

# ROTTLER

## **SG90MTS HEAVY DUTY CYLINDER HEAD SEAT & GUIDE MACHINE MACHINE INSTALLATION MANUAL**





# PARTS ORDERING

For optional equipment catalogs, please visit <https://www.rottlermfg.com/documentation.php>

For fastest service ordering parts or equipment, contact us via e-mail with the information below. For customers within the U.S., send emails to [parts@rottlermfg.com](mailto:parts@rottlermfg.com), for customers outside of the U.S., use [intlparts@rottlermfg.com](mailto:intlparts@rottlermfg.com)

Have the following information on hand to expedite the ordering process:

1. Your name, business name, and contact number
2. Customer number, or your billing address if you do not have a customer number
3. Shipping address if different from the billing address
4. Machine model and serial number
5. Part number and description of the item(s) to order
6. Preferred method of shipment

For customers outside of the U.S. requiring faster service, contact your local distributor.

In some cases, you may be requested to send a photo of the part you are ordering if it is a replacement part or does not appear in our database.

If you are unsure which part you need to order, contact our service department, and ask to speak to one of our service consultants. They will assist you in determining which part(s) you require.

**THERE IS A MINIMUM ORDER OF \$25.00**

# **MANUAL SECTIONS**

**INTRODUCTION**

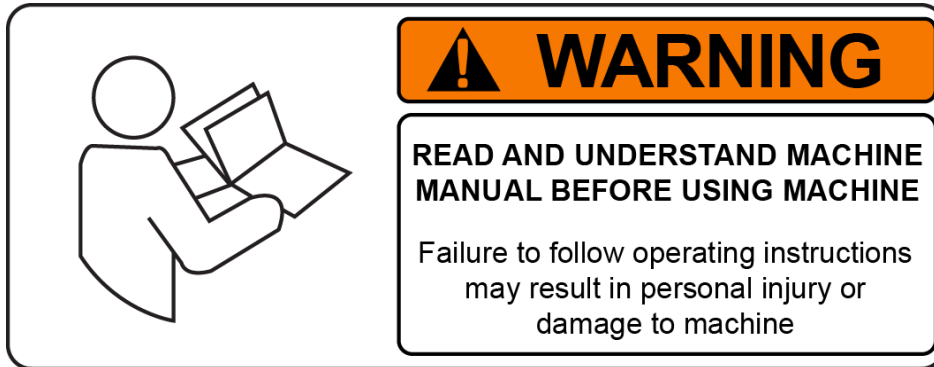
**INSTALLATION**

# INTRODUCTION

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## Introduction



**READ THE SAFETY CHAPTER BEFORE INSTALLING MACHINE. THOROUGHLY UNDERSTAND ALL SAFETY ISSUES BEFORE OPERATING MACHINE.**

### **ATTENTION OWNER/BUSINESS MANAGER**

**To validate the warranty on your new Rottler machine, please be sure to sign and complete the “Installation Report” located in the Installation Chapter of this manual.**

We suggest that the new user of the SG90MTS read the CONTROL DEFINITIONS to get an idea how the machine operates.

The Operating Instructions chapter should be read in order to familiarize the user with the actual button pushing sequences required to carry out a job. These chapters in the manual should be considered an introduction. As the operators of the SG90MTS series machines gain experience using the different functions of the machine, the operator will become an expert in utilizing the machine tool.

Beyond the Operating Instructions this manual contains information and part number references on fixtures, cutting tools, and machine maintenance. The operator should read and become familiar with these areas as well.



## Description

The Rottler SG90MTS series were created specifically for heavy-duty cylinder head applications. Although the machine is primarily geared towards large diesel or natural gas cylinder heads, the SG90MTS also can handle small engines with performance applications as well. This makes the SG90MTS the most versatile machine in the Rottler Seat and Guide machine lineup.

The Rottler SG90MTS represents a pinnacle of innovation in modern seat cutting technology. New to this type of machine is the Rottler patented Uni-Pilot tooling technology which allows the operator to move hole-to-hole while cutting seats without the need of re-positioning the pilot or using multiple pilots to process a cylinder head. Furthermore the SG90MTS is outfitted with the Rottler patented Active Spindle technology which automates the locking and unlocking process between centering and cutting operations on previous generations of seat-cutting machines.

