READ THIS FIRST

Model G0894

IMPORTANT UPDATE

For Machines Mfd. Since 10/21
and Owner's Manual Revised 12/20

For questions or help with this product contact Tech Support at (570) 546-9663 or techsupport@grizzly.com

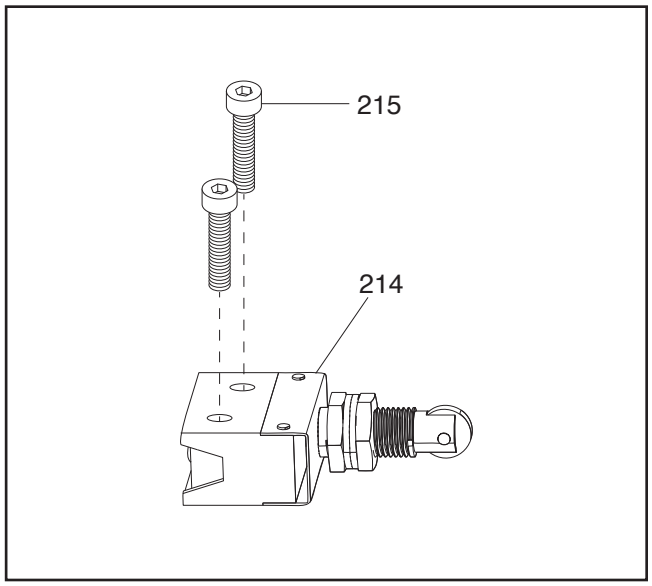
The following change was recently made since the owner's manual was printed:

- Safety switch has been added to electrical cabinet.

Aside from this information, all other content in the owner's manual applies and MUST be read and understood for your own safety. **IMPORTANT: Keep this update with the owner's manual for future reference.**

For questions or help, contact our Tech Support at (570) 546-9663 or techsupport@grizzly.com.

Revised Parts



REF	PART #	DESCRIPTION
214	P0894214	LIMIT SWITCH PANASONIC AZ7311 10A 250V
215	P0894215	CAP SCREW M4-.7 X 30

#KS22190 PRINTED IN CHINA

Test Run

Once assembly is complete, test run the machine to ensure it is properly connected to power and safety components are functioning correctly.

If you find an unusual problem during the test run, immediately stop the machine, disconnect it from power, and fix the problem BEFORE operating the machine again. The **Troubleshooting** table in the **SERVICE** section of this manual can help.

The test run consists of verifying the following: 1) the spindle motor powers up and runs correctly, 2) the axes motors run correctly and the machine properly homes, 3) the E-STOP button safety feature functions properly, and 4) the electrical cabinet safety switch functions properly.

⚠WARNING

Serious injury or death can result from using this machine BEFORE understanding its controls and related safety information. DO NOT operate, or allow others to operate, machine until the information is understood.

⚠WARNING

DO NOT start machine until all preceding setup instructions have been performed. Operating an improperly set up machine may result in malfunction or unexpected results that can lead to serious injury, death, or machine/property damage.

To test run machine:

1. Clear all setup tools away from machine.
2. Ensure controller and cooling pump are connected and operational.
3. Press E-STOP button.
4. Connect machine to power by inserting power cord plug into a matching receptacle.
5. Twist E-STOP button clockwise until it springs out (see **Figure 18**). This resets the switch.

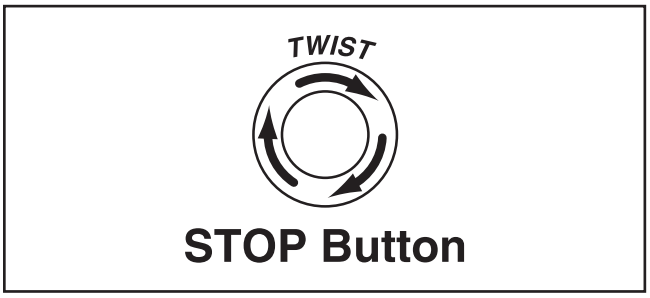


Figure 18. Resetting the E-STOP button.

6. Press ON button to turn machine ***ON***.
7. Verify machine parameters as shown on **Page 22**.
8. Press ON/OFF button on controller to start spindle motor. Verify spindle starts and runs smoothly without any unusual problems or noises. Press ON/OFF to stop spindle motor.
9. Press HOME button on controller. Verify that each axis motor operates smoothly and that all axes move to machine zero.
10. Press E-STOP button on machine to turn machine ***OFF***.
11. WITHOUT resetting E-STOP button, try to start machine by pressing the ON button. The machine should not start.

    — If machine *does not* start, safety feature of E-STOP button is working correctly.

    — If machine *does* start, immediately turn it ***OFF*** and disconnect power. E-STOP button is NOT working properly and must be replaced before further using the machine.

12. Fully open right electrical cabinet door and twist E-STOP button clockwise until it springs out. Try to start machine by pressing the ON button. The machine should not start.

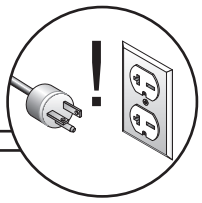
    — If machine *does not* start, safety switch is working correctly. Congratulations! Test Run is complete.

    — If machine *does* start, immediately turn it ***OFF*** and disconnect power. Safety switch is NOT working properly and must be replaced before using machine.

SECTION 7: SERVICE

Review the troubleshooting procedures in this section if a problem develops with your machine. If you need replacement parts or additional help with a procedure, call our Technical Support. **Note:** *Please gather the serial number and manufacture date of your machine before calling.*

Troubleshooting



Motor & Electrical

Symptom	Possible Cause	Possible Solution
Machine does not start, or power supply breaker immediately trips after startup.	1. E-Stop button depressed/at fault. 2. Incorrect power supply voltage or circuit size. 3. Electrical cabinet open/safety switch at fault. 4. Power supply circuit breaker tripped or fuse blown. 5. Computer board at fault. 6. Wiring broken, damaged, or disconnected. 7. Inverter/control box at fault. 8. Motor at fault.	1. Rotate E-Stop button head to reset. Replace if at fault. 2. Ensure correct power supply voltage and circuit size. 3. Close and secure electrical cabinet/replace switch. 4. Ensure power supply circuit is not overloaded and is free of shorts. Reset circuit breaker or replace fuse. 5. Inspect/replace if at fault. 6. Fix broken/damaged wires or disconnected/corroded connections. 7. Inspect inverter/controller box; replace if at fault. 8. Test/repair/replace.
Machine stalls or is underpowered.	1. Dull cutter or incorrect cutter type for task. 2. Machine undersized for task. 3. Spindle jammed. 4. Spindle motor overheated. 5. Incorrect power supply voltage or circuit size.	1. Replace/sharpen cutter. Use proper cutter for cutting task. 2. Use correct cutter/reduce feed rate or depth of cut. 3. Disconnect power. Turn spindle by hand to identify/fix cause of jam. 4. Check coolant, fill reservoir (**Page 33**). 5. Ensure correct power supply voltage and circuit size.
Machine has vibration or noisy operation.	1. Incorrect feed rate, spindle speed, or cutter type. 2. Cutter or spindle at fault. 3. Workpiece loose. 4. Bit chattering. 5. Collet at fault. 6. Machine not level. 7. Spindle bearings at fault.	1. Use correct feed rate and spindle speed; use different cutter. 2. Replace or sharpen cutter; tighten loose spindle; replace defective spindle, collet, or spindle nut (**Page 25**). 3. Secure workpiece with clamps (**Page 26**). 4. Replace/sharpen cutter; index cutter to workpiece; use correct feed rate and spindle speed. 5. Replace collet. 6. Level machine (**Page 18**). 7. Test by rotating spindle; rotational grinding/loose shaft requires bearing replacement.

Wiring Diagram

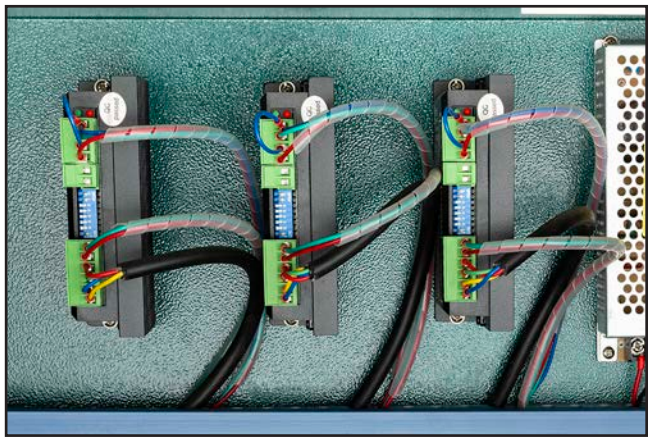
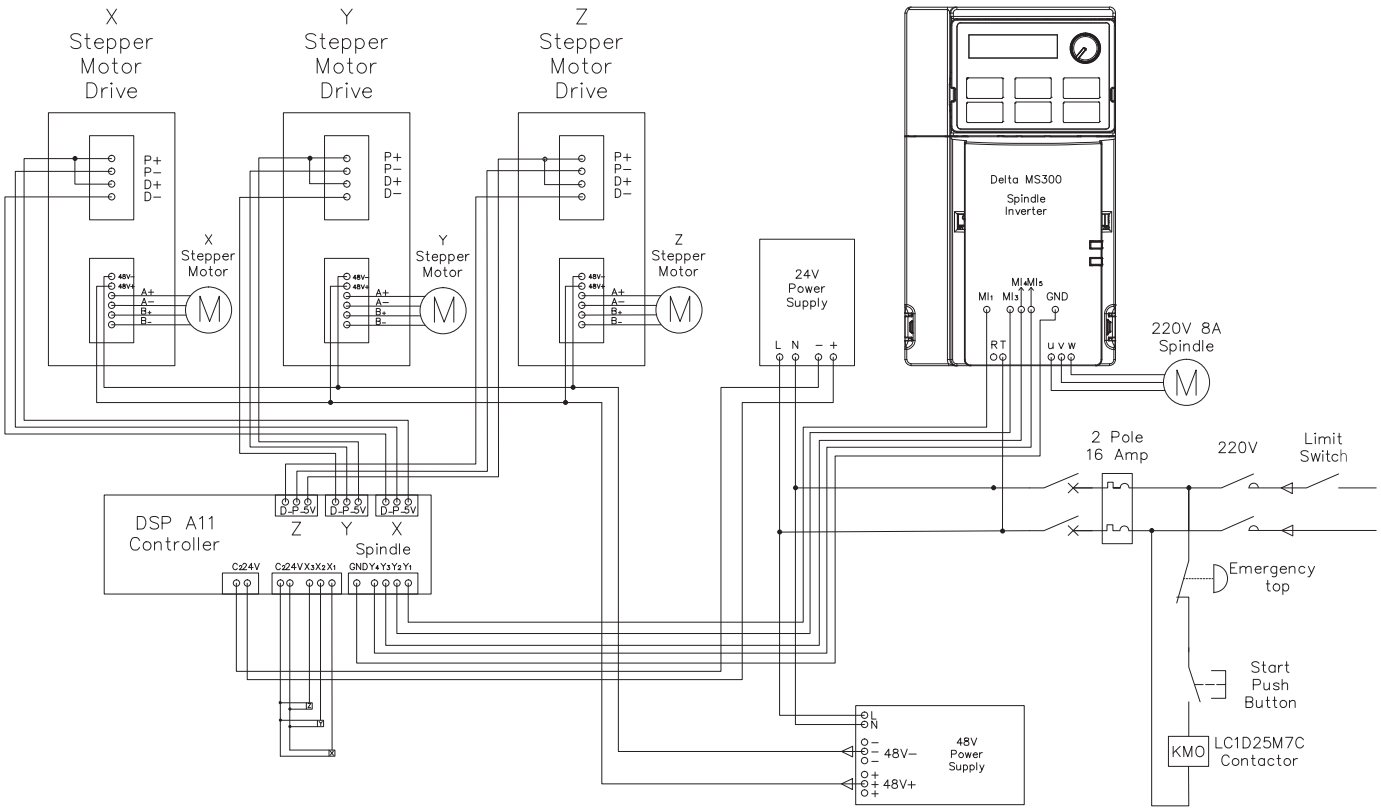


Figure 31. Stepper drivers.

Figure 33. VFD/Inverter.



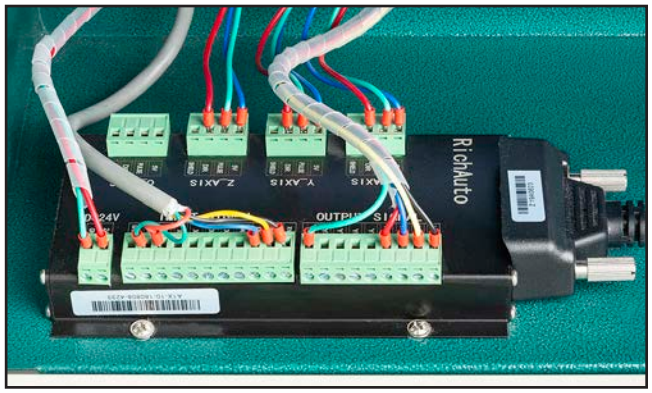


Figure 32. RichAuto Controller.

Figure 34. 48-Volt power supply.

STOP *READ ELECTRICAL SAFETY ON PAGE 37!*

MODEL G0894
24" X 36" CNC ROUTER
OWNER'S MANUAL
(For models manufactured since 07/20)

#AI20488 PRINTED IN CHINA V2.12.20

⚠ WARNING!

This manual provides critical safety instructions on the proper setup, operation, maintenance, and service of this machine/tool. Save this document, refer to it often, and use it to instruct other operators.

Failure to read, understand and follow the instructions in this manual may result in fire or serious personal injury—including amputation, electrocution, or death.

The owner of this machine/tool is solely responsible for its safe use. This responsibility includes but is not limited to proper installation in a safe environment, personnel training and usage authorization, proper inspection and maintenance, manual availability and comprehension, application of safety devices, cutting/sanding/grinding tool integrity, and the usage of personal protective equipment.

The manufacturer will not be held liable for injury or property damage from negligence, improper training, machine modifications or misuse.

⚠ WARNING!

Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:

- **Lead from lead-based paints.**
- **Crystalline silica from bricks, cement and other masonry products.**
- **Arsenic and chromium from chemically-treated lumber.**

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: Work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.

Table of Contents

INTRODUCTION

Contact Info

We stand behind our machines! If you have questions or need help, contact us with the information below. Before contacting, make sure you get the **serial number** and **manufacture date** from the machine ID label. This will help us help you faster.

Grizzly Technical Support
1815 W. Battlefield
Springfield, MO 65807
Phone: (570) 546-9663
Email: techsupport@grizzly.com

We want your feedback on this manual. What did you like about it? Where could it be improved? Please take a few minutes to give us feedback.

Grizzly Documentation Manager
P.O. Box 2069
Bellingham, WA 98227-2069
Email: manuals@grizzly.com

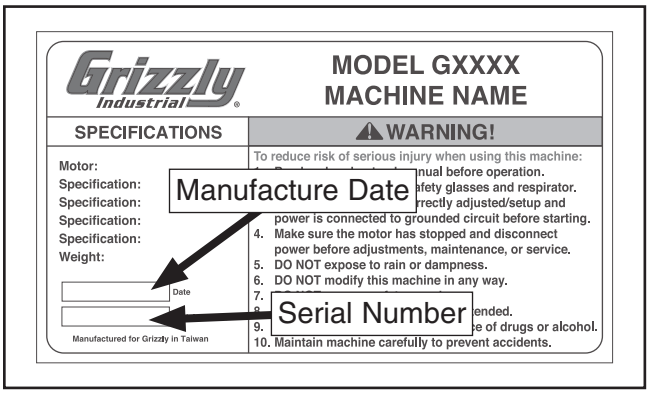
Manual Accuracy

We are proud to provide a high-quality owner's manual with your new machine!

We made every effort to be exact with the instructions, specifications, drawings, and photographs in this manual. Sometimes we make mistakes, but our policy of continuous improvement also means that **sometimes the machine you receive is slightly different than shown in the manual**.

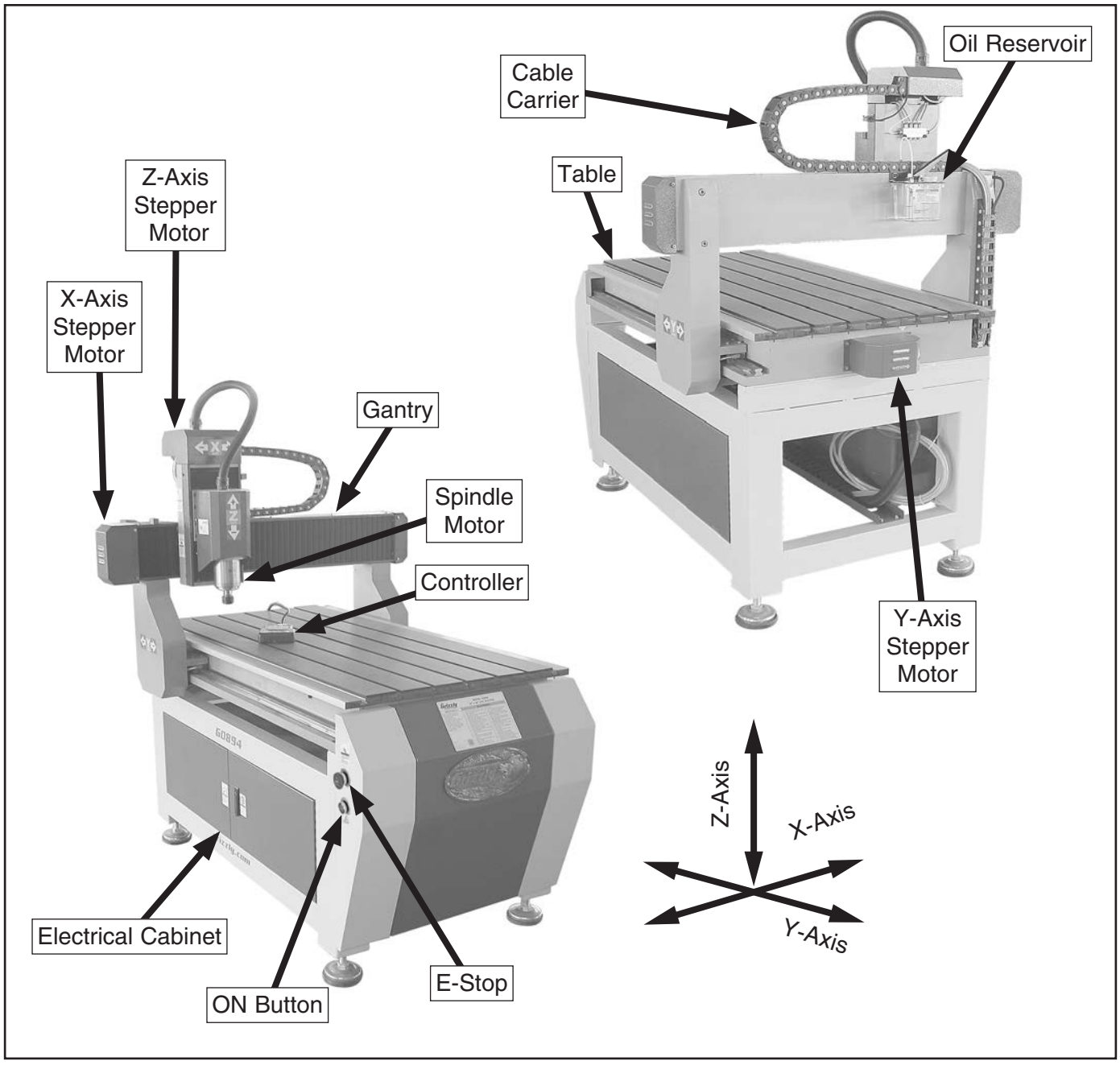
If you find this to be the case, and the difference between the manual and machine leaves you confused or unsure about something, check our website for an updated version. We post current manuals and manual updates for free on our website at **www.grizzly.com**.

