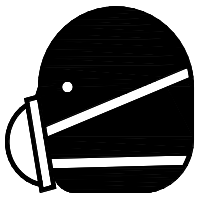
BEWARE OF PINCH POINTS

Keep hands and fingers away from the servo motors drive belt and pulleys when performing maintenance. Keep motor guards in place at all times while the machine is running.



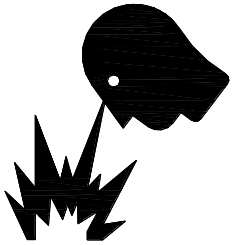
DUST HAZARD

Wear appropriate dust mask. Dust created while using machinery can cause cancer, birth defects, and long term respiratory damage. Be aware of the dust hazards associated with all types of materials.



DUST PARTICLES AND IGNITION SOURCES

DO NOT operate the table saw in areas where explosion risks are high. Such areas include locations near pilot lights, open flames, or other ignition sources.



CUTTING HAZARD

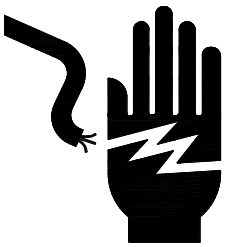
Keep hands and fingers away from the rotating shaper cutters. These rotating cutters can be extremely dangerous if you do not follow proper safety procedures. **NEVER place hands directly over or in front of the cutter. Keep hand at least 6" (150mm) from the shaper cutter while operating.**

ENTANGLEMENT HAZARD – ROTATING SPINDLE

Contain long hair, **DO NOT** wear jewelry or loose fitting clothing.

HIGH VOLTAGE

USE CAUTION IN HIGH VOLTAGE AREAS. DO NOT assume the power to be off.
FOLLOW PROPER LOCKOUT PROCEDURES.



EMERGENCY STOP BUTTON

In the event of incorrect operation or dangerous conditions, the machine can be stopped immediately by pressing the **E-STOP** button. Twist the emergency stop button clockwise (cw) to reset.
Note: Resetting the E-Stop will not start the machine.
Note: There is also a E-Stop located on the Hand Held Control. Verify that both E-Stops are reset or the machine will not start.

SAFETY PRECAUTIONS

Wood working can be dangerous if safe and proper operating procedures are not followed. As with all machinery, there are certain hazards involved with the operation of the product. Using the machine with respect and 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.
Safety equipment such as guards, push sticks, hold-downs, feather boards, goggles, dust masks and hearing protection can reduce your potential for injury. But even the best guard won't make up for poor judgment, carelessness or inattention. **Always use common sense** and exercise **caution** in the workshop. If a procedure feels dangerous, don't try it.
REMEMBER: Your personal safety is your responsibility.

WARNING: FAILURE TO FOLLOW THESE RULES MAY RESULT IN SERIOUS PERSONAL INJURY

Dear Valued Customer:

- All Baileigh woodworking machines should be used only for their intended use.
- Baileigh does not recommend or endorse making any modifications or alterations to a Baileigh machine. Modifications or alterations to a machine may pose a substantial risk of injury to the operator or others and may do substantial damage to the machine.
- Any modifications or alterations to a Baileigh machine will invalidate the machine's warranty.

Please enjoy your Baileigh machine! ....Please enjoy it SAFELY!

1. **FOR YOUR OWN SAFETY, READ INSTRUCTION MANUAL BEFORE OPERATING THE MACHINE.** Learn the machine's application and limitations as well as the specific hazards.
2. **Only trained and qualified personnel can operate this machine.**
3. **Make sure guards are in place and in proper working order before operating machinery.**
4. **Remove any adjusting tools.** Before operating the machine, make sure any adjusting tools have been removed.
5. **Keep work area clean.** Cluttered areas invite injuries.
6. **Overloading machine.** By overloading the machine, you may cause injury from flying parts. **DO NOT** exceed the specified machine capacities.

7. **Do not force tool.** Your machine will do a better and safer job if used as intended. **DO NOT** use inappropriate attachments in an attempt to exceed the machines rated capacity.
8. **Use the right tool for the job. DO NOT** attempt to force a small tool or attachment to do the work of a large industrial tool. **DO NOT** use a tool for a purpose for which it was not intended.
9. **Dress appropriate. DO NOT** wear loose fitting clothing or jewelry as they can be caught in moving machine parts. Protective clothing and steel toe shoes are recommended when using machinery. Wear a restrictive hair covering to contain long hair.
10. **Use eye and ear protection**. Always wear ISO approved impact safety goggles. Wear a full-face shield if you are producing metal filings.
11. **Do not overreach**. Maintain proper footing and balance at all times. **DO NOT** reach over or across a running machine.
12. **Stay alert**. Watch what you are doing and use common sense. **DO NOT** operate any tool or machine when you are tired.
13. **Check for damaged parts**. Before using any tool or machine, carefully check any part that appears damaged. Check for alignment and binding of moving parts that may affect proper machine operation.
14. **Observe work area conditions**. **DO NOT** use machines or power tools in damp or wet locations. Do not expose to rain. Keep work area well lighted. **DO NOT** use electrically powered tools in the presence of flammable gases or liquids.
15. **Keep children away**. Children must never be allowed in the work area. **DO NOT** let them handle machines, tools, or extension cords.
16. **Store idle equipment**. When not in use, tools must be stored in a dry location to inhibit rust. Always lock up tools and keep them out of reach of children.
17. **DO NOT operate machine if under the influence of alcohol or drugs**. Read warning labels on prescriptions. If there is any doubt, **DO NOT** operate the machine.
18. Turn off power before checking, cleaning, or replacing any tooling or parts.
19. Be sure all equipment is properly installed and grounded according to national, state, and local codes.
20. Inspect power and control cables periodically. Replace if damaged or bare wires are exposed. **Bare wiring can kill!**
21. **Be Sure** all equipment is properly installed and grounded according to national, state, and local codes. If machine is equipped with a three-prong plug, it should be plugged into a three-hole electrical receptacle. If an adapter is used to accommodate a two-prong receptacle, the adapter plug must be attached to a known ground. Never remove the third prong.
22. **Never leave machine running unattended. TURN POWER OFF**. Don't leave machine until it comes to a complete stop.

23. Know the location of the ON - OFF switch and the “E” - STOP button.
24. **DO NOT** bypass or defeat any safety interlock systems.
25. Keep visitors a safe distance from the work area.
26. **Machines can eject** piece parts towards the operator. Know and avoid the conditions which cause the piece part to kickback.
27. **Material Removal Rate.** Attempting to remove too much material at once can cause the piece part to fly out of the lathe causing **severe bodily injury.**
28. **Check** for damaged parts before using machinery. Check for binding or misaligned parts, broken parts, loose bolts, or any other conditions which may impair the machines operation. Repair or replace any damaged parts before operation.
29. **Do not stop** the spindle using your hand. Allow the spindle to stop on its own.
30. **Disconnect power** and make sure all moving parts have come to a complete stop before changing cutting tools, starting any inspection, adjustment, or maintenance procedure.
31. **Properly secure** the cutting tool in the spindle before operating the machine.
32. **Do not remove** any warning signs.
33. **Control of the Piece Part.** If the piece part should unexpectedly move or bind the tool, kickback could occur. Make sure the piece part is supported and secured to the table surface.
34. **Respiratory Protection.** Wear an approved dust mask or respirator while using this machine. Continued exposure to wood dust can cause allergies or long term respiratory problems.
35. **Using Quality Stock.** Inspect the stock over carefully that you intend to route. **NEVER** route a board that has loose knots, staples, or nails in it. Warped stock should be run through a jointer before running it on the router table. **DO NOT** route a piece of stock if you have any doubts about its structural integrity.
36. **Cutting Depth. NEVER** attempt to remove too much material in one pass. Making several light cuts produces a cleaner finish and helps to prevent kickback.
37. **Using Safety Guards. NEVER** remove any guards or covers while machine is running. **Cutter Hazard. NEVER** place hands directly over or in front of the cutter. **ALWAYS** keep hands at least 6” (150mm) from the cutter while operating.
38. **Maintain machine in top condition**. Keep clean for best and safest performance. Follow instructions for lubricating and changing accessories.
39. **Warning**: The dust generated by certain woods and wood products can be injurious to your health. Always operate machinery in well-ventilated areas and provide for proper dust removal. Use wood dust collection systems whenever possible.

Noise Emission

Given that there exists a relationship between noise level and exposure times, it is not precise enough to determine the need for supplementary precautions. The factors affecting the true level of exposure to operators are clearly the amount of time exposed, the characteristics of the working environment sources of dust and noise, etc. For example, adjacent machines; in other words, the level of ambient noise. Therefore, it is recommended that the operator(s) of this machine wear hearing protection whenever this machine is in operation.

Combustion Hazard

WARNING: POTENTIAL COMBUSTIBLE DUST HAZARD! Follow Safe Work Practices.
This machine creates dust and chips that may be combustible.

- **The dust generated by certain materials can be injurious to your health. ALWAYS operate machinery in well-ventilated areas and provide for proper dust removal.**
- **ALWAYS wear proper PPE.**
- **Use a dust collection system which matches your material whenever possible.**
- **No Smoking or open flame.**
- **No Welding or open Arcs or Sparks.**
- **Use proper cleaning procedures.**

Combustion and Explosion Conditions

The first three elements are those needed for a fire, i.e., the familiar "fire triangle":

- Combustible dust (fuel);
- Ignition source (heat); and,
- Oxygen in air (oxidizer).

An additional two elements must be present for a combustible dust explosion:

- Dispersion of dust particles in sufficient quantity and concentration; and,
- Confinement of the dust cloud.

If one of the first three elements is missing, a fire cannot occur.
If one of the above five elements is missing, an explosion cannot occur.

Source: *Hazard Communication Guidance for Combustible Dusts OSHA 3371-08 2009*

SPECIFICATIONS

Power	220V, 3Ph, 60Hz, 60A*
Horsepower (Router)	10hp (7.45kw) air cooling spindle (ATC)
Table Dimensions (L x W x H)	132” x 83” x 70” (3353 x 2109 x 1778mm)
Actual Working Area	50.5” x 96.5” x 6.7” (1283 x 2450 x 170mm)
Table	Vacuum Table
Router RPM (7 speeds)**	6,000min. – 24,000max. rpm
Maximum Moving Speed	394in/min. (10000mm/min.)
Maximum Engraving Speed	394in/min. (10000mm/min.)
Reposition Accuracy	0.0019” (.05mm)
Tool Diameters	1/8”, 4mm, 6mm, & 12mm
Magazine Size	4 Tools
Tool Holder	ISO30-SK16-60, G2.5/30000, 1709
Collet Type	SK16
Table Style	Vacuum
Air Pressure	9-10CFM @ 100psi
Control System	NK105 DSP G3
File transfer mode	USB interface
X Y Transmission	Rack and Pinion
Z Transmission	Screw Drive
Guide Rails	HIWIN 25mm (X, Y, and Z)
Drive Motor	Leadshine Stepper Motor
Shipping Dimensions	134” x 89” x 78.5” (3404 x 2260 x 1994mm)
Weight	3200lbs. (1459kgs.)
Applicable Material	Acrylic, Copper, Aluminum, Wood, PVC, ABS, Insulation Plate, Bakelite Plate, Honeycomb Plate, Resin, Organic Board, Aluminum Composite Panel

*Includes vacuum pump.
**The actual spindle rpm will vary slightly from the listed values for each step setting. The will normally be repeatable.