The Rottler SG90MTS can be used in either the manual or manual-matic software modes. These modes can be selected from the main screen and are further defined in the sections below. Beyond these two modes, operators will find that the SG90MTS also has features to allow automated tapping, reaming, and drilling cycles for other work such as guide work or work on the manifold sides of cylinder heads.

### Software Modes:

**MANUAL** – This mode allows the operator to control the base functions of the machine individually. These functions include; floating the workhead and cradle, locking/un-locking the sphere, and turning the spindle on and off. Within this mode the operator can also set the zero for the spindle position DRO, as well as set the spindle RPM for cutting and finishing. This mode is very useful when cutting only one seat or testing parameters to setup a MANUALMATIC program.

**MANUALMATIC** – This mode automates the seat cutting process by storing spindle positions, which when the spindle DRO matches these stored values will cause the machines functions as mentioned above to activate automatically. Values can be stored by moving the spindle to the desired height, and then pressing the "set" button next to the labeled values. Manualmatic programs can be created for both intake and exhaust seats on specific cylinder heads to allow the operator to process heads by simply selecting the program and then moving the spindle through the stored values to cut a seat. This is explained further in the operating instructions section.

## Disclaimer

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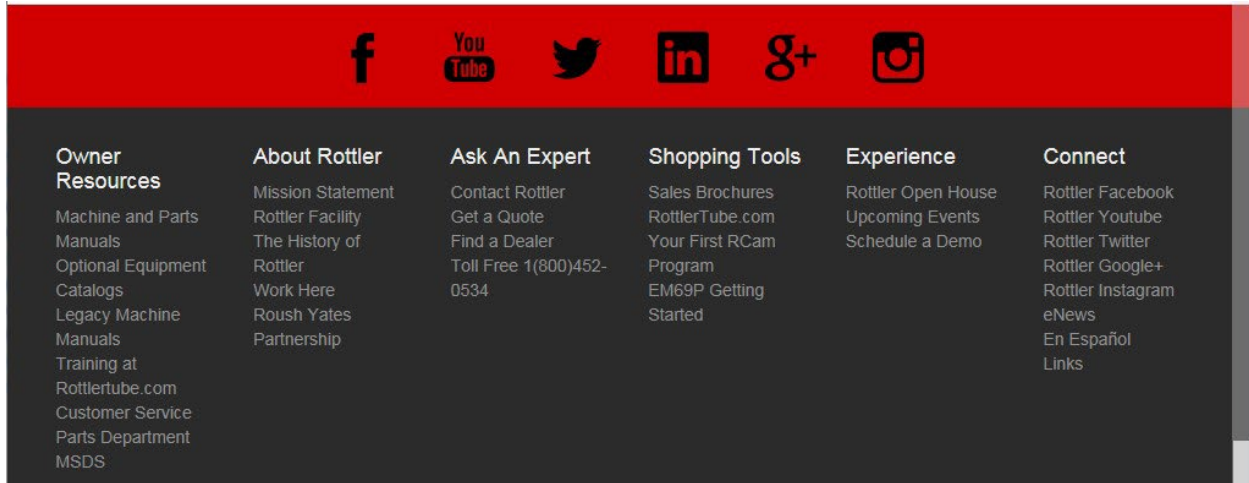
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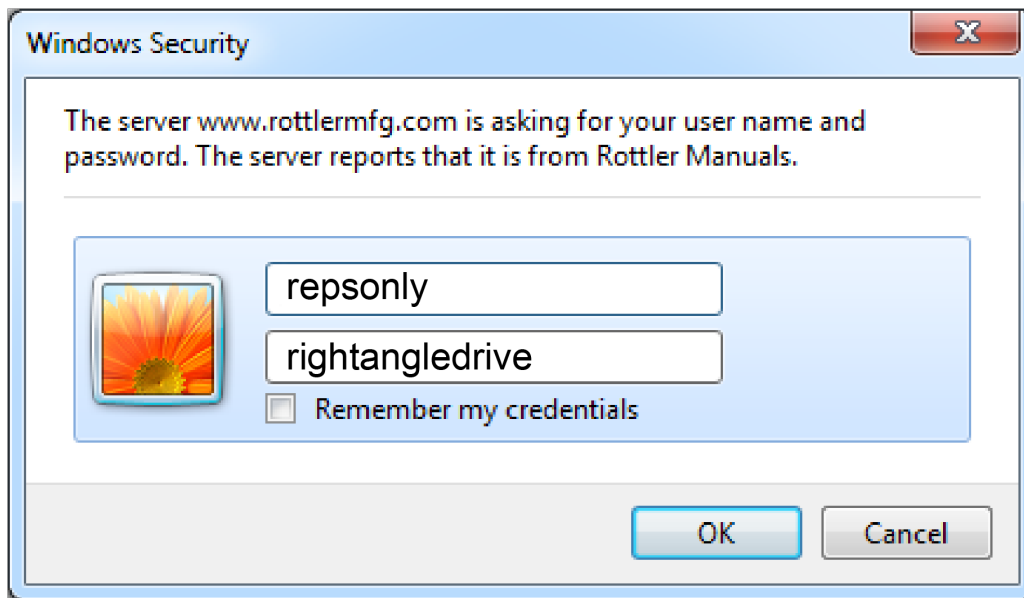
## Online Documentation Access