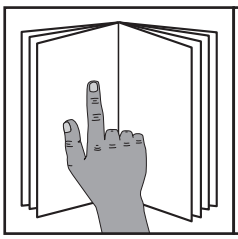
Alternatively, you can call our Technical Support for help. Before calling, make sure you write down the **Manufacture Date** and **Serial Number** from the machine ID label (see below). This information is required for us to provide proper tech support, and it helps us determine if updated documentation is available for your machine.



Identification

Become familiar with the names and locations of the controls and features shown below to better understand the instructions in this manual.

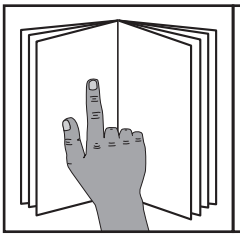




⚠WARNING

To reduce your risk of serious injury, read this entire manual BEFORE using machine.

Controls & Components



⚠WARNING

To reduce your risk of serious injury, read this entire manual BEFORE using machine.

Refer to the following figures and descriptions to become familiar with the basic controls and components of this machine. Understanding these items and how they work will help you understand the rest of the manual and minimize your risk of injury when operating this machine.

Spindle Assembly

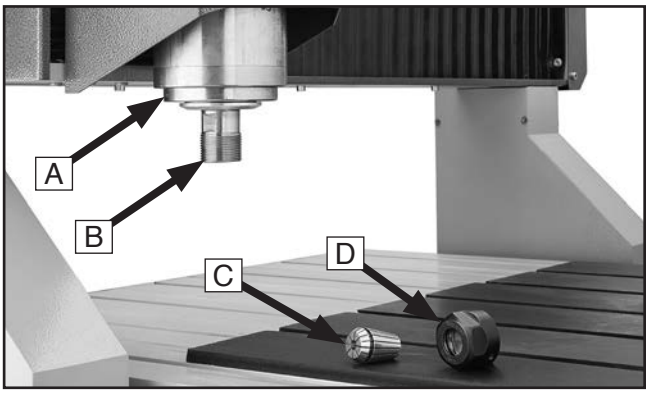


Figure 1. Spindle components.

A. Spindle Motor: 3 HP motor capable of rotating cutting tool at 24,000 RPM.

B. Spindle: Motor shaft that holds the cutting tool, spindle nut, and collet.

C. ER20 Collet: Holds cutting tool.

D. Spindle Nut: Secures collet and cutting tool on spindle.

Power Controls

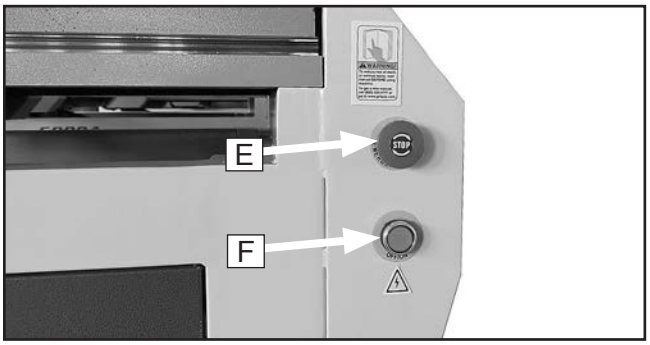


Figure 2. Power buttons.

E. E-STOP Button: Disables power to machine. To reset, twist button clockwise until it pops out.

F. ON Button: Enables power to machine.

Additional Components

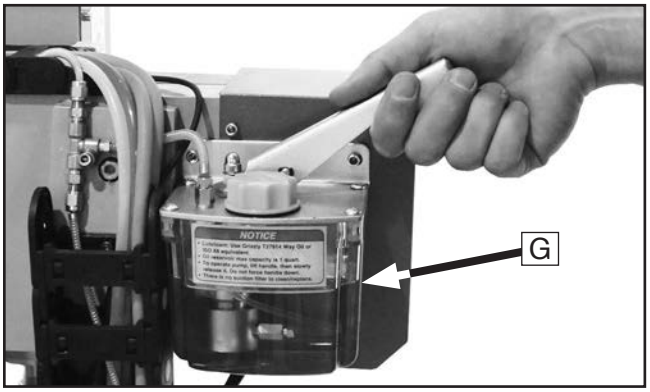


Figure 3. Oiler components.

G. Oiler System: Holds one quart of T27914 ISO-68 machine oil. One pump lubricates ball screws and bearings on all axes.

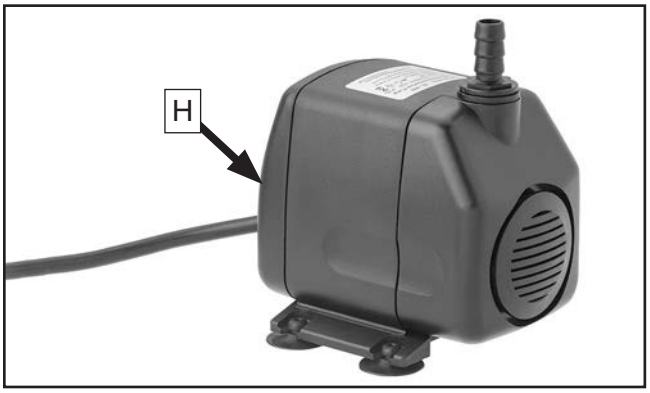


Figure 4. Coolant pump.

H. Cooling Pump: Cools spindle motor by continuously pumping water while plugged in.

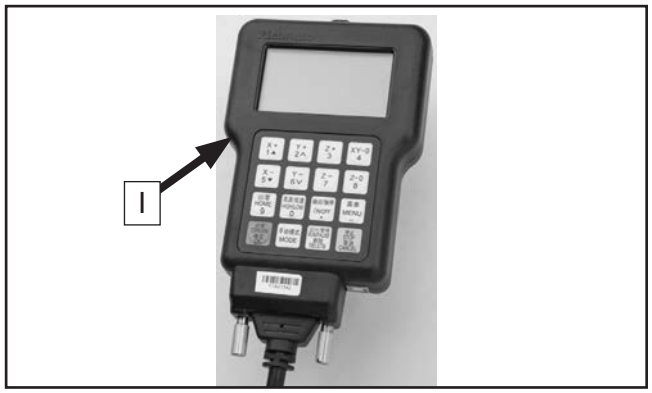


Figure 5. Hand-held controller.

I. Controller: Controls machine functions.

Controller Functions

The following commands are used for the basic navigation of the machine and controller. Additional functions can be accessed with multi-button commands, see **Using Advanced Controls** on **Page 30** for more information.

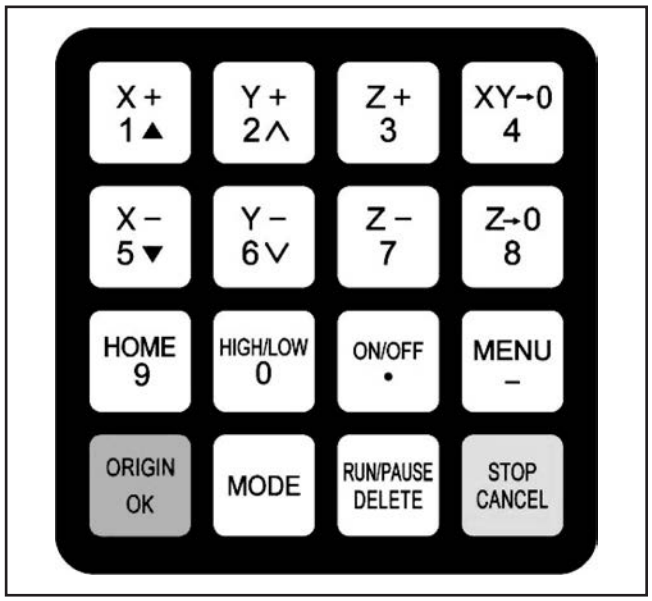


Figure 6. Controller buttons.

X+ or **1:** Moves spindle motor along X-axis in positive direction. Scrolls menu up. Input for "1".

Y+ or **2:** Moves spindle motor along Y-axis in positive direction. Increases feed rate. Scrolls sub-menu up. Input for "2".

Z+ or **3:** Moves spindle motor along Z-axis in positive direction. Increases spindle speed during process. Input for "3".

XY->0 or **4:** Sets work origin of X- and Y-axes (see **Page 28**). Input for "4".

X- or **5:** Moves spindle motor along X-axis in negative direction. Scrolls menu down. Input for "5".

Y- or **6:** Moves spindle motor along Y-axis in negative direction. Decreases feed rate. Scrolls sub-menu down. Input for "6".

Z- or **7:** Moves spindle motor along Z-axis in negative direction. Decreases spindle speed during process. Input for "7".

Z->0 or **8:** Sets work origin of Z-axis (see **Page 28**). Input for "8".

HOME or **9:** Returns all axes to home position (see **Page 28**). Input for "9".

HIGH/LOW or **0:** In manual mode, selects high or low speed for axis movement. Input for "0".

ON/OFF or **(.):** Turns spindle ***ON*** or ***OFF***. Input for decimal point.

MENU or **(-):** Enters setup menus. Input for the negative symbol.

ORIGIN or **OK:** Returns all axes to work origin (see **Page 28**). Confirms motions, inputs, or operations.

MODE: Toggles between the three jogging modes: Continuous, Step or Distance.

RUN/PAUSE or **DELETE:** Runs or pauses processing. Used to load a program from either the USB drive or internal memory.

STOP or **CANCEL:** Stops a running program. Cancels commands.

Glossary Of Terms

The following is a list of common definitions, terms and phrases used throughout this manual as they relate to this CNC router and woodworking in general. Become familiar with these terms for assembling, adjusting or operating this machine. Your safety is VERY important to us at Grizzly!

Axis: Direction of movement. On a three-axis milling machine, axes are typically X (left-right), Y (front-back) & Z (up-down). Axis directions are described as positive or negative. On this machine, negative movement is defined as movement towards the front (Y), left (X), and bottom (Z) of the working envelope.

Ball End (Ball Nose): A cutting tool that has a rounded cutting arc, where the arc diameter is equal to the cutting diameter.

Ball Screw: Drive system component. The ball screw is rotated by the stepper motor and provides the means for moving the gantry and spindle along the axes.

Bed: The bed of the CNC consists of a welded steel frame, an extruded aluminum table top, and a tongue-and-groove table top with integrated T-slots.

CAD: Computer aided design. CAD software is used to create a digital model of a project.

CAM: Computer aided manufacturing. CAM software converts CAD models into a toolpath defined by G-code that CNC machines can interpret.

Chip Load: Chip load is the measure of the thickness of chips a tool will cut. Chip load is equal to: Feed Rate ÷ (Spindle Speed X Number of Flutes).

CNC: Computer numerical control. Manufacturing controlled by a computer via coded instructions.

Climb Cut: Cut that occurs when the rotation of the cutter moves in same direction as the workpiece.

Collet: Metal collar that holds the cutting tool in place within a spindle nut.

Conventional Cut: Cut that occurs when the rotation of the cutter moves in opposite direction as the workpiece.

Compression Bit: A cutting tool with a combination of up and down shear cutting edges. Typically used for cutting laminate material to prevent tear-out on both sides of the sheet.

Tool Deflection: Tool deflection occurs when the spindle speed and feed rate exert sufficient force to deflect the cutting tool. Deflection leads to excessive wear and chatter, which can shorten tool life and leave unwanted tooling marks on the material.

Down-Cut Bit: A cutting tool with edges that carve downward on the face of the toolpath. Reduces the potential for tear-out, but requires a slower feed rate.

Dust Shoe: An accessory that channels dust and debris directly from the cutting tool through an attached dust collection system.

End Mill: A cutting tool with a straight end, typically with spiral flute(s). It creates a channel with a flat bottom perpendicular to the sides.

Feed Rate: The speed at which the cutting tool moves along a workpiece.

Flute Length: The length of the cutting portion on a router bit or cutting tool.

Flutes: The cutting edges or inserts of a router bit or cutting tool.

Finish Cut: A 3D toolpath that reduces or eliminates the irregular contours left by a rough cut.

Form Bit: A bit that carves a standard profile such as a roundover, ogee, or similar contour.

Gantry: The structure that straddles the bed and carries the spindle. It moves the full length of the bed along the Y-axis.

G-Code: A machine language that uses axis points and commands, which the machine uses to move and perform functions.

Hold-Down: A clamp used to firmly hold a workpiece or fixture to the table.

Home Position: A fixed point on the machine set with proximity switches. It is the machine zero point on all axes.

Letter Address: The first letter of a G-code command. Commands with similar functions are usually grouped within the same letter address. For example, the "G" letter address deals with preparatory functions that define the machine's operation, while the "M" letter address handles miscellaneous machine functions such as turning on spindles, pumps, and other auxiliary tasks.

Origin: User designated zero point for a workpiece from which the router will reference the positioning of all cutting.

Plunge: The distance on the Z-axis that the spindle and cutting tool moves toward, into, or along the workpiece.

Pocket Toolpath: A toolpath that creates a cavity in the horizontal surface of a workpiece.

Post Processor: A software function that formats G-code into a dialect understood by a specific machine.

Profile Toolpath: A toolpath that cuts along the profile of a set of vectors. Typically used to cut out the shape of a design.

Proximity Switch: A magnetic limit switch that is used to find home position.

Rapid: The maximum speed of each axis. Higher rapid rates decrease machining times.

Rough Cut: A 3D toolpath where the initial cut is designed to remove unwanted material, leaving a rough contour.

Soft Limits: Axis limits imposed by the work space boundaries and based on controller settings and the location of home. An “out of soft limits error” implies that there is not enough room to move in a designated direction based on the positioning of the workpiece.

Spindle Speed: Rotational speed of cutting tool (RPM).

Spoilboard: Sacrificial material placed under the workpiece that allows the cutting tool to go past the workpiece to ensure a full, clean cut without damaging the work table. Usually made of MDF.

Stepper Motor: DC motor that moves in precise steps when pulses are received. Has very accurate positioning and speed control.

Surfacing: The process of leveling the surface of a workpiece or spoilboard so it is perpendicular to the spindle.

Toolpath: User defined route that the cutter follows to machine a workpiece.

Tool Setter: A device used to set the zero point (origin) for the Z-axis.

Up-Cut Bit: A cutting tool with edges that carve upward on the face of the toolpath. This removes chips from the material, but can pull the material off the bed and splinter the top edge.

VFD: Variable frequency drive that controls the speed (RPM) of the spindle. Enables the fine tuning of the spindle during the operation of a toolpath.

Working Envelope: The three-dimensional area that the spindle can travel within while cutting or milling.

MACHINE DATA SHEET

Customer Service #: (570) 546-9663 · To Order Call: (800) 523-4777 · Fax #: (800) 438-5901

MODEL G0894
24" X 36" CNC ROUTER

Product Dimensions:

Weight	772 lbs.
Width (side-to-side) x Depth (front-to-back) x Height	45 x 56-1/2 x 62 in.
Footprint (Length/Width)	47-1/4 x 28-1/2 in.

Shipping Dimensions:

Type	Plywood Crate
Content	Machine, Controller
Weight	882 lbs.
Length x Width x Height	60 x 54 x 70 in.
Must Ship Upright	Yes

Electrical:

Power Requirement	220V, Single-Phase, 60 Hz
Prewired Voltage	220V
Full-Load Current Rating	16A
Minimum Circuit Size	20A
Connection Type	Cord & Plug
Power Cord Included	Yes
Power Cord Length	10 ft.
Power Cord Gauge	14 AWG
Plug Included	Yes
Included Plug Type	6-20
Switch Type	ON/OFF Push Button w/E-stop
Inverter (VFD) Type	Delta VFD022E21A
Inverter (VFD) Size	3HP

Motor:

Spindle Motor

Type	Spindle
Horsepower	3 HP
Voltage	220V
Phase	3-Phase
Amps	8A
Max Speed	24,000 RPM
Cycle	60 Hz
Power Transfer	Direct

X-Axis Motor

Type	Stepper
Frame Size	NEMA 34
Amps	4.3A

Y-Axis Motor

Type	Stepper
Frame Size	NEMA 34
Amps	4.3A

Z-Axis Motor

Type	Stepper
Frame Size	NEMA 34
Amps	4.3A

Main Specifications:

Axis Information

X Axis Travel	35-3/8 in.
Y Axis Travel	23-5/8 in.
Z Axis Travel	8 in.
X/Y Travel Speed	32 FPM
Z Travel Speed	16 FPM

Construction

Table	Aluminum w/Closed Cell PVC
Body Construction	Steel
Paint.	Enamel

Cutting Information

Cutting Area	23-5/8 x 35-3/8 in.
Maximum Distance Spindle to Table	5 in.
Cutting Accuracy	+/-0.005 in.

