Techno CNC Systems

ATLAS
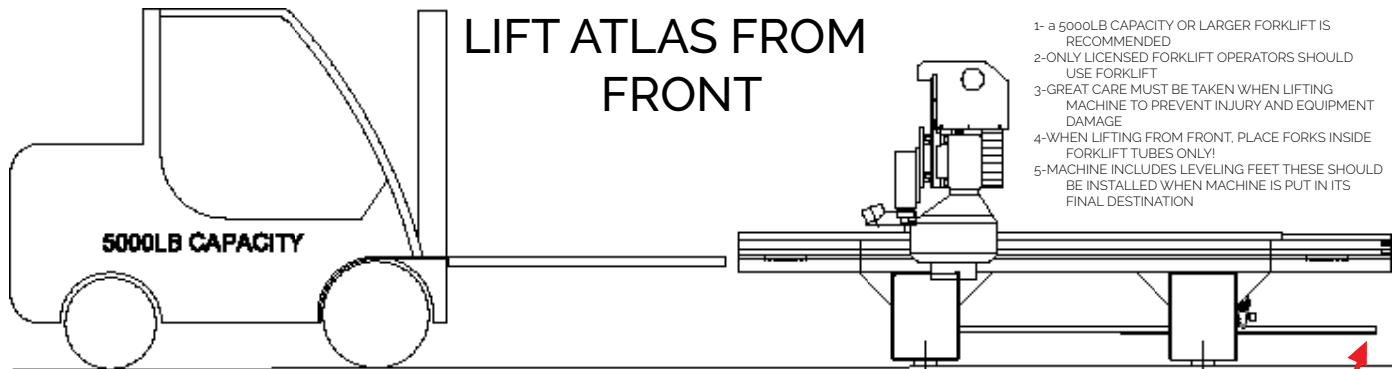## Series CNC
Router Manual

This document will provide a quick guide to the set up and operation of the Techno ATLAS CNC router equipped with the NC studio controller.

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Techno CNC Systems Atlas Series Forklift Guide

LIFT ATLAS FROM FRONT

5000LB CAPACITY

1- a 5000LB CAPACITY OR LARGER FORKLIFT IS RECOMMENDED
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4- WHEN LIFTING FROM FRONT, PLACE FORKS INSIDE FORKLIFT TUBES ONLY!
5- MACHINE INCLUDES LEVELING FEET THESE SHOULD BE INSTALLED WHEN MACHINE IS PUT IN ITS FINAL DESTINATION

Install Leveling Feet When Placing Machine

Cable Carrier Tray May Not Be Bolted To Frame.
This Should Be Completed When Machine is Elevated

LIFT ATLAS FROM SIDE

5000LB CAPACITY

INSTALL LEVELING FEET WHEN PLACING MACHINE.

CABLE CARRIER TRAY MAY NOT BE BOLTED TO FRAME THIS SHOULD BE COMPLETED WHEN MACHINE IS ELEVATED.
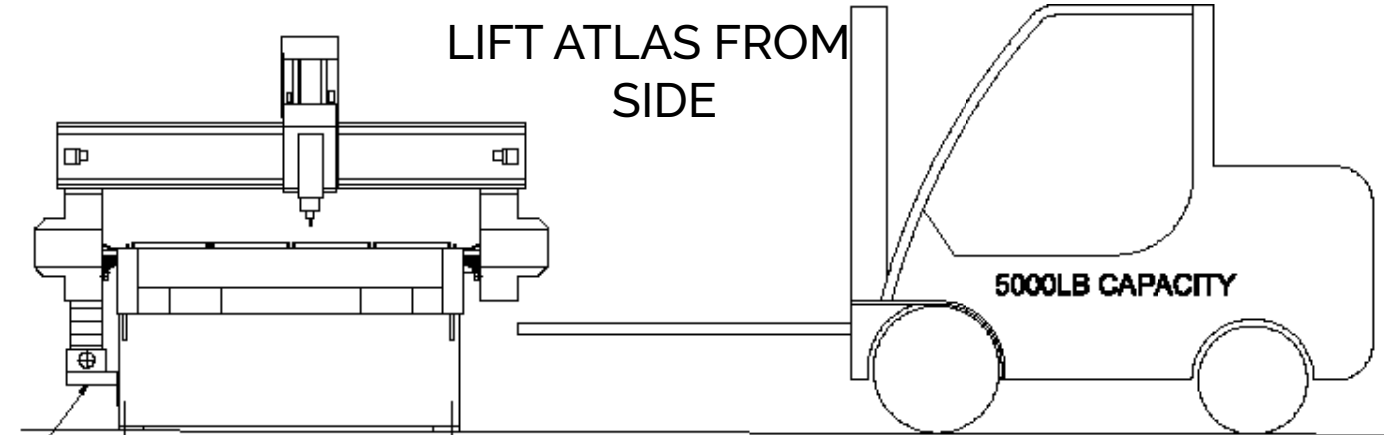
1- a 5000LB CAPACITY OR LARGER FORKLIFT IS RECOMMENDED
2- ONLY LICENSED FORKLIFT OPERATORS SHOULD USE FORKLIFT
3- GREAT CARE MUST BE TAKEN WHEN LIFTING MACHINE TO PREVENT INJURY AND EQUIPMENT DAMAGE

4- IT IS RECOMMENDED TO HAVE FORK LIFE EXTENSIONS.
5- WHEN LIFTING MACHINE FROM SIDE PLACE WOOD BLOCKS BETWEEN THE FORK AND STEEL FRAME TO PREVENT DAMAGE TO VACUUM PIPING. GREAT CARE MUST BE TAKEN WHEN LIFTING FROM SIDE TO PREVENT DAMAGE TO WIRING. FORKS MUST EXTEND ALL THE WAY THROUGH FRAME.
WARNING: WHEN LIFTING FROM SIDE WEIGHT MAY BE UNBALANCED.
6- MACHINE INCLUDES LEVELING FEET! THESE SHOULD BE INSTALLED WHEN MACHINE IS PUT IN ITS FINAL DESTINATION

SAFETY WARNING:

DO NOT LIFT MACHINE OR MOVE MACHINE BY THE GANTRY

For safety and to prevent damage to the machine, lift machine using the forklift tubes and frame ONLY
** Some Atlas Series CNC Routers do NOT have forklift tubes. **
If so, make sure forklift blades enter through the frame of the machine only. Use blocks when lifting machine to prevent damage to the vacuum table plumbing **

Safety Instructions

> READ THESE INSTRUCTIONS THOROUGHLY <u>BEFORE</u> OPERATING MACHINE. DO NOT OPERATE MACHINE IF YOU ARE UNFAMILIAR WITH THESE SAFE OPERATING INSTRUCTIONS. DO NOT OPERATE MACHINE WITHOUT KNOWING WHERE THE EMERGENCY STOP SWITCH IS LOCATED.

> <u>WARNING</u>: IMPROPER OR UNSAFE OPERATION OF THE MACHINE WILL RESULT IN PERSONAL INJURY AND/OR DAMAGE TO THE EQUIPMENT.

1. Keep fingers, hands, and all other objects away from machine while power is on.

2. Disconnect power to all system components when not in use, when changing accessories, and before servicing.

3. Do not loosen, remove, or adjust machine parts or cables while power is on.

4. Exercise care with machine controls and around keyboard to avoid unintentional starting.

5. Make sure voltage supplied is appropriate to specifications of components.

6. Machines must be plugged into three-pronged grounded outlets. Do not remove the grounding plug or connect into an ungrounded extension cord.

7. Keep cables and cords away from heat, oil, and sharp edges. Do not overstretch or run them under other objects or over work surfaces.

8. Use proper fixtures and clamps to secure work. Never use hands to secure work.

9. Do not attempt to exceed limits of machine.

10. Do not attempt to use machine for purposes other than what is intended.

11. Use machine only in clean, well-lit areas free from flammable liquids and excessive moisture.

12. Stay alert at all times when operating the machine.

13. Always wear safety goggles.

14. Do not wear loose-fitting clothing when operating machine. Long hair should be protected.

15. Always maintain proper balance and footing when working around the machine.

16. Maintain equipment with care. Keep cutting tools clean and sharp. Lubricate and change accessories when necessary. Cables and cords should be inspected regularly. Keep controls clean and dry.

17. Before using, check for damaged parts. An authorized service center should perform all repairs. Only identical or authorized replacement parts should be used.

18. Remove any adjusting <u>keys</u> and wrenches before turning machine on.

19. Do not operate the machine unattended.

20. Follow all safety instructions and processing instructions in the MSDS for the material being processed.

21. Use proper precautions with dust collection systems to prevent sparks and fire hazards.

22. Make sure to have proper fire extinguishing equipment on hand at all times.

> PREVENT FIRE HAZARDS by using the proper feeds, speeds, and tooling while operating your Techno machine. For example, setting feeds and speeds too low and/or using dull tool bits creates friction at the material. The friction generates heat which can result in a fire that can be drawn through the vacuum table or dust collector without warning. Fire hazard from friction heating caused by dull tools is possible when cutting certain materials, especially composite material such as wood composites, MDF and Particleboard.   © 2012
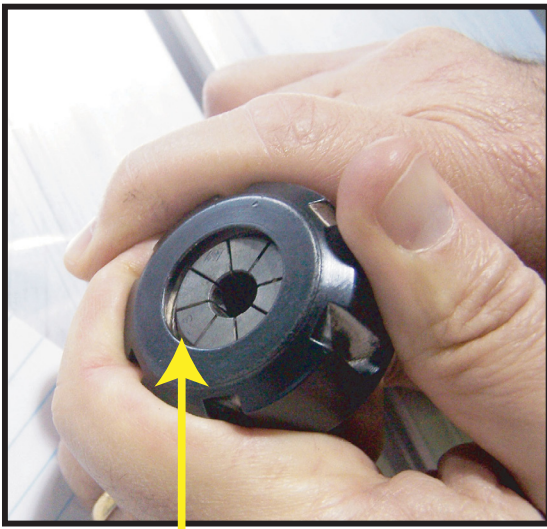
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> ⚠ WARNING!
> THE SPINDLE WILL BE DAMAGED
> IF UNBALANCED EQUIPMENT IS USED.
>
> AIR SUPPLY MUST BE FILTERED AND DRY.
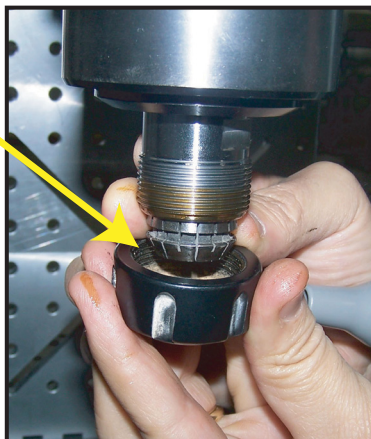
COLLETING GUIDELINES

WRONG!

This picture shows an improper assembly. Notice the gap and angle of the collet in relation to the nut. The collet is not flush to the end of the collet nut. Correct this assembly before using.

RIGHT!

The picture above is how your collet nut assembly should look: the end of the collet is flush with the bottom surface of the collet nut. You will hear and feel a "SNAP" as the collet properly goes into the collet nut. Once it is assembled, then "SCREW" the nut onto the threaded spindle end.

DO NOT PUSH THE COLLET INTO THE SPINDLE AT ANY TIME!

The collet should be secured in the collet nut before threading onto the spindle

FOR TOOLCHANGE AND FIXED COLLET SPINDLES:

ONLY USE TOOLHOLDERS, COLLET NUTS AND TOOLS THAT ARE BALANCED TO MEET OR EXCEED THE MAX RATED SPEED OF THE SPINDLE.

# I. Techno Atlas Series Unpacking and Placement

Remove all bubble wrap, foam, and strapping from the machine.