Online documentation for machines and optional equipment can be accessed at the Rottler website. To access documentation open your browser and navigate to <https://www.rottlermfg.com>.

Scroll to the bottom of the page and under the Owner Resources title click the type of documentation you want to access.



If a log in window pops up asking for user name and password fill in the blanks as shown.



# INSTALLATION

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## **ATTENTION OWNER/BUSINESS MANAGER**

**To validate the warranty on your new Rottler machine, please be sure to sign the installation report after the installation technician has installed the machine and verified the machine is operating correctly and given the operators operation and maintenance training.**

**Thank you for your cooperation and the opportunity to be of service to you.**

# ROTTLER MANUFACTURING



## INSTALLATION REPORT

SG90MTS

REV 010924

**OFFICE USE ONLY**

Route to:

Orders Notified \_\_\_\_\_ Eng Mgr \_\_\_\_\_ Svc Mgr \_\_\_\_\_ Assem Mgr \_\_\_\_\_ Andy \_\_\_\_\_ Svc Filing \_\_\_\_\_

Warranty Exp Date \_\_\_\_\_

### ROTTLER MANUFACTURING MUST HAVE THIS REPORT RETURNED TO PROPERLY QUALIFY WARRANTY ON EQUIPMENT

Customer: \_\_\_\_\_ Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_ Phone: \_\_\_\_\_

Country: \_\_\_\_\_

Machine Model: \_\_\_\_\_ Serial Number: \_\_\_\_\_ Representative: \_\_\_\_\_

**MACHINE INSTALLATION:** Electrical information MUST be complete to validate this report.

***Customer is responsible for providing electricity to machine in a manner that meets the local electrical code requirements.***

\_\_\_\_\_ Check machine level for equal support on feet.

\_\_\_\_\_ This machine requires between 208 and 240 Volts AC, Single Phase, 50/60 Hz power supply.

Measure the incoming voltage between L1 and L2. Current requirements for this machine are 30 amps. Measure the incoming AC voltage at least twice during installation.

1) \_\_\_\_\_ VAC    2) \_\_\_\_\_ VAC

\_\_\_\_\_ Measure each leg of the incoming supply to ground. When using a one leg and neutral of a 380

VAC three phase supply L1 should measure 240 VAC and Neutral should measure almost 0

VAC. L1 to ground \_\_\_\_\_ VAC    L2 to ground \_\_\_\_\_ VAC.

Make sure all electrical equipment has the proper overload protection. The SG90MTS should have a stable power supply to prevent damage and uncontrolled movement of the machine.



Neutral and machine ground are not the same thing. You should measure an open circuit between Neutral and ground.



**IF VOLTAGE IS OUTSIDE THE CORRECT RANGE AT ANY TIME THE MACHINE WILL NOT OPERATE PROPERLY AND MAY BE DAMAGED.**

\_\_\_\_\_ Relocate electrical enclosure from shipping location to operating location on lower right side of machine.

\_\_\_\_\_ Air of the proper pressure and capacity connected to the machine. Air supply must be free from oil and water. Oil or water will damage electrical and air components. Air pressure should never drop below 90 PSI at any time. Failure to provide adequate air supply may cause improper floating and clamping.