Table Information

Table Length	49-1/4 in.
Table Width	27-1/2 in.

Other Related Information

Number of Leveling Feet	4
Collet Type	ER20

Other Specifications:

Country of Origin	China
Warranty	1 Year
Approximate Assembly & Setup Time	3 Hours
Serial Number Location	ID Label

Features:

Table with T-Track
Digital Display w/USB Port and Keypad
Liquid Cooled Spindle

Accessories:

Collets: 1/8", 1/4", and 1/2"
Open-End Wrenches: 18/21mm and 27/30mm
T-Track Hold-Down Clamps (4)
Spindle Coolant Pump

SECTION 1: SAFETY

For Your Own Safety, Read Instruction Manual Before Operating This Machine

The purpose of safety symbols is to attract your attention to possible hazardous conditions. This manual uses a series of symbols and signal words intended to convey the level of importance of the safety messages. The progression of symbols is described below. Remember that safety messages by themselves do not eliminate danger and are not a substitute for proper accident prevention measures. Always use common sense and good judgment.

⚠DANGER **Indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.**

⚠WARNING **Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.**

⚠CAUTION **Indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury. It may also be used to alert against unsafe practices.**

NOTICE **Alerts the user to useful information about proper operation of the machine to avoid machine damage.**

Safety Instructions for Machinery

⚠WARNING

OWNER'S MANUAL. Read and understand this owner's manual BEFORE using machine.

TRAINED OPERATORS ONLY. Untrained operators have a higher risk of being hurt or killed. Only allow trained/supervised people to use this machine. When machine is not being used, disconnect power, remove switch keys, or lock-out machine to prevent unauthorized use—especially around children. Make your workshop kid proof!

DANGEROUS ENVIRONMENTS. Do not use machinery in areas that are wet, cluttered, or have poor lighting. Operating machinery in these areas greatly increases the risk of accidents and injury.

MENTAL ALERTNESS REQUIRED. Full mental alertness is required for safe operation of machinery. Never operate under the influence of drugs or alcohol, when tired, or when distracted.

ELECTRICAL EQUIPMENT INJURY RISKS. You can be shocked, burned, or killed by touching live electrical components or improperly grounded machinery. To reduce this risk, only allow qualified service personnel to do electrical installation or repair work, and always disconnect power before accessing or exposing electrical equipment.

DISCONNECT POWER FIRST. Always disconnect machine from power supply BEFORE making adjustments, changing tooling, or servicing machine. This prevents an injury risk from unintended startup or contact with live electrical components.

EYE PROTECTION. Always wear ANSI-approved safety glasses or a face shield when operating or observing machinery to reduce the risk of eye injury or blindness from flying particles. Everyday eyeglasses are NOT approved safety glasses.

⚠WARNING

WEARING PROPER APPAREL. Do not wear clothing, apparel or jewelry that can become entangled in moving parts. Always tie back or cover long hair. Wear non-slip footwear to reduce risk of slipping and losing control or accidentally contacting cutting tool or moving parts.

HAZARDOUS DUST. Dust created by machinery operations may cause cancer, birth defects, or long-term respiratory damage. Be aware of dust hazards associated with each workpiece material. Always wear a NIOSH-approved respirator to reduce your risk.

HEARING PROTECTION. Always wear hearing protection when operating or observing loud machinery. Extended exposure to this noise without hearing protection can cause permanent hearing loss.

REMOVE ADJUSTING TOOLS. Tools left on machinery can become dangerous projectiles upon startup. Never leave chuck keys, wrenches, or any other tools on machine. Always verify removal before starting!

USE CORRECT TOOL FOR THE JOB. Only use this tool for its intended purpose—do not force it or an attachment to do a job for which it was not designed. Never make unapproved modifications—modifying tool or using it differently than intended may result in malfunction or mechanical failure that can lead to personal injury or death!

AWKWARD POSITIONS. Keep proper footing and balance at all times when operating machine. Do not overreach! Avoid awkward hand positions that make workpiece control difficult or increase the risk of accidental injury.

CHILDREN & BYSTANDERS. Keep children and bystanders at a safe distance from the work area. Stop using machine if they become a distraction.

GUARDS & COVERS. Guards and covers reduce accidental contact with moving parts or flying debris. Make sure they are properly installed, undamaged, and working correctly BEFORE operating machine.

FORCING MACHINERY. Do not force machine. It will do the job safer and better at the rate for which it was designed.

NEVER STAND ON MACHINE. Serious injury may occur if machine is tipped or if the cutting tool is unintentionally contacted.

STABLE MACHINE. Unexpected movement during operation greatly increases risk of injury or loss of control. Before starting, verify machine is stable and mobile base (if used) is locked.

USE RECOMMENDED ACCESSORIES. Consult this owner's manual or the manufacturer for recommended accessories. Using improper accessories will increase the risk of serious injury.

UNATTENDED OPERATION. To reduce the risk of accidental injury, turn machine ***OFF*** and ensure all moving parts completely stop before walking away. Never leave machine running while unattended.

MAINTAIN WITH CARE. Follow all maintenance instructions and lubrication schedules to keep machine in good working condition. A machine that is improperly maintained could malfunction, leading to serious personal injury or death.

DAMAGED PARTS. Regularly inspect machine for damaged, loose, or mis-adjusted parts—or any condition that could affect safe operation. Immediately repair/replace BEFORE operating machine. For your own safety, DO NOT operate machine with damaged parts!

MAINTAIN POWER CORDS. When disconnecting cord-connected machines from power, grab and pull the plug—NOT the cord. Pulling the cord may damage the wires inside. Do not handle cord/plug with wet hands. Avoid cord damage by keeping it away from heated surfaces, high traffic areas, harsh chemicals, and wet/damp locations.

EXPERIENCING DIFFICULTIES. If at any time you experience difficulties performing the intended operation, stop using the machine! Contact our Technical Support at (570) 546-9663.

Additional Safety for CNC Routers

⚠WARNING

You can be seriously injured or killed by getting clothing, jewelry, or long hair entangled with rotating cutter/spindle. You can be severely cut or have fingers amputated from contact with rotating cutters. You can be blinded or struck by broken cutting tools, wood chips, workpieces, or adjustment tools thrown from the rotating spindle with great force. To reduce your risk of serious injury when operating this machine, completely heed and understand the following:

UNDERSTAND ALL CONTROLS. Make sure you understand the function and proper use of all controls before starting. This will help you avoid making mistakes that result in serious injury.

AVOIDING ENTANGLEMENT. DO NOT wear loose clothing, gloves, or jewelry, and tie back long hair. Keep all guards in place and secure. Always allow spindle to stop on its own. DO NOT stop spindle using your hand or any other object.

WEAR EYE PROTECTION. Always wear safety glasses. This provides protection for your eyes from wood chips or broken cutting tools.

USE CORRECT SPINDLE SPEED. Follow recommended speeds and feeds for each size and type of cutting tool. This helps avoid injury risk from tool breakage during operation and ensures best cutting results.

FIRE HAZARD. To reduce risk of fire, always use recommended feeds and speeds for cutting tool and workpiece type, and avoid operations that dwell in the workpiece. Be aware of signs of fire. Chips and dust collection can disguise embers and smoke. Prepare a fire safety plan and ensure it is practiced by all operators. Never operate machine unattended unless workspace has a lights-out fire prevention system.

INSPECT CUTTING TOOL. Inspect cutting tools for sharpness, chips, or cracks before each use. Replace dull, chipped, or cracked cutting tools immediately.

PROPERLY SECURE CUTTER. Firmly secure cutting tool so it does not fly out of spindle during operation.

PROPERLY COLLECT DUST. Only use dust collector to clear chips while spindle is turning. DO NOT clear chips by hand—use a brush or shop vacuum when spindle/axes are NOT turning or moving.

SECURE WORKPIECE TO TABLE. Clamp workpiece to table, so workpiece cannot unexpectedly shift or spin during operation. NEVER hold workpiece by hand during operation.

PROPERLY MAINTAIN MACHINE. Keep machine in proper working condition to help ensure that it functions safely and all guards and other components work as intended. Perform routine inspections and all required maintenance. Never operate machine with damaged or worn parts that can break or result in unexpected movement during operation.

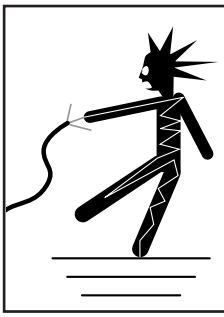
DISCONNECT POWER FIRST. To reduce risk of electrocution or injury from unexpected startup, make sure CNC router is turned ***OFF***, disconnected from power, and all moving parts are completely stopped before changing cutting tools or performing any inspection, adjustment, or maintenance procedure.

REMOVE SPINDLE TOOLS. Always remove wrenches and other tools used on the spindle immediately after use. This will prevent them from being thrown by the spindle upon startup.

SECTION 2: POWER SUPPLY

Availability

Before installing the machine, consider the availability and proximity of the required power supply circuit. If an existing circuit does not meet the requirements for this machine, a new circuit must be installed. To minimize the risk of electrocution, fire, or equipment damage, installation work and electrical wiring must be done by an electrician or qualified service personnel in accordance with all applicable codes and standards.



⚠WARNING

Electrocution, fire, shock, or equipment damage may occur if machine is not properly grounded and connected to power supply.

Full-Load Current Rating

The full-load current rating is the amperage a machine draws at 100% of the rated output power. On machines with multiple motors, this is the amperage drawn by the largest motor or sum of all motors and electrical devices that might operate at one time during normal operations.

Full-Load Current Rating at 220V ..... 16 Amps

The full-load current is not the maximum amount of amps that the machine will draw. If the machine is overloaded, it will draw additional amps beyond the full-load rating.

If the machine is overloaded for a sufficient length of time, damage, overheating, or fire may result—especially if connected to an undersized circuit. To reduce the risk of these hazards, avoid overloading the machine during operation and make sure it is connected to a power supply circuit that meets the specified circuit requirements.

Circuit Information

A power supply circuit includes all electrical equipment between the breaker box or fuse panel in the building and the machine. The power supply circuit used for this machine must be sized to safely handle the full-load current drawn from the machine for an extended period of time. (If this machine is connected to a circuit protected by fuses, use a time delay fuse marked D.)

⚠CAUTION

For your own safety and protection of property, consult an electrician if you are unsure about wiring practices or electrical codes in your area.

Note: *Circuit requirements in this manual apply to a dedicated circuit—where only one machine will be running on the circuit at a time. If machine will be connected to a shared circuit where multiple machines may be running at the same time, consult an electrician or qualified service personnel to ensure circuit is properly sized for safe operation.*

Circuit Requirements

This machine is prewired to operate on a power supply circuit that has a verified ground and meets the following requirements:

Nominal Voltage 208V, 220V, 230V, 240V
Cycle ..... 60 Hz
Phase ..... Single-Phase
Power Supply Circuit ..... 20 Amps
Plug/Receptacle ..... NEMA 6-20

Grounding Requirements

This machine MUST be grounded. In the event of certain malfunctions or breakdowns, grounding reduces the risk of electric shock by providing a path of least resistance for electric current.

This machine is equipped with a power cord that has an equipment-grounding wire and a grounding plug. Only insert plug into a matching receptacle (outlet) that is properly installed and grounded in accordance with all local codes and ordinances. DO NOT modify the provided plug!

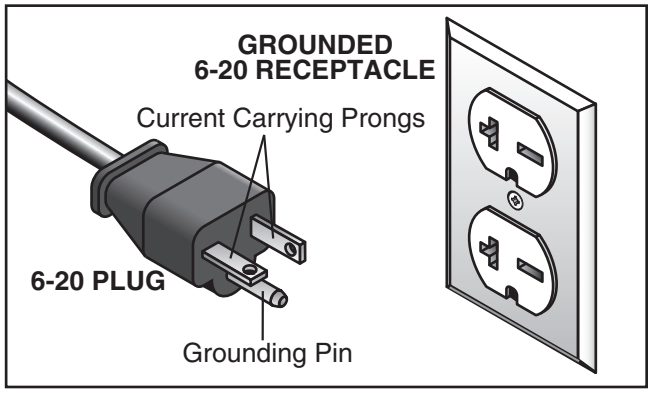
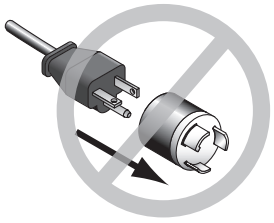


Figure 7. Typical 6-20 plug and receptacle.

⚠CAUTION



No adapter should be used with plug. If plug does not fit available receptacle, or if machine must be reconnected for use on a different type of circuit, reconnection must be performed by an electrician or qualified service personnel, and it must comply with all local codes and ordinances.

⚠WARNING

Serious injury could occur if you connect machine to power before completing setup process. DO NOT connect to power until instructed later in this manual.

Improper connection of the equipment-grounding wire can result in a risk of electric shock. The wire with green insulation (with or without yellow stripes) is the equipment-grounding wire. If repair or replacement of the power cord or plug is necessary, do not connect the equipment-grounding wire to a live (current carrying) terminal.

Check with a qualified electrician or service personnel if you do not understand these grounding requirements, or if you are in doubt about whether the tool is properly grounded. If you ever notice that a cord or plug is damaged or worn, disconnect it from power, and immediately replace it with a new one.

Extension Cords

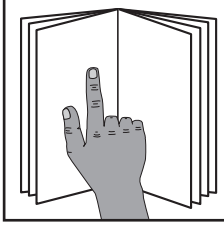
We do not recommend using an extension cord with this machine. If you must use an extension cord, only use it if absolutely necessary and only on a temporary basis.

Extension cords cause voltage drop, which can damage electrical components and shorten motor life. Voltage drop increases as the extension cord size gets longer and the gauge size gets smaller (higher gauge numbers indicate smaller sizes).

Any extension cord used with this machine must be in good condition and contain a ground wire and matching plug/receptacle. Additionally, it must meet the following size requirements:

Minimum Gauge Size .....12 AWG
Maximum Length (Shorter is Better).....50 ft.

SECTION 3: SETUP



⚠WARNING

To reduce your risk of serious injury, read this entire manual BEFORE using machine.

⚠WARNING

Eye injury hazard! Always wear safety glasses when using this machine.

⚠WARNING

HEAVY LIFT!

Straining or crushing injury may occur from improperly lifting machine or some of its parts. To reduce this risk, get help from other people and use a forklift (or other lifting equipment) rated for weight of this machine.

Needed for Setup

The following items are needed, but not included, for the setup/assembly of this machine.

Description	Qty
• Forklift or hoist (rated for 1000 lbs.)	1
• Safety Glasses (for each person)	1
• Level	1
• Open-End Wrench 8mm	4
• Hex Wrench 4mm	4
• 5-Gallon Bucket and Lid	1
• Drill	1
• Drill Bit 3/8", 1"	1 Ea.
• Dust Collection System	1
• Dust Hose 4"	1
• Hose Clamps 4"	2
• Water	4 Gal.

NOTICE

High mineral content or dirty coolant can cause buildup and damage spindle motor. Do not use tap water if water quality is low.

Unpacking

This machine was carefully packaged for safe transport. When unpacking, separate all enclosed items from packaging materials and inspect them for shipping damage. ***If items are damaged, please call us immediately at (570) 546-9663.***

IMPORTANT: Save all packaging materials until you are completely satisfied with the machine and have resolved any issues between Grizzly or the shipping agent. *You MUST have the original packaging to file a freight claim. It is also extremely helpful if you need to return your machine later.*

Inventory

The following is a list of items shipped with your machine. Before beginning setup, lay these items out and inventory them.

If any non-proprietary parts are missing (e.g. a nut or a washer), we will gladly replace them; or for the sake of expediency, replacements can be obtained at your local hardware store.

Box 1 (Figure 8) **Qty**

- **A.** CNC Router (Not Shown) 1
- **B.** Collet ER20 ⅛" 1
- **C.** Collet ER20 ¼" 1
- **D.** Collet ER20 ½" 1
- **E.** Spindle Nut 1
- **F.** Power Cord 1
- **G.** Open-End Wrench 27/30mm 1
- **H.** Open-End Wrench 18/21mm 1
- **I.** Hex Bolt M8-1.25 x 40 4
- **J.** Hold-Down Clamp 4
- **K.** Flat Washer 8mm 4
- **L.** Wing Nut M8-1.25 4
- **M.** T-Slot Bolt M8-1.25 x 80 4
- **N.** Dust Shoe 1
- **O.** Dust Shoe Mount 1
- **P.** Phillips Head Screw M5-.8 x 40 1
- **Q.** Hex Nut M5-.8 1
- **R.** USB Cable 1
- **S.** 50-Pin Cable 1
- **T.** Hand-Held Controller 1
- **U.** Spindle Cooling Pump (Not Shown) 1

NOTICE

If you cannot find an item on this list, carefully check around/inside the machine and packaging materials. Often, these items get lost in packaging materials while unpacking or they are pre-installed at the factory.