Carefully remove the Atlas from its wood pallet. Be sure to remove the bolts from its four leveling feet insertion holes, as well as anything stowed under the Atlas during shipping.
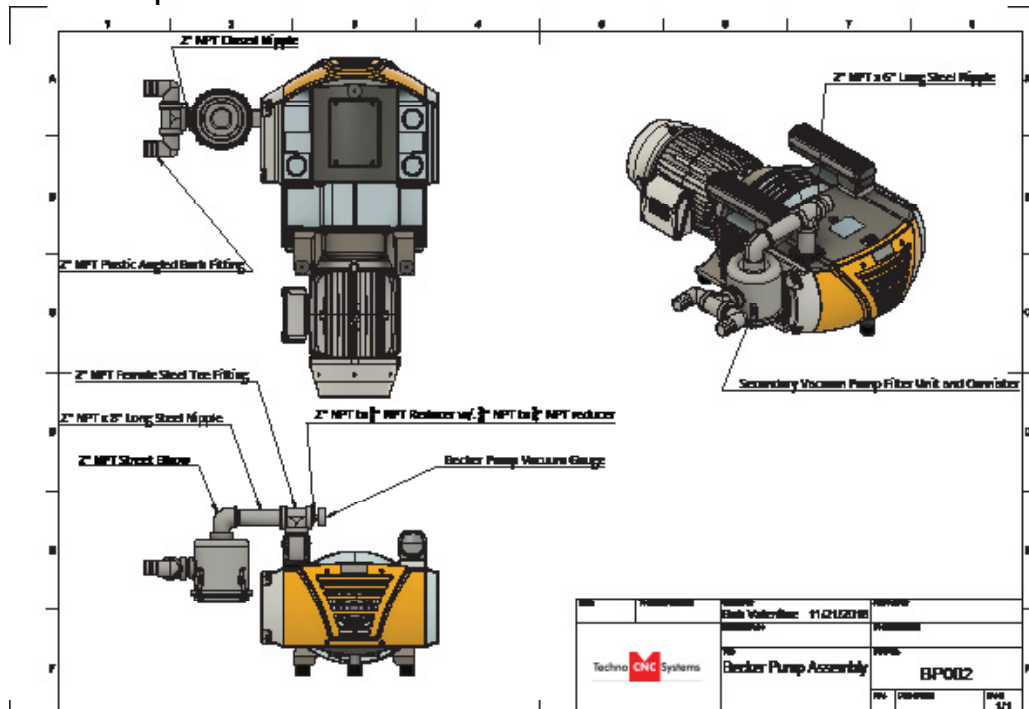
Attach the provided leveling feet to the legs and adjust accordingly until the table is level.

Fig.1.1a

Remove the four brackets used to stabilize the gantry during shipping using a M5 allen wrench. (Fig. 1.1a)

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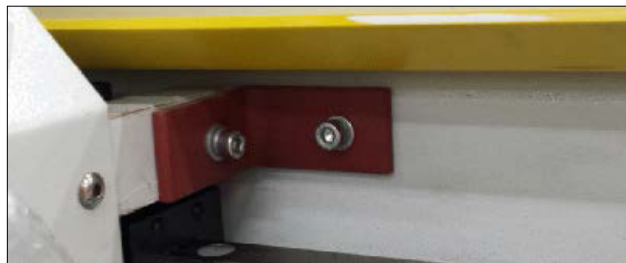
1.1 Vacuum Pump Installation

NOTE:
The cover was removed from Motor Starter Control Box.

Pump/Blower Motor Starter Box & Connector

Three Phase Control Box connects to L1, L2, L3 and GND

You will need to have the electrician connect AC power **(208-230V 3PH)** as specified on the unit to the Motor Starter at L1, L2, L3 and Ground (PE).

WARNING: Direction of Pump Rotation is critical. Briefly start pump and check rotation (arrow on casing). Exchange phases if rotation is incorrect. IF YOU RUN THE PUMP/BLOWER CONTINUOUSLY IN THE WRONG DIRECTION, THE VANES WILL BE DAMAGED.

Fig 1.7 Matching connector that will plug into the controller box (shown left)

The starter box will have a round silver connector attached to a black cable coming out of it. The connector plugs into the socket on the side of the machine (shown in Fig. 1.7). The cable provides the signal to the starter coil to turn the vacuum pump on.

II. TECHNO ATLAS SERIES CONNECTIONS:

The Techno ATLAS Series CNC Router is powered by 208-230 V, 3 Phase. Unless specially requested, the electronics require 3-phase power.

1.1
The Electronics are housed in the large NEMA enclosure as shown in Figure 1.1. When unpacking the machine avoid twisting the cable conduit that guides the cables to the rest of the machine.

Enclosure

Fig. 1.1

1.2
Open the rear of the controller using the provided key located around the emergency stop button or inside of the tool box.

You will now have access to the electronics that drive the CNC. (shown in Fig. 1.2).

The terminals for the power connection are located at the bottom of the box (shown in Fig.1.3)

Fig. 1.2

1.3
Have a licensed electrician connect the 208-230 V, 3 ph power, to the shown terminals (Fig 1.3). Make sure that all local electrical codes are obeyed. For single phase power, connect power to L1 and L3 only.
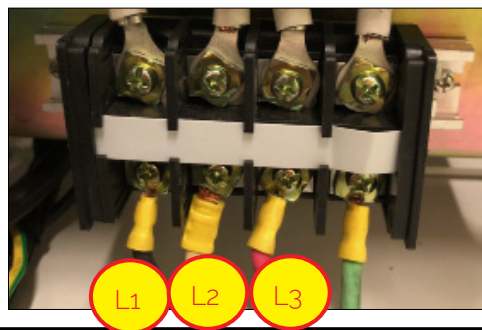
Fig. 1.3

L1 L2 L3

1.4
Unpack the hand-held controller (shown in Fig 1.4) and carefully attach this to the controller board. (shown in Fig 1.5).

Fig. 1.4

1.5
Guide the cable through the hole on the side of the enclosure and attach the hand-held controller to the DB 15 terminal. (Fig 1.5)
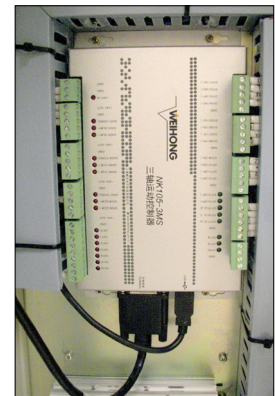
Fig. 1.5

1.6
If the machine has a vacuum hold down pump, there is a matching connector that will plug into the controller box (shown in Fig.1.6). Vacuum Starter Connection

Fig. 1.6

Make sure wire conduit is properly attached as shown in photos - any exposed wiring could be damaged and cause harm to the machine.
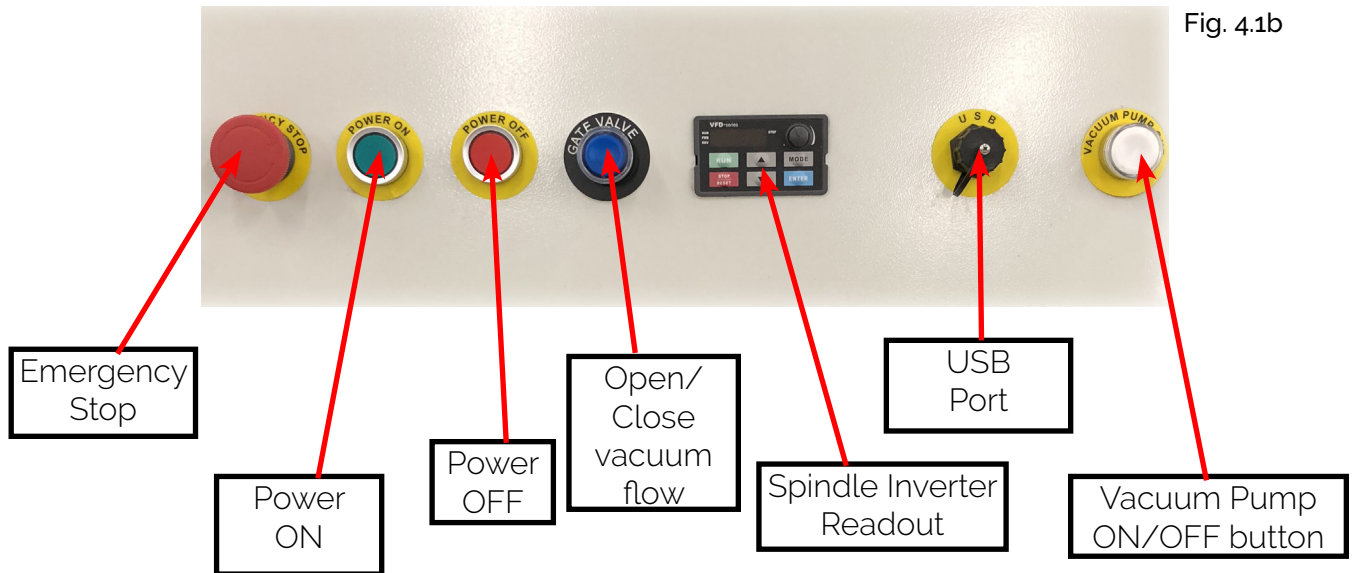

Make sure to attach a ground wire from the ground lug on the back of the machine to a grounding rod.

II.I. Enabling the Atlas Series Machine

4.1 Control Panel Functions

Figure 4.1b shows the buttons and their functions.

Fig. 4.1b

Emergency Stop

Power ON

Power OFF

Open/ Close vacuum flow

Spindle Inverter Readout

USB Port

Vacuum Pump ON/OFF button

4.2 Powering On

Fig. 4.2a

Fig. 4.2b

Turn the machine on by turning the main power disconnect switch (Fig 4.2a) to the upright position. Note: Enclosure doors must be closed for system power to be enabled.
Power is now applied to the controller box. The red light will now light up indicating the machine is powered. Press the green button (fig. 4.2B) to enable system.

If system does not enable and red power button remains illimuniated, check the Emergency Stop button to make sure it is not pressed. Turn Emergency stop clockwise to release.

II.II Atlas Startup

When the machine first powers on, the display on the controller will light up and say "Starting System". (Fig. 2.1a)

Once the system has booted it will ask the user "Back to reference point?" Fig 2.2b
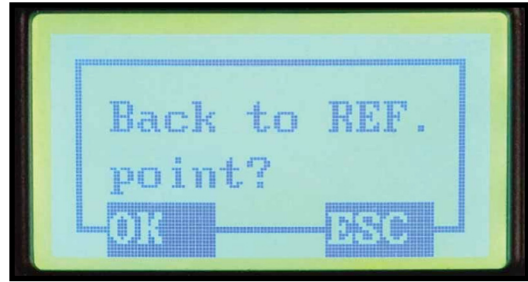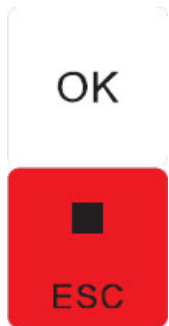
Fig. 2.1a

Fig. 2.2b

This is also known as 'homing' the machine. It refers to the process of the machine finding its mechanical home position.

From this point, the user has two options;
Home the machine or cancel the homing process. We recommend that you home the machine every time you start up.

Pressing "OK" will initiate the homing process. The machine will first move the Z-axis to the top of travel and then the X and Y axis will move simultaneously until both are at the home / reference position at the front left corner of the machine bed.

Press "ESC" will skip the homing process.
WARNING: There will be no reference position and break points, offsets and all functions that rely on a reference position will be invalid.
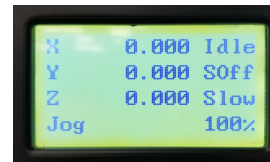
NOTE: The homing procedure can be aborted at anytime by pressing ESC.
Once the machine has moved to its homing position on each axis, it will stop and enter an IDLE state and will be ready to use.