\_\_\_\_\_ **BEFORE** turning power on to the machine. Check all wires for security by using the correct screw driver and turning CW until movement stops. Stranded wire can “spread” slightly from vibration during transport.

- \_\_\_\_\_ Remove all shipping brackets in accordance with the machine manual.
- \_\_\_\_\_ Clean any rust inhibitor from the machine surfaces. Slide the spindle base from side to side continually cleaning the machine base until all inhibitor is removed.
- \_\_\_\_\_ Have the operator read through the operation manual before training begins. This will help him be familiar with the button pushing sequences. Have the operator read through the manual again after training and some of the sequences will make more sense.
- \_\_\_\_\_ Calibrate angle sensor

## MACHINE START-UP



**CAUTION** When starting the machine for the first time, it may move out of control. Make sure all hands are clear of machine parts. Be ready to press the Emergency Stop button if needed.

- \_\_\_\_\_ Turn main power on from the main incoming breaker box.

## MACHINE MOVEMENTS

- \_\_\_\_\_ Make sure there is nothing obstructing the full vertical travel of the machine.
- \_\_\_\_\_ When the machine is on the clamp mode and the air pressure is with the requirements, try to move workhead to verify that you have a solid clamp of Work head.
- \_\_\_\_\_ Place the level on the leveling post. The level assembly is referenced to the spindle via the level pin. It is therefore important to check alignment of the pin in reference to the spindle. Even though the level has been carefully calibrated at the factory, it is a good idea to recheck calibration before putting the machine into service. In the event that the level is dropped or handled roughly then the following recalibration methods should be implemented. If calibration is required refer to manual for Calibrating the Digital Level \_\_\_\_\_ Start the spindle and verify operation.

## INSTRUCTING THE OPERATOR:

***Note: Rotter employees and representatives per company policy are not permitted to provide end user of Rottler equipment with any OEM specifications for the workpiece that is created by end user using Rottler equipment.***

- \_\_\_\_\_ Using the operating manual as a guide explain the function of all buttons.
  - \_\_\_\_\_ Cycle all machine movements and supervise the handling of same by operator.
  - \_\_\_\_\_ Demonstrate the engaging of the fine feed system.
  - \_\_\_\_\_ Point out safety features to customer and operator.
- Do not push any buttons without thinking of safety first.



**CAUTION** Do not assume the Digital level has been calibrated rotate 180 to verify alignment.

- \_\_\_\_\_ The following is a checklist to go through every time the machine is started to begin machining a seat.

- Work piece secure
- RPM set
- Tool holder adjusted to the correct setting base on the type of seat you will be machining
- Tool holder locked in place
- Floating of the Workhead and clamping

- \_\_\_\_\_ Proceed to have operator to machine a seat under you control.
- \_\_\_\_\_ **Parts ordering, refer to the operating manual for part numbers and description.**
- \_\_\_\_\_ Review Emergency stop procedure and with operator per operating manual.





## Installation Procedure

### Location

Care should be taken when installing the SG90MTS to guarantee safe and efficient working conditions are met. You should consult with your shops safety and manufacturing managers before installation to make sure that the installation will meet your facilities working requirements.

### Unpacking and Lifting

Care should be taken during unpacking and lifting to make sure that the machine does not receive any unwanted damage. The shipping brackets which are painted red all need to be removed before turning on the machine. You may need to remove sheet metal to access all of the shipping brackets during removal.

#### **CAUTION**

**THIS MACHINE IS TOP-HEAVY.** Use care when lifting and moving Machine. Approximate shipping Weight of Machine is 5000 lbs. (2273 kg).



### Positioning the Machine:

Lift Machine using a fork lift. Move fork lift to front of Machine and separate forks so they are visually centered. Insert forks under front-center of Machine, using care not to damage Foot Pedals Valve or Air Lines. Tilt forks slightly upward so Machine will lean toward fork lift and lift Machine.

While Machine is on fork lift, install five (6) Leveling Screws and Jam Nuts in holes provided in bottom of Machine Base. Two (2) Screws installed in rear-corners and one (2) Screw installed in front and rear center of Machine Base will serve as Leveling Screws; while two (2) Screws installed in front-corners of Machine Base will serve only as Support Screws.