Thickness of Engraving Material

Acrylic	Cutting Speed (m/m)	Soft Metal	Cutting Speed (m/m)
≥10mm	0-4000	≤0.5mm	0-4000
≤10mm	0-10000	0.5-1mm	0-2500

Vortex Air Pump

Model	ZBW-160E
Motor	7.5 HP (5.5kw)
Power	220V, 3Ph, 60Hz, 20A
Speed	1700Rpm
Maximum Flow Rate	5650ft^3/h (160m^3/h)
Maximum Pressure	-1775lbs/ft^2 (-85Kpa)

TECHNICAL SUPPORT

Our technical support department can be reached at 920.684.4990 and asking for the support desk for purchased machines. Tech Support handles questions on machine setup, schematics, warranty issues, and individual parts needs: (other than die sets and blades).
For specific application needs or future machine purchases contact the Sales Department at: sales@baileigh.com, Phone: 920.684.4990, or Fax: 920.684.3944.

Note: *The specifications and dimensions presented here are subject to change without prior notice due to improvements of our products.*

Note*: The photos illustrations used in this manual are representative only and may not depict the actual color, labeling, or accessories, and may be intended to illustrate technique only.*

UNPACKING AND CHECKING CONTENTS

Your Baileigh machine is shipped complete. Separate all parts from the packing material and check each item carefully. Make certain all items are accounted for before discarding any packing material.

WARNING: SUFFOCATION HAZARD! Immediately discard any plastic bags and packing materials to eliminate choking and suffocation hazards to children and animals.
If any parts are missing, DO NOT place the machine into service until the missing parts are obtained and installed correctly.

Cleaning

WARNING: DO NOT USE gasoline or other petroleum products to clean the machine. They have low flash points and can explode or cause fire.

CAUTION: When using cleaning solvents work in a well-ventilated area. Many cleaning solvents are toxic if inhaled.

Your machine may be shipped with a rustproof waxy coating and/or grease on the exposed unpainted metal surfaces. Fully and completely remove this protective coating using a degreaser or solvent cleaner. Moving items will need to be moved along their travel path to allow for cleaning the entire surface. For a more thorough cleaning, some parts will occasionally have to be removed. **DO NOT USE** acetone or brake cleaner as they may damage painted surfaces.
Follow manufacturer's label instructions when using any type of cleaning product. After cleaning, wipe unpainted metal surfaces with a light coating of quality oil or grease for protection.

Important: *This waxy coating is **NOT** a lubricant and will cause the machine to stick and lose performance as the coating continues to dry.*

TRANSPORTING AND LIFTING

⚠ CAUTION: Lifting and carrying operations should be carried out by skilled workers, such as a truck operator, crane operator, etc. If a crane is used to lift the machine, attach the lifting chain carefully, making sure the machine is well balanced. Choose a location that will keep the machine free from vibration and dust from other machinery. Keep in mind that having a large clearance area around the machine is important for safe and efficient working conditions.

Follow these guidelines when lifting with truck or trolley:

- The lift truck must be able to lift at least 1.5 – 2 times the machines gross weight.
- Make sure the machine is balanced. While transporting, avoid rough or jerky motion, and maintain a safe clearance zone around the transport area.
- Use a fork lift with sufficient lifting capacity and forks that are long enough to reach the complete width of the machine.
- Remove the securing bolts that attach the machine to the pallet.
- Approaching the machine from the side, lift the machine on the frame taking care that there are no cables or pipes in the area of the forks.
- Move the machine to the required position and lower gently to the floor.
- Level the machine so that all the supporting feet are taking the weight of the machine and no rocking is taking place.

INSTALLATION

IMPORTANT:

Consider the following when looking for a suitable location to place the machine:

- Overall weight of the machine.
- Weight of material being processed.
- Sizes of material to be processed through the machine.
- Space needed for auxiliary stands, work tables, or other machinery.
- Clearance from walls and other obstacles.
- Maintain an adequate working area around the machine for safety.
- Have the work area well illuminated with proper lighting.
- Keep the floor free of oil and make sure it is not slippery.

- Remove scrap and waste materials, make sure the work area is free from obstructions.
- It is important to maintain free area around the machine, which is required for the working place. If any long material is machined, it is necessary to have a sufficient room in front of the machine as well behind it in the places of material input and output.
- **LEVELING:** The machine should be sited on a level, concrete floor. Provisions for securing it should be in position prior to placing the machine. The accuracy of any machine depends on the precise placement of it to the mounting surface.
- **FLOOR:** This tool distributes a large amount of weight over a small area. Make certain that the floor can support the weight of the machine, work stock, and the operator. The floor should also be a level surface. If the unit wobbles or rocks once in place, be sure to eliminate by using shims.
- **WORKING CLEARANCES:** Take into consideration the size of the material to be processed. Make sure that you allow enough space for you to operate the machine freely.
- **POWER SUPPLY PLACEMENT:** The power supply should be located close enough to the machine so that the power cord is not in an area where it would cause a tripping hazard. Be sure to observe all electrical codes if installing new circuits and/or outlets.

GETTING TO KNOW YOUR MACHINE

This NC machine 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 NC 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 extremely repeatable.
With the purchase of the relevant software, it can produce intricate carvings and / or nesting which is also a valuable feature of NC machining that saves on waste and costs.

- **Bed**. The bed of the machine consists of a heavy steel frame and a vacuum table top to hold down the material to be cut.
- **Vacuum Top**. The table top is divided into four hold down areas. Each area has an air inlet connected to a shut-off ball valve. This gives the operator complete control as to where the hold down system is turned on or off.
- **Gantry**. The gantry straddles the bed and carries the router spindle motion system. It is moved along the length of the bed by a precision rack and pinion system that is controlled by the machine controller.
- **Router Spindle**. The router spindle is moved along the gantry by a precision rack and pinion system that is controlled by the machine controller.
- **Frame**. The frame is a heavy welded construction that supports all the other parts of the machine.

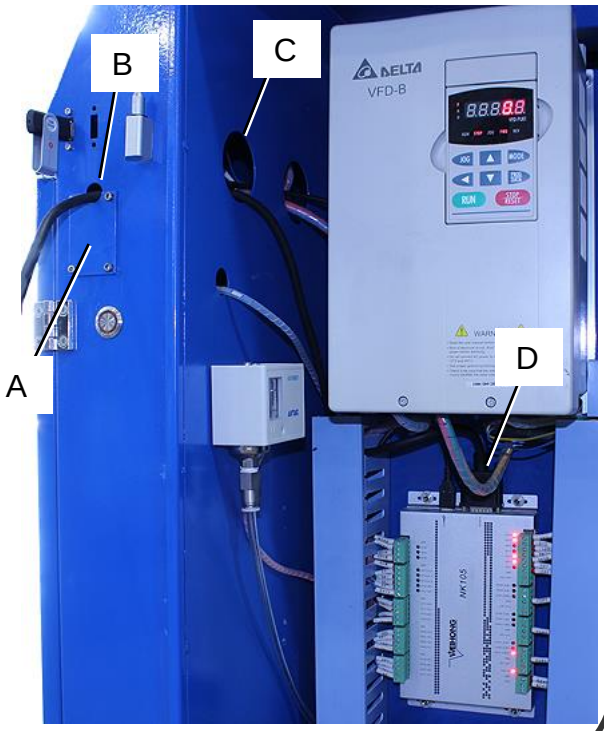
- **Electrical Control Cabinet**. The electrical control cabinet is a separate console that may be positioned as needed by the operator within the length of the connecting cables. The operator must however, position the cabinet to provide quick access to the emergency stop if needed, and make sure it does not interfere with the operation of the gantry, or loading and unloading of material. Do not place the cords in a position that will cause a tripping hazard, or damage the cords.
- **Cable Reel Track**. The cable track runs along the side of the machine in a trough and carries all the electrical cables.
- **Vacuum Air Pump**. The air pump supplies vacuum to all four areas of the table top.
- **Automatic Tool Changer** The operator can program tool changes right into the program. The table has a tool changer that accommodates up to six tools and has a sensor to compensate for and set tool length.

ASSEMBLY AND SET UP

WARNING: For your own safety, DO NOT connect the machine to the power source until the machine is completely assembled and you read and understand the entire instruction manual.

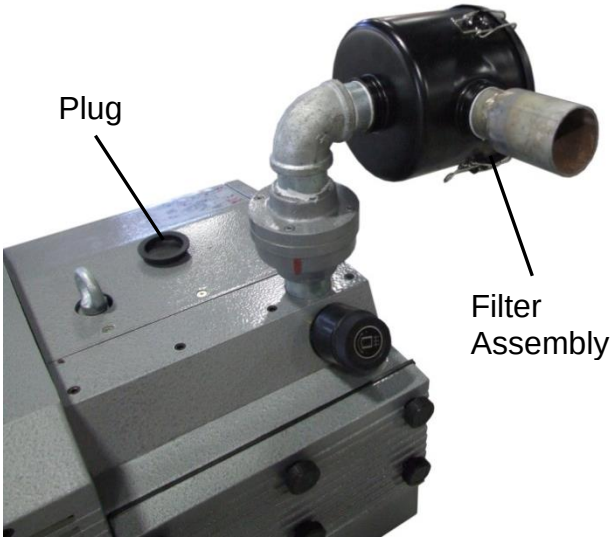
Hand Held Controller Connections

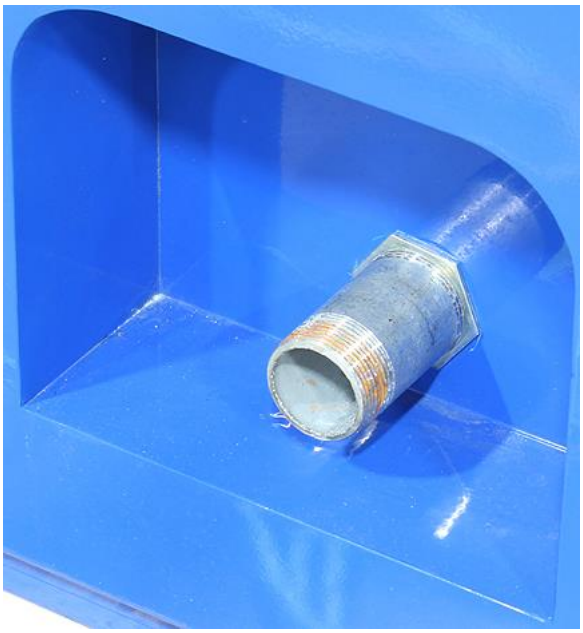
1. Open the electrical cabinet doors to gain access to the operating controller. The front door may be lifted up and off of the hinge pins to allow for better access to the components and passages.
2. Remove the four screws and the cover (A) to allow the plug end of the hand-held cable to be routed into the control cabinet.
3. Route the plug and cable to the controller as shown by B, C, and D call outs and connect the plug to the board and ensure that the screws are finger tight. Verify that the USB connector has not been loosened.
4. Install the cover around the cable and over the opening.
5. If removed, install the front door and latch the doors closed.



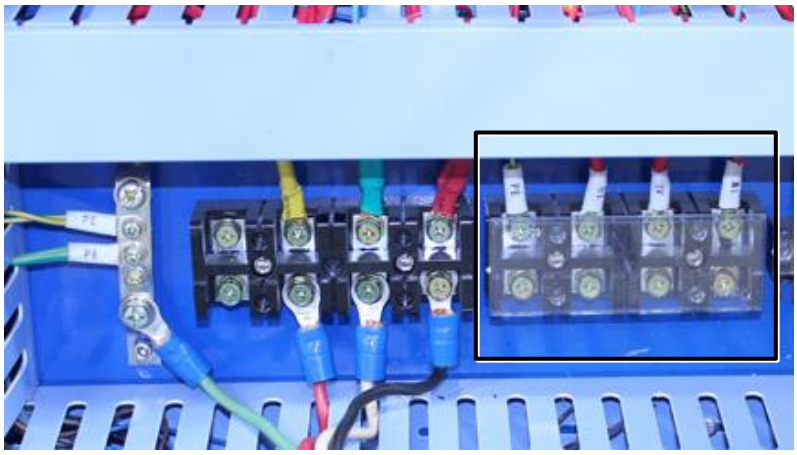
Preparing the Vacuum Pump

1. Verify that the label on the pump indicates the correct power requirements, 220V, 3ph, 20A.
2. Place the vacuum pump at the rear of the table within reach of the main vacuum port. Leave a minimum of 6” (153mm) of open space on all side of the pump for air flow and service access.
3. Remove the hole plug and apply Teflon tape to the threaded nipple and screw the filter assembly into the hole of the pump as shown.
4. Route the Push the end of the vacuum hose from the table onto the filter assembly fitting, and secure with two hose clamps.