Main Screens:
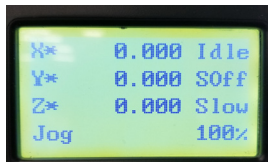
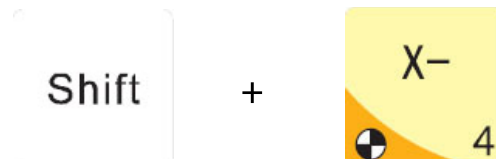This picture shows that the machine **has** been homed due to the X* Y* Z* symbols

This picture shows that the machine **has not** been homed due to the X Y Z symbols (there are no *s next to the symbols)
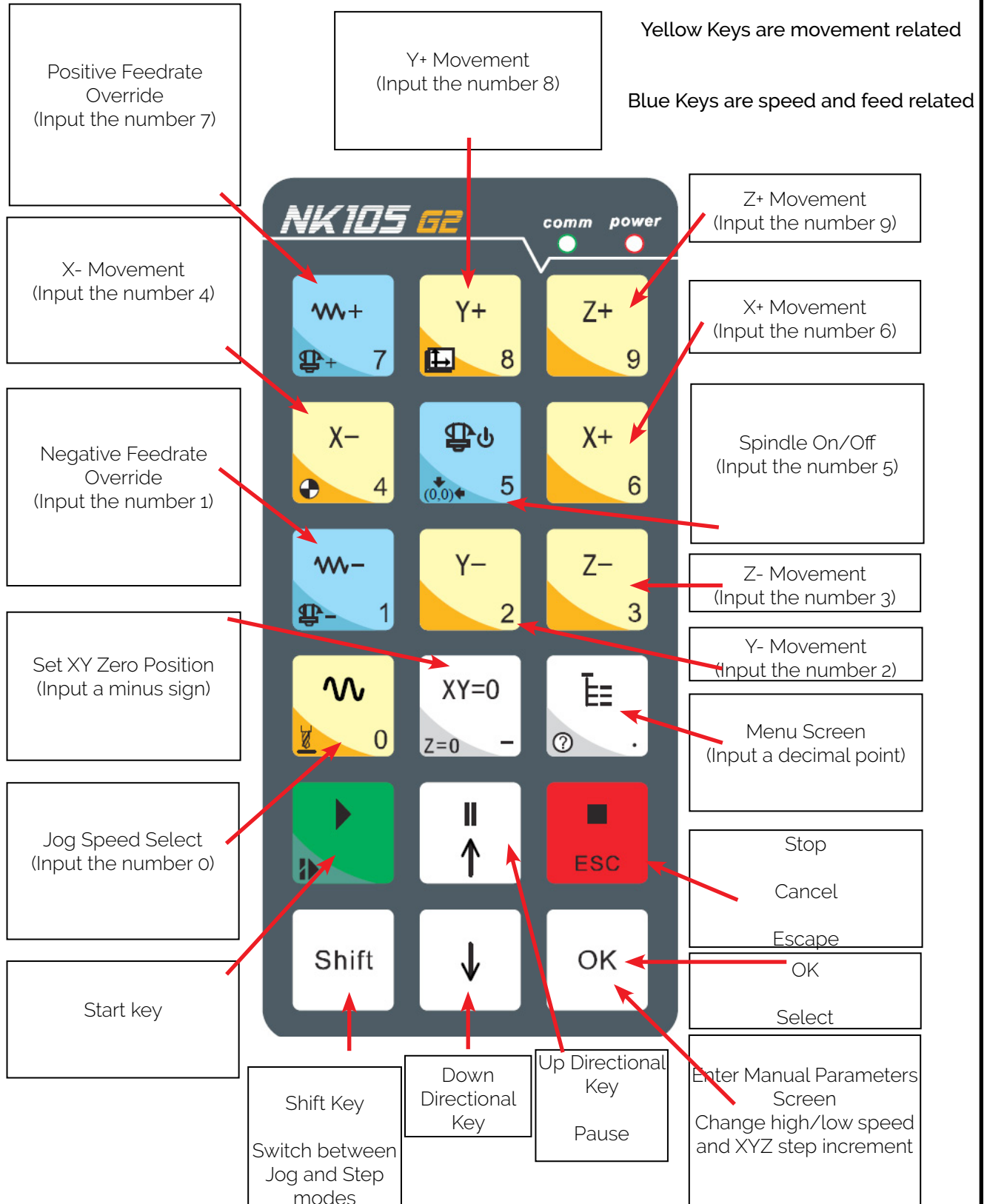
ADVANCED HOMING:
If you hit "ESC" by accident, or would like to reindicate the axes, there are two ways to "Home" again.
1) Press Menu > 3. Operations > 1. Back REF Point > 1. All Home

2) Shortcut   Shift + X– 4

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Single Keystroke Functions on the Handheld Pendant

Yellow Keys are movement related

Blue Keys are speed and feed related

Positive Feedrate
Override
(Input the number 7)

Y+ Movement
(Input the number 8)

Z+ Movement
(Input the number 9)

X- Movement
(Input the number 4)

X+ Movement
(Input the number 6)

Negative Feedrate
Override
(Input the number 1)

Spindle On/Off
(Input the number 5)

Z- Movement
(Input the number 3)

Y- Movement
(Input the number 2)

Set XY Zero Position
(Input a minus sign)

Menu Screen
(Input a decimal point)

Jog Speed Select
(Input the number 0)

Stop

Cancel

Escape

OK

Select

Start key

Enter Manual Parameters
Screen
Change high/low speed
and XYZ step increment

Shift Key

Switch between
Jog and Step
modes

Down
Directional
Key

Up Directional
Key

Pause

Key icon	Key name	Function
	Override+	Increase feedrate override; input the number 7
	Y+	Move Y axis in the positive direction (rear of table); input the number 8
	Z+	Move Z axis in the positive direction (top of travel); input the number 9
	X-	Move X axis in the negative direction (left of table); input the number 4
	Spindle ON/ OFF	Manually turn spindle on/off; input the number 5
	X+	Move X axis in the positive direction (right of table); input the number 4
	Override-	Decrease feedrate override; input the number 1
	Y-	Move Y axis in the negative direction (front of table); input the number 2
	Z-	Move Z axis in negative direction (bottom of travel); input the number 3
	Speed switchover	Toggle between manual jog high/slow speeds; input the number 0
	Clearing	Set XY=0 point (XY origin); input a minus sign
	Menu	Open the main menu; input a decimal point

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Key icon	Key name	Function
	Start	Start machining
	Up	Pause machining; Up direction arrow when navigating menus
	ESC	Stop machining; Cancel; Escape
Shift	Shift	Switch between jog and stepping modes; Auxilliary key
↓	Down	Down direction arrow when navigating menus
OK	OK	OK; Select; Open manual jog/step adjustment screen

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Shift Commands / Combination Keystrokes

To use the shift commands, you must press and hold the shift key and then select a second key.

Key icon	Function
Shift + ⁊ 7	Increase spindle RPM
Shift + Y+ 8	Switch between work (relative) and machine (absolute) cooridinates **When it reads X1 Y1 Z1, that is relative. When it reads X* Y* Z*, that means absolute.**
Shift + X– 4	Go to XYZ home (mechanical origin)
Shift + 5	Go to current work origin (relative origin)
Shift + 1	Decrease spindle RPM
Shift + 0	Set ZO position using touch-off pad
Shift + XY=0 Z=0	Set ZO position manually
Shift + ▶	Resume from breakpoint MO command

III. Operating Tutorials

3.0- Switching Movement to Step or Jog.

There are two modes that allow the user to control the movement of the machine: Jog and Step. To switch between these modes press the "Shift" button. The mode will be displayed on the bottom left of the screen.

Jog- Also known as continuous mode. When a directional arrow is pressed, the machine will move in that direction until the button is released.

Stepping- Also known as step mode. When a directional arrow is pressed, the machine will move an exact amount, as dictated by the manual parameters page. To move again, you must release the button and press it again.

NOTE: See section 3.3 to learn how to change jog speeds and step sizes.
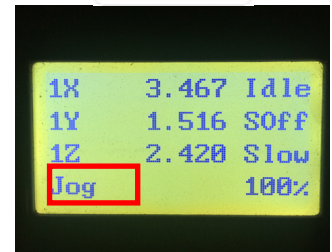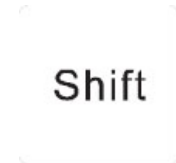
3.1- Jogging the machine and changing from High/Low Jog Speed.

To Jog the machine, hold down one of the Yellow directional keys on the keypad while in Jog mode. The keypad has X+,X-,Y+,Y-,Z+,Z- printed on the keys to indicate direction.

The machine has two speeds, High and Slow.
When the machine starts it will be in the Slow speed.

To toggle between low and high speed press the Jog Speed Select Button. You can only toggle speed when in Jog Mode.
The LCD will display High or Slow on the right of the screen.

Press 'OK' to change the default high and slow speeds, see section 3.3.
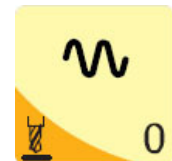
Select between high and slow Jog speeds

3.2- Stepping the machine.

To move the machine in increments, press the shift key once so that the controller indicates "stepping" . When in stepping mode, press down one of the Yellow directional keys on the keypad The keypad has X+,X-,Y+,Y-,Z+,Z- printed on the keys to indicate direction.

This will move the machine in predetermined increments for the axis selected.
By default, the X and Y axes will move in .005 inches and the Z axis will move in .001 inches.
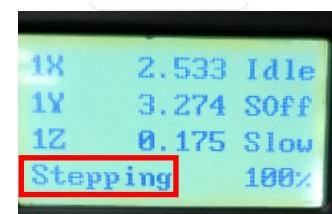
3.3- Modifying the Jog Speed and Step Size

The machine can be jogged at two speeds, slow and high. You can also change the increments in which the machine will move in Step mode. These speeds are set in the Manual Parameters page.

To access the Manual Parameters page press OK from the Main Screen (Not menu)

Low Speed

High Speed

Step Sizes
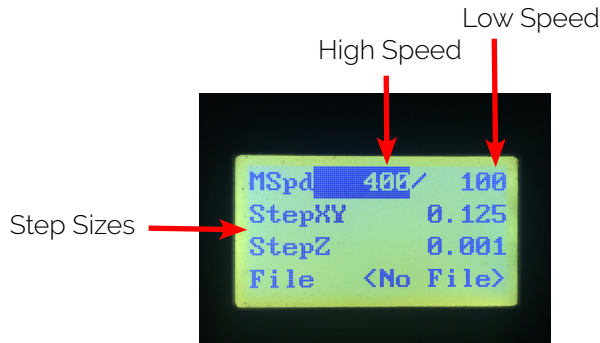
To move the cursor, use the Up and Down directional arrows.
Enter a new value.
Press OK to accept that value.

Set the High and Slow speed to a suitable value.
Adjust the Step value as needed.

To Exit out of this screen and return to the main menu press ESC.

⚠ WARNING:

Adjust the step size carefully. If you set the step size to an excessive value, the machine will move by that value and could damage the machine.

When inputting a decimal increment, you must enter the value as 0.### <Zero+decimal+(your increment)>

3.4- Feedrate Override

While running a G-Code file, the user can manually override the feedrate or cutting speed of the program. The range of the override goes from 0% to 120% of the original feedrate.

The user can override the feedrate using the following keys:
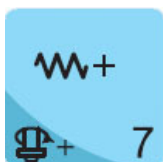
Increase Feedrate
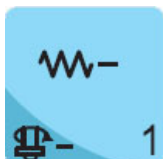
Decrease Feedrate

DO NOT MAKE
0% OR
THE MACHINE
WILL NOT MOVE

3.5- Adjusting the XYZ Zero position/WCS/User Origin.

XYZ zero position, Working Coordinate System (WCS), and User Origin are all the same thing.

Different CAM systems and users just name the concept differently. For convenience XYZ zero position will be used in the rest of this manual.

XYZ zero position is the location point on a drawing in a CAD/CAM package where X,Y and Z all equal zero.

Generally, XY zero is on the bottom left corner and Z zero is the top of the part. In fig 3.5a the letters are located away from the XY zero, all points representing positive integers.
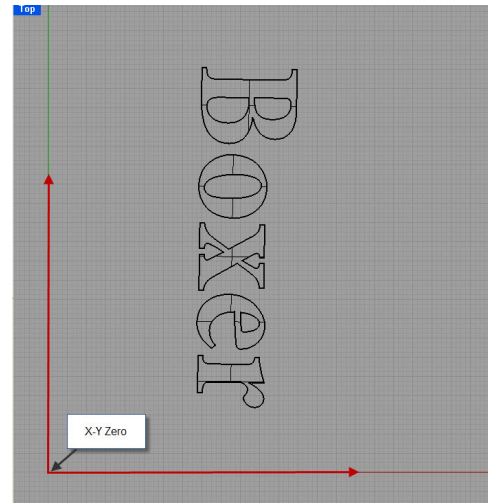
Fig. 3.5a

In Fig 3.5b the object represents the material the letters will be cut from. The machine should be jogged to the corner of the material by using the directional arrows on the keypad. Once the machine is in location press to set XY zero. The coordinates on the controller will change to 0,0.XY zero is now set.
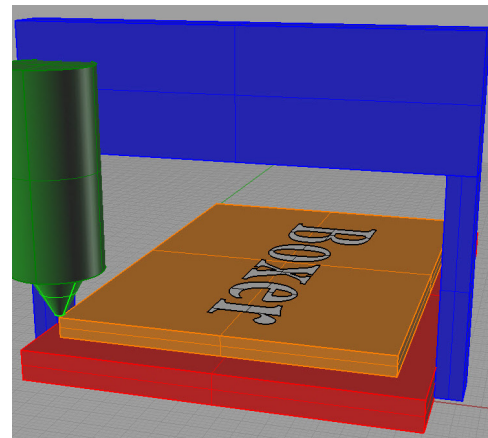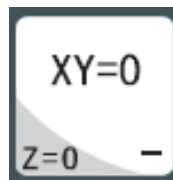
Fig.3.5b

There are two methods for setting the Z-axis zero position:

1. Manual Method: Use the Z-axis directional arrows on the keypad to move the router to the top of the material. Switch to Step Mode to slowly move the machine into position. When the router bit is in position press shift/aux and the Z=0 button as shown.