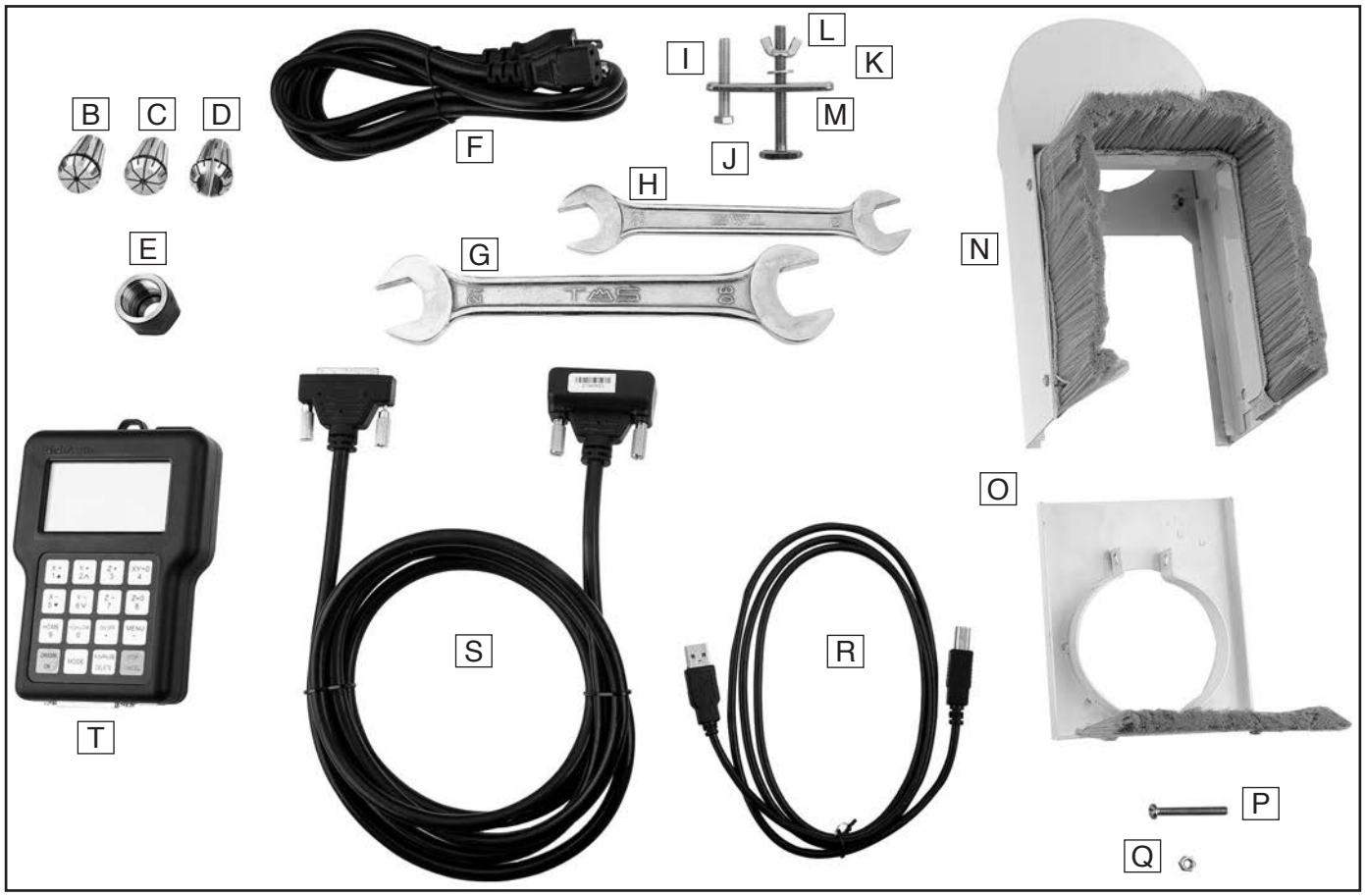


Figure 8. G0894 inventory.

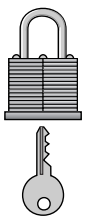
Site Considerations

Weight Load

Refer to the **Machine Data Sheet** for the weight of your machine. Make sure that the surface upon which the machine is placed will bear the weight of the machine, additional equipment that may be installed on the machine, and the heaviest workpiece that will be used. Additionally, consider the weight of the operator and any dynamic loading that may occur when operating the machine.

Space Allocation

Consider the largest size of workpiece that will be processed through this machine and provide enough space around the machine for adequate operator material handling or the installation of auxiliary equipment. With permanent installations, leave enough space around the machine to open or remove doors/covers as required by the maintenance and service described in this manual. **See below for required space allocation.**



⚠CAUTION

Children or untrained people may be seriously injured by this machine. Only install in an access restricted location.

Physical Environment

The physical environment where the machine is operated is important for safe operation and longevity of machine components. For best results, operate this machine in a dry environment that is free from excessive moisture, hazardous chemicals, airborne abrasives, or extreme conditions. Extreme conditions for this type of machinery are generally those where the ambient temperature range exceeds 41°–104°F; the relative humidity range exceeds 20%–95% (non-condensing); or the environment is subject to vibration, shocks, or bumps.

Electrical Installation

Place this machine near an existing power source. Make sure all power cords are protected from traffic, material handling, moisture, chemicals, or other hazards. Make sure to leave enough space around machine to disconnect power supply or apply a lockout/tagout device, if required.

Lighting

Lighting around the machine must be adequate enough that operations can be performed safely. Shadows, glare, or strobe effects that may distract or impede the operator must be eliminated.

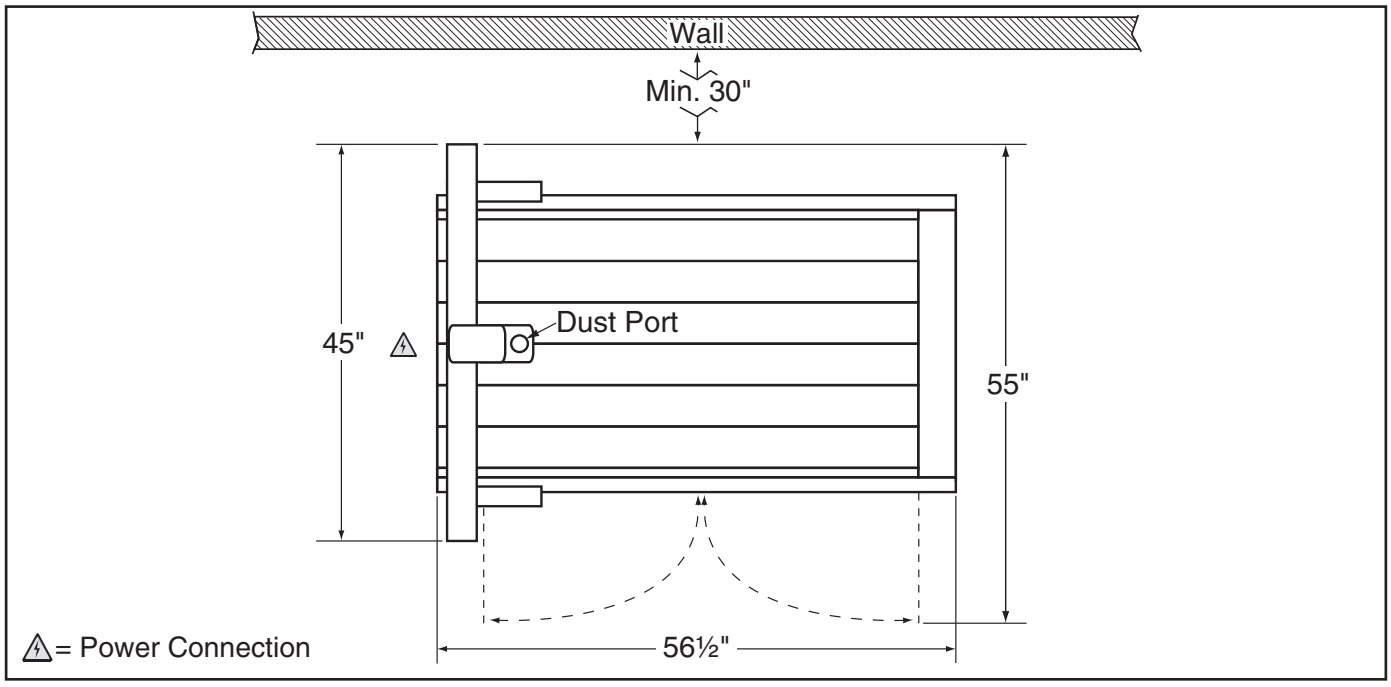


Figure 9. Minimum working clearances.

Lifting & Placing

⚠WARNING

HEAVY LIFT!

Straining or crushing injury may occur from improperly lifting machine or some of its parts. To reduce this risk, use a forklift (or other lifting equipment) rated for weight of this machine.

Do not attempt to lift or move this machine without using the proper lifting equipment (such as forklift or crane) or the necessary assistance from other people. Each piece of lifting equipment must be rated for at least 1000 lbs. to support dynamic loads that may be applied while lifting. Refer to **Needed for Setup** on **Page 15** for complete list of needed equipment for setup and installation.

Tools Needed **Qty**
Forklift or hoist (rated for 1000 lbs.) 1

To lift and move machine:

1. Move crate to machine work site.

2. Remove crate top and sides, small items inside crate, and blocks around machine base.

3. Lift machine with forklift or hoist just enough to clear pallet, then move pallet out of the way and return machine to the ground.

   Note: *Lift machine by the underside of machine body and between the leveling feet.*

Leveling

NOTICE

For accurate cutting results and to prevent warping the table and frame MUST be leveled from side to side and from front to back on both ends. Re-check the table and frame 24 hours after installation, two weeks after that, and then annually to make sure they remain level.

Leveling machinery helps precision components remain straight and flat during the lifespan of the machine. Components on a machine that are not level may slowly twist due to the dynamic loads placed on the machine during operation.

Adjust leveling feet and use a level to check each axis. Repeat as needed.

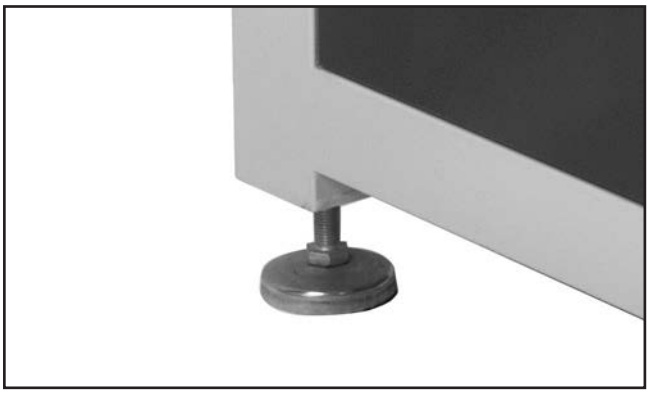


Figure 10. Leveling foot.

Connecting Cooling Pump

The Model G0894 includes an external pump that cools the spindle motor. Coolant tubes come pre-installed on the motor and run through the cable carrier. The tube must be connected to the pump and submerged within a coolant reservoir.

A minimum of 4 gallons of water is required for normal operations. Hot conditions may require more coolant. If working environment reaches temperatures below freezing, anti-freeze must be added.

NOTICE

The spindle motor on this machine creates heat during normal operation and is intended to be used with a cooling system. Operating the router without the cooling pump may damage the internal components of the spindle motor.

1. Drill two ⅜" holes and one 1" hole in lid of 5-gallon bucket.

2. Locate both coolant tubes under bed at rear of machine, then insert each coolant tube through ⅜" holes in bucket lid (see **Figure 11**).

3. Insert cooling pump plug and cooling pump power cord through 1" hole in lid (see **Figure 11**).

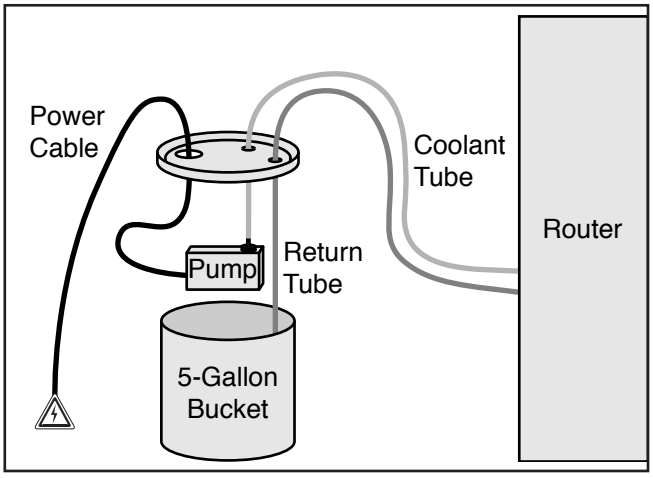


Figure 11. Connected cooling system.

4. Connect either coolant tube from back of machine to cooling pump outlet (see **Figure 12**).

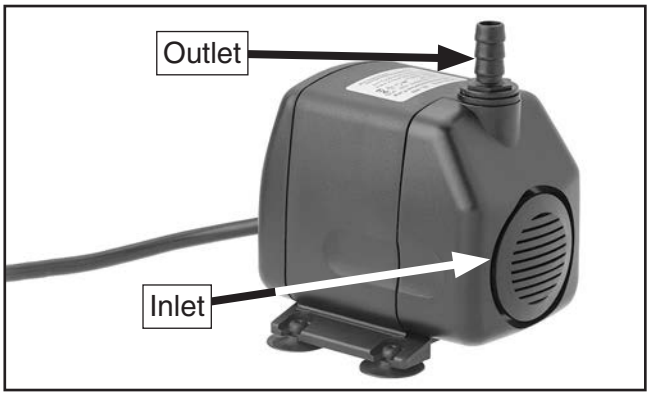


Figure 12. Example of cooling pump.

5. Place pump and return tube in 5-gallon bucket (see **Figure 11**).

NOTICE

High mineral content or dirty coolant can cause buildup and damage spindle motor. Do not use tap water if water quality is low.

6. Fill bucket with 4 gallons of distilled water. Make sure pump is completely submerged.

7. Secure bucket lid.

Connecting Controller

1. Connect 50-pin cable to controller module in electrical cabinet, then route cable through hole in cabinet floor (see **Figure 13**).

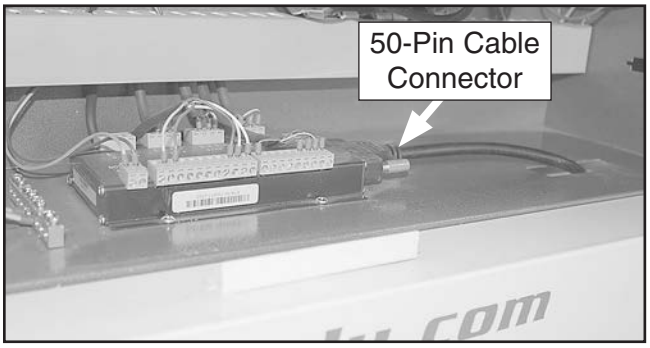


Figure 13. Hand-held controller connections.

2. Connect opposite end of 50-pin cable to hand-held controller (see **Figure 14**).

Figure 14. Controller connected to cable.

Dust Collection

⚠CAUTION

This machine creates a lot of wood chips/dust during operation. Breathing airborne dust on a regular basis can result in permanent respiratory illness. Reduce your risk by wearing a respirator and capturing the dust with a dust-collection system.

Minimum CFM at Dust Port: 400 CFM

Do not confuse this CFM recommendation with the rating of the dust collector. To determine the CFM at the dust port, you must consider these variables: (1) CFM rating of the dust collector, (2) hose type and length between the dust collector and the machine, (3) number of branches or wyes, and (4) amount of other open lines throughout the system. Explaining how to calculate these variables is beyond the scope of this manual. Consult an expert or purchase a good dust collection "how-to" book.

To connect dust collection system to machine:

1. Attach dust shoe bracket to spindle motor (see **Figure 15**).

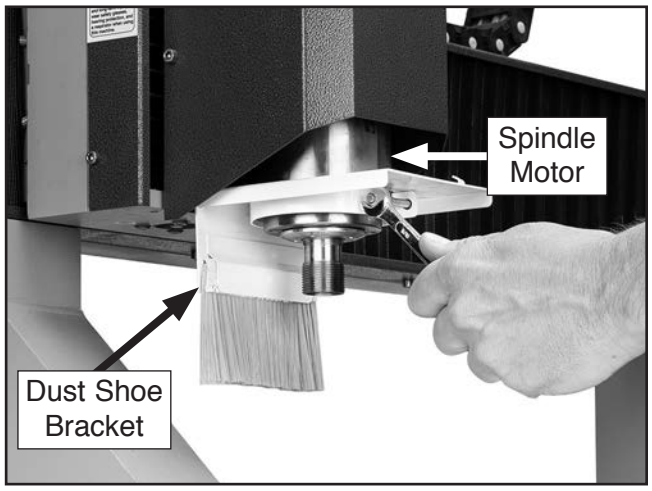


Figure 15. Attaching dust shoe bracket.

2. Fit 4" dust hose over dust shoe, as shown in **Figure 16**, and secure in place with hose clamp.

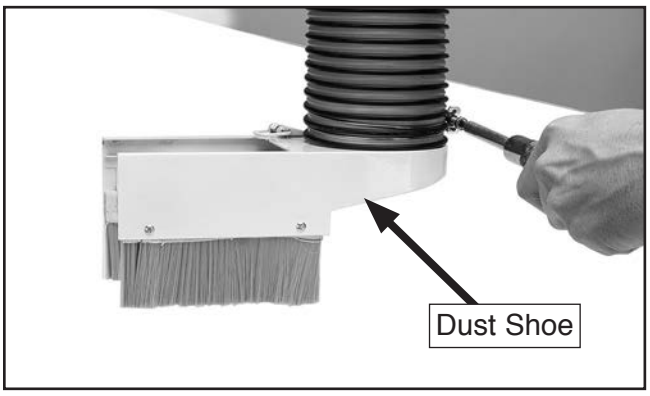


Figure 16. Tightening dust hose clamp.