Move Machine to desired location and placed leveling bolts over the center hole of the Leveling Pad. Be certain to allow sufficient clearance to allow access for leveling and also for connecting air and electrical lines. Lower machine onto leveling pads making certain that the leveling bolts align into counterbore on leveling pads.

Be certain nothing interferes with air or electrical lines running from the floating head assembly to the cabinet. Determine there is no possibility of air or electrical lines dragging on wall surfaces or adjacent machinery.

Wipe top Rails with a clean, dry cloth to remove protective shipping oil.

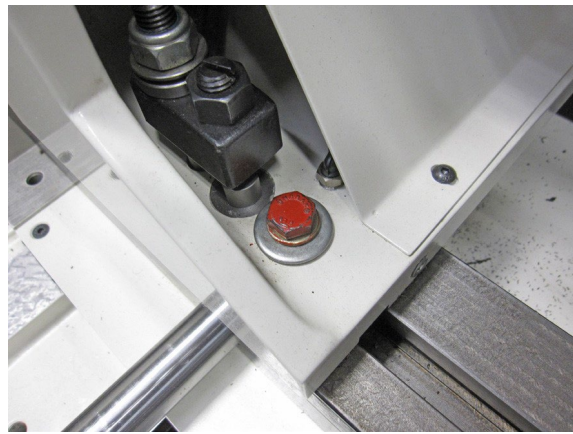
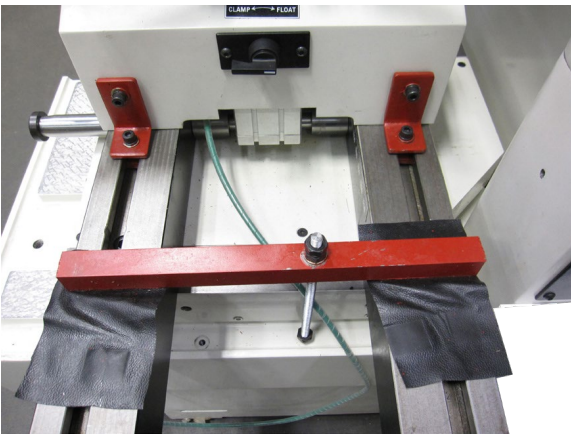
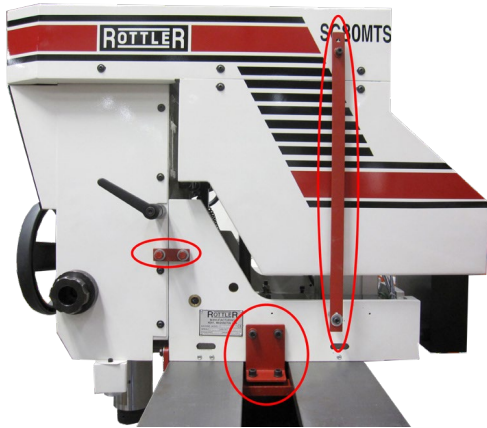
#### **CAUTION:**

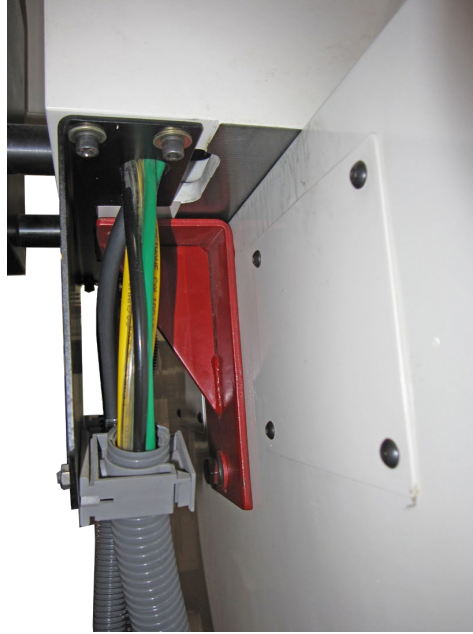
Do not attempt to move the Work Head unless Air Supply is connected, and air valve is turned on, and foot Pedal is depressed, allowing Head to float on Rails apply (WD40) or similar degreaser and flow the work Head side by side to remove all the shipping oil from under the work head. (Top Upper surfaces rails should be clean and free of oil).