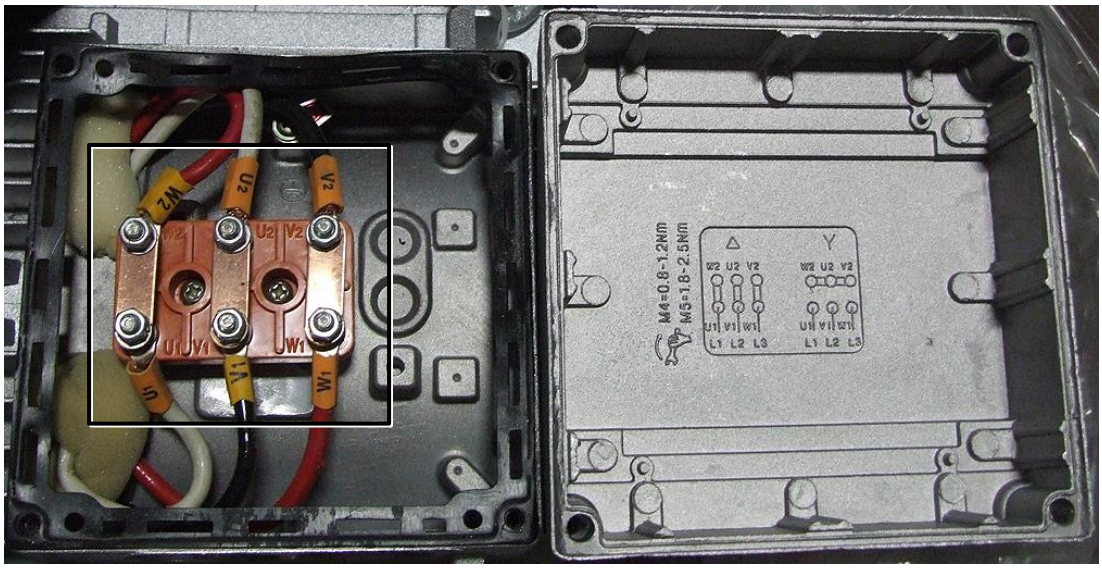




5. Have an electrician route and connect a power cord (customer supplied) from the vacuum pump to the console electrical cabinet terminal strip.



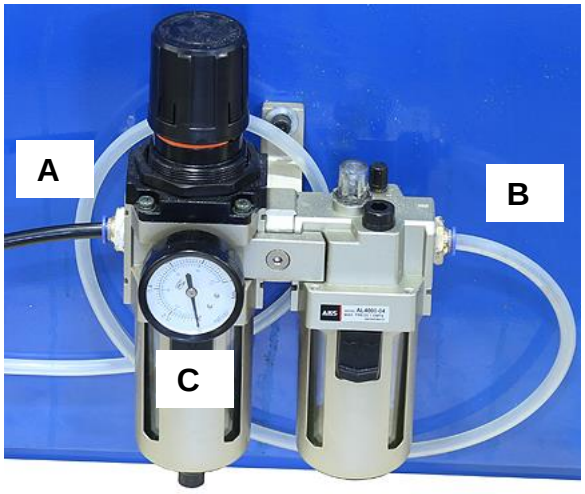
6. Connect the L1, L2, and L3 wires to the terminal block using the Delta (Δ) wiring on the motor as shown.



7. Once power is connected to the entire machine, verify that the motor is rotating in the direction as indicated by the arrow on the motor cap to create a vacuum.
8. If not, disconnect power to the machine, and switch the L1 and L3 wires. DO NOT move the ground wire.
9. Once In operation, clean the filter frequently, daily to weekly depending upon the usage of the system.

Air Connection and Settings

1. Route the air line into the filter side (A) of the filter / regulator assembly. The air supply (customer supplied) should be 9-10CFM @ 85psi.
2. Push the air line into the quick connect and verify that it is locked into the coupler.
3. Fill the oiler with a quality air tool oil.
4. When the system setup is completed, set the main pressure regulator (C) to 85psi.



Dust Hose Connections

This machine is equipped with a dust collection port.

Note: *A dust collector and ducting (hose) is optional and not included with the table.*

The minimum required air speed at the end of flexible tube is 20 m/sec. The minimum required air volume of the machine is 750 m³/hr. (43,000~49,000 cu. ft./hr.). Use antistatic and electrically conductive hoses only.

IMPORTANT: Use care and planning when attaching and routing flexible hose for dust collection. DO NOT create an entanglement hazard or a trip hazard or an interference of the work station when routing the hose(s).

The 4” (100mm) dust port is part of and on the top of the router head.

When connecting the flexible hose, plan for:

- The hose to travel with the router head when the machine is in operation.
- Positioning so as NOT to interfere with the operator or the work piece.
- Prevention of the hose from creating a trip or entanglement hazard.
- Having the hose secured to the port to prevent accidental detachment during operation.

ELECTRICAL

WARNING: Baileigh Industrial is not responsible for any damage caused by wiring up to an alternative 3-phase power source other than direct 3-phase. If you are using an alternate power source, consult a certified electrician or contact Baileigh Industrial prior to energizing the machine.

CAUTION: HAVE ELECTRICAL UTILITIES CONNECTED TO MACHINE BY A CERTIFIED ELECTRICIAN!
Check if the available power supply is the same as listed on the machine nameplate.

WARNING: Make sure the grounding wire (green) is properly connected to avoid electric shock. DO NOT switch the position of the green grounding wire if any electrical plug wires are switched during hookup.

Power Specifications

Your tool is wired for 220 volts, 60Hz alternating current. Before connecting the tool to the power source, make sure the machine is cut off from power source.
Before switching on the power, you must check the voltage and frequency of the power to see if they meet with the requirement, the allowed range for the voltage is ±5%, and for the frequency is ±1%.

Considerations

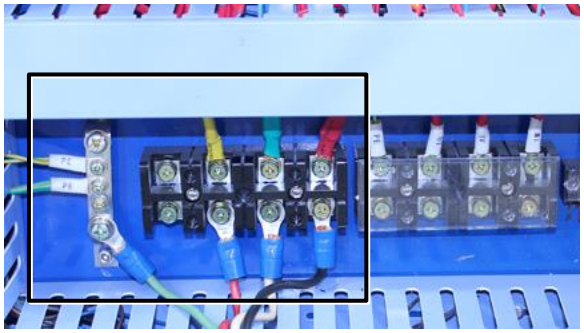
- Observe local electrical codes when connecting the machine.
- The circuit should be protected with a time delay fuse or circuit breaker with a amperage rating slightly higher than the full load current of machine.
- A separate electrical circuit should be used for your tools. Before connecting the motor to the power line, make sure the switch is in the “OFF” position and be sure that the electric current is of the same characteristics as indicated on the tool.
- All line connections should make good contact. Running on low voltage will damage the motor.
- In the event of a malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. This tool is equipped with an electric cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into a matching outlet that is properly installed and grounded in accordance with all local codes and ordinances.

⚠ WARNING: In all cases, make certain the receptacle in question is properly grounded. If you are not sure, have a qualified electrician check the receptacle.

- Improper connection of the equipment-grounding conductor can result in risk of electric shock. The conductor with insulation having an outer surface that is green with or without yellow stripes is the equipment-grounding conductor. If repair or replacement of the electric cord or plug is necessary, do not connect the equipment-grounding conductor to a live terminal.
- Check with a qualified electrician or service personnel if the grounding instructions are not completely understood, or if in doubt as to whether the tool is properly grounded.
- Repair or replace damaged or worn cord immediately.

Power cord connection:

1. Unlock and open the electrical enclosure door.
2. Route a power cord (customer supplied) from the machine toward the power supply.
    a. Route the power cord so that it will NOT become entangled in the machine in any way.
    b. Route the cord to the power supply is a way that does NOT create a trip hazard.



3. Connect the three power wires terminals L1, L2, & L3. Connect the ground wire (typically green) to the PE block.
4. Check that the power cord has not been damaged during installation.
5. When the machine is clear of any obstruction. The main power switch may be turn ON to test the operation. The controller will power ON, and Turn the switch OFF when the machine is not in operation.
6. Test the vacuum pump for proper rotation. Even with correct polarity to the console, the vacuum pump could be out of polarity and run in the wrong direction. Refer back to “Preparing Vacuum Pump” for rotation and correction.
7. Close the electrical enclosure door. DO NOT operate with the door open.
8. Turn the switch OFF when the machine is not in operation.

OPERATION

⚠ CAUTION: Always wear proper eye protection with side shields, safety footwear.

Start by reading and familiarizing yourself with the Weihong NK105G2/G3 Controller Operation Manual following the NK105G3 specific information. This manual will go through all of the settings, keys, and functions of the controller. The instructions within this manual will only cover basic operation of a general program. Using the controller operation manual will expand upon the controller's capabilities.

Main Cabinet Controls

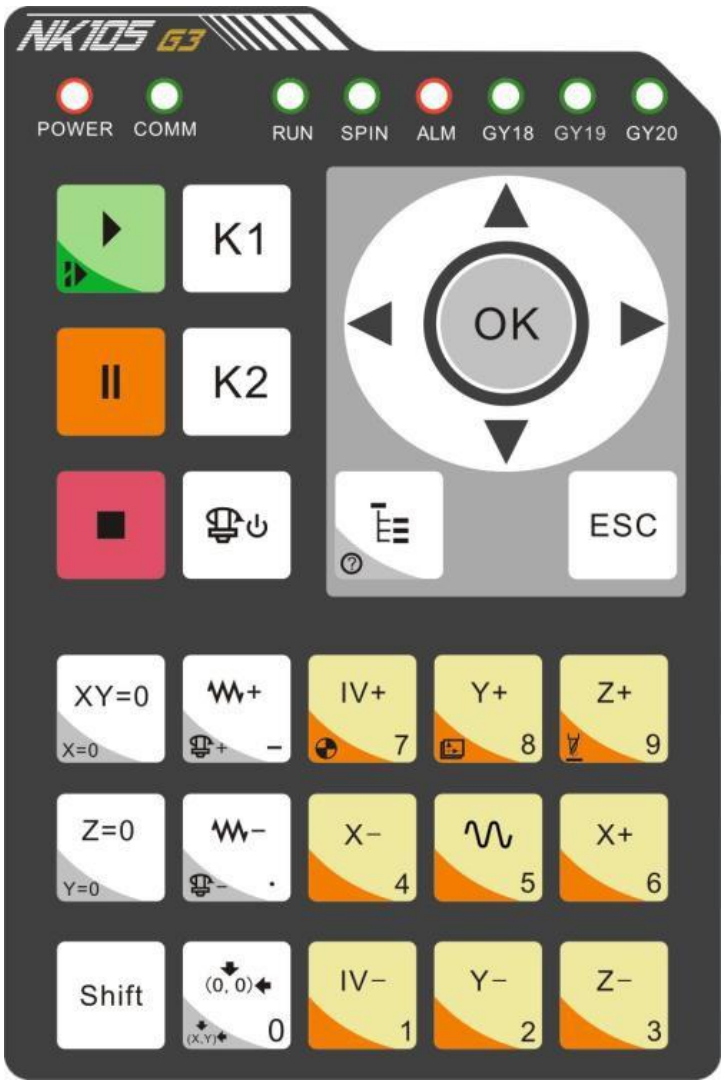
The control console is a semi portable cabinet that can be positioned as needed within the length of the operating cables.
By using the portability of the control cabinet along with the portability of the hand-held control, the operator will be able to position themselves in a location by which they can see the operation of the machine and safely start and stop the machines actions.