3. Tug hose with light/medium force to make sure it does not easily come off.

   Note: *A tight fit is necessary for proper performance.*

4. Slide dust shoe onto bracket (see **Figure 17**) and secure in place with latch.

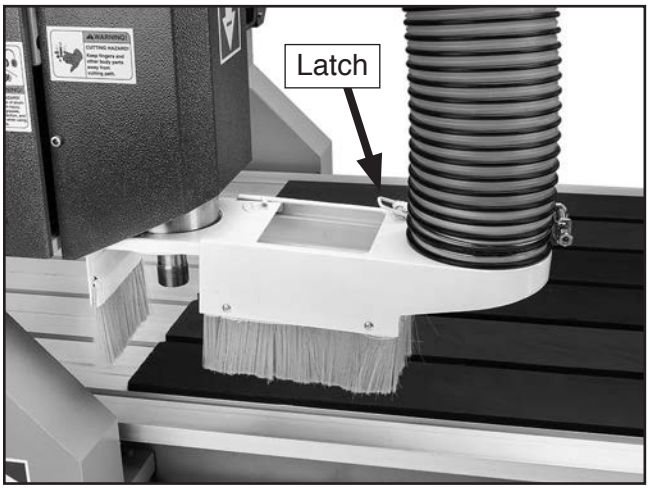


Figure 17. Dust shoe attached.

Test Run

Once assembly is complete, test run the machine to ensure it is properly connected to power and safety components are functioning correctly.

If you find an unusual problem during the test run, immediately stop the machine, disconnect it from power, and fix the problem BEFORE operating the machine again. The **Troubleshooting** table in the **SERVICE** section of this manual can help.

The test run consists of verifying the following: 1) the spindle motor powers up and runs correctly, 2) the axes motors run correctly and the machine properly homes, and 3) the E-STOP button safety feature functions properly.

⚠WARNING

Serious injury or death can result from using this machine BEFORE understanding its controls and related safety information. DO NOT operate, or allow others to operate, machine until the information is understood.

⚠WARNING

DO NOT start machine until all preceding setup instructions have been performed. Operating an improperly set up machine may result in malfunction or unexpected results that can lead to serious injury, death, or machine/property damage.

To test run machine:

1. Clear all setup tools away from machine.
2. Ensure controller and cooling pump are connected to machine.
3. Press E-STOP button.
4. Connect machine to power by inserting power cord plug into a matching receptacle.
5. Twist E-STOP button clockwise until it springs out (see **Figure 18**). This resets the switch so the machine can start.

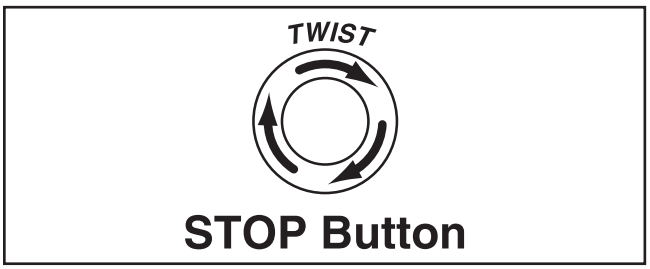


Figure 18. Resetting the E-STOP button.

6. Press ON button on machine to turn machine ***ON***.
7. Verify machine parameters as shown on **Page 22**.
8. Press ON/OFF button on controller to start spindle motor. Verify spindle starts and runs smoothly without any unusual problems or noises. Press ON/OFF to stop spindle motor.
9. Press HOME button on controller. Verify that each axis motor operates smoothly and that all axes move to machine zero.
10. Press E-STOP button on machine to turn machine ***OFF***.
11. WITHOUT resetting E-STOP button, try to start machine by pressing the ON button. The machine should not start.

    — If the machine *does not* start, the safety feature of the E-STOP button is working correctly. Congratulations! The Test Run is complete.

    — If the machine *does* start, immediately turn it ***OFF*** and disconnect power. The safety feature of the E-STOP button is NOT working properly and must be replaced before further using the machine.

Verifying Parameters

Machine parameters are essential to any operation. If the parameters are wrong, the machine will not produce accurate results, and damage to the machine and workpiece may occur. The machine parameters have been set at the factory, but they can be changed or lost due to hardware, software, or power issues. Consult this section to verify and reset parameters.

NOTICE

Verify machine parameters before running any operation whenever machine is powered *ON.* Parameters can be changed or lost when power cycling occurs, and operating with incorrect parameters may result in damage to machine or workpiece.

To verify machine parameters:

1. Press MENU, then scroll to Machine Setup on the controller and press OK.

2. Scroll to each parameter shown on this page and press OK to verify.

   — To change a parameter, press RUN/PAUSE, then enter the new parameter. Press OK to save.

Pulse Equivalent:

Unit Pulse Per MM

X Equival 160.000
Y Equival 160.000
Z Equival..... 320.000

Table Size:

Unit mm

X Equival 600.000
Y Equival 900.000
Z Equival..... 130.000

Home Setup:

Home Speed mm/sec

X Equival 6000.000
Y Equival 6000.000
Z Equival..... 6000.000

Set Home Direction

X Equival ..... Neg
Y Equival ..... Neg
Z Equival..... Pos

Speed Limit:

X Speed Limit MM/Min.

-Dir 4000.00
+Dir 4000.00

Y Speed Limit MM/Min.

-Dir 4000.00
+Dir 4000.00

Z Speed Limit MM/Min.

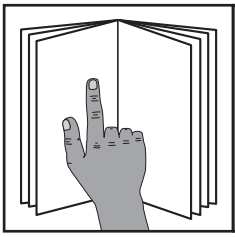
-Dir 3000.00
+Dir 1800.00

SECTION 4: OPERATIONS

Operation Overview

The purpose of this overview is to provide the novice machine operator with a basic understanding of how the machine is used during operation, so the machine controls/components discussed later in this manual are easier to understand.

Due to the generic nature of this overview, it is **not** intended to be an instructional guide. To learn more about specific operations, read this entire manual, seek additional training from experienced machine operators, and do additional research outside of this manual by reading "how-to" books, trade magazines, or websites.



⚠WARNING

To reduce your risk of serious injury, read this entire manual BEFORE using machine.

⚠WARNING

Eye injuries, respiratory problems, or hearing loss can occur while operating this tool. Wear personal protective equipment to reduce your risk from these hazards.



NOTICE

If you are not experienced with this type of machine, WE STRONGLY RECOMMEND that you seek additional training outside of this manual. Read books/magazines or get formal training before beginning any projects. Regardless of the content in this section, Grizzly Industrial will not be held liable for accidents caused by lack of training.

To complete a typical operation, the operator does the following:

1. Designs/writes G-code that defines toolpath.
2. Uploads G-code to USB drive.
3. Examines workpiece to make sure it is suitable for cutting.
4. Installs appropriate cutter for type of material and operation.
5. If necessary, cuts workpiece to fit within working envelope of machine.
6. Clamps workpiece securely to table.
7. Turns machine ***ON***.
8. Homes all axes and verifies parameters (see **Page 22**).
9. Connects USB drive to hand-held controller.
10. Sets work origin. Sets Z-axis relative to workpiece or table, depending on toolpath requirements.
11. Connects dust shoe and dust collection system to spindle.
12. Puts on safety glasses, respirator, and hearing protection.
13. Plugs in cooling pump and turns dust collection system ***ON***
14. Runs G-code. Spindle will automatically start and follow toolpath.
15. When toolpath is complete, spindle will stop and return to position defined by G-code.

Workpiece Inspection

Some workpieces are not safe to cut or may require modification before they are safe to cut. **Before cutting, inspect all workpieces for the following:**

- ***Material Type:*** This machine is intended for cutting natural and man-made wood products, laminate covered wood products, and some plastics. Cutting drywall or cementitious backer board creates extremely fine dust and may reduce the life of the bearings. This machine is NOT designed to cut metal, glass, stone, tile, etc.; cutting these materials with this machine may lead to injury.

- ***Foreign Objects:*** Nails, staples, dirt, rocks and other foreign objects are often embedded in wood. While cutting, these objects can become dislodged and hit the operator, or break the cutter, which might then fly apart. Always visually inspect your workpiece for these items. If they can't be removed, DO NOT cut the workpiece.

- ***Large/Loose Knots:*** Loose knots can become dislodged during the cutting operation. Large knots can cause machine damage. Choose workpieces that do not have large/loose knots or plan ahead to avoid cutting through them.

- ***Wet or "Green" Stock:*** Cutting wood with a moisture content over 20% causes unnecessary wear on the cutter and yields poor results.

- ***Excessive Warping:*** Workpieces with excessive cupping, bowing, or twisting are dangerous to cut because they are unstable and often unpredictable when being cut. DO NOT use workpieces with these characteristics!

- ***Minor Warping:*** Workpieces with slight cupping can be safely supported if cupped side is facing table. On the contrary, a workpiece supported on the bowed side will rock during a cut and could cause severe injury.

Choosing Cutter

There are many cutters available. Be sure to choose the right one for your application and material. Read all manufacturer instructions before installing and using a cutter.

When choosing a cutter, consider:

1. ***Material Type:*** Most cutters are designed for specific material. Choose a unique bit for plywood, engineered wood products, hardwood, and composite to improve overall results. If a general-purpose bit is needed, a two-flute, upcut, spiral bit is a good choice.

2. ***Application:*** Many design features are best cut using specific tools. For example:

   — Use a V-bit for cutting signs and lettering.

   — Use a spoilboard cutter or fly cutter for surfacing a spoilboard or finishing a smooth, flat workpiece, such as a counter top.

   — Use a form bit to cut a profile with a uniform contour, such as an ogee or round over.

   — Use a chipbreaker or rougher for rough cuts and quickly removing a large amount of material when the finish does not matter.

3. ***Feed and Speed Rates:*** Feed rate, spindle speed, and number of flutes on the cutter determine chip load. The chip load affects the best diameter bit to use to get the highest quality finish while minimizing wear. Most manufacturers will list the recommended chip load for their cutters.

4. ***Depth and Width of Cut:*** The cutter must be long enough to reach the maximum plunge depth of the operation and small enough to cut the details of the piece. However, shorter, wider bits will deflect less, leading to more accurate cuts, and they are less prone to wear and breakage.

5. ***Finish:*** If a high-quality finish is a priority, use a cutter with more flutes. Four-flute cutters will be the most available in most cases. Don't forget that number of flutes is a component of calculating chip load.

6. ***Chip Displacement:*** Up-cut bits keep the workpiece clear of chips, but on composite materials the upward force of the operation will chip and fray the top surface of the workpiece. Down-cut bits leave a smooth finish on the top of the workpiece, but pressing chips down creates more heat during the cut and frays the bottom of the workpiece on through cuts. Compression bits are fluted to cut up on the bottom, and down on the top, compressing the workpiece during a cutting operation. Compression bits are ideal for cutting materials like plywood and other composites.

Changing Cutter

⚠CAUTION

Cutters are sharp! To reduce the risk of being cut, wear leather gloves when handling, installing, and removing cutters from spindle.

Items Needed	Qty
Open-End Wrench 21mm	1
Open-End Wrench 30mm	1

To change cutter:

1. Home all axes (see **Homing Axes** on **Page 28**), then turn machine ***OFF***.

2. DISCONNECT MACHINE FROM POWER!

3. Secure spindle with 21mm open-end wrench (see **Figure 19**).

4. Place scrap material or shop rag under spindle to catch cutter.

5. Remove spindle nut with 30mm open-end wrench (see **Figure 19**), then remove collet and cutter.

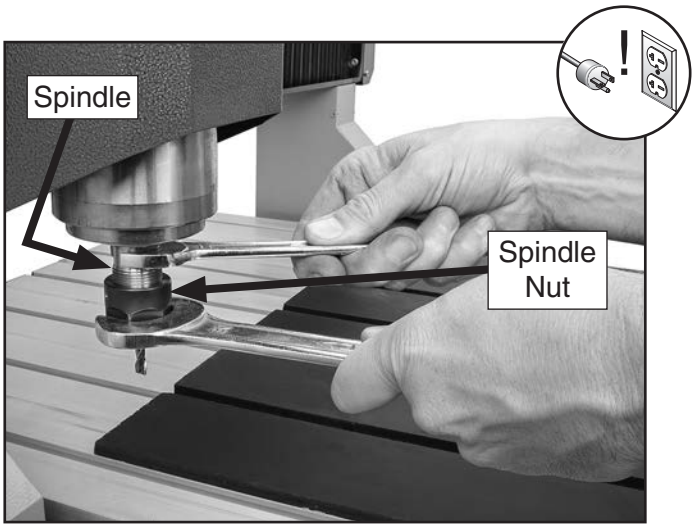


Figure 19. Changing cutter.

6. Place new cutter in collet and spindle nut, then tighten spindle nut to secure cutter.

Clamping Workpiece

Always secure the workpiece to the table with clamps to avoid injury and damage to the machine and cutter. Always use at least four clamps.

Items Needed	Qty
Clamps	4 or more

To clamp workpiece to table:

1. Clear dust, wood chips, and tools from table surface and T-slots.

2. Thread hex bolt into clamp plate, then insert T-bolt through clamp plate and thread flat washer and wing nut (see **Figure 20**).

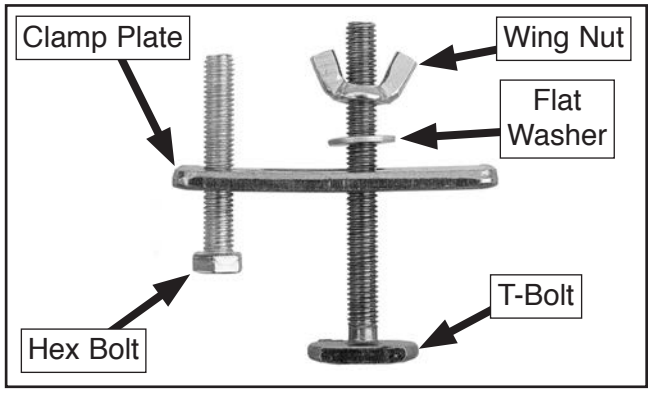


Figure 20. T-slot clamp components.

3. Place workpiece on table. Joint or shim if necessary to ensure a flat work surface.

4. Slide T-bolts into T-slots, then adjust wing nuts and hex bolts so clamp plates are higher than workpiece (see **Figure 21**).

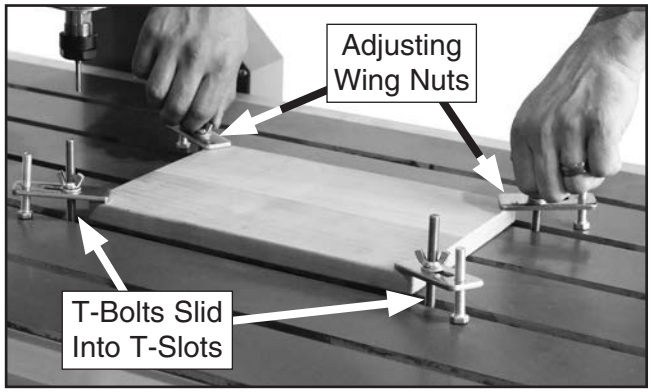


Figure 21. Clamping workpiece to table.

5. Position clamps so workpiece is stable and does not rock. Take into consideration axis positions when G-code runs.

6. Tighten wing nuts until workpiece is secure and flat against table on all four sides/corners.

Using a Spoilboard

A spoilboard should be used with any operation the cutter cuts completely through the workpiece. Typically, a spoilboard is made of MDF that has been surfaced perfectly flat. Even a new piece of material should be surfaced before use.

NOTICE

Moisture will swell and warp MDF spoilboards. Using a warped spoilboard will result in damaged or inaccurately cut workpieces and could result in damage to the machine. If liquid is spilled on spoilboard, it must be dried and resurfaced, or replaced.

Clamping Spoilboard

Items Needed	Qty
MDF (sized for table or workpiece)	1
Clamp Set, Double Sided Tape, or Wood Screws	1

To clamp a spoilboard:

1. Clamp surfaced spoilboard to machine bed using included hold-down clamps (see **Figure 22**).

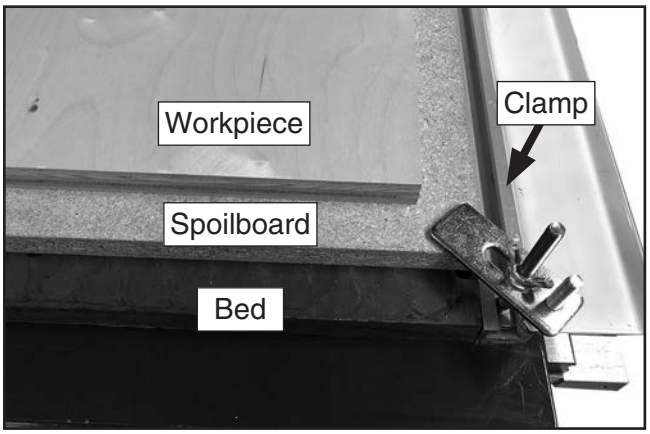


Figure 22. Spoilboard clamped to router bed.

2. Secure workpiece to spoilboard.

   Note: *Depending on the needs of the workpiece and G-code, it could be appropriate to use additional hold-down clamps, double-sided tape, or mount the workpiece directly to the spoilboard with screws.*

Surfacing

The G0894 can be used to surface a spoilboard or workpiece, using the mill plane feature and an appropriate cutter (see **Choosing Cutter** on **Page 24**).

Items Needed **Qty**
Spoilboard Cutter or Fly Cutter 1

To surface using the mill plane operation:

1. Hold down RUN/PAUSE on controller, then press HIGH/LOW and release buttons together to open advanced processing menu.

2. Scroll to "Mill plane" and press OK.

3. Choose "Scan mill" or "Encircle mill" and press OK. A list of operation parameters will appear.

   Note: *A "Scan mill" operation runs back and forth from one end of the defined workpiece to the other. An "Encircle mill" operation runs from the outside to the inside of the defined workpiece.*

4. Define operation parameters. Press RUN/PAUSE to change a parameter and OK to save. Distances are measured in millimeters.

   — Scan Type changes the direction of the operation. For scan milling, "X Scan" runs back and forth across the X-axis, and "Y Scan" runs back and forth across the Y-axis. For encircle milling, "AC" runs counter clockwise around the workpiece and "C" runs clockwise around the workpiece.

   — Height and Width defines the size of the area to be surfaced.

   — Diameter defines the diameter of the surfacing tool used.

   — Depth defines the total depth of material removed. Z Step defines how much material is removed per pass. For example, a Depth of 1 and Z Step of 0.25 would remove 1mm of material over four passes.