2. Tool Calibration Pad: Place the touch off pad on top of the material and under the cutter. Press shift and 0 simultaneously. The spindle will slowly move down until it touches the touchpad. The Z axis will now be set to the top of the material.

The Z coordinate will now read 'Z 0.000', according to the Relative Work Origin.
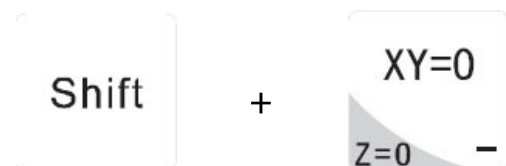
Zero Z-axis Manually
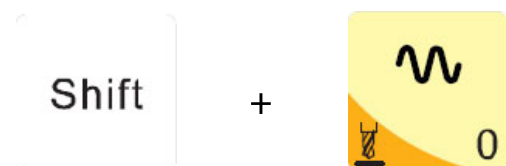
Activate Z-Touch off procedure.

3.6- Loading a G-code File.

Press the Menu button.

Select "2.USB files" to access the flash drive.
Only a G-code file with an "nc" extension with show.

Scroll through the files with [‖ ↑] and [↓]

Select file by pressing OK.

Then load the file by pressing 1.

Note:
Files can be copied from this USB to the controller using the "2" button
Local disk space is limited!

Once a file is copied locally, it can also be selected from the jog speed /step size screen

Loading G-Code file: Before pressing OK (notice that there is no checkmark)

Loading G-Code file: Notice the check mark next to the file I want to work with. The check mark appears after pressing OK. Finally, press 1 to load file, 2 to delete the file, or 3 to copy it.
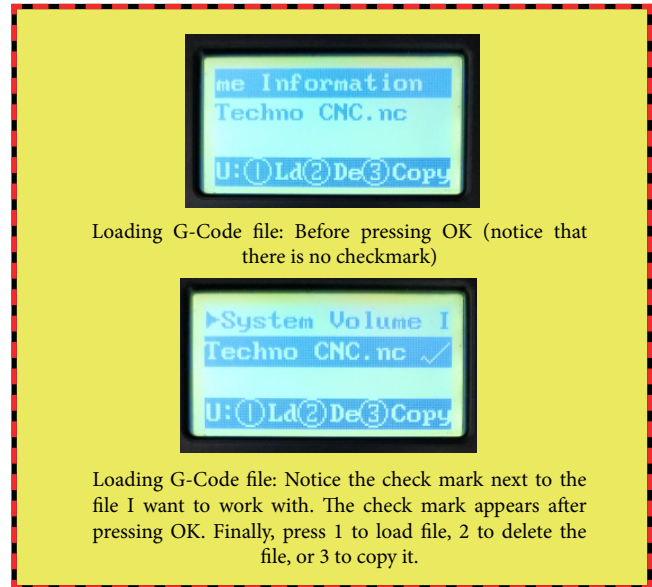
3.7- Running a G-code file.

Once the XYZ origin has been set as per section 3.5 and the file has been loaded as per section 3.6, the user is ready to run the G-code file.

To run the G-code file simply press the start button
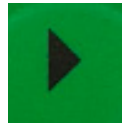
Once the spindle has reached its programmed speed, the machine will move into position to start the first cut.

The file can be paused while running by pressing the pause button.

To resume the file press   To abort the file at any time press

NOTE: When the machine pauses, the spindle will stop and the Z axis will move to the Z clearance/Safe height to allow inspection of the part.

If the machine is jogged off the part during a pause, it will lose its position and when the file is resumed it will start from the new position.

IV. Advanced Tutorials.

4.1- Alternating between Override and Programmed Feedrates.

The controller can run G-code files with speed set by the user on the keypad, override speed, or with speed set in the CAM package/G-code file, programmed speeds.

To determine what speed protocol will be used, do the following:

In the main screen, press menu [icon] to enter the menu screen .

Use the [icon] and [icon] key to scroll the cursor and highlight   4. Oper Param
Press OK to select.

Use the [icon] and [icon] key scroll the cursor and highlight   8. Ignore F code

9. Ignore S code

Press OK to select.

NOTE:
The F or S Option. F stands for Feed rates, and S stands for Spindle RPMs.
Highly Recommended "No" means speed in the G-code file will be obeyed.
"Yes" means speed will be overrode by the controller.

4.2 Setting the Override Speed for a G-code file.

From the main screen, press Menu to access the Menu screen. [icon]

Use the up and down [icon] [icon] to move the cursor and highlight   4. Oper Param

Press OK to select this option and enter the Operations Parameters screen

Use the up and down keys to move between each option + press enter to select the option.
Press OK to edit the data and use the number keys to enter data.
Press OK to save data and Cancel to exit out of the screen.
Keep pressing cancel until you return to the main screen.

1. G00 Speed

2. GXX Speed

G00 Speed is the rapid speed, or the speed the machine moves when the cutter is above the material.
GXX Speed is the speed the machine moves when the cutter is in the material.
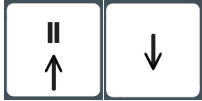
This speed will vary with cutter size, material, cutter type, etc. Great care must be taken when setting feedrates and spindle RPM, otherwise risk broken tools and loss of material.

7.5 How to Use all 6 Work Coordinates

This controller allows a user to have up to 6 work coordinates saved at a time. They are labeled as G54, G55, G56, G57, G58, and G59. The controller should be automatically set for G54 (work coordinate system 1) because next to X, Y and Z on the main screen should be a number 1. In order for the controller to use another coordinate system like G55 (work coordinate system 2), there needs to be another number next to X, Y, and Z, and in this case that would be number 2. In order to change between each coordinate system go to the Main Menu, 3.Operations, and finally 6.Select WCS.

From the main screen, press Menu to access the Menu screen.

Use the up and down   to move the cursor and highlight   3. Operations

Use the up and down   to move the cursor and highlight   6. Select WCS
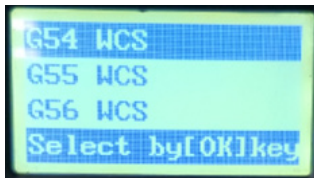
Scroll through each of the WCS and press OK to the work coordinate system that needs to be used.
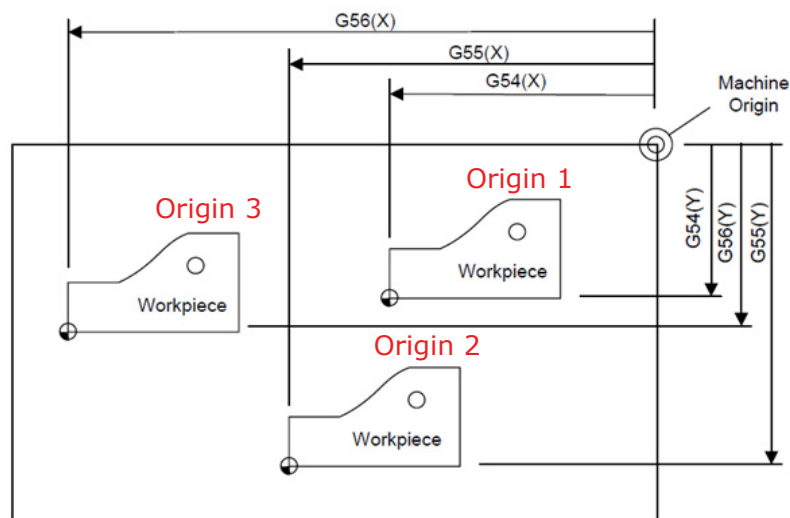
Labeled here is the multiple work coordinate origins that can be saved for certain parts or fixtures. G54 represents Origin 1, G55 represents Origin 2, and G56 represents origin 3, etc

7.6 How to Use the Select Line Number Function

A file that is currently loaded to the machine may be ran using only certain line numbers of the G-Code if the operator chooses to do so. If the operator accidentally presses STOP, they can use this function to run from the last ran G-code line number (For ex: N100). This can be done by using the select line number function on the controller.

First, **turn the spindle on.** Then, go to the Main Menu, then go to the 3.Operations, then go to 3.Select Line No., and then type in the corresponding line numbers you would like to start and stop at.

From the main screen, press Menu to access the Menu screen.

Use the up and down to move the cursor and highlight 3. Operations

Use the up and down to move the cursor and highlight 3. Select Line No.

```
Total:462
StartLi    200
EndLine    462
——Execute Now-
```

```
Total:462
StartLi    200
EndLine    462
  Execute Now-
```
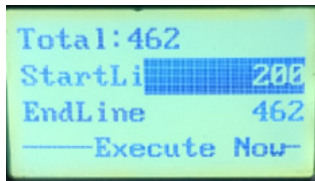
Go to the Start Line and End Line and enter in where you would like to start and end the file. The End Line will automatically be set as the last line in the G-Code unless you decide to change it. Scroll down to Execute Now and press OK for the file to run from the Start Line to the End Line.
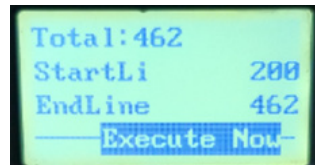
If we take a look at this G-code, we can see that we will be starting from Line 200 and ending the G-code file at 463

USING THE 4TH AXIS ON THE TECHNO ATLAS MACHINES:

Note: The 4th axis on the Atlas Titan machine is not a true 4th axis. You can only use this to do "wrapping" tool paths. This means that the file is designed as a regular, flat, 3-axis file,
which is scaled so that the width matches the circumference of round stock. Then, instead of
cutting flat, the rotary is substituted for the X-axis and the cut follows the circumference of the stock, as if it is being "wrapped" around it.

To change from normal 3-axis operation to rotary operation, you must change some settings in the controller:

1. Press the menu button on the keypad. Go to and press OK to select "5. MFR Param". The password is 33587550.

5. MFR Param

2. Go to and press OK to select "3. Pulse Equiv". Make note of the X-axis value, it should be 0.0075.

3. Pulse equiv

3. Calculate the new pulse equivalent value based on the diameter of the cylindrical stock being used through the following equation:

Rotary Pulse Equivalent = (25.4 * π * D) / 39,700

Where D is the diameter of the rotary stock in inches.

4. Enter the calculated value for Rotary Pulse Equivalent in the location for X under Pulse Equiv. To input a decimal number, please press 0 (zero) first, then the button for the decimal point and then the numbers.

5. Exit the menu and restart the machine. The new settings will now be applied.

6. Now jog to your starting point and set your X and Y origin. This position should be above the rotary part. Note: The X-axis will most likely move at a different speed than normal and the coordinates will not look right.

7. Flip the switch in the front of the machine into Rotary mode.

8. Run your part

To revert back to normal 3-axis operation, follow the first two steps and then put the original value, 0.0075, into the X-axis pulse equivalent variable, then reboot the machine to apply the changes.

Techno CNC Systems

Notes On the G-code File

If a part requires multiple tools, it is best to output a different file for each part.

If the G-code file references a tool number higher than T10, then the controller will give an error at the start of the file. M6 T1 to M6 T10 are allowed.

In general it is best to remove T commands by telling the CAM package that the machine is not a tool changer machine, or insuring that the Tool number does not exceed 10.

G92 is the Axis presetting command, when this command is encountered in the G-code file the XYZ zero position is set at the position the machine is in at that time.

In general it is best to remove this from the G-code file, or if it is in the G-code file, make sure the machine is at the origin before you press start.

The controller will recognise G54 to G59 offset commands.

Acceleration Set

Under the menu MFR Params, there is a sub menu called Velocity.

This menu controls the acceleration and cutting motion of the machine.

The Defaults for these parameters are:
Jerk   310
Single Axis Acc   25
Max Turn Acc   50

A low Max Turn Acc will result in arcs that move in a jerky motion or at a slow speed.

Techno **CNC** Systems

VII. Appendix

ATLAS Settings

High/Low Speeds and Step Distances (from main screen, press 'OK')

MSpd:	800 / 100
Step XY:	0.005
Step Z:	0.005
File:	(active file name)

Note: These numbers can vary.

All following settings can be found by pressing the 'Menu' key and are worded/abbreviated as you would see them on screen.

Note: All settings with '*' on screen requires reboot to take effect.