IMPORTANT: *Watch and be aware of the routing of the cords between the control cabinet and the table* so that they will NOT become a trip hazard get entangled in the machine in any way.

The switch controls on the face of the control cabinet are from right to left:	
	
Emergency Stop Button	In the event of incorrect operation or dangerous conditions, the machine can be stopped immediately by pressing the **E-STOP** button. Twist the emergency stop button clockwise (cw) to reset. **Note:** Resetting the E-Stop will not start the machine. **Note:** There is also a E-Stop located on the Hand-Held Control. Verify that both E-Stops are reset or the machine will not start.

System Button (Off Button)	The outside edge of the System button will illuminate in Red when power is connected to the control cabinet and the table is Not powered On. When the table is powered On, the light will be off. When the machine is in operation, pressing the System button will shut down the machine operation.
Power Button (On Button)	When the table is ready for operation, press the Power button to start the system and allow the system to boot up. When the system is On, the outside edge of the Power button will illuminate in Green. When the table is Off the light will be off.
Suction Pump (On/Off Button)	This button is active when the table is powered on and booted up for operation. Press the Suction button to start and run the vacuum pump the outer edge will illuminate in Red. Press the Suction Pump button again to stop the vacuum pump. The light will be off.
USB Port	The USB port is located on the side of the cabinet.

Hand Held Controls

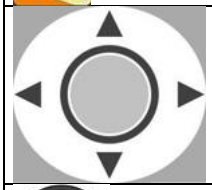


With the use of single-key or combination keys, all the operations can be realized.
The single-key functions are primarily based upon the larger symbol and the center of each key. These commands will change for example when entering numbers. For example: The Y+ key will automatically be the digit 8 when the cursor on screen is in a field that has a number value that can be changed. When in the normal operating screen, the Y+ key moves the gantry in the Y+ direction. When the Y+ key is used in combination with the Shift key, then the result will be to change the system from reading the MCS (Machine Coordinate System) and WCS (Workpiece Coordinate System).

The following tables list the single and combination key stroke commands with a general description of the function that will result.

Single Key Function Table

Key Icon	Key Name	Function
	Start	Start key; breakpoint resume with the help of the auxiliary key
	Pause	Pause during machining
	Stop	Stop machining
	Spindle ON/OFF	Start or stop of spindle under manual mode
	Menu	Entering menu page; entering image update page at the time of system start-up; entering help page with the help of the auxiliary key
	ESC	Esc key; returning to the previous page, cancels selection or entry.
	XY clearing	XY clearing; X clearing with the help of the auxiliary key
	Z clearing	Z clearing; Y clearing with the help of the auxiliary key
	Shift	Auxiliary key; switchover between stepping mode and jog mode under machining page
	Override+	Increase of feedrate override; increase of spindle gear with the help of the auxiliary key when the spindle port has input
	Override-	Decrease of feedrate override; decrease of spindle gear with the help of the auxiliary key when the spindle port has input
	Back to workpiece origin	XY axes backing to workpiece origin; XY axes backing to fixed point with the help of the auxiliary key; input of number 0
	X-	Negative movement of X axis; input of number 4
	X+	Positive movement of X axis; input of number 6
	Y+	Positive movement of Y axis; input of number 8; switchover between MCS and WCS with the help of the auxiliary key
	Y-	Negative movement of Y axis; input of number 2; first tool measurement with the help of the auxiliary key

	Z+	Positive movement of Z axis; input of number 9
	Z-	Negative movement of Z axis; input of number 3; measurement after tool change with the help of the auxiliary key
	Speed Change	Switches between jog speed and rapid jog speed in jog mode; input of number 5
	IV+, Positive	Positive movement of the extended axis; input of number 7; homing all the axes with the help of the auxiliary key
	IV-, Negative	Negative movement of the extended axis; input of number 1
	Screen Navigation	The arrows on the navigation icon are used to move the cursor around the screen to highlight the line or item on screen to be selected or edited.
	OK	OK key; Accepts the selection or entry, advances to the next page
	K1	Turns the spray valve on and off. Uses air to siphon coolant.
	K2	Used to manually raise and lower the dust shroud around the spindle.

Function Information of Combination Key

The usage of the combination key: press the auxiliary key, and then the second; release the two keys after the corresponding function is called.

Combination Key Function Table

Key icon	Function
Shift + 	Breakpoint resume
Shift + 	entering help page of combination key
Shift + 	X clearing
Shift + 	Y clearing
Shift + 	Increase of spindle gear
Shift + 	Decrease of spindle gear
Shift + 	XY axes backing to fixed point
Shift + 	homing all the axes
Shift + 	Switchover between MCS and WCS
Shift + 	Jiggle function
Shift + 	First tool measurement
Shift + 	Measurement after tool change
Shift + 	Measurement each tool length

Start Up

1. Verify that the table surface is clear for the spindle to move.
2. Verify that both the E-Stop buttons are released.
3. Press the Power button and allow the system to boot up.
4. When the message is displayed on the hand-held control to “Back to REF point”, press OK.
5. Allow the head (spindle assembly) to return to the Home position (shown). The Home position is with the Head in the front left corner of the table with the spindle fully raised.
6. The system is now ready for operation.

Note: *This is described as starting from the Home position. Starting with the head in other location about the table will only change the amount of movement remaining in any specific direction.*

7. Using the key pad, press the X+ and or Y+ to move the head around the table.
8. Pressing the X+ 6 (X+) or X− 4 (X-) keys will move the head across the width of the table.
9. Pressing the Y+ 8 (Y+) or Y− 2 (Y-) keys will move the gantry along the length of the table.
10. Pressing the Z+ 9 (Z+) or Z− 3 (Z-) keys will raise and lower the spindle.

Setting Workpiece Coordinate

1. Load and secure the material to the table surface so that it will not move during the machining process.
2. Using the X and Y coordinated keys, move the spindle over the highest position on the work piece.
3. Using the Z- coordinate key, lower the spindle so that the tool tip just lightly contacts the top surface of the work piece.

4. Press the 

(Z=0) key to set the Z coordinate work position.
5. If the current XY location is not the desired starting point, use the X and Y coordinated keys, to move the spindle to the desired starting location.
6. When the center of the cutting tool is located at the desired starting point, press the 

(XY=0) key. This will set the controller coordinates to zero and set this as the X and Y workpiece origin.

Loading a Program

CAUTION: The router head with the spindle turning will be moving around the table once the program is loaded. Verify that the table is clear and that the tooling will only contact intended material which is properly secured to the table. Failure to clear the surface or secure the material can cause serious injury.

The console has a USB port located on the right side near the top.

Note: *Never use a memory stick with a format other than FAT32. If you do it will crash your machine computer. Contact technical support should this occur. It is recommended that if you use additional memory sticks, they be formatted to FAT32 and a file allocation of 4096 identified for NC machine use only.*

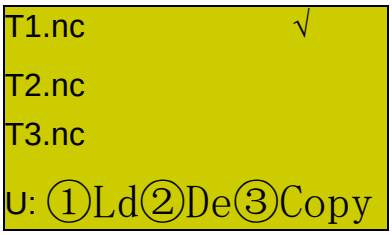
IMPORTANT: Ensure that the spindle is clear of any persons, parts, pieces, and or tooling. The spindle will start to turn and could cause injury.

1. If using a new file, load your *.nc program onto the USB flashdrive and plug the USB into the USB slot in the console.
2. Press the  (menu) key. The menu screen will display the file location choices. Local File are files saved to the controller memory. USB Files are those files saved on the USB disk.

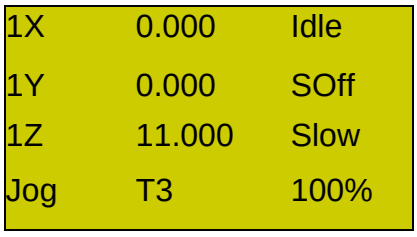
1	Local File
2	USB Files
3	Operations
4	Oper Param

3. Use the up or down arrows on the  (navigation) key to select the USB File if desired. Press 

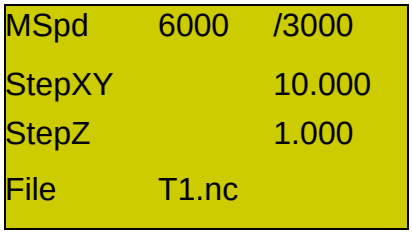
on the desired file source. Local File used for this example.



4. When the files are listed, use the up or down arrows on the navigation key to select the file that you want to load into the controller.
5. When the program you want is highlighted, press the OK key to select the desired file. This will place a check mark at the right side of the screen for the program selected. The file T1.nc is selected in the image above.
6. When the desired file is selected, press 1 to load the file, 2 to delete the file or 3 to copy the file. Normal operation from the USB drive will be to Load the file.
7. The screen will change to show the main operating screen.



8. Pressing the OK key will open the operational parameter screen. This will allow the operator to edit the travel speed of the head during the machining operation.



9. Use the up or down navigation arrow keys to highlight the desired value to edit. Then use the digit keys to enter the desired values and press the OK key to accept the change.

10. Press the ESC (ESC) key to return to the main operating screen.

11. Verify that the spindle and the table are clear and safe for operation. Press the (Start) key to start the machining operation.

1X	999.000	Run
1Y	999.000	1S
1Z	-99.000	Slow
F:3600		100%

Note: *The coordinates for the X, Y, and Z axis will be the values that the spindle is at and will be changing as the head moves to complete the program.*
The "F" rate (travel speed) will also change as the program is running.

12. The spindle will start and come to full (as set) rpm and the operating screen will display the operating information as the program is running.

During the operation of a program, the travel speed may be changed in 10% increments from 0% (stopped) to 120% by pressing the or the keys.

13. The spindle rpm may be changed by pressing the combination of the Shift + , or the Shift + keys. This will change the spindle speed from 0S stopped, up to 7S, maximum spindle rpm.
14. When the program is completed, pressing the OK key will display the program process information. This will be the file name and the time in hours, minutes and seconds in which it took to run the program.
15. The head will move to the "Park" position as set from the factory or as set by the operator following the instructions in the NK105 manual. The operational key may be used to move the head to a location which provides the safest and easiest access to the material to be removed or repositioned, or for a tool change.

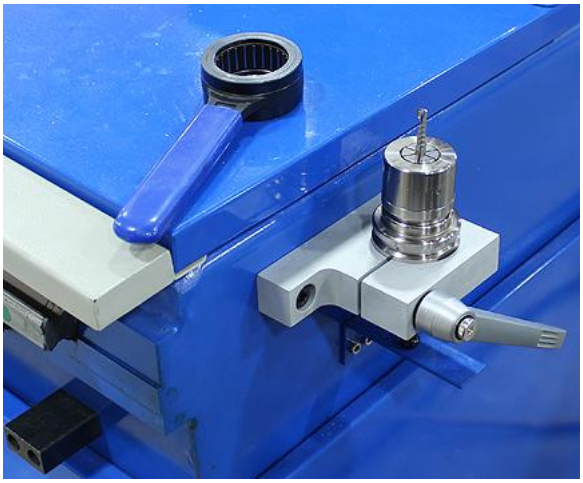
SETTING THE TOOL LENGTH

One of the first things that will need to be done is loading the cutting tool into the tool holders. Each tool must then be placed into the tool magazine in the exact location as defined in the programming software. It is useful to mark each toolholder and tool assembly with a marker to ensure that they are installed back into the correct tool magazine positions.

⚠ ***IMPORTANT:*** *If the Tool No. in the program does not match the tool location in the tool magazine, the result will be a damaged project and possibly damage to the tool and table. DAMAGE DUE TO INCORRECT TOOL NUMBER SETTING AND TOOL PLACEMENT IN THE TOOL MAGAZINE WILL NOT BE COVERED UNDER WARRANTY.*

Selecting each tool to be measured is done by running the specific program designed for each tool. There are six programs loaded into “Local Files” memory. Run the file “T1.NC” to select the tool in the number one position. Run the file “T2.NC” to select the tool in the number two position. Repeat this for each tool position.