5. Press OK after all parameters have been saved to start the mill plane operation.

Adjusting Axis Positions Manually

Knowing how to manually control axis movement is an essential part of operating the G0894. Axes must be positioned manually whenever a work origin is set.

Use axis movement buttons on controller (X+, X-, Y+, Y-, Z+, and Z-) to move axes. See **Controller Functions** on **Page 5** for detailed button descriptions.

Manual axis movement can be performed at two speeds and in three motion modes: Continuous, Step, and Distance.

NOTICE

Manual axis movement can move beyond soft limit proximity switches, which can damage the machine. Be aware of axis locations during manual movement, and be prepared to stop machine if axes move unexpectedly.

Changing Axis Movement Speed

1. Press HIGH/LOW to toggle between fast and slow speeds.

Changing Axis Movement Mode

1. Press MODE to toggle between Continuous, Step, and Distance modes.

   — In Continuous mode, press and hold axis movement buttons to move axes. Release button to stop movement.

   — In Step mode, press button to move axis one step. Step size is determined by speed mode.

   — In Distance mode, press button to move axis a user-defined distance. Set distance by toggling to Distance mode, then input distance and press OK. Controller will display current setting.

Homing Axes

Homing the machine returns all three axes to "home" position or the machine-specific zero point. Home is determined by magnetic limit switches and will not change. Since all machine movement is calculated from home, always home axes and verify machine parameters before each operation.

To home axes:

1. Press HOME. Verify all axes move to their farthest positions.

2. Verify all machine parameters listed in **Verifying Parameters** on **Page 22**.

Setting Work Origin

Work origin is the workpiece-specific zero point, the starting point for your toolpath. All three axes need to be zeroed at the work origin before running code.

The Z-axis can be set in relation to either the table surface or the workpiece surface, but it must correspond to what is established in the G-code. If this is not done properly, the cutter may crash into the material or the table, causing damage to the workpiece or the machine.

NOTICE

Set work origin before each unique operation. The work origin of all axes must match the origin of the toolpath established in the G-code. Failure to set the work origin may cause the cutter to crash and damage the workpiece, machine, or cutter.

To set work origin:

1. Clamp workpiece to table, insert cutter, and load G-code onto controller.

2. Manually move X- and Y-axes to toolpath origin established in G-code.

3. Manually move Z-axis down to ⅛" above workpiece or table surface (as determined by G-code).

4. Place piece of paper between cutter tip and surface. Slowly step Z-axis down while sliding paper until paper cannot move.

5. Press XY->0 to set X- and Y-axis origin.

6. Press Z->0 to set Z-axis origin.

Creating G-Code File

Before operations can be run on the Model G0894, a toolpath must be designed and converted to G-code.

CAM software converts a CAD model into G-code, which defines a toolpath for the project, and then formats the G-code into a machine specific dialect via a post-processor.

This machine does not read advanced formatting By default, it only runs letter addresses for simple axis movement. Review **Changing Advanced Settings** on **Page 30** for information about turning on additional G-code functions.

An operator could also write G-code manually. Often, this is more efficient than designing and processing through CAD/CAM. In addition, knowledge of G-code is integral to refining toolpaths produced by CAM software.

Items Needed	Qty
CAD/CAM Software or text editor	1
USB Drive 16GB or less	1

IMPORTANT: DO NOT use a USB drive larger than 16GB. The controller is designed to read USB drives formatted below 16GB.

To create G-Code:

1. Load CAD file into CAM software. Take into consideration what type of material will be cut and what type of cutter will be used. Make note of where you will place clamps.

2. Run post-processing application to export G-code.

   Note: *Use post-processing options specific to the Model G0894 or the RichAuto A11 controller when available. If a post-processor for this machine isn't available, use a post-processor with minimal formatting.*

3. Do a practice run within software to identify any areas of concern (double-check feed/speed rates, depth of cut, and the direction the cutter will be traveling).

4. Review G-code and simplify code if needed.

5. Export G-code to USB drive in ***.NC***, ***.TAP***, or ***.TXT*** format.

Uploading and Running G-Code

To load G-code onto controller:

1. Turn machine ***ON***.

2. Insert USB drive loaded with G-code into controller (see **Figure 23**).

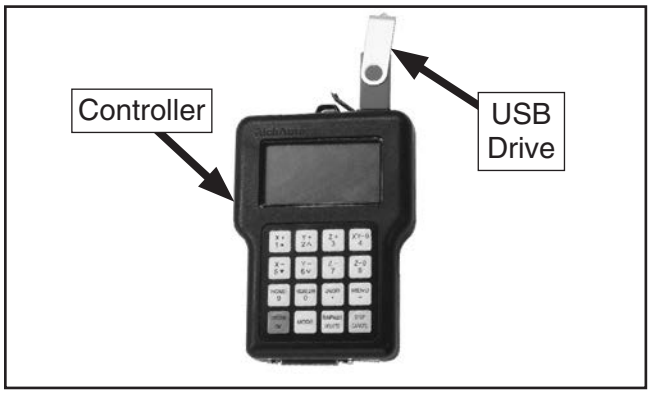


Figure 23. USB drive connected to controller.

3. Press MENU, then scroll to "Operate File" on the controller and press OK.

4. Scroll to "Copy File" and press OK.

5. Scroll to "Udisk File" and press OK, then navigate to G-code file and press OK.

To run G-code:

1. Press RUN/PAUSE.

2. Scroll to "Internal File" and press OK, then scroll to G-code file and press OK. The screen will display "Set Work Param".

   — To change a work parameter, scroll to the parameter and press "RUN/PAUSE", then input the new value and press OK to save.

3. Press OK to begin operation.

   — Press RUN/PAUSE to pause axis movement. Spindle will continue to spin. Axes can be manually moved while paused. Press RUN/PAUSE again to resume, then OK to resume from new axis position, or STOP to return to original position.

— Press Y+ and Y- during operation to manually change spindle ratio. Spindle ratio ranges from 0.1 (stopped) to 1.0 (full speed).

— Press STOP to completely stop operation. Choose between "Save break" to save breakpoint to return to later, or "Discard break" to stop operation without saving. Resume saved processing through the advanced processing menu (see **Using Advanced Controls** on this page).

Changing Advanced Settings

NOTICE

Changing advanced settings will change the default functions of your machine and how it processes files. Changing advanced settings is only recommended for experienced operators. After changing settings, monitor machine operation carefully to prevent damage to the machine, workpiece, or cutter.

Many advanced functions of the G0894 are turned off by default. Notably, S and F letter addresses are ignored until turned on in the controller.

Most advanced settings are accessible through the "AUTO PRO SETUP" menu.

To turn on F-code processing:

1. Press MENU, then scroll to "AUTO PRO SETUP" and press OK.
2. Scroll to "G Code Setup" and press OK.
3. Scroll to "F Read" and press RUN/PAUSE. "Ign F" will change to "Read F". Press OK to save.

To turn on S-code processing:

1. Press MENU, then scroll to "AUTO PRO SETUP" and press OK.
2. Scroll to "G Code Setup" and press OK.
3. Scroll to "S Read" and press RUN/PAUSE. "Ign S" will change to "Read S". Press OK to save.

Using Advanced Controls

All the basic controls of the G0894 are performed through single-button commands on the controller, but some advanced features require multi-button commands to access.

Advanced Processing Menu

Advanced tool functions are accessed through the advanced processing menu. Functions include array work, resuming stopped jobs, surfacing a workpiece, calculating bounds of a file, and calculating processing time of a file.

To access advanced processing menu:

1. Hold down RUN/PAUSE, then press HIGH/LOW and release buttons together.

Switching Coordinate Systems

Up to nine work coordinate systems can be saved at a time. When work origin is set, it is set for the active coordinate system. If the absolute coordinate system is active, work origin cannot be set.

To access advanced processing menu:

1. Hold down MENU, then press one 0-9 number button and release buttons together.

   — Press MENU + 0 to activate absolute coordinate system (mechanical coordinates).

   — Press MENU + 1-9 to activate work coordinate systems.

SECTION 5: ACCESSORIES

⚠WARNING

Installing unapproved accessories may cause machine to malfunction, resulting in serious personal injury or machine damage. To reduce this risk, only install accessories recommended for this machine by Grizzly.

NOTICE

Refer to our website or latest catalog for additional recommended accessories.

V-Carve CNC Router Software
T28100—V-Carve Desktop Software
T28101—V-Carve Pro Software
V-Carve provides a powerful but intuitive software solution for cutting parts on a CNC Router. It combines CAD and CAM so you can design your work and create your toolpath in one interface. V-Carve includes the functionality demanded for complex work while remaining incredibly easy to use and affordably priced.

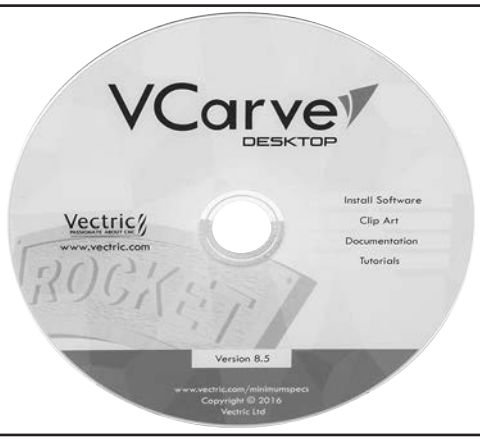


Figure 24. T28100 V-Carve Desktop Software.

Cutters
C1921—Router Bit Set for Sign Making
DC1808—3/16" Solid Carbide Upcut Spiral
DC1811—5/16" Solid Carbide Upcut Spiral
DC1814—3/16" Solid Carbide Downcut Spiral
DC1816—5/16" Solid Carbide Downcut Spiral

Figure 25. C1921 Router Bit Set for Sign Making.

Basic Eye Protection

T20501—Face Shield Crown Protector 4"
T20502—Face Shield Crown Protector 7"
T20503—Face Shield Window
T20451—"Kirova" Clear Safety Glasses
T20452—"Kirova" Anti-Reflective S. Glasses
T20456—DAKURA Safety Glasses, Black/Clear

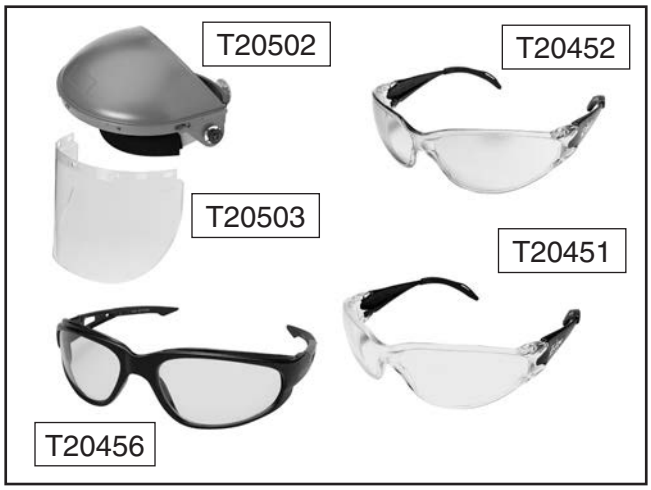


Figure 26. Eye protection assortment.

G0860—1½ HP Portable Cyclone Dust Collector
This compact unit features an impressive 868 CFM and up to 9.7" of static pressure - perfect for handling up to two large machines at once. The 20-gallon collection drum with quick release handle catches large particulate for quick and clean bag changes, and the pleated 1-micron filter captures remaining dust.

Figure 27. G0860 Cyclone Dust Collector.

H2499—Small Half-Mask Respirator
H3631—Medium Half-Mask Respirator
H3632—Large Half-Mask Respirator
H3635—Cartridge Filter Pair P100
Wood dust has been linked to nasal cancer and severe respiratory illnesses. If you work around dust everyday, a half-mask respirator can be a lifesaver. Also compatible with safety glasses!

Figure 28. Half-mask respirator with disposable cartridge filters.

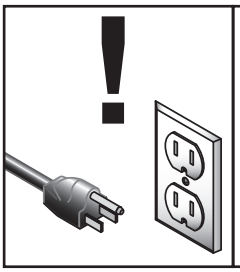
D4206—Clear Flexible Hose 4" x 10'
D4256—45° Elbow 4"
D4216—Black Flexible Hose 4" x 10'
W1034—Heavy-Duty Clear Flex Hose 4" x 10'
D2107—Hose Hanger 4¼"
W1015—Y-Fitting 4" x 4" x 4"
W1017—90° Elbow 4"
W1019—Hose Coupler (Splice) 4"
W1317—Wire Hose Clamp 4"
W1007—Plastic Blast Gate 4"
W1053—Anti-Static Grounding Kit
Hand-picked selection of commonly used dust collection components for 4" dust ports.

Figure 29. Dust collection accessories.

T27914—Moly-D Machine and Way Oil, 1 Gal.
This ISO 68 machine and way oil is one of the best we've found for maintaining bed ways, sliding ways, gearboxes, and leadscrews. Why? It is extremely tacky and includes the superior friction-reducing compound Moly-D to maximize component life and minimize wear.

Figure 30. T27914 Moly-D Machine and Way Oil.

SECTION 6: MAINTENANCE



⚠WARNING
To reduce risk of shock or accidental startup, always disconnect machine from power before adjustments, maintenance, or service.

Schedule

For optimum performance from this machine, this maintenance schedule must be strictly followed.

Ongoing
To minimize your risk of injury and maintain proper machine operation, shut down the machine immediately if you ever observe any of the items below, and fix the problem before continuing operations:

- Loose mounting bolts.
- Damaged or dull cutter.
- Clogged or dirty collet, spindle nut, or spindle collet hole.
- Blocked dust collection.
- Worn or damaged wires.
- Low or dirty water in coolant bucket.
- Any other unsafe condition.

Weekly Maintenance
- Clean cutter.
- Check/adjust lubrication level in oiler.
- Clean/vacuum dust buildup in T-slots.
- Inspect spoilboard for defects and flatness.

Monthly Check
- Check tubing and connections for coolant system and oiler system.
- Inspect wiring connections for loose wires.

Cleaning & Protecting

Cleaning the Model G0894 is relatively easy. Vacuum excess wood chips and sawdust, and wipe off the remaining dust with a dry cloth.

Lubrication

The G0894 ball screw bearings require regular lubrication to perform at their highest potential. There is an oiler system, located on the back of the gantry, that pumps oil to these bearings.

Lube Type.....T27914 Way Oil or ISO 68 Oil
Lube Amount .....1 Pump
Lubrication Frequency..... 8 hrs. of Operation
Oil Reservoir Max Capacity..... 1 qt.

Coolant

The G0894 spindle motor requires a constant flow of coolant to prevent overheating. It is recommended that distilled water be used to prevent mineral buildup inside the system. Monitor water level and cleanliness regularly. Replace water if discolored or if debris is visible.

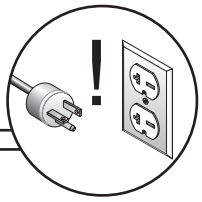
Coolant Type..... Distilled Water
Coolant Amount ..... 4 gal.
Coolant Frequency..... 8 hrs. of Operation

If machine is operated or stored in freezing temperatures, anti-freeze should be added to coolant.

SECTION 7: SERVICE

Review the troubleshooting procedures in this section if a problem develops with your machine. If you need replacement parts or additional help with a procedure, call our Technical Support. **Note:** *Please gather the serial number and manufacture date of your machine before calling.*

Troubleshooting



Motor & Electrical

Symptom	Possible Cause	Possible Solution
Machine does not start, or power supply breaker immediately trips after startup.	1. E-Stop button depressed/at fault. 2. Incorrect power supply voltage or circuit size. 3. Power supply circuit breaker tripped or fuse blown. 4. Computer board at fault. 5. Wiring broken, damaged, or disconnected. 6. Inverter/control box at fault. 7. Motor at fault.	1. Rotate E-Stop button head to reset. Replace if at fault. 2. Ensure correct power supply voltage and circuit size. 3. Ensure power supply circuit is not overloaded and is free of shorts. Reset circuit breaker or replace fuse. 4. Inspect/replace if at fault. 5. Fix broken/damaged wires or disconnected/ corroded connections. 6. Inspect inverter/controller box; replace if at fault. 7. Test/repair/replace.
Machine stalls or is underpowered.	1. Dull cutter or incorrect cutter type for task. 2. Machine undersized for task. 3. Spindle jammed. 4. Spindle motor overheated. 5. Incorrect power supply voltage or circuit size.	1. Replace/sharpen cutter. Use proper cutter for cutting task. 2. Use correct cutter/reduce feed rate or depth of cut. 3. Disconnect power. Turn spindle by hand to identify/ fix cause of jam. 4. Check coolant, fill reservoir (**Page 33**). 5. Ensure correct power supply voltage and circuit size.
Machine has vibration or noisy operation.	1. Incorrect feed rate, spindle speed, or cutter type. 2. Cutter or spindle at fault. 3. Workpiece loose. 4. Bit chattering. 5. Collet at fault. 6. Machine not level. 7. Spindle bearings at fault.	1. Use correct feed rate and spindle speed; use different cutter. 2. Replace or sharpen cutter; tighten loose spindle; replace defective spindle, collet, or spindle nut (**Page 25**). 3. Secure workpiece with clamps (**Page 26**). 4. Replace/sharpen cutter; index cutter to workpiece; use correct feed rate and spindle speed. 5. Replace collet. 6. Level machine (**Page 18**). 7. Test by rotating spindle; rotational grinding/loose shaft requires bearing replacement.