1. LOCAL FILES
2. USB FILES
3. OPERATIONS
    1. Back to REF Point
        1. All Home
        2. Z Home
        3. X Home
        4. Y Home
    2. Rect Machining
        1. Params Setting
            Engr Depth
            Each Depth
            Tool Dia
            Nose Gap
            Height
            Width
            X Init
            Y Init
            Mode Horiz Mill
            EXECUTE
        2. Load the Last
    3. Select Line No
        Total: ____
        StartLine: ____
        EndLine:_____
        EXECUTE NOW
    4. Machining Info
        Time
        X: _____
        Y: _____
        Z: _____
    5. Park MCS Site

                        1.   Park Mode
                    Not Move
                    To Park Site
                    To WCS Origin
                2.   Park Site
                    1. Input Site
                            Input Park Site
                                X: _____
                                Y: _____
                                Z: _____
                    2. Select Site
                            Select Current Position As
                            Park Pos by [OK] Key
                            Return ny [ESC] Key
        6. Select WCS
                G54 WCS
                G55 WCS
                G56 WCS
                  Select by [OK]
4. Oper Param
    1. G00 Speed
            800.00 in/min
    2. GXX Speed
            400.00 in/min
    3. Back REF First
            YES
    4. Lifts on Pause*
            0.25 inch
    5. Offset →
            1.   Public Offest
                1. X
                2. Y
                3. Z
            2.   Work Offset
                1. G54 Offset →
                    1. X
                    2. Y
                    3. Z   *(settings repeat through G59)*
    6. Cycle Process →
            1.   Cycle Process
                NO
            2.   Cycle Times
                1
            3.   Cycle Interval

```
                              0 ms
                  4.        S-Off in Intev
            NO
      7.  G73-G83 Retract
                  0.0 inch
      8.  Ignore F Code
            NO
      9.  Ignore S Code
            NO
      10. Spindle Stop →
                  1.        S off at Pause*
                  YES
                  2.        S off at Stop*
                  YES
                  3.        S off at End
                  Yes
      11. Ratio on Manu*
            NO
      12. DXF Params →
                  1.        Lifting Height*
                  2.        Process Depth*
                  3.        1st Point as 0*
                  NO
                  4.        Shape Process*
                  NO
                  5.        Bottom Process*
                  NO
                  6.        Metric Size*
                  NO
      13. ENG Params →
                  1.        Lifting Height*
                  0.039
                  2.        Tool Change Tip*
                  YES
                  3.        Cycle Times*
                  1
                  4.        Deep Hole Mode*
                  0
                  5.        Retract Amount*
                  0.25
                  6.        Select Tool No*
                  YES
      14.  Tool Change →
                  1.        ATC Capacity*
```

          10
    2.   Current Tool No
        1
    3.   Tool Offset
      1. Tool 1
          X: _____
          Y: _____
          Z: _____   *(settings repeat through tool 10)*

  15. ENG Unit
     YES

5. MFR Param   **PASSWORD: 33587550**

    1. Velocity →
        1.   Decel Dist
           0.394 inch
        2.   Approach Speed
           25.00 in/min
        3.   Single Axis Acc
           25.00 in/sec^2
        4.   Max Turn Acc
           100.00 in/sec^2
        5.   Jerk
           300.00 in/sec^3
        6.   Max Speed of Z
           125.00 in/min
        7.   Short Seg Spd Lmt
           YES
        8.   SPDLMT Length
           0.1 inch
        9.   Enbl Plunge Rate
           NO
        10.   Z Plunge Cut Spd
           50.00 in/min
        11.   REF Circle Radius
           0.1 inch
        12.   REF Circle Speed
           100.00 in/min
    2. Axis Output Dir →*
       X: Negative
       Y: Negative
       Z: Negative
    3. Pulse Equiv →*

X: 0.007855	0.0062100 (Mini)	0.0012500 (BT1212)
Y: 0.007855	0.0062100 (Mini)	0.0012500 (BT1212)
Z: 0.002500	0.0031720 (Mini)	0.0012500 (BT1212)

4. Machine Stroke →
   1. Strk Upper Lmt →
      X:
      Y: *varies depending on machine size*
      Z:
   2. Strk Lower Lmt →
      X:
      Y: *varies depending on machine size*
      Z:
5. Ref Point Set →
   1. RefP Speed →
      X: 70 in/min
      Y: 70 in/min
      Z: 60 in/min
   2. RefPDir
      X: Negative
      Y: Negative
      Z: Positive
   3. Retract Dist
      1. X Retract Dist
         0.079 inch
      2. Y Retract Dist
         0.079 inch
      3. Z Retract Dist
         0.079 inch
6. Spindle Set →
   1. Spindle Gears*
      7
   2. On/Off Delay
      5000 ms
   3. Initial Gear*
      6
   4. Max Spdl Speed*
      18000
7. Y Rotary Axis →
   1. Y as Rotary Axis*
      NO
   2. Rotary Y Pulse
      0.006 deg/pulse
   3. MM as Unit
      NO
   4. Rev Work Radius
      0.394
   5. Rotary Takeoff

0.291 rad/s
6. Rotary Y Acc
6.98 rad/s^2
7. Max Rotary Vel
30 r/min
8. Backlash Set
1. Compensation on
NO
2. Axis Backlash →*
X: 0.0
Y: 0.0
Z: 0.0
9. Calib Thickness
1.587 inch   *(will vary slightly)*
10. Enable S Algo
YES
11. Arc Incriment
YES
12. Forward Look Seg
50
13. Sign of BK REF
YES
14. Safety Height*
0.25 inch
15. Lube →
1. Enable Auto Lube
NO
2. Time Interval
5000s
3. Duration
5s
16. G00 Feed 100%*
YES
17. Smoothing Time
0.0s
6. Param Upkeep
1. Backup Params
2. Restore Params
3. Factory Params
4. Export Params
5. Import Params
7. System Upkeep
1. Language
1. Chinese

```
                    2.        English
    2.   Export Log
    3.   System Update
    4.   Register
    5.   Help
                Spec: Help Message Show Delay
                Value: 60
                Unit: S
    6.   Reboot
    7.   Exit
    8.   Diagnosis
                    1.        System Info
                        1.   Software Version
                        2.   Card No
                        3.   Remaining Time
                        4.   Register Tmes
                    2.        Port List
                    3.        Keypress Diag
                    4.        Import Diag
                    5.        Outport Diag
```

VIII. ATLAS Machine Lubrication

8.1 Lubricating the X-Y Rack and Pinion

Lubrication is important with rack and pinion gearing systems. A thin film of grease should always be present on the contacting tooth flanks to minimize metal to metal contact.

Lithium grease lubrication is recommend over oil, as the oil lubrication will flow away from tooth flanks.

The grease should be applied to the rails at regular intervals, depending on the usage of the machine. Use a small brush to coat both rails on the side of the Y-axis and the single rail across the X-axis. Fig 8.1
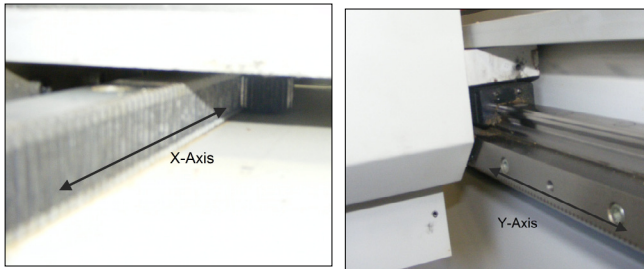
Fig 8.1

8.2 Lubricating the X-Y-Z Rails

The rail carriage bearings are sealed and protected with wipers. The rails should be lightly oiled to allow smooth operation. Avoid a build up of debris on the rails by blowing them off with air, or wiping them down with a rag. The rails do not need to be lubricated as often as the rack, once a month should be sufficient.
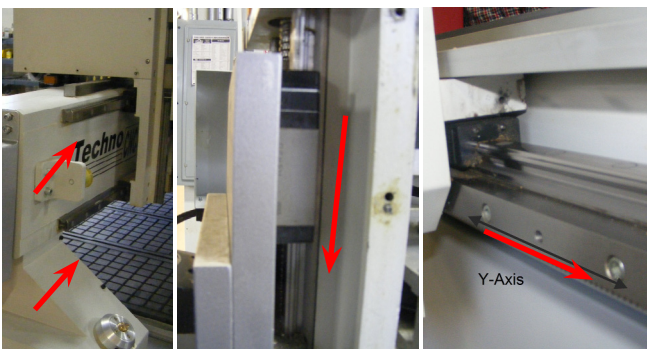
X-Axis   Z-Axis   Y-Axis   Fig 8.2

8.3 Lubricating Z Ballscrew

The Z axis uses a ballscrew and ballnut instead of a Rack and Pinion. The ballnut has a nipple for applying lubrication to the mechanism. Fig 8.3a
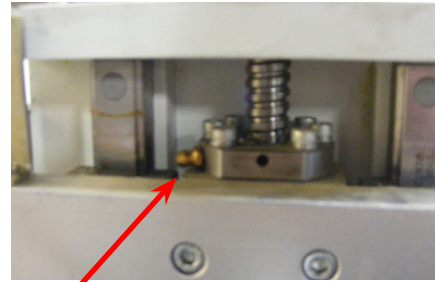
Lubrication Point   Fig 8.3a

Lithium grease is pumped into the lubrication point with the application gun provided with the machine. Fig 8.3b

Fig 8.3b

8.4 Recommended Lubricants

Lithium Based Grease:
Alvania Grease No. 2(Shell)
or Equivalent.
Techno Part No.
        H90Z00-8670T8
Oil:
Vactra No. 2s(mobile)
Tonner Oil or Equivalent.
Techno Part No.
    H90200-LUBE002

Oil and Grease Kit:
Techno Part No.
        H90Z00-LUBEKIT2

Shop all parts, accessories and tooling online at: www.technocncshop.com

NOTE: AVOID A BUILD UP OF DEBRIS ON MOVING PARTS. CLEAN OFF ANY DEBRIS TO AVOID DAMAGING THE MACHINE.

BECKER

Betriebsanleitung	**Driftsinstruks**	**VTLF 2.200**
Operating Instructions	**Driftsinstruktioner**	**VTLF 2.250**
Instructions de service	**Käyttöohje**	
Istruzioni d'uso	**Driftsvejledning**	
Handleiding	**Instrukcja obsługi**	
Instrucciones para el manejo	**Kezelési útmutató**	
Manual de instruções	**Návod k obsluze**	
Naudojimosi instrukcija	**Navodilo za uporabo**	98/37 EG
Kasutusjuhend	**Návod na obsluhu**	2006/95 EG
Lietošanas instrukcija	**El Kitabi**	
Οδηγίες χρήσης	**Инструкция по эксплуатации**	
取扱説明書	使用说明书	
사용설명서		

CE

DIN EN ISO 14001:2005

DIN EN ISO 9001
001929 QM

MAX.
VACUUM → mbar

MAX. V̇ → m³/h

DIN EN ISO 2151	L_{pA} = **75-77** dB(A) - 50Hz
	L_{pA} = **77-79** dB(A) - 60Hz
DIN EN ISO 3744	K_{pA} = 3 dB(A)

☑ **AIR**

250 kg
551 lbs

A > 400mm
A > 16"

> 5°C/41°F
< 45°C/113°F

max. 90%

max.
800m

90°

1

2

BPC 28100052202 04/09

Techno CNC Systems

3

No. 2

5 mm

13 mm

4

5

8

6

BECKER
Mat.Nr. XXXXXX   ENXXXX   CE
3~Mot. XXXXXXXX
NoUD XXXXXX   xx

50 Hz	XXKW	60 Hz	XXKW
xxx-xxx / xxx-xxx V △ /Y		xxx-xxx / xxx-xxx V △ /Y	
xx-xx / xx-xx A		xx-xx / xx-xx A	

cos φ 0.XX-0,XX   cos φ 0.XX-0,XX
XXXX-XXXX /min   XXXX-XXXX /min   XX kg

7

L2
L1   L3

L2 L1 L3

Softstart

U

t

U1 V1 W1

M
3~

optional

M   M
3~   3~ υ

PTC   Bi-metal

8

MAX.
6x /h

I =ON

0 =OFF

< 2m	$\phi\, \mathbf{2}_{1/2}$"		
2m...3m	$\phi\, \mathbf{2}_{1/2}$"	+	-p
> 3m...10m	$\phi\, \mathbf{3}$"	+	VACUUM

9

A.

B.

0 = OFF

C.

40 - 200 h ▶ AIR ?

D.

F1

E.

VTLF 2.200 **SK**
VTLF 2.250 **SK**

F.

VTLF 2.200 **SK**
VTLF 2.250 **SK**

G.