[www.rottlermfg.com](http://www.rottlermfg.com)

## Removing Shipping Brackets

Before leveling the machine, loosen and remove the all shipping brackets and bolts. (Figures 1 – 5)





## Leveling the Machine

Leveling should only be done with a Calibrated Precision Machinists level (Starrett 98 or better rating). You should check with the manufacturer for precision and accuracy specifications before leveling the machine.



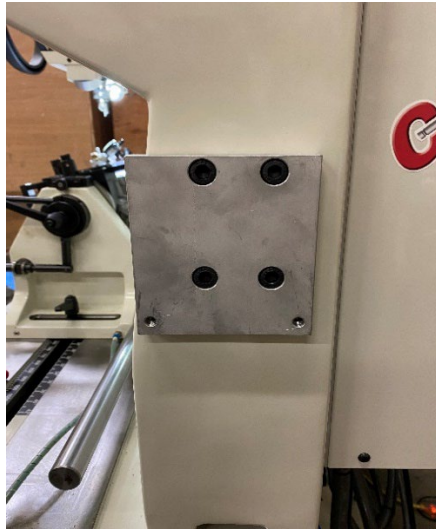
Level the machine using the upper float surface for reference as shown in the images above. It is recommended to level the machine in the front to back direction and then side to side. The machine should be level within  $.0001"/1'$  as visualized through the levels viewing glass and graduation lines. Check both directions after adjusting and before tightening the lock nuts to ensure that the machine is indeed level.

## Insert Sharpener Installation

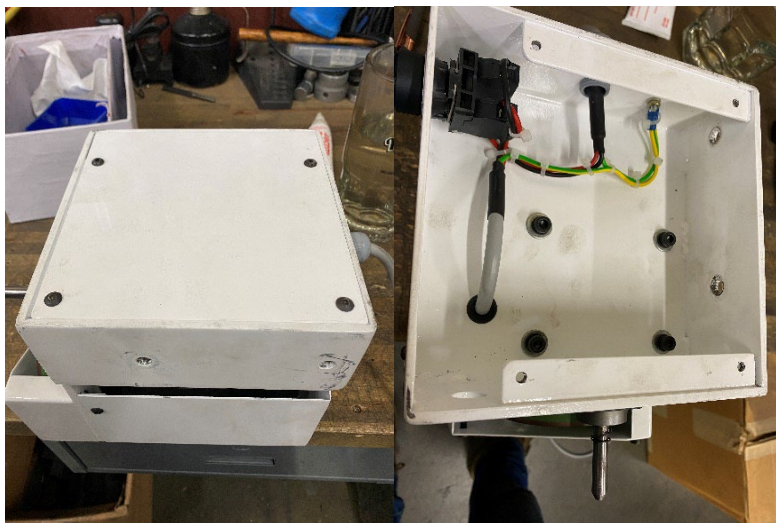
All Rottler Seat and Guide machines are supplied with an insert sharpening unit for dressing RCA and RCB inserts. On most machines, the sharpener may be attached to the right-hand side of the machine base. On machines such as the SG100XY model, the sharpener unit may be wired with a standard 220V single phase plug and used as a bench-top unit.

Installation:

Step 1: Install the aluminum mounting plate to the side of the machine



Step 2: Remove the 4 bolts that secure the bottom cover located on the bottom of the sharpener unit





Step 3: Mount the sharpener unit to the machine with the supplied bolts. The shaper mounts using the two holes accessed with the bottom cover removed and mounts to the threaded holes on the previously installed aluminum mounting plate.