Machine Operations

Symptom	Possible Cause	Possible Solution
Inconsistent cutting depth.	1. Loose cutter. 2. Spoilboard not flat. 3. Z-axis ball screw has too much movement. 4. Workpiece loose. 5. Z-axis limit switch at fault. 6. CAM/G-code at fault.	1. Tighten spindle collet (**Page 25**). 2. Clean/resurface spoilboard (**Page 26**). 3. Inspect/tighten/replace if needed. 4. Secure workpiece with clamps (**Page 26**). 5. Test/replace. 6. Review G-code and correct errors.
Machine fails to home, or moves beyond soft limits when homing.	1. Incorrect machine parameters. 2. Faulty connection. 3. Limit switch not aligned. 4. Loose limit switch wire. 5. Limit switch at fault. 6. Circuit board at fault. 7. 50-pin data cable at fault.	1. Verify machine parameters (**Page 22**). 2. Find/secure connection. 3. Inspect/adjust. 4. Secure connection. 5. Inspect/replace if needed. 6. Inspect/replace if needed. 7. Replace cable.
Display shows "out of soft limits error".	1. Toolpath outside of working envelope. 2. Toolpath too large for working envelope. 3. Work origin incorrect in G-code. 4. Incorrect machine parameters. 5. Incorrect coordinate system in CAM software.	1. Reset work origin and secure workpiece so toolpath falls within working envelope. 2. Revise toolpath/break up toolpath into multiple sections. 3. Revise toolpath. 4. Verify machine parameters (**Page 22**). 5. Set correct coordinates in CAM software.
Controller not processing correctly.	1. Incompatible file. 2. Electrical interference. 3. Incorrect machine parameters.	1. Reformat G-code and re-upload to controller. 2. Retrace wiring and isolate the strong from the weak electrical currents and the ground. 3. Verify machine parameters (**Page 22**).
Finished workpiece incorrect size.	1. Pulse equivalent incorrect. 2. Incorrect cutter.	1. Verify controller parameters and update pulse equivalent (**Page 22**). 2. Use correct cutter for job.
Spindle moves in opposite direction when homing.	1. Faulty connection between limit switch and circuit board. 2. Homing direction set incorrectly in controller. 3. Limit switch at fault. 4. Electrical interference triggering limit switch. 5. Circuit board at fault. 6. 50-pin data cable at fault.	1. Retrace wiring to determine where bad connection is located. 2. Input correct homing parameters (**Page 22**). 3. Replace. 4. Reset circuit. 5. Replace. 6. Replace.
Axis will not move after controller receives commands.	1. One axis not moving. 2. All axes not moving.	1. Check connection to motor. Check 50-pin connection to circuit board. 2. Inspect 50-pin cable and circuit board connection Inspect power supply to stepper motors. Inspect mechanical components, such as ball screw connections. Repair/replace as needed.
Axis movement and location not repeatable.	1. Ball screws worn. 2. Ball screw/motor coupler worn.	1. Inspect/repair. 2. Inspect/repair.

Symptom	Possible Cause	Possible Solution
One or more axes only move in one direction.	1. Circuit board and motor connection loose. 2. Incorrect machine parameters. 3. Circuit board at fault. 4. Stepper motor at fault.	1. Inspect connections and ensure all are tight. 2. Verify machine parameters (**Page 22**). 3. Inspect/clean plugs and sockets and retry. Replace if bad. 4. Inspect/clean plugs and sockets and retry. Replace if bad.
One or more axes will not move.	1. Direction wire and pulse wire in wrong place on circuit board. 2. Stepper motor disconnected. 3. Stepper motor at fault. 4. No pulse signal output from circuit board.	1. Rewire. 2. Reconnect. 3. Inspect/repair/replace. 4. Replace circuit board.
Controller screen is dim.	1. Power supply disconnected or damaged. 2. Power supply voltage too high for controller. 3. 50-pin cable at fault. 4. Display at fault.	1. Inspect/replace power supply from circuit board. 2. Use correct power supply. High voltage may damage controller; replace if needed. 3. Inspect/clean plugs and sockets and retry. Replace if bad. 4. Replace controller.
Controller screen is blank, flickers, or restarts.	1. Faulty controller connection. 2. Incorrect power supply voltage or circuit size. 3. Display or controller at fault.	1. Inspect/clean plugs and sockets and retry. Replace if bad. 2. Ensure correct power supply voltage and circuit size. 3. Replace controller.
Controller screen says spindle is ***ON*** when spindle is ***OFF*** and spindle is ***OFF*** when spindle is ***ON***.	1. Wrong connections at circuit board.	1. Rewire.

SECTION 8: WIRING

These pages are current at the time of printing. However, in the spirit of improvement, we may make changes to the electrical systems of future machines. Compare the manufacture date of your machine to the one stated in this manual, and study this section carefully.

If there are differences between your machine and what is shown in this section, call Technical Support at (570) 546-9663 for assistance BEFORE making any changes to the wiring on your machine. An updated wiring diagram may be available. **Note:** *Please gather the serial number and manufacture date of your machine before calling. This information can be found on the main machine label.*

⚠WARNING
Wiring Safety Instructions

SHOCK HAZARD. Working on wiring that is connected to a power source is extremely dangerous. Touching electrified parts will result in personal injury including but not limited to severe burns, electrocution, or death. Disconnect the power from the machine before servicing electrical components!

MODIFICATIONS. Modifying the wiring beyond what is shown in the diagram may lead to unpredictable results, including serious injury or fire. This includes the installation of unapproved aftermarket parts.

WIRE CONNECTIONS. All connections must be tight to prevent wires from loosening during machine operation. Double-check all wires disconnected or connected during any wiring task to ensure tight connections.

CIRCUIT REQUIREMENTS. You MUST follow the requirements at the beginning of this manual when connecting your machine to a power source.

WIRE/COMPONENT DAMAGE. Damaged wires or components increase the risk of serious personal injury, fire, or machine damage. If you notice that any wires or components are damaged while performing a wiring task, replace those wires or components.

MOTOR WIRING. The motor wiring shown in these diagrams is current at the time of printing but may not match your machine. If you find this to be the case, use the wiring diagram inside the motor junction box.

CAPACITORS/INVERTERS. Some capacitors and power inverters store an electrical charge for up to 10 minutes after being disconnected from the power source. To reduce the risk of being shocked, wait at least this long before working on capacitors.

EXPERIENCING DIFFICULTIES. If you are experiencing difficulties understanding the information included in this section, contact our Technical Support at (570) 546-9663.

NOTICE

The photos and diagrams included in this section are best viewed in color. You can view these pages in color at www.grizzly.com.

COLOR KEY

BLACK	Bk	BLUE	Bl	YELLOW	Yl	LIGHT BLUE	Lb
WHITE	Wt	BROWN	Br	YELLOW GREEN	Yg	BLUE WHITE	Bw
GREEN	Gn	GRAY	Gy	PURPLE	Pu	TURQUOISE	Tu
RED	Rd	ORANGE	Or	PINK	Pk		

Wiring Diagram

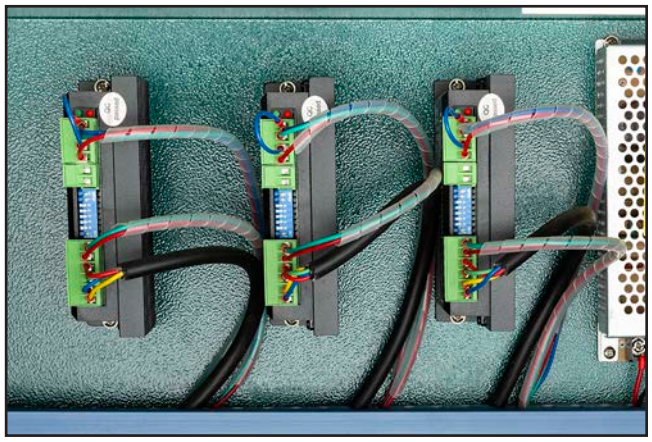
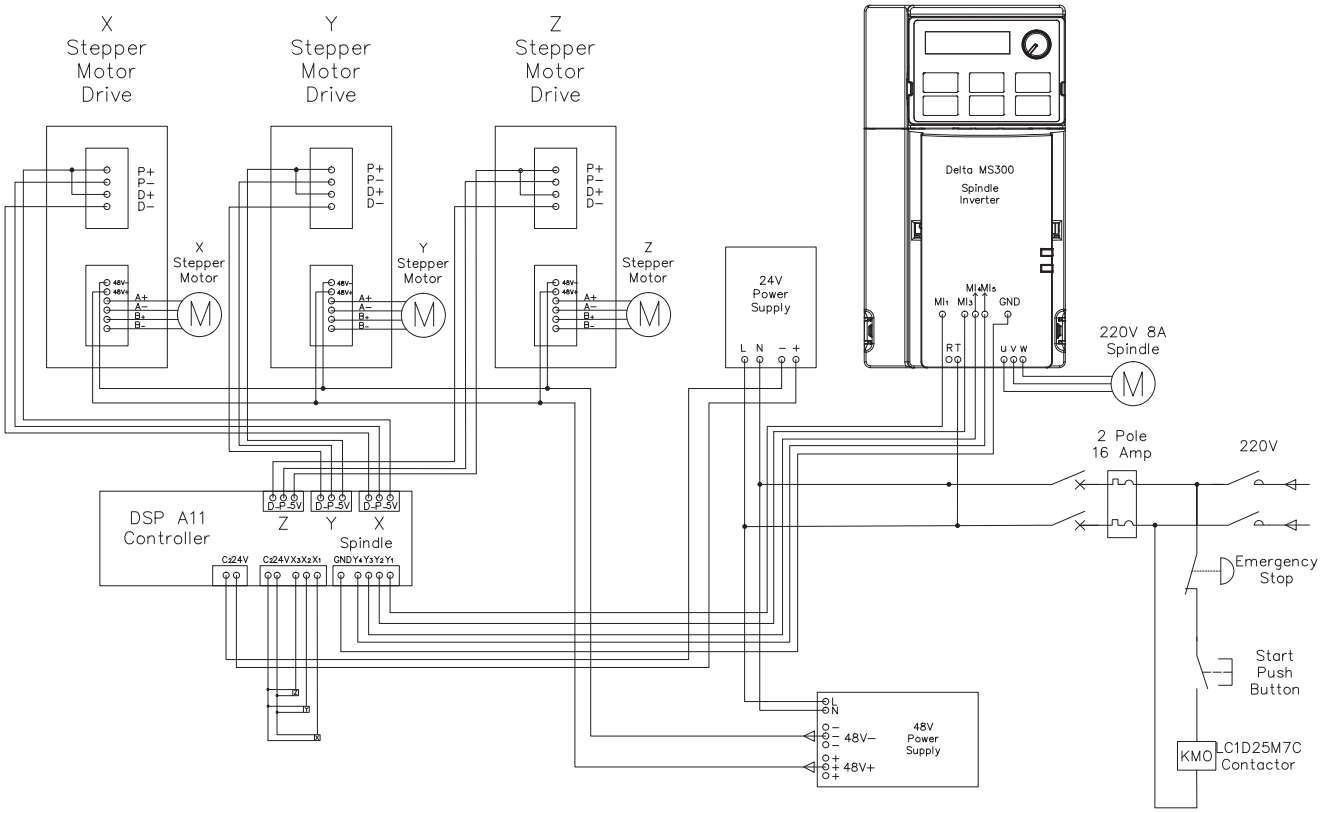


Figure 31. Stepper drivers.

Figure 33. VFD/Inverter.



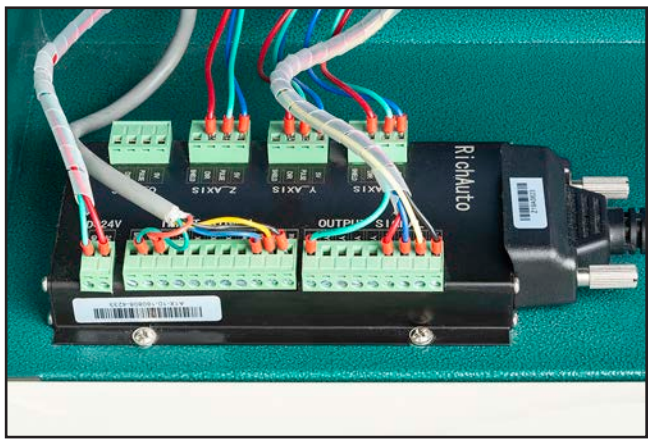


Figure 32. RichAuto Controller.

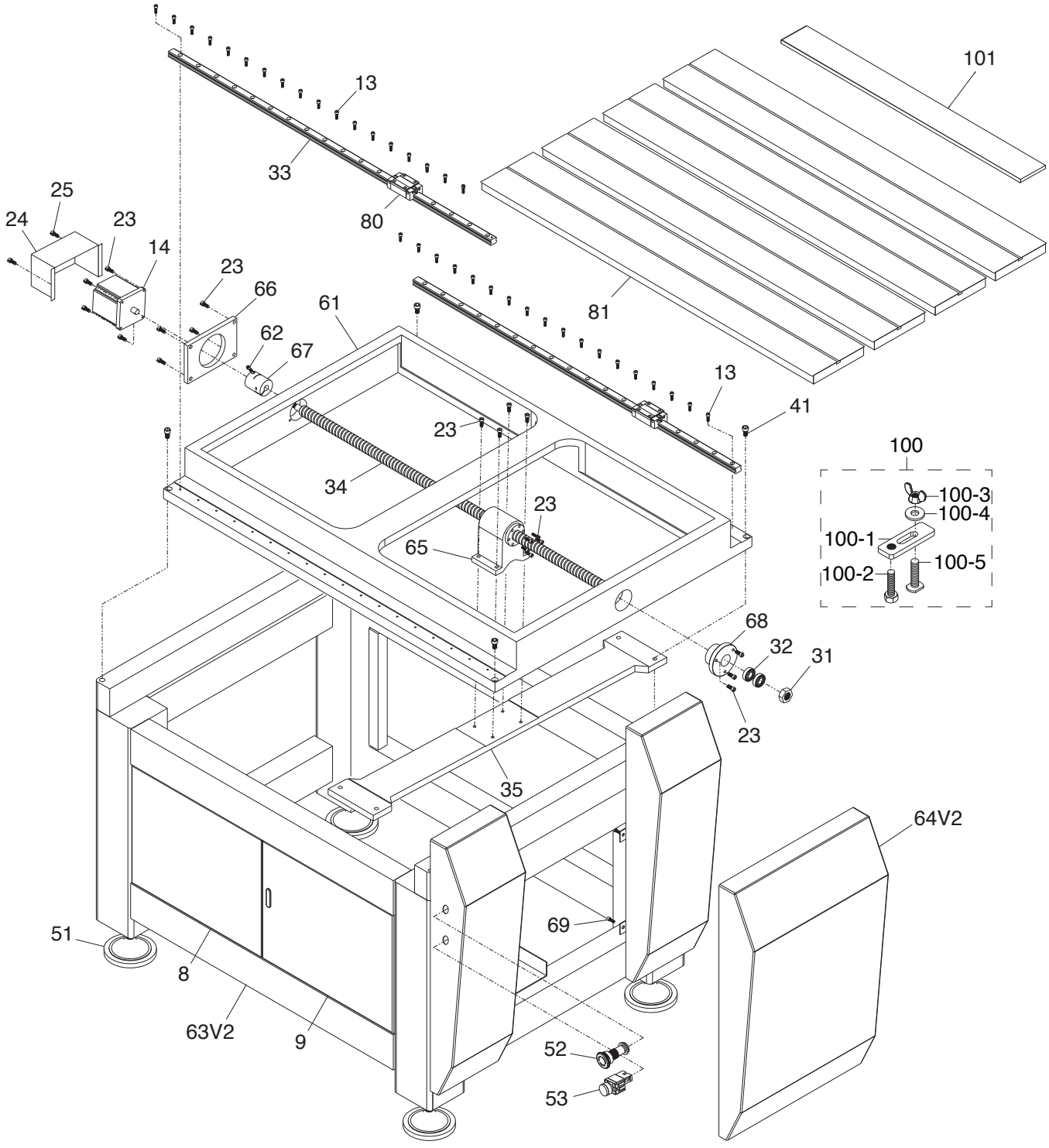
Figure 34. 48-Volt power supply.

STOP *READ ELECTRICAL SAFETY ON PAGE 37!*

SECTION 9: PARTS

We do our best to stock replacement parts when possible, but we cannot guarantee that all parts shown are available for purchase. Call **(800) 523-4777** or visit **www.grizzly.com/parts** to check for availability.