1. Manually load and unload each of the tool holder with the correct bit securely installed in the holder. Use the tooling clamp at the back of the table to support the tool holder while installing the bit. Use the directional bearing wrench to tighten the collet nut to secure the bit into the tool holder.
2. Mark and position each tool holder and bit assembly in the magazine so that you can accurately verify the specific tool position for each tool. This MUST match the tool number for the program to be used to machine the material.
3. With the table powered On, View the screen to identify which tool the controller thinks is loaded. In the screen simulation below, this controller thinks Tool 3 (T3) is currently in the spindle. If the program T3 is selected, nothing will happen as the controller is already set to T3.



1X	0.000	Idle
1Y	0.000	SOff
1Z	11.000	Slow
Jog	T2	100%

4. Press the “Menu” key, the Local Files will be highlighted. Press OK.

5. Scroll to and load the file “T1.NC”. This will be the file number for tool number 1 in which you are going to measure.
6. When the file is loaded, press the  (Start) key to execute the program to change to the desired tool.
7. Once tool number 1 is loaded and the program is completed, press the combination keys of 

+ 

(Shift + X+) to enter the tool measurement operation. When asked, press the 

(OK) key. The spindle will move to the position over the tool touch sensor and lower and touch the sensor. While lowering, the speed will change from a fast speed to a slow speed. This is both normal and required. If the spindle is lowering at the fast speed when the bit contacts the touch sensor, it will crash the touch sensor. This would indicate that the bit that is installed is too long for this system. The bit should not extend out of the collet more than 2” (50mm).
8. The bit will touch the sensor, (typically twice and may appear as a quick bounce), and then lift approximately 1mm above the touch pad.
9. When completed, tool number 1 has been measured and that Z coordinate will have been recorded within the systems memory.
10. Repeat these steps for each tool holder and bit assembly.
11. Once completed, this will need to be repeated when the bit in the holder is changed in any way, either by sharpening, or replacing or similar change.

Manually Changing Tool Holders

IMPORTANT: *If the Tool No. in the program does not match the tool location in the tool magazine, the result will be a damaged project and possibly damage to the tool and table. DAMAGE DUE TO INCORRECT TOOL NUMBER SETTING AND TOOL PLACEMENT IN THE TOOL MAGAZINE WILL NOT BE COVERED UNDER WARRANTY.*

When needed, the tooling may be changed manually.

1. Install the desired bit into the tool holder.
2. Make note of and if needed, mark the tool holder so that it is loaded into the correct magazine location. Remember, the tool magazine location MUST match the tool number for the program to be used to machine the material.

3. With the table powered On, Press the “Menu” key, scroll down to the “Operation” option and press OK.
4. Scroll up to the “Tool Change Parameter” and press OK.
5. Scroll to “Current ToolNo.” and press OK. The tool number shown must match the empty magazine location. As an example, if magazine number 1 is empty and is installed in the spindle; the current tool number will be 1.
6. Using the digit keys, set the current tool to number 3.
7. Remove tool 3 from the tool holder, grasp the tool that is in the spindle and then press and hold the Red Manual release switch (A) on the side of the spindle to release that tool. Release the switch when the tool is out of the spindle.
8. Place that tool back into the magazine in its correct location.
9. Press and hold the Red manual release switch (A) and insert tool number 3 into the spindle.
10. Hold the tool up into the spindle and release the manual switch. When the spindle clamps onto the tool, it may be released.
11. The tool has now been manually changed and the controller has been set to know that the tool has been changed. In this case, tool 3 has been installed in the spindle and programed into the controller.
12. If this tool is being changed because a new bit has been installed, then proceed with the next steps to measure the tool.

13. Press the combination keys of Shift + X+ 6 (Shift + X+) to enter the tool measurement operation. When asked, press the OK (OK) key. The spindle will move to the position over the tool touch sensor and lower and touch the sensor. While lowering, the speed will change from a fast speed to a slow speed. This is both normal and required. If the spindle is lowering at the fast speed when the bit contacts the touch sensor, it will crash the touch sensor. This would indicate that the bit that is installed is too long for this system. The bit should not extend out of the collet more than 2” (50mm).

14. The bit will touch the sensor, (typically twice and may appear as a quick bounce), and then lift approximately 1mm above the touch pad.
15. When completed, tool number 3 has been measured and that Z coordinate will have been recorded within the systems memory.
16. Repeat these steps as needed for any other tool holder and bit assemblies.
17. Once completed, this will need to be repeated when the bit in the holder is changed in any way, either by sharpening, or replacing or similar change.

MENU TREE

The normal operation screen will display is a combination of rows and columns.
X, Y, and Z are each in a row with their coordinate locations relative to the last set workpiece coordinate. The right or 3rd column is a display of the active operating conditions and settings. When the machine is not moving it will display “Idle”. When it is being moved or running a program, it will display “Run”.
The next row down will display the Spindle status. SOff = Spindle Off. When the spindle is running, this will display from 0S to S7 depending upon the operator’s settings. These steps or gears are the relative rpm that the spindle will be turning at.
Pressing the “Shift” key will change between “Jog” or “Stepping”. This will change the movement of the axises from continues as long as the axis key is pressed to moving a specific distance each time the axis key is pressed.

1X	0.000	Idle
1Y	0.000	SOff
1Z	11.000	Slow
Jog	T1	100%

Pressing the OK key will change to the parameters screen for the operation being performed. Using the up or down arrow keys will move the cursor around the screen to allow for values to be edited as needed. Press ESC to return to the Operating screen. Pressing the

MSpd	8000/	3000
StepXY		0.100
StepZ		0.100
File	T1.NC	

Book 2 shows the tables of the options that are listed in the full system menu. While most options are available and active, some are not. Those options under the Mfg Parameter require a password to enter to help prevent damage to the material and machine.
When a menu item is highlighted, use the OK key to enter the next level, or accept any changes. Use the ESC to move back a screen or cancel any changes.

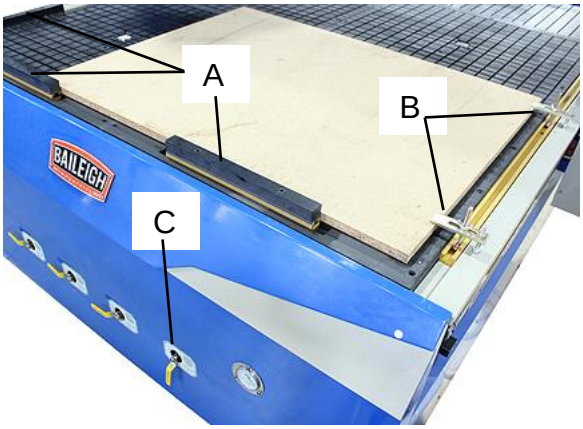
ATTACHING THE WORKPIECE

⚠ CAUTION: The router head with the spindle turning will be moving around the table once the program is loaded. Verify that the table is clear and that the tooling will only contact intended material which is properly secured to the table. Failure to clear the surface or secure the material can cause serious injury.

There are two methods of attaching the workpiece during the machining process. These may be used together or separately. Using both methods together is recommended.

Mechanical Clamping

This machine is equipped with T-Slots around the edge of the cutting surface. Using the T-Slots with the stop cleats (A) and the simple leverage clamps (B), will hold the material to the surface and prevent movement during the machining process. This job attachment method can only be used if the outside edges are not being machined. When using the clamps, place a piece of packing under the jacking bolt to protect the bed of the machine.



Vacuum Clamping

This machine also has a vacuum system which can be used to hold the material to the table. It is highly recommended that at a minimum, the stop cleats (A) also be used when using vacuum to hold the material to the table.
When using vacuum, make sure there is no foreign matter on table and keep it clean before working so that the machine has enough vacuum force. It is recommended to use a double-sides adhesive tape or sealant (customer supplied consumables) to create the seal between the table and the sacrificial board and or material.
Open and close the vacuum valves (C shown open the others are off) at the front of the table to direct the vacuum force toward that area of the table that is being used to hold material. Insert the port plugs into the unused ports to prevent debris from entering the ports and clogging the vacuum filter.

Vacuum Considerations

- Regularly clean the vacuum system air filters and passages to ensure enough vacuum force.
- Seal as much of the surface between the table and the workpiece and possible to limit vacuum leakage.
- When using spoil board (typical and recommended) such as MDF or similar, use a fly cutter to machine both surfaces to remove just enough material to open the pours of the material to allow the vacuum to suck through the material. Be sure to seal the edges and any areas not covered by the workpiece.
- Consider having more than one spoil board. Having spoil board that are made for specific machining operations that may be repeated will allow for the spoil board to be customized with holes and or slots through the spoil board to the table surface. This can increase the vacuum force that will pass through the spoil board to hold the workpiece. Be aware however, that if these passages are used on a workpiece that allows these holes to be open and uncovered, this will reduce the hold force of the vacuum.

SACRIFICIAL BOARD

(Spoil Board)

Note: *Do not confuse flatness with bow. If the board is bowed it may not stick down. Never use a bowed board as a sacrificial board.*

A popular method to fixture parts onto the table is to use a sacrificial board attached to the machine table with two-sided or double-stick tape. The sacrificial board should be a flat smooth material such as 1/2" thick, MDF, melamine covered particle board or other smooth material. The parts to be machined can also be attached to the melamine surface with two-sided tape. Ideally, the sacrificial board needs to be positioned in the center of the machine's work envelope if possible, to provide the greatest flexibility.

1. Using the design program that you have purchased for your machine, draw the work envelope that corresponds to your machine.
2. The lower-left corner of the work envelope will correspond to the machine's home position. This will normally be X0, Y0 in the drawing.
3. Then draw the sacrificial board, example, a 48" X 96" (1219.2mm x 2438.4mm) rectangle and locate it in the center of the work envelope.
4. Note the dimension that the corner of the square is from the home position. This will provide you the exact location of the sacrificial board's lower left corner.
5. An easy way to set this position is to fit a pointed bit into the router spindle and jog the router spindle to the corner position based on the coordinates determined in the drawing and align the sacrificial board with this position. This procedure will also give you practice in jogging the router spindle to a required position.

Precautions regarding sacrificial boards

The sacrificial board will become porous when the melamine has been cut through, and will absorb moisture. As moisture is absorbed the dimensions of the board will change. In general, this will not be a problem as the changes from day to day are typically very small. Also, the changes will in general be over the complete board.

There are however exceptions. Do not allow the board to become wet. If the board does become wet, remove the board from the machine and replace with a new board. Allowing the board to dry may take several days. Once the board has completely dried it may be possible to plane the board and re-use it, but the likely hood is that it is scrap.

Attaching Workpiece to Sacrificial Board

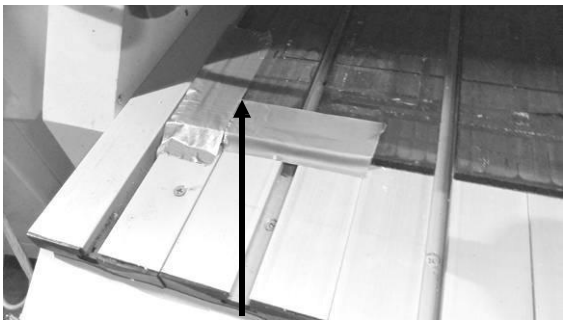
Double-sided tape can be used to attach the workpiece to the sacrificial board. If you are using double-sided tape, ensure that the sacrificial board and the workpiece are clean and do not have saw dust or chips as this will affect the ability of double-sided tape to hold the job securely. Only use the smallest amount of double sided tape as it will make it easier to remove the piece once it has been machined.

Removing Workpiece from Sacrificial Board

Lift the part off the sacrificial board with a wide blade putty knife or similar tool.