F2 F2
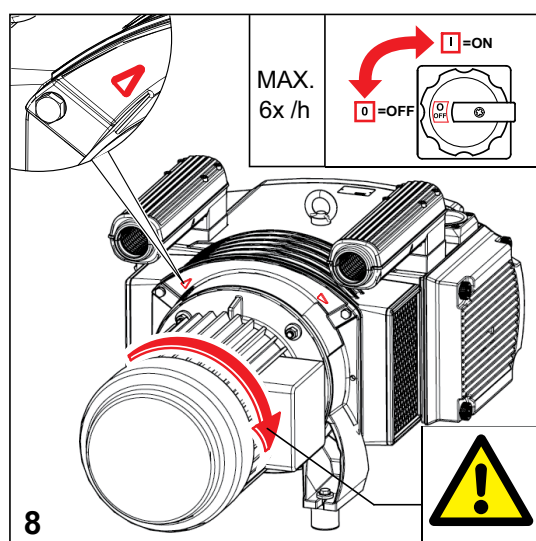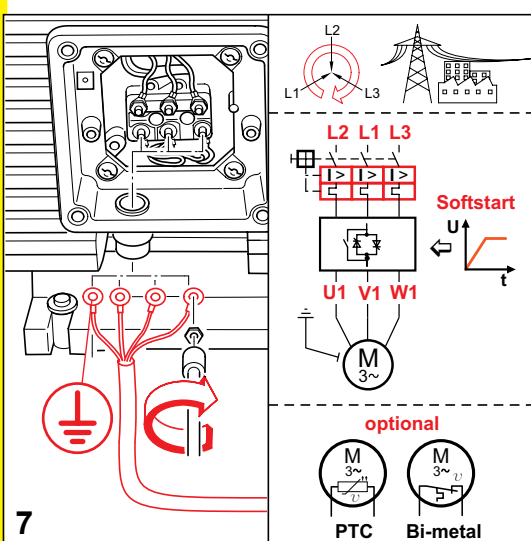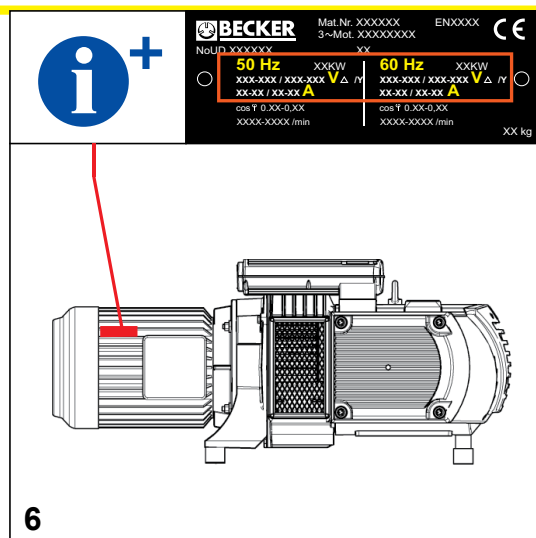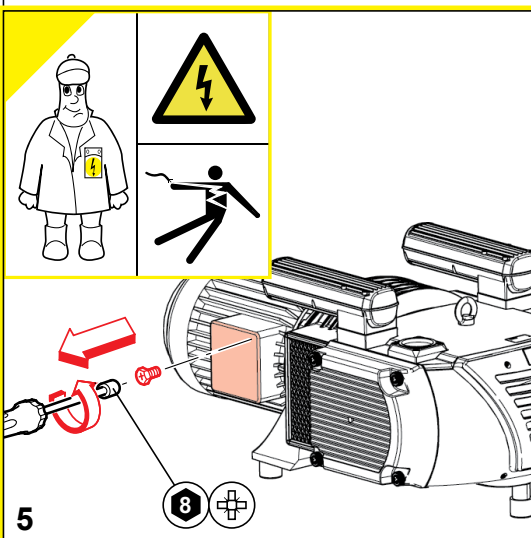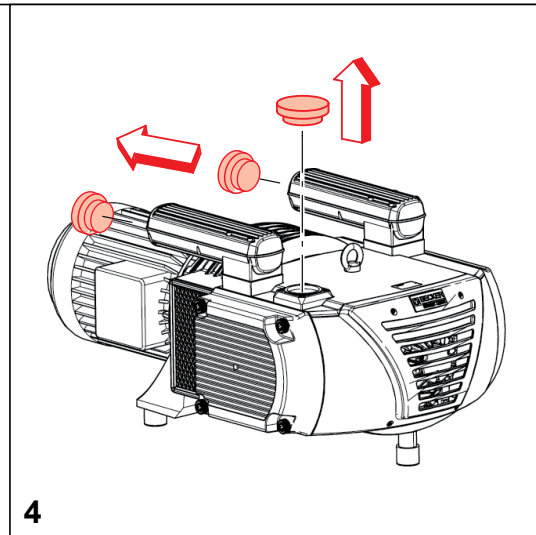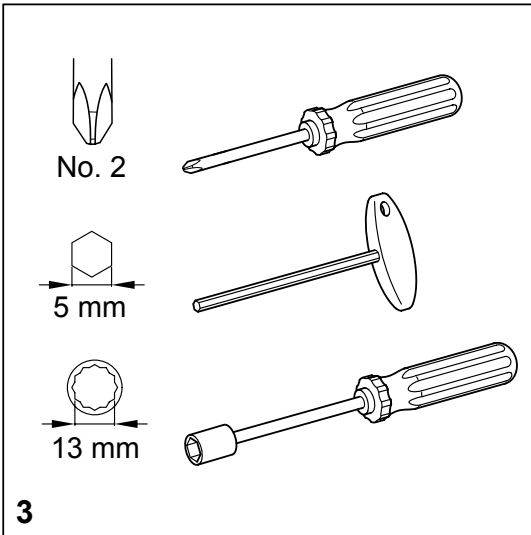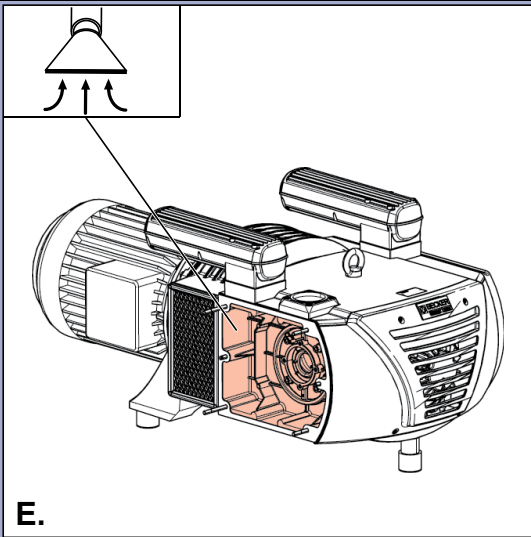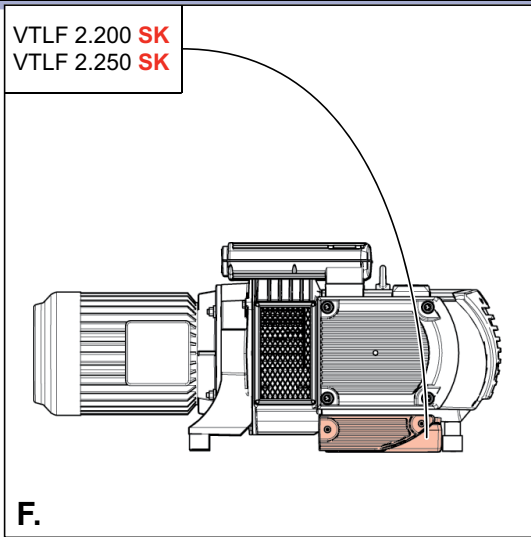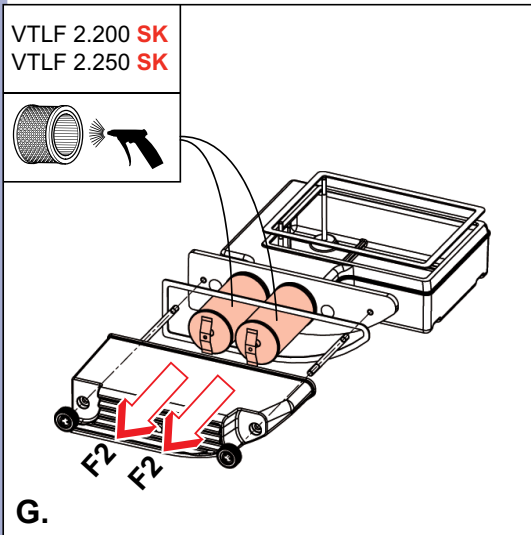
F1
D: 218 mm
H: 122 mm
No.: **909512**

F2 (VTLF - **SK**)
D: 64 mm
H: 120 mm
No.: (2x) **909510**

H.

3000 h

I. 5

J. 13

Techno CNC Systems

K.

A MAX. MIN.

$A_{MIN} > 41mm$

$A_{MIN} < 41mm$

→ No. 90136701005 **(SET)**

L.

M.

N.

3000 h

O.