Base & Y-Axis

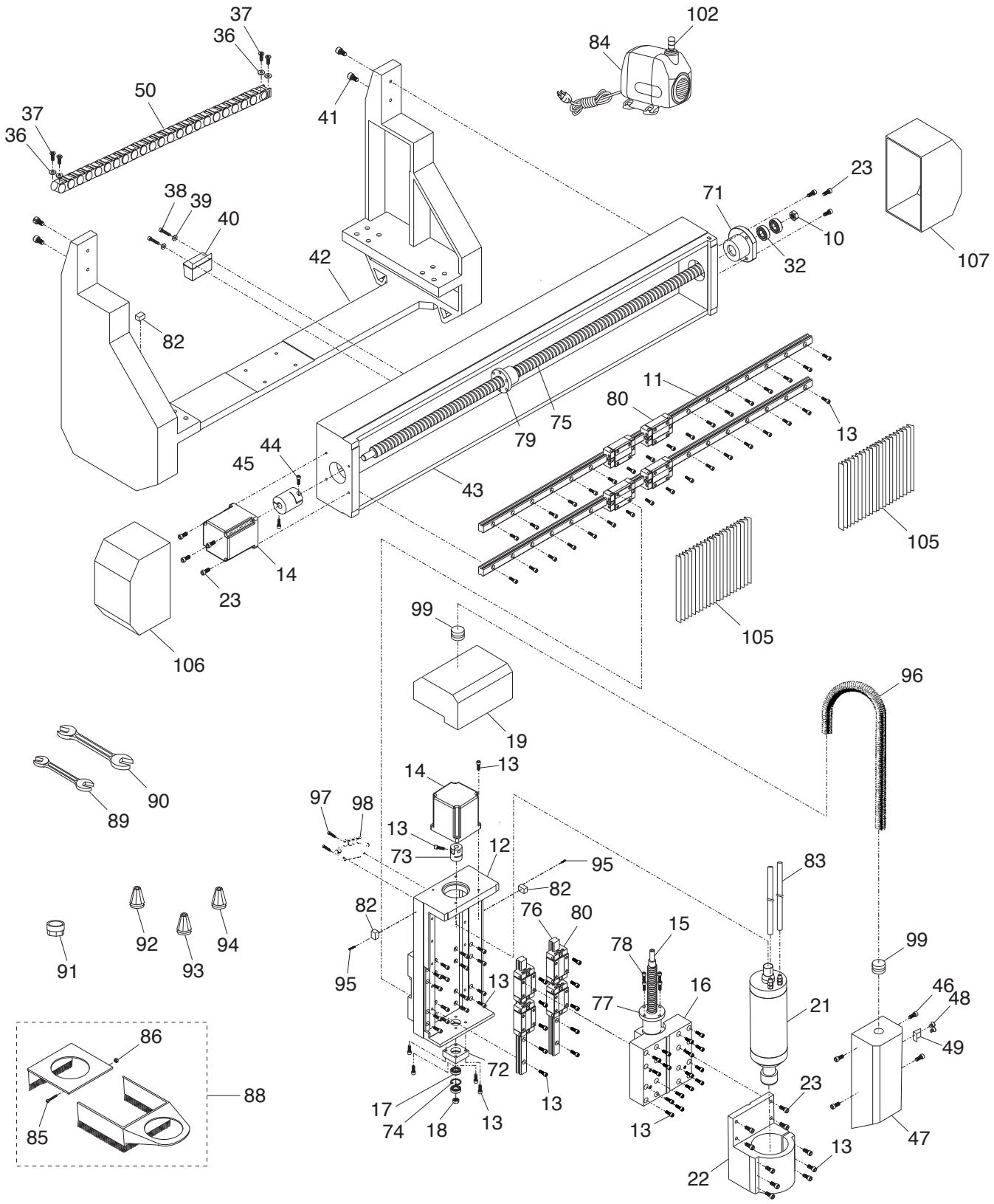


Base & Y-Axis Parts List

REF	PART #	DESCRIPTION
8	P0894008	CABINET DOOR (LEFT)
9	P0894009	CABINET DOOR (RIGHT)
13	P0894013	CAP SCREW M5-.8 X 20
14	P0894014	STEPPER MOTOR NEMA 34
23	P0894023	CAP SCREW M6-1 X 20
24	P0894024	STEPPER COVER Y-AXIS
25	P0894025	CAP SCREW M5-.8 X 12
31	P0894031	HEX NUT M12-1.75
32	P0894032	BALL BEARING 6201ZZ
33	P0894033	Y-AXIS LINEAR GUIDE RAIL
34	P0894034	Y-AXIS BALL SCREW
35	P0894035	BEARING BLOCK SUPPORT BRACKET
41	P0894041	CAP SCREW 5/16-24 X 1-1/4
51	P0894051	LEVELING FOOT
52	P0894052	E-STOP BUTTON YJ 139-LA38 30MM
53	P0894053	BUTTON SWITCH YJ 139-LA38 30MM GRN
61	P0894061	BED FRAME

REF	PART #	DESCRIPTION
62	P0894062	CAP SCREW M5-.8 X 12
63V2	P0894063V2	BODY V2.01.20
64V2	P0894064V2	COVER (FRONT) V2.01.20
65	P0894065	BEARING BLOCK
66	P0894066	SPACER PLATE
67	P0894067	Y-AXIS SHAFT COUPLER
68	P0894068	Y-AXIS SHAFT COLLAR
69	P0894069	CAP SCREW M5-.8 X 10
80	P0894080	SLIDE BRACKET
81	P0894081	BED SECTION
100	P0894100	T-SLOT CLAMP
100-1	P0894100-1	T-SLOT CLAMP PLATE
100-2	P0894100-2	HEX BOLT M8-1.25 X 50
100-3	P0894100-3	WING NUT M8-1.25
100-4	P0894100-4	FLAT WASHER 8MM
100-5	P0894100-5	T-BOLT M8-1.25 X 80
101	P0894101	PVC FOAM COVER

Gantry & Spindle

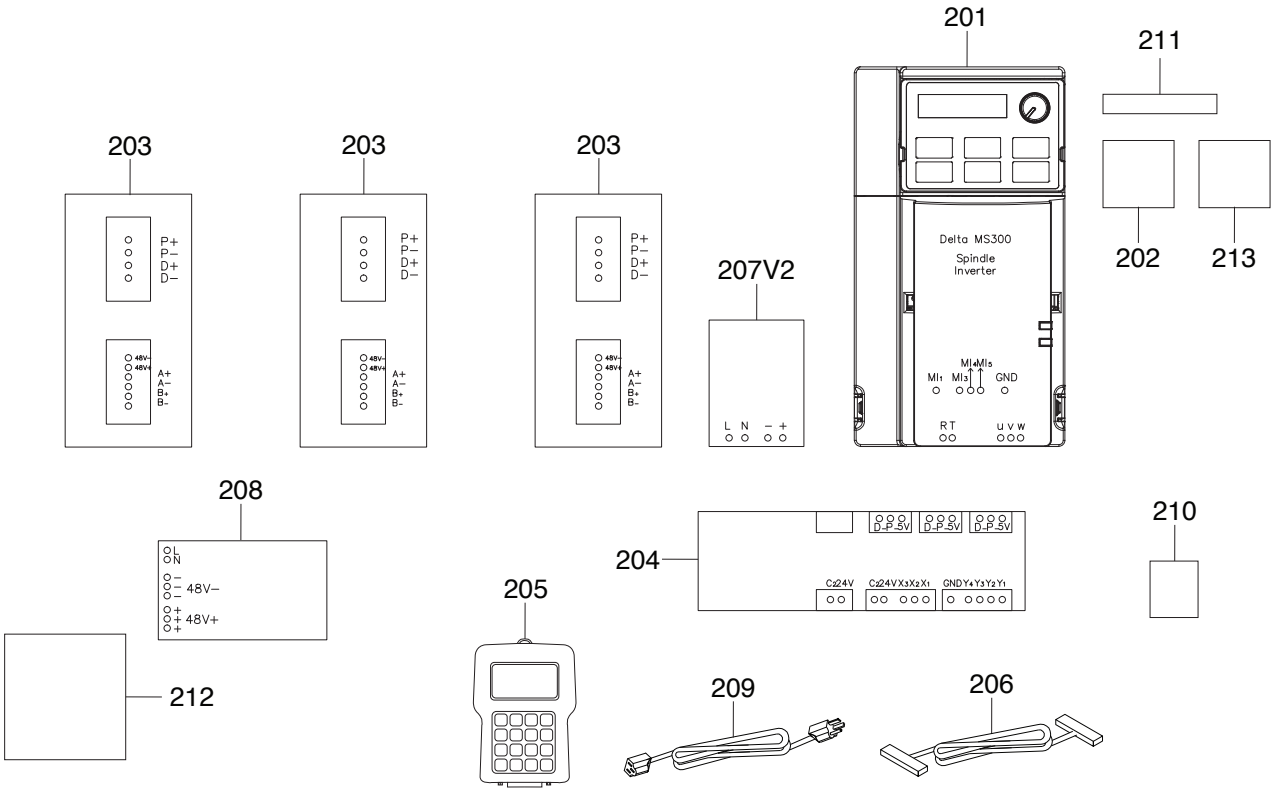


Gantry & Spindle Parts List

REF	PART #	DESCRIPTION
10	P0894010	HEX NUT M12-1.75
11	P0894011	X-AXIS LINEAR GUIDE RAIL
12	P0894012	SPINDLE MOTOR CARRIAGE
13	P0894013	CAP SCREW M5-.8 X 20
14	P0894014	STEPPER MOTOR NEMA 34
15	P0894015	Z-AXIS BALL SCREW
16	P0894016	SPINDLE MOTOR MOUNTING BLOCK
17	P0894017	BALL BEARING 6901ZZ
18	P0894018	HEX NUT M10-1.5
19	P0894019	MOTOR COVER
21	P0894021	SPINDLE MOTOR 3HP 220V 3-PH
22	P0894022	SPINDLE MOTOR MOUNT
23	P0894023	CAP SCREW M6-1 X 20
32	P0894032	BALL BEARING 6201ZZ
36	P0894036	FLAT WASHER 5MM
37	P0894037	FLAT HD SCR M5-.8 X 10
38	P0894038	CAP SCREW M6-1 X 16
39	P0894039	FLAT WASHER 6MM
40	P0894040	LUBRICATION PUMP
41	P0894041	CAP SCREW 5/16-24 X 1-1/4
42	P0894042	GANTRY SUPPORT FRAME
43	P0894043	GANTRY
44	P0894044	CAP SCREW M5-.8 X 30
45	P0894045	X-AXIS SHAFT COUPLER
46	P0894046	CAP SCREW M5-.8 X 12
47	P0894047	SPINDLE COVER
48	P0894048	FLAT HD SCR M5-.8 X 6
49	P0894049	SENSOR PLATE
50	P0894050	CABLE CARRIER
71	P0894071	X-AXIS SHAFT COLLAR

REF	PART #	DESCRIPTION
72	P0894072	SPINDLE SHAFT COLLAR
73	P0894073	Z-AXIS SHAFT COUPLER
74	P0894074	EXT RETAINING RING 22MM
75	P0894075	X-AXIS BALL SCREW
76	P0894076	Z-AXIS LINEAR GUIDE RAIL
77	P0894077	Z-AXIS SHAFT COLLAR
78	P0894078	CAP SCREW M5-.8 X 20
79	P0894079	SHAFT COLLAR
80	P0894080	SLIDE BRACKET
82	P0894082	PROXIMITY SWITCH OMRON TL-Q5MC1
83	P0894083	COOLANT TUBE 8MM ID X 6MM OD
84	P0894084	COOLANT PUMP 110V
85	P0894085	PHLP HD SCR M5-.8 X 40
86	P0894086	HEX NUT M5-.8
88	P0894088	DUST SHOE W/BRACKET
89	P0894089	WRENCH 18 X 21MM OPEN-ENDS
90	P0894090	WRENCH 27 X 30MM OPEN-ENDS
91	P0894091	SPINDLE NUT
92	P0894092	COLLET ER20 1/8
93	P0894093	COLLET ER20 1/4
94	P0894094	COLLET ER20 1/2
95	P0894095	CAP SCREW M4-.7 X 20
96	P0894096	CONDUIT PLASTIC
97	P0894097	CAP SCREW M5-.8 X 20
98	P0894098	OIL LINE JUNCTION
99	P0894099	STRAIN RELIEF PG31
102	P0894102	WATER PUMP ADAPTER
105	P0894105	DUST COVER
106	P0894106	GANTRY COVER (LEFT)
107	P0894107	GANTRY COVER (RIGHT)

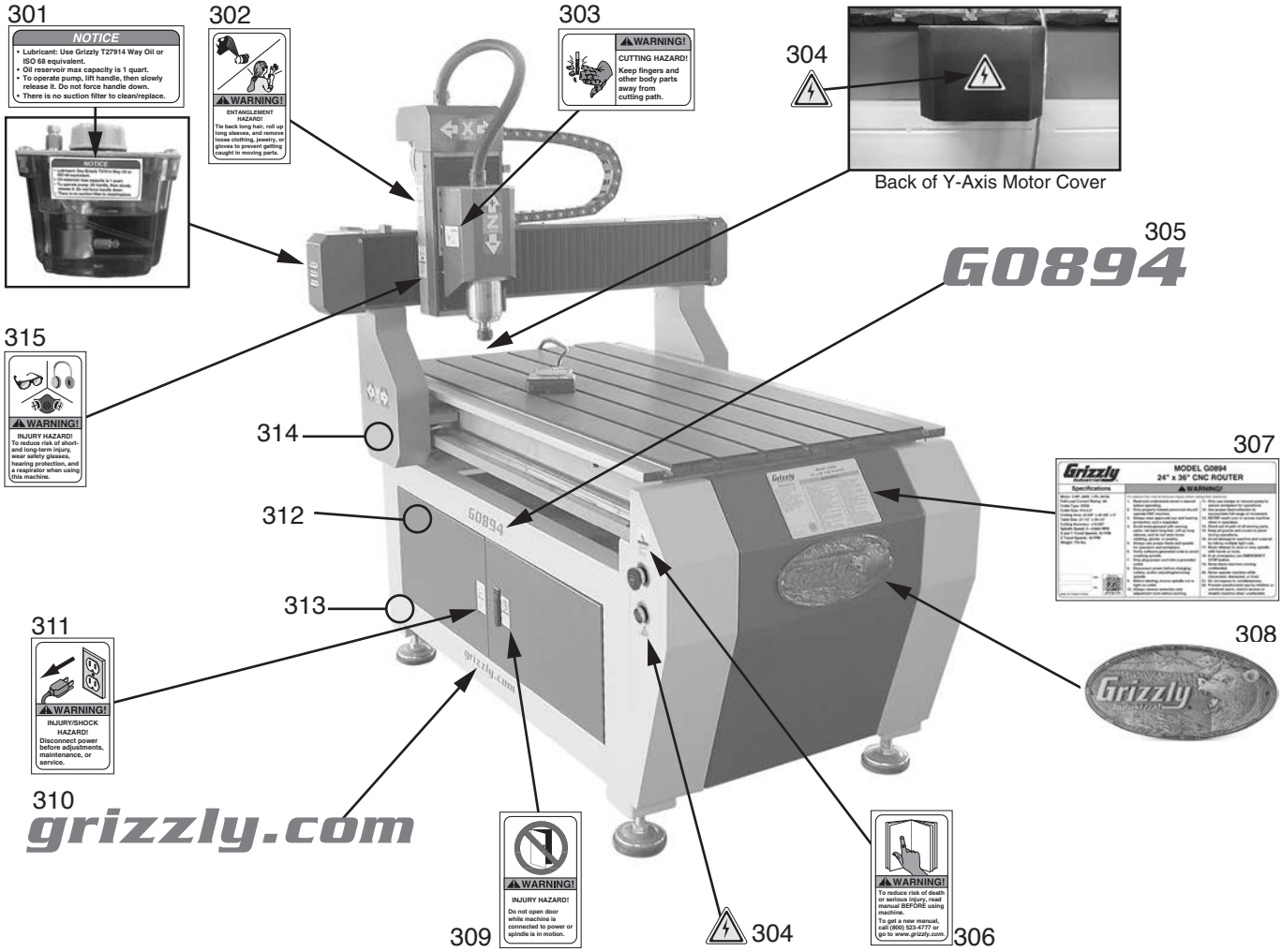
Electrical Cabinet Components



REF	PART #	DESCRIPTION
201	P0894201	VFD DELTA MS300 VFD022E21A
202	P0894202	CIRCUIT BREAKER 16A IC65N
203	P0894203	STEP DRIVER LEADSHINE DM542-05
204	P0894204	DSP CONTROLLER RA A11X-10 SYSTEM CARD
205	P0894205	DSP CONTROLLER RICHAUTO A11X-10
206	P0894206	50 PIN CABLE 72"
207V2	P0894207V2	POWER SUPPLY GY75W-24-B 24V

REF	PART #	DESCRIPTION
208	P0894208	POWER SUPPLY GY600W-48-A 260V
209	P0894209	POWER CORD 14G 3W 72" 6-20P
210	P0894210	AC POWER ENTRY MODULE 15A 250V
211	P0894211	TERMINAL BAR 6P M4.7 X 12 TM3
212	P0894212	FAN SXUQN DP200A JQH2123HSL
213	P0894213	CONTACTOR LC1D18M7C

Labels & Cosmetics



REF	PART #	DESCRIPTION
301	P0894301	NOTICE LABEL
302	P0894302	ENTANGLEMENT LABEL
303	P0894303	WARNING CUTTING HAZARD LABEL
304	P0894304	ELECTRICITY LABEL
305	P0894305	MODEL NUMBER LABEL
306	P0894306	READ MANUAL LABEL
307	P0894307	MACHINE ID LABEL
308	P0894308	GRIZZLY NAMEPLATE-LARGE

REF	PART #	DESCRIPTION
309	P0894309	WARNING INJURY HAZARD LABEL
310	P0894310	GRIZZLY.COM LABEL
311	P0894311	DISCONNECT 110V LABEL
312	P0894312	GRIZZLY GREEN TOUCH-UP PAINT
313	P0894313	BEIGE TOUCH-UP PAINT
314	P0894314	LIGHT GREY TOUCH-UP PAINT
315	P0894315	EYE/EAR/LUNG LABEL

⚠WARNING

Safety labels help reduce the risk of serious injury caused by machine hazards. If any label comes off or becomes unreadable, the owner of this machine MUST replace it in the original location before resuming operations. For replacements, contact (800) 523-4777 or www.grizzly.com.

WARRANTY & RETURNS

Grizzly Industrial, Inc. warrants every product it sells for a period of **1 year** to the original purchaser from the date of purchase. This warranty does not apply to defects due directly or indirectly to misuse, abuse, negligence, accidents, repairs or alterations or lack of maintenance. This is Grizzly's sole written warranty and any and all warranties that may be implied by law, including any merchantability or fitness, for any particular purpose, are hereby limited to the duration of this written warranty. We do not warrant or represent that the merchandise complies with the provisions of any law or acts unless the manufacturer so warrants. In no event shall Grizzly's liability under this warranty exceed the purchase price paid for the product and any legal actions brought against Grizzly shall be tried in the State of Washington, County of Whatcom.

We shall in no event be liable for death, injuries to persons or property or for incidental, contingent, special, or consequential damages arising from the use of our products.

The manufacturers reserve the right to change specifications at any time because they constantly strive to achieve better quality equipment. We make every effort to ensure that our products meet high quality and durability standards and we hope you never need to use this warranty.

In the event you need to use this warranty, contact us by mail or phone and give us all the details. We will then issue you a "Return Number," which must be clearly posted on the outside as well as the inside of the carton. We will not accept any item back without this number. Proof of purchase must accompany the merchandise.

Please feel free to write or call us if you have any questions about the machine or the manual.

Thank you again for your business and continued support. We hope to serve you again soon.

To take advantage of this warranty, you must register it at **https://www.grizzly.com/secureforms/warranty-card**, or you can scan the QR code below to be automatically directed to our warranty registration page. Enter all applicable information for the product.