Moving the router head to the sacrificial board corner position.

1. With the router head in the home position, lower the router bit to just above the sacrificial board top face.
2. Use the X+ 6, X− 4, Y+ 8, and/or Y− 2 keys to set the X and Y position to the corner dimension.
3. The point of the router bit is now located over the point that the corner of the sacrificial board should be.
4. You may need to move the router bit lower so that it is closer to the top surface of the sacrificial board by pressing the Z- button.

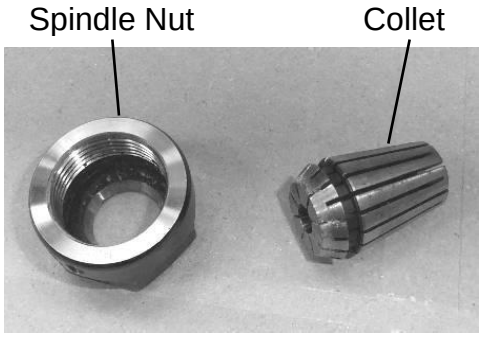


5. Press the XY=0 Z=0 key. This will set the origin and the machine has a new datum point and will be the X=0 / Y=0 in your design program.
6. Move the sacrificial board so that the corner of the sacrificial board is directly under the point of the router bit.
7. Place tape around the corner of the sacrificial board on the bed of the machine. This will give you a position to place the double-sided tape that will be used to attach the sacrificial board the bed of the machine.

8. Move the router head in the X+ direction so that it is approximately at the end of the sacrificial board.
9. Move the sacrificial board so that it lines up with the point of the router bit.
10. Place tape on the bed of the machine at the edge of the sacrificial board.
11. Move the router head to the end of the machine furthest X and Y position. The router head will be out of the way and allow you to have access to the bed of the machine.
12. Remove the sacrificial board.
13. Clean the bed of the machine so that there are no wood chips or dust. Apply double-sided tape to the bed of the machine using the tape that you have just applied as reference. You need to apply three or 4 strips of double-sided tape to the bed of the machine with sufficient length so that the sacrificial board is attached along its complete length and width.
14. Clean the sacrificial board so that the surface will adhere to the double-sided tape.
15. Remove the backing from the double-sided tape.
16. With 2 people, lift the sacrificial board over the table and lower so the reference tape that you applied to the bed of the machine aligns with the corner and edge of the sacrificial board.
17. Lower and press down so that the double-sided tape sticks to the sacrificial board. Do not worry if the sacrificial board is not perfectly aligned with the tape as you will have to reset the home position. The clamps can also be used to clamp the sacrificial board to the bed of the machine.

ROUTER BIT INSTALLATION AND REMOVAL

Note: *Collets & spindle collet hole must be cleaned regularly. Ensure that the slots in the collets are free of sawdust, as sawdust build up will keep the collet from compressing. If the collet or spindle holes are not clean, the router bit may not run true and this will affect the performance of your machine.*

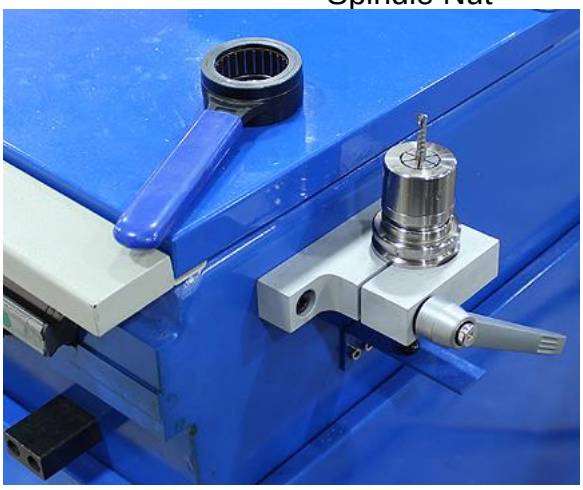


1. Disconnect and lockout power to the router table.
2. Select a router bit and its relevant collet.
3. Install the collet into the spindle nut. Press the collet into the spindle nut until it snaps into place. The face of the collet and the face of the spindle nut will be close to flush.

Collet fitted to Spindle Nut

Note: *The router bit must not be installed into the collet until the collet has been installed into the spindle nut. With the router bit installed into the collet, the collet cannot compress and snap into the spindle nut.*
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 and remove the collet while a cutter is installed, as the collet will not compress and pop out.

4. Install the spindle nut and collet assembly onto the spindle thread by hand.
5. Press the bit into the collet. Verify that the flute of the router bit is not inside the collet and is at least a minimum of 1/16” (2.50mm) outside the collet.
6. Use the tooling clamp at the back of the table to support the tool holder while installing the bit. Use the directional bearing wrench to tighten the collet nut to secure the bit into the tool holder. Do not over tighten.
7. Place the tool holder and bit assembly into the tool magazine in the exact location as is set up in the CAM software being used.



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

Router Bits

Types of router bits.
There are five basic types of router bits: straight, up shear, down shear, combination (also called compression), and form tools (round over, ogee, etc.).

1. Straight Router Bits.

These are the standard router bits that are commonly used with handheld routers and are readily available at most home centers.

2. 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 has a tendency to chip the top surface, especially veneers or melamine surfaces.

Ball nose Router Bits are a variation of the up shear bit design but have a radius end. These bits are typically used for 3D surfacing applications.

3. Down Shear Router Bits.

These bits are similar to the up shear but with an opposite spiral that actually tends to pack the chips into the kerf. These bits prevent chipping the material surface, especially with veneers or melamine surfaces.

4. 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" (6mm) in length so that the bit can be used on 1/4" (6mm) veneered plywood and for dados.

5. 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.

AUTOMATIC OILER

The router table has an automatic lubricating system mounted on the back side of the left end of the gantry. The oiler can be set for both the time intervals between oiling cycles, and how long the pump runs during an oiling cycle.
The oiler will pump oil for one cycle when the machine is powered On. The interval timer (bottom display) will then set to the full interval time and start to count down to the next cycle. When the interval timer counts down to zero, the pump will run and pump oil for the number of seconds programed into the cycle timer (top display).
The interval timer can be set from 001 to 999 minutes.
The cycle timer can be set from 001 to 999 seconds.

1. Fill the oiler with 30W oil.
2. When setting the oiler, it will start digit by digit with the interval time, (bottom display) and then set the cycle time (top display) digit by digit.
3. Power ON the table.
4. Press and hold the “Set” button for 3 seconds until the ones digit in the lower display begins to flash.
5. Use the ▲ or ▼ buttons to change the display to the desired digit and then press the “Set” button until the tens digit flashes.
6. Use the ▲ or ▼ buttons to change the display to the desired digit and then press the “Set” button until the hundreds digit flashes.
7. Use the ▲ or ▼ buttons to change the display to the desired digit and then press the “Set” button until the ones digit of the cycle time display flashes.
8. Repeat these steps in the cycle display to set the desired oil cycle time.
9. When the cycle time digits are set, press and hold the “Set” button for 3 seconds to lock in the settings. The pump will run for the set cycle time.

When the oiler detects a system fault, the display will flash a fault code and sound a beeper and the pump will stop working.

- When the display shows “ERO”, it means low oil. Add oil.

- When the display shows “ERP”, it means low system pressure. Check for pipe/tube damage or leaks, or the lubrication cycle time is too short to develop a pressure reading.
- When the display shows “ERS”, it means that the system is running overtime.

AIR MISTER

The air mist system may be used to spray air at the cutting area or coolant using a siphon system where the air draws the coolant into the block and then sprays the air coolant mixture at the cutting area.

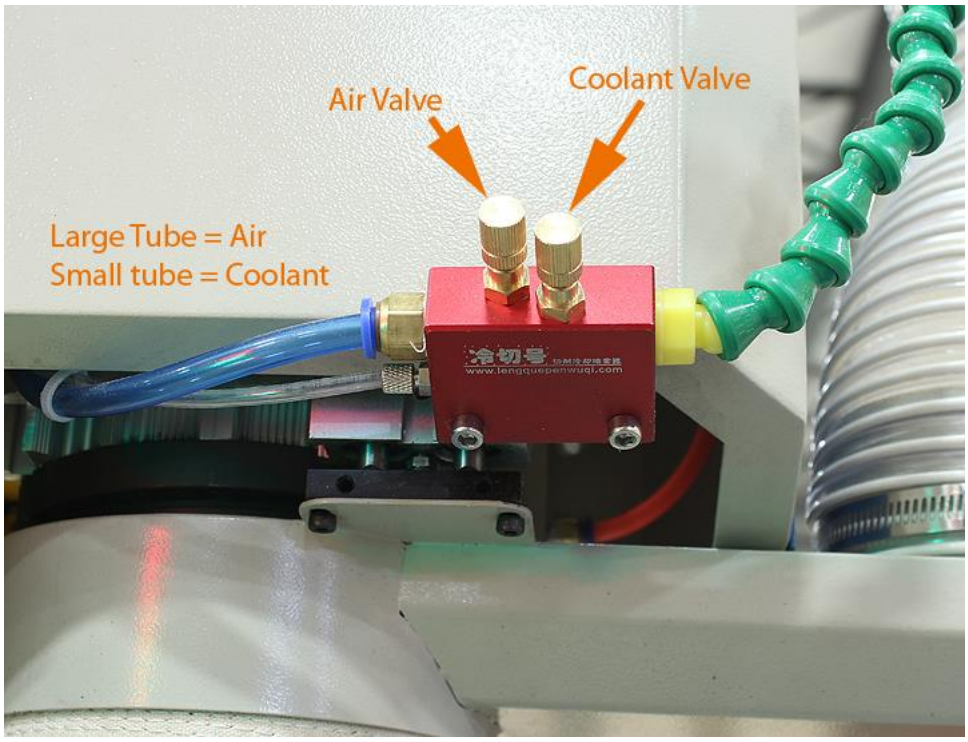
The K1 key turns the spray valve on and off.

The larger input tube for the air line.
The left (as pictured) needle valve controls the air flow.

- Adjust the upper left valve for air flow.

The smaller tube is for the coolant line.
The right (as pictured) needle valve controls the coolant flow.

- Adjust the lower right valve for coolant flow.



This is a venturi based syphon system. No coolant will flow without air flow.
The coolant valve may be closed to spray only air if desired.

Air supply requirements:
9-10CFM @ 85psi.

LUBRICATION AND MAINTENANCE

WARNING: Make sure the electrical disconnect is OFF before working on the machine.
Maintenance should be performed on a regular basis by qualified personnel.
Always follow proper safety precautions when working on or around any machinery.

Daily Maintenance

- Check daily for any unsafe conditions and fix immediately.
- Check that all nuts and bolts are properly tightened.
- Do a general cleaning by removing dust and scrap from the T-slots on the bed. Keep area around machine clear of debris.
- Check that the control console circulating fans are working and the emergency stop button is in good working order.
- Clean the machine and lubricate unpainted surfaces with a Teflon lubricant. Wipe off any excess and buff with a dry polishing cloth. This will reduce the chance of rust forming.
- Check cutter teeth for chips and dullness. Sharpen or replace any worn or damaged tooling.
- Generally inspect the machine for damage and loose or worn parts.
- Collets & spindle collet hole must be cleaned regularly.
- Ensure that the slots in the collets are free of sawdust. As sawdust builds up it will stop the collet from 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.
- Check the filters on the inlet of the vacuum pump for debris.
- Inspect the power plug and cord.