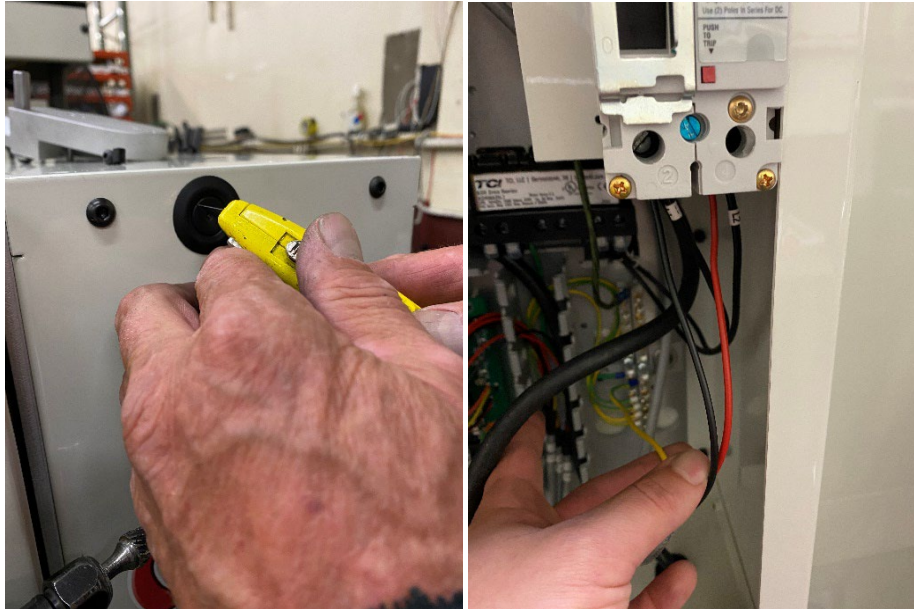


Step 4: The sharpener should now be installed on the side of the machine as shown in the figure below:



Step 5: Wire the sharpener by running the power cable through the side of the cabinet and over to the breaker in the electrical cabinet. The sharpener is wired by attaching the red and black power leads to the T1 and T2 terminals on the lower part of the breaker as shown in the figure below. The green and yellow ground cable can be connected to any open ground terminal in the terminal block behind the breaker.

**NOTE: POWER MUST BE OFF DURING THIS PROCEDURE AND THE MACHINE SHOULD BE DISCONNECTED FROM ANY POWER SUPPLY!**

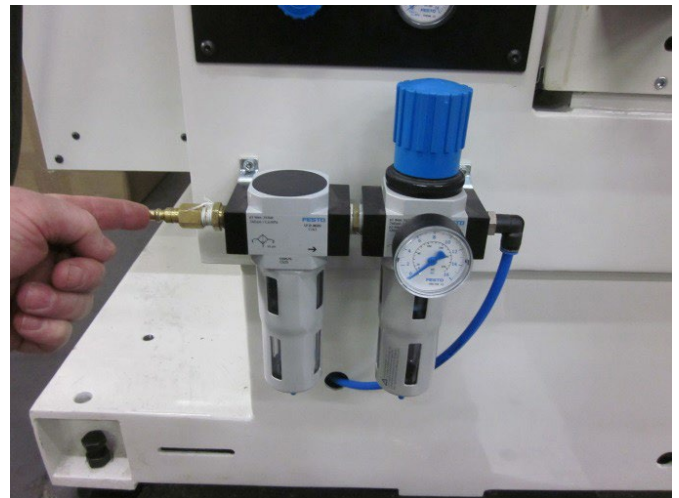


For operation instructions, see the Operations Manual.

### Air Supply

The air supply for the SG90MTS should be moisture and contaminant free. Failure to supply "clean" air may result in premature wear and failure to the pneumatic and mechanical systems operated by the supplied air.

A 100PSI source line should be attached at the input location to the regulator shown in the image to the right. The regulator should come adjusted from the factory, this should not be adjusted unless otherwise instructed to do so.



## Air Adjustments

### Float

The float regulators are located on the left side of machine base. They are marked **“Work Head Air Float Adjustment”**. The machine should come set from the factory at optimum levels. Adjustment should be done only if absolutely necessary. To adjust the float settings, follow the procedure outlined below:

Starting with all regulators set at 1 bar and with the **“workhead float”** button activated, slowly increase pressure at all regulators .5 bar at a time until the workhead begins to float.

Move the workhead throughout its travel, to check for any spots that appear to be dragging.

If workhead is dragging in the forward position, (workhead pulled closest to operator) raise the 2 front regulators 1 mark until it floats without dragging. The same process can be done for the rear regulators. You may have to go back and forth a few times to get this correct. If workhead is not dragging lower the PSI until it does and then raise 1 notch at a time until it is free. Typically the front two regulators will be slightly higher than the rear two.