No. 743303

Amblygon
TA 15/2

2x 10g

P.
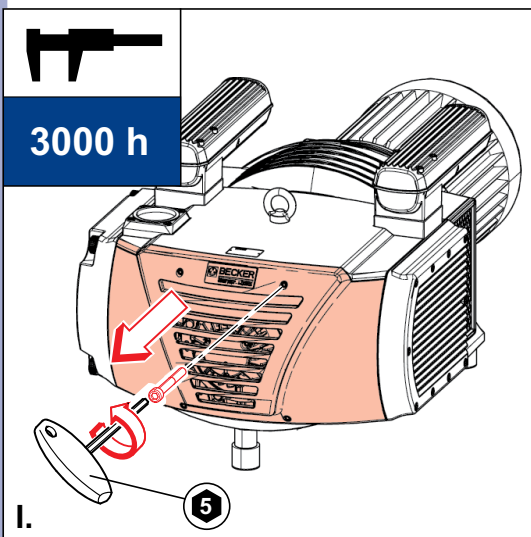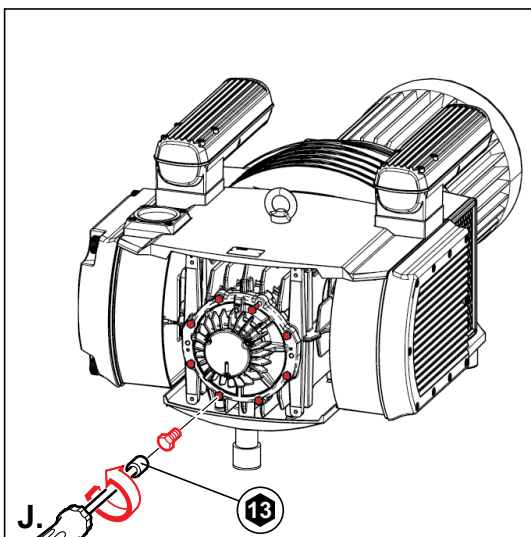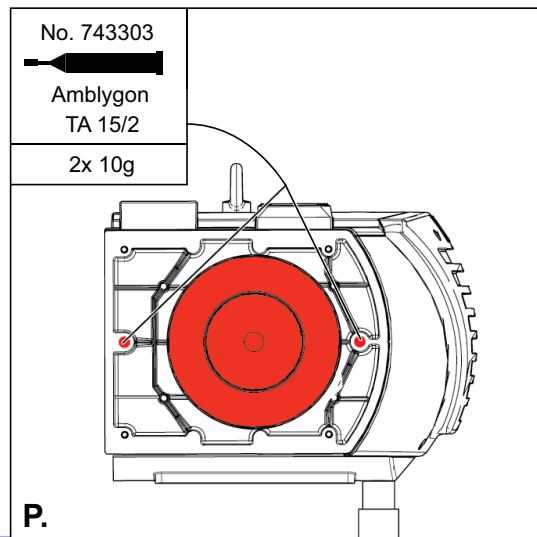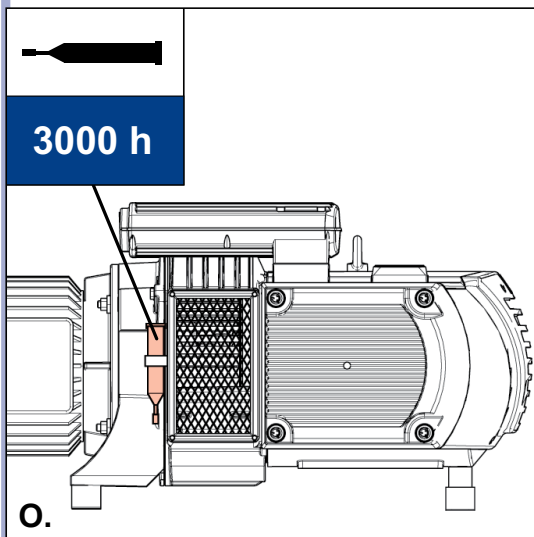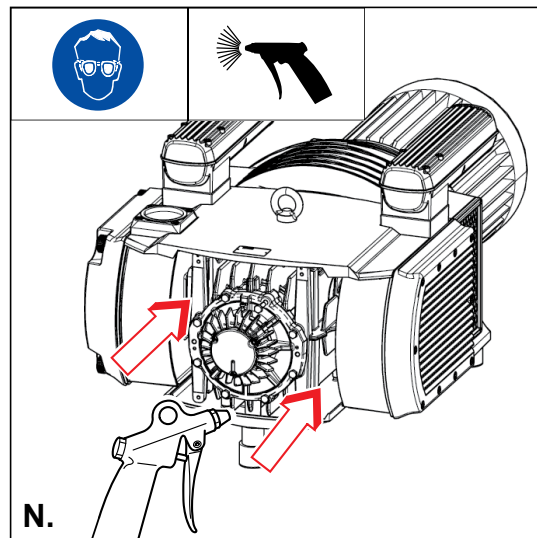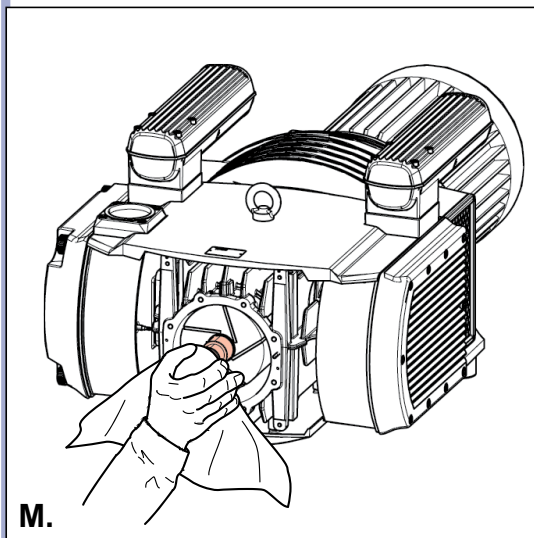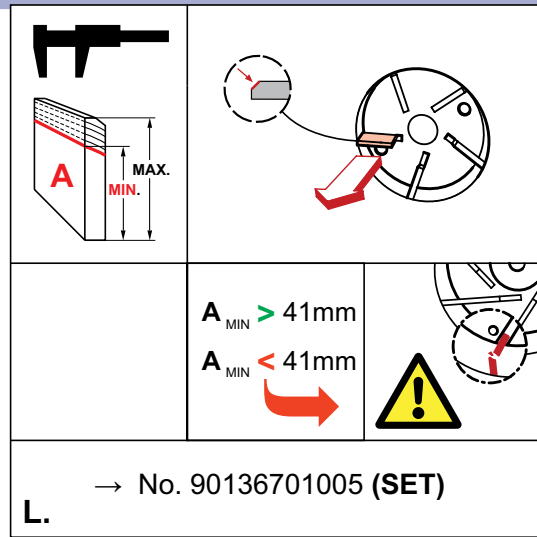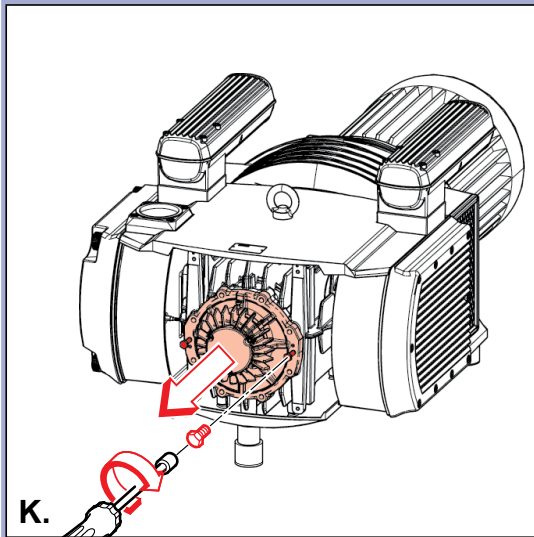
TLF 2.250-2.500
Internal Filter Inspection

-Tools required-

Flashlight

ATTENTION

VISUAL CLUES REGARDING VTLF 2.250 FILTER MAINTENANCE SHOULD NOT ALWAYS BE THE SOLE INDICATOR OF WHETHER A FILTER IS "CLEAN".

THOUGH THE FILTER HAS TREMENDOUS SURFACE AREA, THE DEEP PLEATING OF THE FILTER MAY DISGUISE WHETHER THE FILTER IS CLOGGED.

A PERIODIC PHYSICAL INSPECTION SHOULD BE PERFORMED TO MAKE SURE THERE IS A GOOD FLOW OF AIR THROUGH THE FILTER.

A CLOGGED FILTER IS ALMOST ALWAYS THE CAUSE OF PRE-MATURE VANE WEAR OR IN SOME CASES, PUMP FAILURE

-Remove the (4) black knobs by hand-
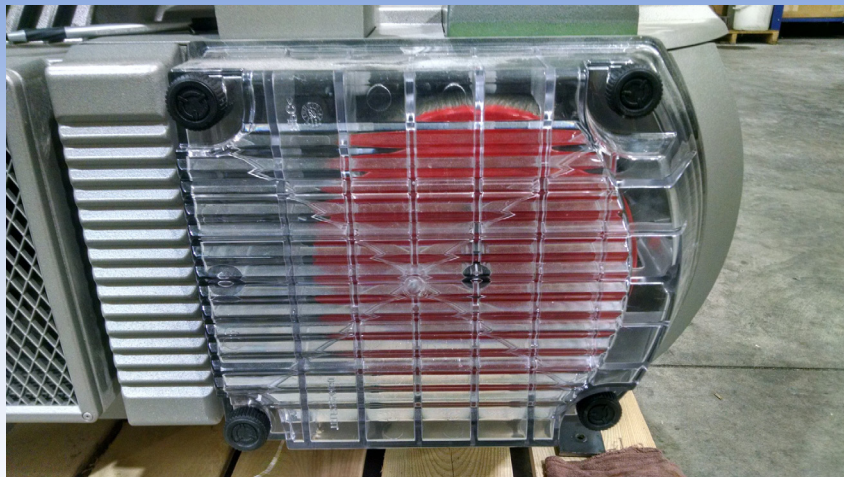
-Remove the internal filter and look for debris-

-Check for large debris deposits. This is an indicator that the filter caught the smaller particles-
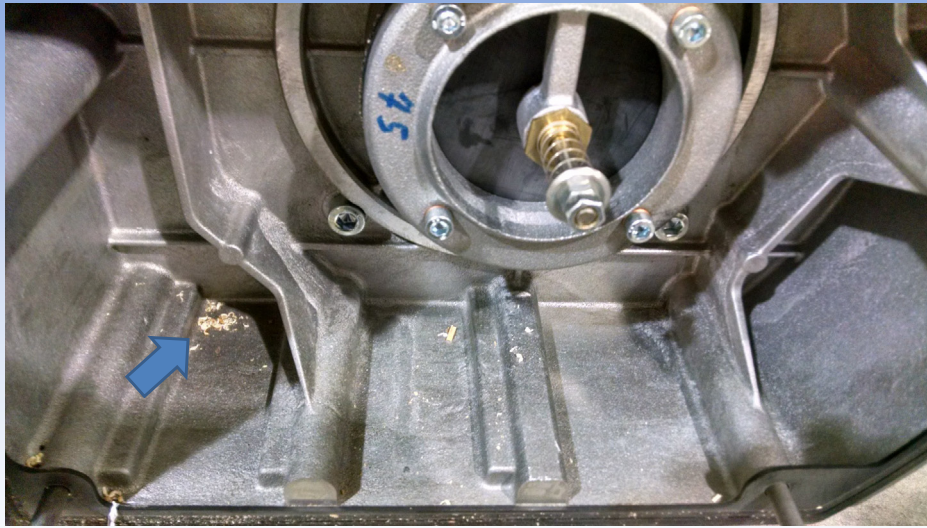
-Use a flashlight on the outside of the filter-

Atlas Series Manual

If light **cannot** be seen on the inside, the filter is clogged and needs replaced.

-If you **can** see light, then blow out the filter using compressed air and replace-

- This needs to be a modest amount of light.

- Light should be present through each pleat.

Greasing TLF 2.200-2.360

-Tools required-
X1 – 7433050000
(50 gram grease gun)

BECKER

Author: Mike Ruff
Becker Pumps Corp.

Greasing instructions

The greasing instructions can be found on step "P." in the operation manual sent with each pump.

Or they can be found at
www.Beckerpumps.com

Bearings are to be grease every 3000 – 4000 hours

Special grease
No. 74330300000

25x

25x ◆◆ (≈10g)

P.
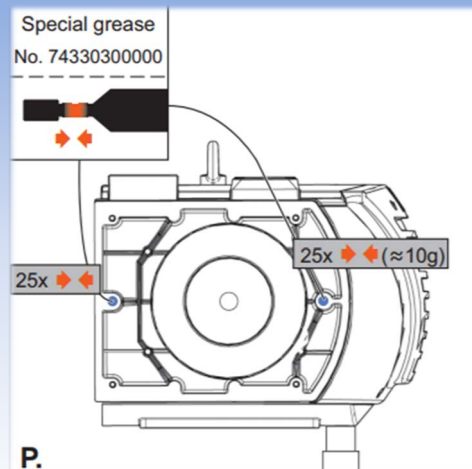
BECKER

Author: Mike Ruff
Becker Pumps Corp.

All new units come with new grease guns.

(Found in either of the two places below)
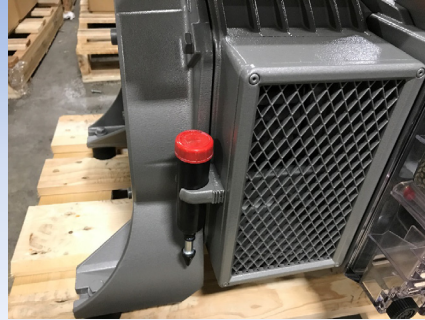
Author: Mike Ruff
Becker Pumps Corp.

GREASING PROCEDURE

Author: Mike Ruff
Becker Pumps Corp.

Remove the filter cover by loosening the black hand knobs.
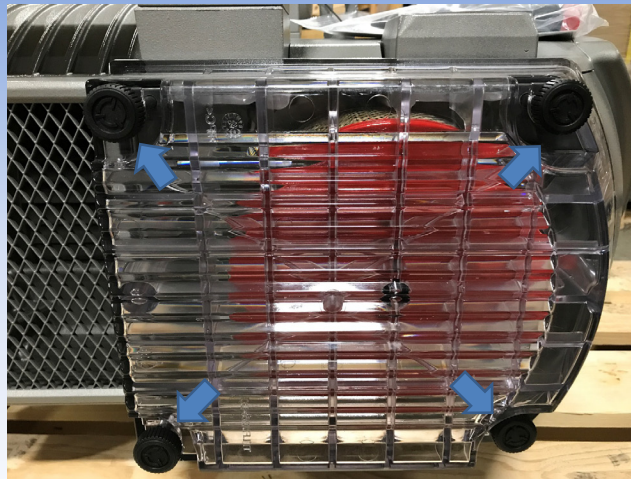
Author: Mike Ruff
Becker Pumps Corp.

Remove the internal filter and replace if needed.

Grease fittings are found next to the filter.
(Remove the red caps.)

Author: Mike Ruff
Becker Pumps Corp.

Remove the black cap from the grease gun

Author: Mike Ruff
Becker Pumps Corp.

Prime all new grease guns by placing them at an angle against a hard surface.

Pump a few times until the grease is visible at the tip.

Author: Mike Ruff
Becker Pumps Corp.

Place the grease gun against the push fitting

Pump 10x into each bearing

(New or dry bearings = 25 times per bearing)

BECKER

Author: Mike Ruff
Becker Pumps Corp.

Once the pump is ran, the grease will evenly distribute between the rollers and ball bearings.

BECKER

Author: Mike Ruff
Becker Pumps Corp.

DAILY MAINTENANCE

Check the machine before start up and clean it after every use.

Check to ensure chips and dust are not caught in the X, Y or Z ball screws. Dislodge all chips and thoroughly clean dust.

Make sure the machine bed is clear of obstacles.

REGULAR MAINTENANCE

Generally, this maintenance should be completed every month

Moving parts on the machine may loosen or displace over time from regular operation and dust that forms during regular machine operation will often stick to the lubrication oil used on thhe moving parts of the machine (ballscrew, linear rails). This dust can cause premature wearing and damage to the precision bearings.