***Note*: When cleaning chips and debris from the machine, use a brush and a shop vacuum. **DO NOT** blow off the machine with compressed air. The force of the compressed air may force chips into critical mechanisms or may inflict injury to yourself or others.**

Weekly Maintenance

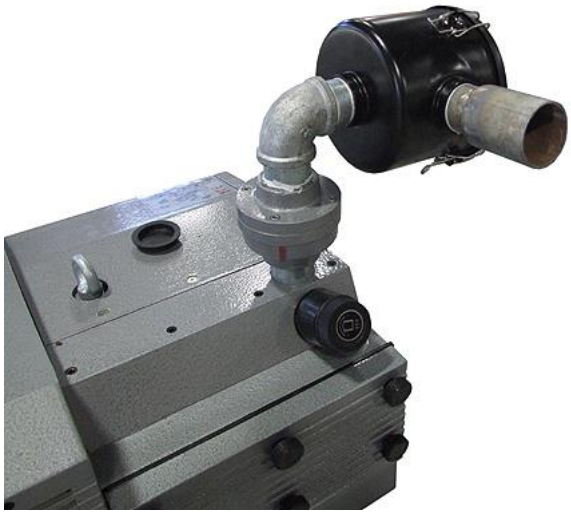
- Thoroughly clean the machine.
- Check any exposed electrical wiring for wear or damage.
- Inspect the power unit ground clamp for wear or damage.

- Clean the cutters.
- Generally inspect the machine for damage and loose or worn parts.
- Check the dust extraction system for blockages and any large scrap that could cause blockages.
- Check the screen on the inlet of the vacuum pump for debris.

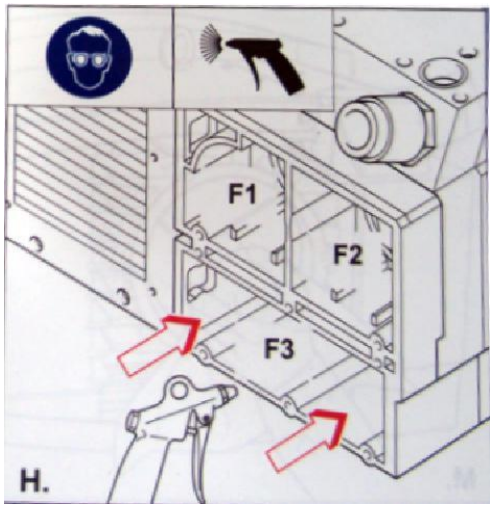
Monthly Maintenance

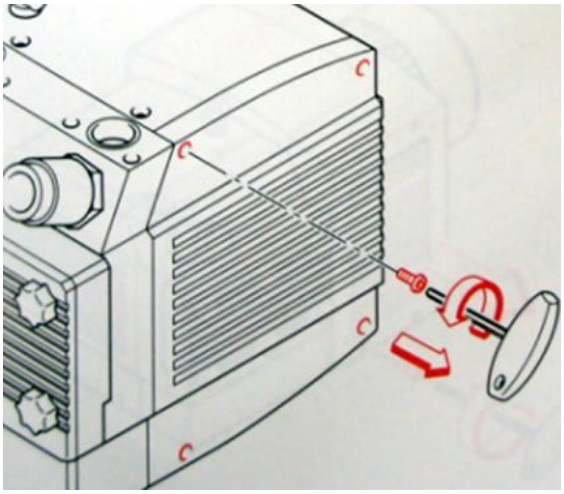
- Tighten any loose bolts, nuts, or screws on the machine.
- Inspect the timing belts for wear (every 3 months).
- Grease the gear racks for the “X” & “Y” axes. Use a general purpose grease.

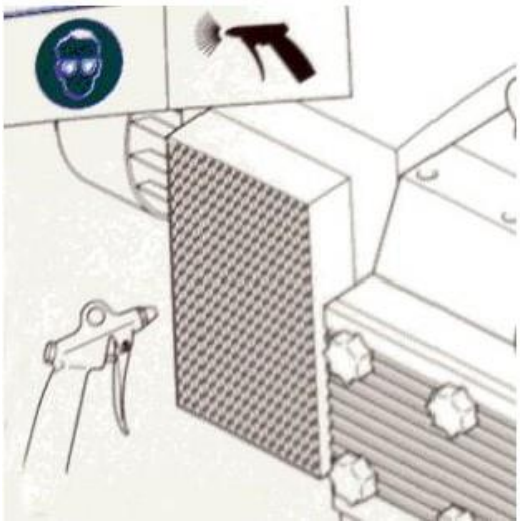
Air Pressure System Maintenance

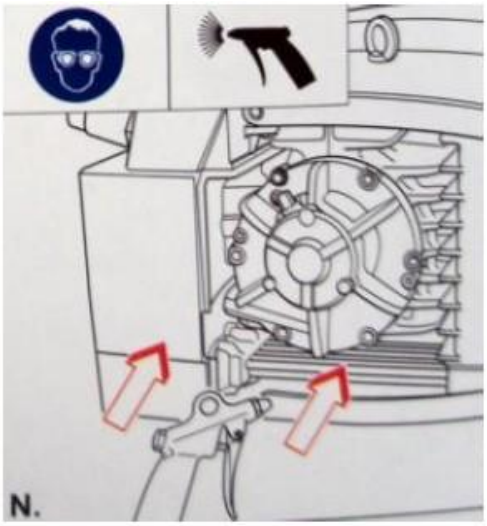


1. The primary inlet filter should be cleaned daily or before the start of each work shift.
2. The inlet (F1 and F2) and exhaust (F3) filters inside the vacuum pump needs to be cleaned weekly depending upon usage to keep dust from entering the pump.
3. General cleaning of the vacuum pump should be done daily to weekly depending upon usage to provide for full air flow in and around the entire vacuum pump.
4. Use a brush and a shop vacuum to dislodge and remove any dust and chips from the vacuum pump.
5. Remove the covers and clean each of the filter chambers and fins to allow for full air flow.
6. Lubricate every three months. Only use the designated grease.


F1
F2
F3
H.





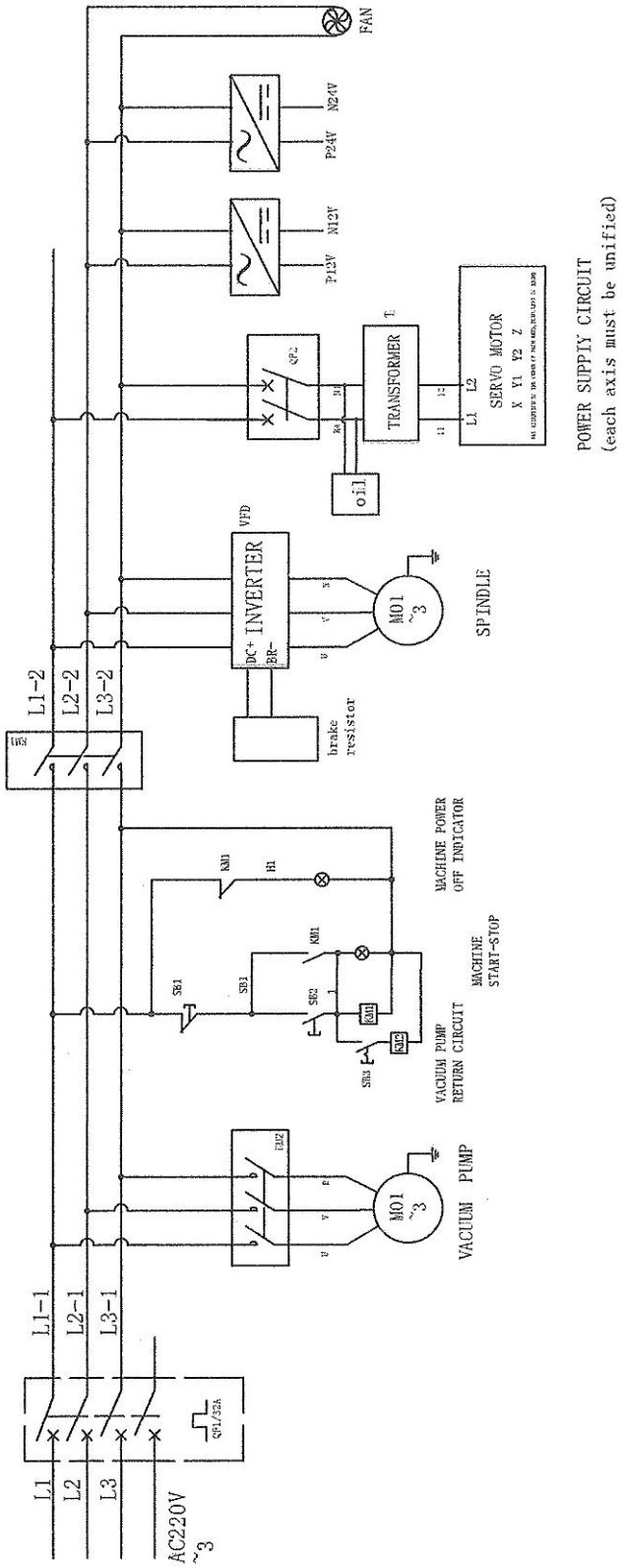

N.