Once the correct float is established lock the regulators in place by pushing in on the blue adjusting knob. With the workhead in the center of its travel, let go of the workhead to make sure that it stays centered while floating. If this is not the case then adjust the regulators by wither lowering or raising the pressure until the workhead is "balanced".



### Power Supply

This machine has the following power requirements:

- 208 to 240 VAC
- Single Phase Power
- 50 or 60 Hz
- 30 Amps

See illustration below for correct connection of incoming power. Measured power at the machine's main breaker must be within the required range listed above. If incoming power is not within range, a transformer must be used. Failure to do so will cause the machine to function abnormally and cause permanent damage to the electronic control system.



Some electrical services contain a “Hot Leg, High Leg, or Wild Leg”, where single phase is derived from a three phase connection and one leg measures 208VAC to Ground instead of 120VAC. It is not permitted to use the “Hot Leg” for providing power to this machine. Voltage measured between the phases must be between 208VAC and 240VAC, while each phase to ground must be ~120VAC.

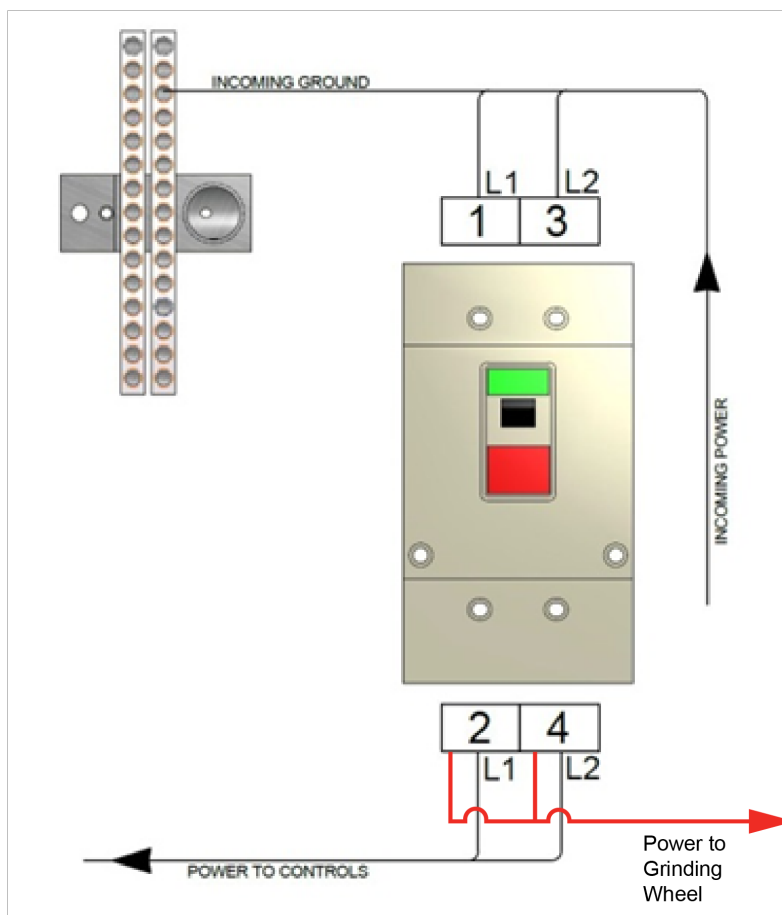
## IMPORTANT

*Electrically connect in accordance with national and local electrical codes.*

## CAUTION

*Do not attempt to connect more 240VAC to this machine.*

*Do not attempt to connect to Three Phase Power.*



## Grounding

The machine requires a good earth ground. The grounding conductor from the incoming power source must be connected to the grounding block located inside of the electrical cabinet. A ground rod installed in addition to the electrical service grounding conductor is permitted, but must be connected directly to the grounding block inside of the electrical cabinet. Connecting the ground rod to the machine base is not permitted. Consult a Licensed Electrician in your area to assess the installation, and install the appropriate ground rod if necessary. Failure to do so may lead to an installation that is unsafe and does not meet national and local electric codes.

## Transformer Connections

This machine has the following minimum transformer size requirement:

- 10 kVA

If a transformer is necessary for machine installation, please refer to the diagram below for connection information. Transformers must be sized to meet the minimum power requirements listed above. Consult a Licensed Electrician in your area for transformer selection and installation.