Inspect the hardware of each component on the machine, checking for loose bolts in case they have loosened over time. Pay special attention to linear rails, bearing blocks, spindle plates, limit switches and gantry uprights.

Loose harware can result in the machine going out of square, poor accuracy and repeatbility, damage to components and broken wires.

Check to make sure that any wires are not being pinched or crushed by moving mechanical parts.

Listen for abnormal noises during operation, Grinding noises, squeals and/or banging sounds are NOT normal,

Clean grime and any accumulated lubricating oil off the guide rail and bearing blocks.

Turn on power to the machine and move it to clean and lubricate everywhere along the guide rail and rack and pinion.

Lubricate ball screw assemblies monthly to ensure peak mechanical performance.

Thoroughly clean components of any excess lubrication before fresh coating.

Ball screw assemblies should be lubricated via the grease nipple using a grease gun.

Check your machine for squareness and for backlash. Out of square machines and machines with backlash are indicative of a crash or loose hardware.

Techno CNC Systems

IX. Atlas Troubleshooting

Problem	Solution
Hand held controller display is blank with no power	Ensure the machine has power and is turned on.
	Ensure that the 24V power supply has its green LED indicating it is on.
	Make sure the NK105 controller has power.
	Make sure the handheld conroller is plugged in.
	Make sure the Emergency stop switches are not pushed in
	Make sure the wire harness from enclosure is plugged in.
Machine will not jog or move	If the handheld controller say "ESTOP" in the top right hand corner, the machine has moved beyond its limit.
	Shut down and manually push the machine off its limit switches
	Ensure the feedrate override is not set to 0%
Machine crashes during homing process	To confirm the limit switches are working properly, place a metal screw driver over any of the (3) axis limit switches, and the LED light on the switch itself should turn on and off.
	When the machine is moving, ensure its metallic striker plate is passing close enough to the switch for it to trip.
Axis motor has loud bang or grinding sound	Motor has stalled, lower speed, re-home
Spindle will not turn on	Ensure enclosure is closed
	Ensure VFD display does not display error, if so, full power restart
Touchpad is no working, spindle crashes down	Ensure touchpad works by touching pad to ground on machine and showing GX16 input tripping
	Wire may be broken
	Spindle may have worn bearings
	Tool may not be suitable for touchpad

TECHNO CNC SYSTEMS LIMITED WARRANTY & COVERAGE

Limited Warranty On Techno Brand Products

Subject to the terms and conditions set forth in this warranty document, Techno CNC Systems LLC ("Techno") warrants its Techno brand products ("Product" or "Products") to the original purchaser for a period of one (1) year against defects in material and workmanship under normal use and conditions ("Product Limited Warranty"). The Product Limited Warranty commences on the date of Product shipment from Techno facilities and expires one (1) year from the ship date ("Product Warranty Period").

Spare or replacement parts ("Part" or "Parts") for Techno Products are warranted to the original purchaser for a period of ninety (90) days against defects in material and workmanship under normal use and conditions ("Parts Limited Warranty"). A Parts Limited Warranty commences on the date of a Part shipment from Techno facilities and expires ninety (90) day from the ship date ("Parts Warranty Period").

A Product Limited Warranty may be validly transferred to one additional party by the original purchaser provided that a reregistration fee is paid to Techno within seven (7) days of transfer of the Product and prior to the expiration of the Warranty Period. Reregistration of any Product warranty does not extend the Warranty Period. A Parts Warranty is not transferable.

Product Limited Warranty and Parts Limited Warranty are hereinafter referred to collectively as "Limited Warranty." Product Warranty Period and Parts Warranty Period are hereinafter referred to collectively as "Warranty Period."

What Is Covered Under The Limited Warranty

During the Warranty Period, Products and Parts that Techno deems validly subject to a warranty claim will be repaired or replaced, in Techno's sole discretion, without charge. Repaired items may include new or refurbished replacement parts. Replaced items may be new or may be manufactured from serviceable used parts. Items that have been repaired and/or replaced will be warranted only for the unexpired portion of the applicable Warranty Period to the original purchaser.

As a condition to this Limited Warranty, customers shall have read the operator's manual and registered the Product or Part with Techno within 30 days of purchase.

What Is Not Covered Under The Limited Warranty

Events That Are Not Covered Under This Limited Warranty Include:

* Normal maintenance services as outlined in the operator's manual or other operational instructions provided by Techno (such as oil change, cleaning, lubrication and adjustments).
* Replacement of consumable items such as oil, lubricants, belts, router bits, or other items subject to normal service replacement.

* Product/Part damage resulting from third-party parts, accessories or systems connected to or used in conjunction with the Product/Part that have adversely affected its operation, performance or durability.

* Product/Part damage caused by normal wear, accidents, improper maintenance, improper use or abuse, alterations, or failure to follow operation and maintenance instructions contained in the operator's manual.

* Products/Parts purchased from any supplier, distributor or dealer not authorized by Techno.

* Labor costs including, but not limited to, such costs as the removal and reinstallation of a component or assembly.

* Insurance and packing costs for a defective items returned to Techno by the customer.

* Product/Part damage caused by electrical surges, improper venting, flooding, fire, freezing, corrosive atmospheric elements, abnormal external temperature, or any event of force majeure such as riot or act of war.

* Noise or vibration unless it is the result of defective material or workmanship of the Product/Part.

* Claims of defective Products or Parts not made in conformance with Techno's return policy as set forth below.

* Transport costs for defective items that require more than one (1) shipping to remedy a claimed defect.

* Claims for personal injuries, incidental or consequential damages, or economic loss (profit or revenue), however caused. i.e. any other incidental, consequential, indirect, special and/or punitive damages, whether based on contract, warranty, tort (including, but not limited to, strict liability or negligence), patent infringement, or otherwise, even if advised of the possibility of such damages. Some states do not allow the exclusion or limitation of certain damages, so the above exclusion or limitation may not apply to a particular customer depending on location.

* CLAIMS FOR PRODUCT COMPONENTS OR PARTS THAT ARE WARRANTED SEPARATELY BY THEIR RESPECTIVE MANUFACTURER(S) OR SUPPLIER(S). Available warranties covering those components are furnished with each Product and Part. Techno CNC Systems does not assume any warranty obligation or liability for components covered exclusively by the stated warranty of a component's respective manufacturer(s) or supplier(s).

Techno's Limited Warranty Shall Be Void In The Event Of An Occurrence Of Any Of The Following:

* Failure by the Original Purchaser to register the Product within thirty (30) days of its purchase.

* Where applicable, failure to validly reregister the Product within seven (7) days of transfer of the Product and prior to the expiration of the Warranty Period.

* Improper installation of the Product, including but not limited to, installation in violation of applicable rules, laws or building codes, and installation for non- recommended uses.

* Accident, abuse or misuse of the Product.

* Failure to follow or comply with the user's operational manual.

* Modification, alteration, addition of non-approved components, or misapplication of the Product or Part in any manner.

* Repairs and service conducted by personnel unauthorized by Techno.

* Modifications to, and tampering with, the Product or Part.

* Use of non-standard parts or accessories without prior written approval from Techno.

* Use of Product or part for purposes for which the item was not designed or intended.

* Cancellation or recall of equipment/parts payment to Techno without specific prior written authorization from Techno.

Warranty Limitations

Techno's maximum liability hereunder is limited to the original purchase price of the Product or Part.

Techno assumes no responsibility for the selection of any Product or Part for a specific application absent Techno's written approval of such application, and makes no general representations whatsoever in respect to any such selection.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED. ALL OTHER WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WHETHER EXPRESSED, IMPLIED, OR ARISING BY OPERATION OF LAW, TRADE USAGE, OR COURSE OF DEALING, ARE HEREBY DISCLAIMED. THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE DESCRIPTION ON THE FACE OF THISE WARRANTY DOCUMENT.

TECHNO SHALL NOT BE LIABLE FOR INDIRECT, INCIDENTAL, SPECIAL, CONSEQUENTIAL, PUNITIVE OR OTHER SIMILAR DAMAGES THAT MAY ARISE, INCLUDING LOST PROFITS, DAMAGE TO PROPERTY OR INJURIES TO A PERSON, LOSS OF USE, INCONVENIENCE, OR LIABILITY ARISING FROM THE INSTALLATION, SERVICE OR USE OF THE PRODUCT OR PART.

UPON THE EXPIRATION OF THE LIMITED WARRANTY PERIOD, TECHNO'S LIABILITY UNDER THIS WARRANTY SHALL TERMINATE.

Some states do not allow the contractual exclusion or limitation of incidental or consequential damages or personal injury, so the limitations set forth herein may not apply to all customers in all locations.

How To Obtain Warranty Repair/Replacement

All defective items covered under the Limited Warranty must be properly returned to Techno for inspection. Techno reserves the right to not accept returns unless the returned item is accompanied by proof of original purchase, a return authorization number ("RAN") from Techno, and shipped in accordance with packaging and shipping instructions given to the customer by Techno. Claims and requests for a RAN must be made within seven (7) days of discovery of a defect. Proper packaging and insurance for transportation is solely the customer's responsibility. All returned items must be sent to the Techno facility located in Ronkonkoma, New York (or such other place as Techno specifically designates to the customer) with a statement of the problem and transportation prepaid. If, upon examination, Techno determines that a warranted defect exists, the returned item will be repaired or replaced in Techno's sole discretion at no charge, and shipped prepaid back to the customer. Return shipment will be by common carrier of Techno's choosing. If rapid delivery is requested by customer, then such transport expense shall be borne by the customer.

Warranty inspections and repairs are performed at Techno's New York facility, where all necessary diagnostic and repair equipment is available. This equipment is difficult to transport and field service is accordingly severely limited and will only be supplied at Techno's sole discretion. If field service is required, all service call expenses, including transportation, travel time, subsistence costs, and the prevailing cost per hour (eight hour minimum) are the responsibility of the customer.

In the event that support diagnostics of a covered Product or Part requires an item to be shipped more than one (1) time for any given claimed warranty defect, then the customer shall bear all transport costs.

If an out-of-warranty situation exists, the customer will be notified of the repair or replacement cost. At such time, the customer must issue a purchase order to cover the cost of the repair/replacement or authorize the item to be shipped back to the customer at the customer's expense. In all cases, a restocking charge of twenty (20%) percent will be charged to the customer on all items returned to stock.

Warranty claims will not be reviewed or remedied unless the warranty registration is received by Techno within thirty (30) days of the purchase date. All warranty issues must be handled through Techno.

Techno customer service can be reached by calling 631-648-7481.

Additional Terms & Conditions

TECHNO RESERVES THE RIGHT TO CHANGE DESIGNS, SPECIFICATIONS, PRICES AND ANY APPLICABLE DOCUMENTATION WITHOUT NOTICE TO THE CUSTOMER.

Techno is not liable for delay or failure to perform any obligation hereunder by reason of circumstances beyond Techno's reasonable control. These circumstances include, but
are not limited to, accidents, acts of God, strikes or labor disputes, laws, rules, or regulations of any government or government agency, fires, floods, delays or failures in delivery of carriers or suppliers, shortages of materials, and any other event beyond Techno's control.

No legal action arising out of any claimed breach of this Limited Warranty may be brought by the more than one (1) year following date of purchase of a Product or Part. This Agreement shall be governed in all respects by the laws of the State of New York, United States of America. Any legal action brought by a customer against Techno must be brought in the state courts of the State of New York, Second Judicial Department. Some states do not allow the contractual limitation of time periods for bringing suit so the limitations set forth herein may not apply to all customers in all locations.

Once an order is placed by the purchaser, in no event shall purchaser cancel payment or any portion thereof (e.g. reverse charges on a credit card or stop payment on a check) without prior express written authorization from Techno. Failure to obtain prior express written authorization from Techno shall be an event voiding Techno's Limited Warranty on the Product or Part and purchaser shall be subject to liability for any damages sustained by Techno.

The terms and conditions contained herein shall constitute the entire agreement concerning the Limited Warranty described herein. No oral or other representations are in effect. No dealer, distributor, or individual is authorized to amend, modify, or extend this Limited Warranty in any manner and only the warranty expressed in this warranty document is extended herein by Techno. Statements made outside this warranty document, such as in dealer advertising or presentations, whether oral or written, do not constitute warranties by Techno and should not be relied upon.

Section headings contained in this warranty document are for informational purposes only and may not be used to limit the terms and conditions set forth in this warranty document. If any portion or provision contained in this Limited Warranty & Coverage shall to any extent be found to be invalid or unenforceable, the remainder of this coverage or the application of such portion or provision in circumstances other than those in which it is held invalid or unenforceable, shall not be affected thereby, and each remaining portion or portion of this Limited Warranty shall be valid and enforceable.