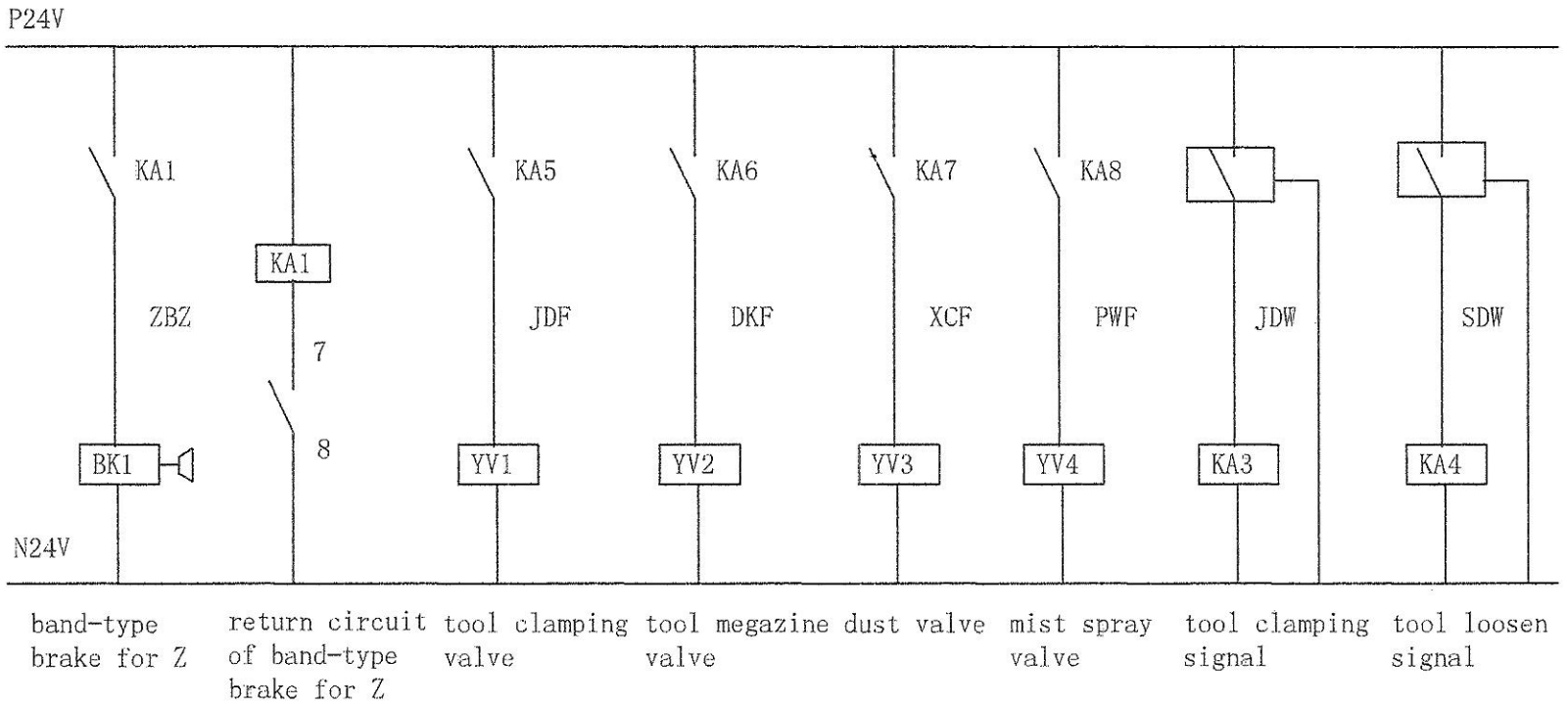
Parts List

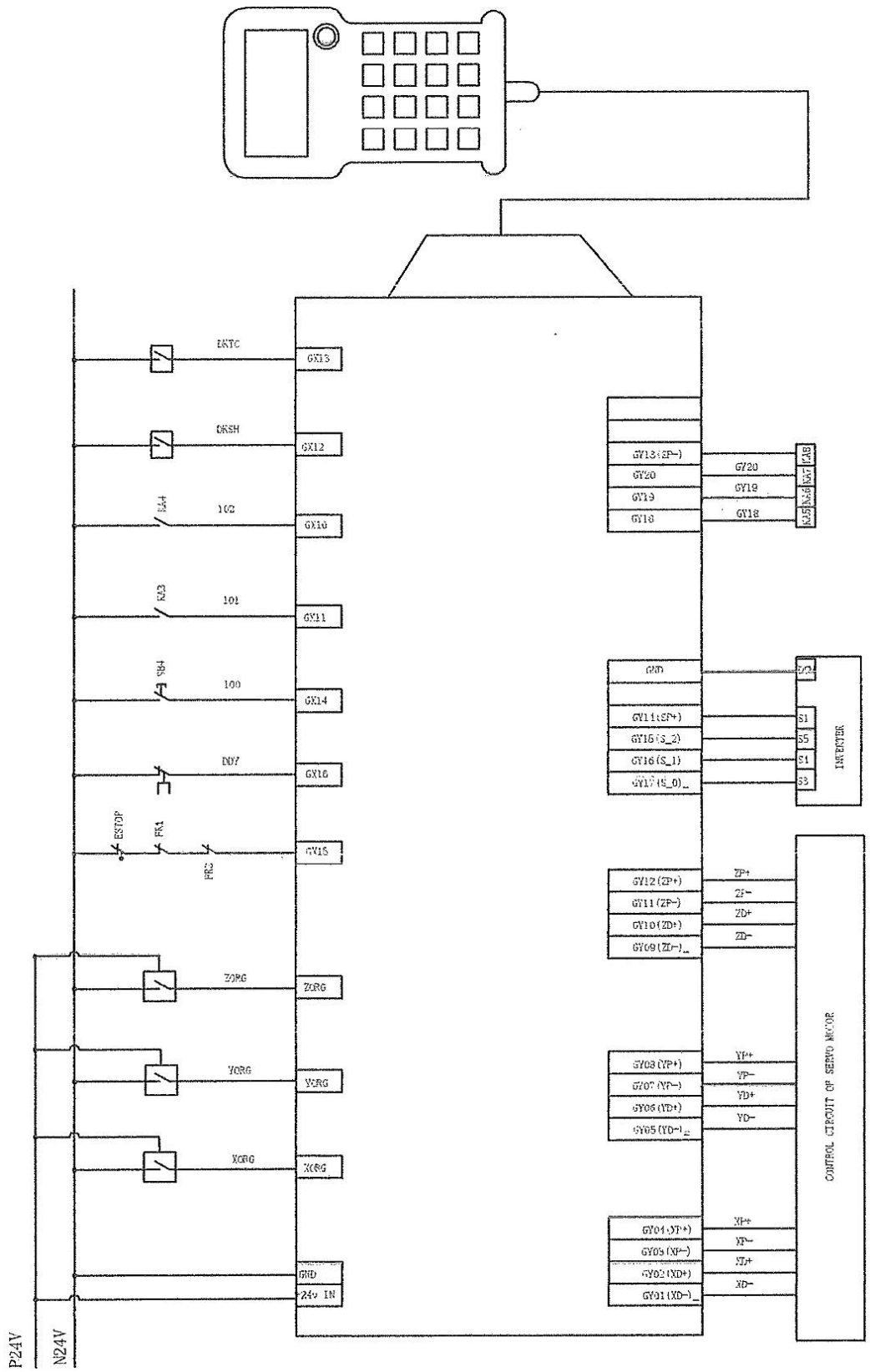
No.	Part Name	Model No.	Qty
1	NK105 DSP Controller	G3	1 set
2	Delta Inverter	11KW/220V	1 pc
3	Delta Motor with Brake	750W	1 pc
4	Delta Motor	750W	3 pc
5	Relay		8 set
6	Switch Power	D-120C	2 pc
7	Phase Sequence	XJ-3	1 pc
8	A.C. Contactor	32A	2 pc
9	Breaker	4P 60A	1 pc
10	Breaker	2P 6A	1 pc
11	Breaker	2P 20A	1 pc
12	Guide Rail (X Axis) HIWIN	7580/25	2 pc
13	Guide Rail (Y Axis) HIWIN	3550/25	2 pc
14	Guide Rail (Z Axis) HIWIN	550/25	2 pc
15	Taiwan TBI Screw Z Axis	468/2510	1 pc
16	Rack	1.5	
17	Nozzle	Φ4	13 pc
18	Oil Discharge	4 "	2 pc
19	Oil Discharge	5 "	1 pc
20	Sliding Block	25	12 pc
21	Supporting Seat Z Axis	BK20	1 pc
22	Supporting Seat Z Axis	FK20	1 pc
23	Limit	NPN	3 pc
24	Japan SHIMPO Reducer		3 pc
25	Belt	360/_	5M
26	Belt Pulley	14 holes 20 tooth	1 pc
27	Gear Rack	20 holes 45mm	1 pc
28	Gear Rack	20 holes 65mm	2 pc
29	Electric Oil Pump	2L	1 pc
30	HSD Spindle	12kw	1 pc
31	Mist Spray		1 pc
32	Pressure Gauge		1 pc
33	Dyad		1 pc

34	Solenoid Valve		4 pc
35	Tool Sensor		1 pc
36	Tool Box		1 pc
37	Tool Holder	ISO30	6 pc
38	Tool Support	ISO	6 pc
39	Air Cylinder	for tool	1 pc
40	Oil-Water Separator		1 pc
41	Air Cylinder for Dust Collection		2 pc
42	Unloading Wrench		1 pc
43	Tool Collet	3.175	1 pc
44	Tool Collet	4	1 pc
45	Tool Collet	6	1 pc
46	Tool Collet	12	1 pc
47	Oiler		1 pc
48	Tool Bit		4 pc
49	Dust Brush		1 pc
50	Snap Ring	44-64	2 pc
51	Tape		1 pc
52	Blind Flange		18 pc
56	USB Wiring		1 pc

ELECTRICAL SCHEMATIC




P24V
KA1
ZBZ
BK1
N24V
KA1
7
8
KA5
JDF
YV1
KA6
DKF
YV2
KA7
XCF
YV3
KA8
PWF
YV4
JDW
KA3
SDW
KA4
band-type brake for Z
return circuit of band-type brake for Z
tool clamping valve
tool megazine valve
dust valve
mist spray valve
tool clamping signal
tool loosen signal


EXTC
GX13
GKSH
GX12
KA4
102
GX10
KA3
101
GX11
KA4
100
GX14
DO7
GX16
ESTOP
FR1
FR2
GX15
ZORG
YORG
XORG
GND
24v IN
P24V
N24V
GY13(ZP-)
GY20
GY19
GY18
GY20
GY19
GY18
CAB
GND
GY11(ZP+)
GY15(S_2)
GY16(S_1)
GY17(S_0)
S1
S5
S1
S3
INVERTER
GY12(ZP+)
GY11(ZP-)
GY10(ZD+)
GY09(ZD-)
ZP+
ZP-
ZD+
ZD-
GY03(YP+)
GY07(YP-)
GY06(YD+)
GY05(YD-)
YP+
YP-
YD+
YD-
GY04(XP+)
GY08(XP-)
GY02(XD+)
GY01(XD-)
XP+
XP-
XD+
XD-
CONTROL CIRCUIT OF SERVO MOTOR

SOFTWARE INFORMATION

Each new cutting table comes with one license of the latest version of BobCAD CAM Express software and Services provided by BobCAD-CAM.
Contact a representative from BobCAD-CAM to get started with BobCAD-CAM. The service representative will help to get you directed to the download links and the license activated. Whether drawing squares or squirrels, flanges or flowers, BobCAD-CAM will help to bring out your drafting artistry skills. Practice and Have Fun!

BobCAD-CAM Vxx (latest version) Express (Covers: Mill, Laser, Plasma, and Waterjet) This software is best for 2D/3D CAD and 2 axis shape cutting.

- DXF DWG IGES & More
- Shape Library, Stretch, Splines, Snap Grid
- Hole Patterns Gears CAMS Sprockets
- Profiling, Kerf Comp, Lead in/out, Backplotting
- Post Processor

BobART
This software is best for image conversions and embossing.

- EPS AI PDF
- JPEG, BMP, Tiff, GIF, PNG, PSD, and more….
- Vectorize (convert images)
- Embossing, Texture, Smoothing
- V carving

1 Hr of Online Line Training
This training is best to learn BobCAD-CAM Fast.

- One on One web training
- Your Parts
- Your Questions
- Your Office
- Video Recording of Training Session

1 Year Technical Support Package
This support package will get you started.

- Expert Technical Support
- Starts from Day of Purchase
- Phone & Email
- Remote Access (connecting computers)

BobCAD-CAM Contacts:

Licensing, Support
727-489-0003
support@bobcad.com

Sales, General Inquiry
844-529-0660
partners@bobcad.com

Use the information below to ensure you are working with a BobCAD-CAM supported and optimized system.
Use the following link to view the most up to date system requirements.
http://bobcad.com/support/system-requirements/?source=webinars_footer

BobCAD-CAM is supported to run on the following Operating Systems:

- Windows 7
- Windows 8
- Windows 10

A 64 Bit System is needed.

BobCAD-CAM System Requirements

- Windows (Minimum)
- 64-bit Operating System
- 3GB RAM
- 256 MB Graphics Card* that supports OpenGL 1.1
- Intel® or AMD® Processors**
- 2GHz Processor
- Windows 10, Windows 8 or Windows 7
- Windows Indexing Service Must Be Enabled
- IE9 or above

Windows (Recommended)

- 6GB RAM or More on Windows 8 x64 Operating System
- 1GB Graphics Card*
- Intel® or AMD® Processors**
- 2GHz Processor (Multi-core) or higher
- Windows 10

***Note**:*
**BobCAD-CAM's stability is dependent on the graphics card ability to process information; integrated memory graphics cards may work but are not recommended.*
ATI® or NVIDIA® graphics cards with dedicated memory are recommended. The graphics card's software driver must be updated to the current software drivers released by the graphics card manufacturer.
**4K displays are not currently supported and may require reducing your screen resolution.*
***BobCAD-CAM is not supported on Apple Macintosh® -based machines. Some customers have shown success in running BobCAD-CAM in a Virtual Windows environment on Mac computers using Boot Camp. While the end user may choose to run Windows on a MAC®, this is not supported by BobCAD-CAM Inc.*

NOTES

BAILEIGH INDUSTRIAL, INC. 1625 DUFEK DRIVE MANITOWOC, WI 54220
PHONE: 920. 684. 4990 FAX: 920. 684. 3944
WWW.BAILEIGH.COM

BAILEIGH INDUSTRIAL LTD. UNIT 1 FULLWOOD CLOSE
SWIFT VALLEY INDUSTRIAL ESTATE, RUGBY
WEST MIDLANDS, CV21 1QH UNITED KINGDOM
PHONE: +44 (0)24 7661 9267 FAX: +44 (0)24 7661 9276
WWW.BAILEIGH.CO.UK