

This document will provide a quick guide to the set up and operation of the Techno HD Mini and Techno HD Series CNC routers equipped with the NCstudio controller.

The HD Series and HD Mini CNC routers are powered by high precision, stepper motors and controlled by a hand-held NCstudio controller.

HD Series



HD mini



NCstudio Controller



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FORKLIFT GUIDE

I. UNPACKING AND MACHINE IDENTIFICATIONS

All Techno machines are shipped assembled and secured to a wooden pallet.

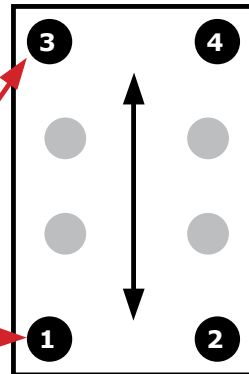
- 1.1** Unpack all items that shipped with your machine. Check the items against the packing slip to be sure nothing was left out. Notify Techno immediately if you are missing any pieces of your shipment.



Fig. 1.1

- Please note the 4 Forklift Tubes on the front and rear of the machine.
- If required, there are 4 Forklift Tubes on the sides of the machine.

Rear of Machine



Front of Machine

II. MEASURING FORKS AND FORKLIFTING MACHINE

- 2.1** Forks must be centered in the front of the machine (shown in Fig 2.1).



Fig. 2.1

- 2.2**

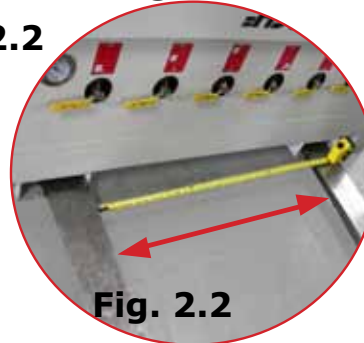


Fig. 2.2

Measure the distance between the forks. (shown in Fig 2.2).

SAFETY WARNING: DO NOT LIFT OR MOVE MACHINE USING GANTRY



For safety and to prevent damage to the machine and cables, Lift Machine Using Forklift Tubes ONLY

Depending on machine size – SEE QUOTE FOR MACHINE WEIGHT
NOTE: Forklift capacity must be adequate to safely lift the machine.
It is recommended to have Fork Lift Extensions to better support load.

- 2.3**

Care must be taken not to damage the valves on the front of the machine. Slowly move in close to the machine.



Fig. 2.3

- 2.4**

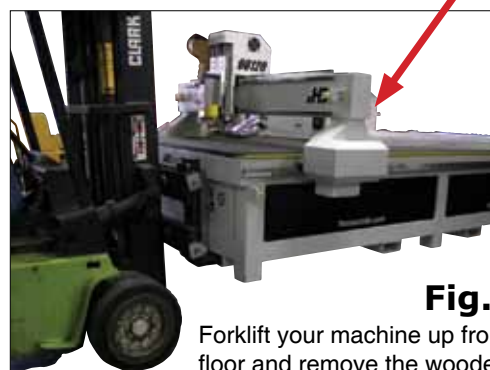


Fig. 2.4

Forklift your machine up from the floor and remove the wooden pallet.

Safety Instructions

READ THESE INSTRUCTIONS THOROUGHLY BEFORE 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.

WARNING: 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 keys 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.

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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.

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

Only the proper assembly should be screwed onto the spindle.



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.

**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 HD MINI SETUP

Carefully remove the HD Mini from its crate. Be sure to remove the brackets from its four feet as well as anything stowed under the HD mini during shipping.

Attached the provided leveling feet to the four legs and adjust accordingly until the table is level.

Remove the front panel of the HD Mini using a M4 allen wrench to install the handheld controller to the machine.

Attached the handheld to the controller (Fig. 1.1) and replace the front panel, carefully routing the handheld wire through the access port.



Fig. 1.1



1.2

The power cable is supplied without a plug. You will need to supply your own plug.

Plug the power cable into the rear of the machine as shown in figure 1.2

Have a suitably qualified person attach the correct plug in compliance with the wiring standards in your area.

The machine must be connected to a 220V, single phase, 15A circuit.

The cable that we supply will be one of two types. It may either be a cable with a brown, blue, and green/yellow wire or a cable with a black, white, and green wire. (Fig 1.3)

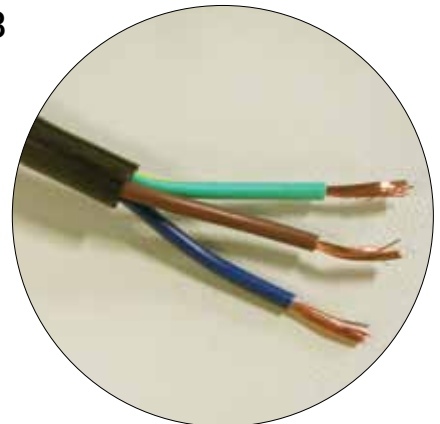
Power is connected as follows:

Green or Green/Yellow conductor is always ground .
The two other conductors will be the hot leads.

Fig. 1.2



Fig. 1.3

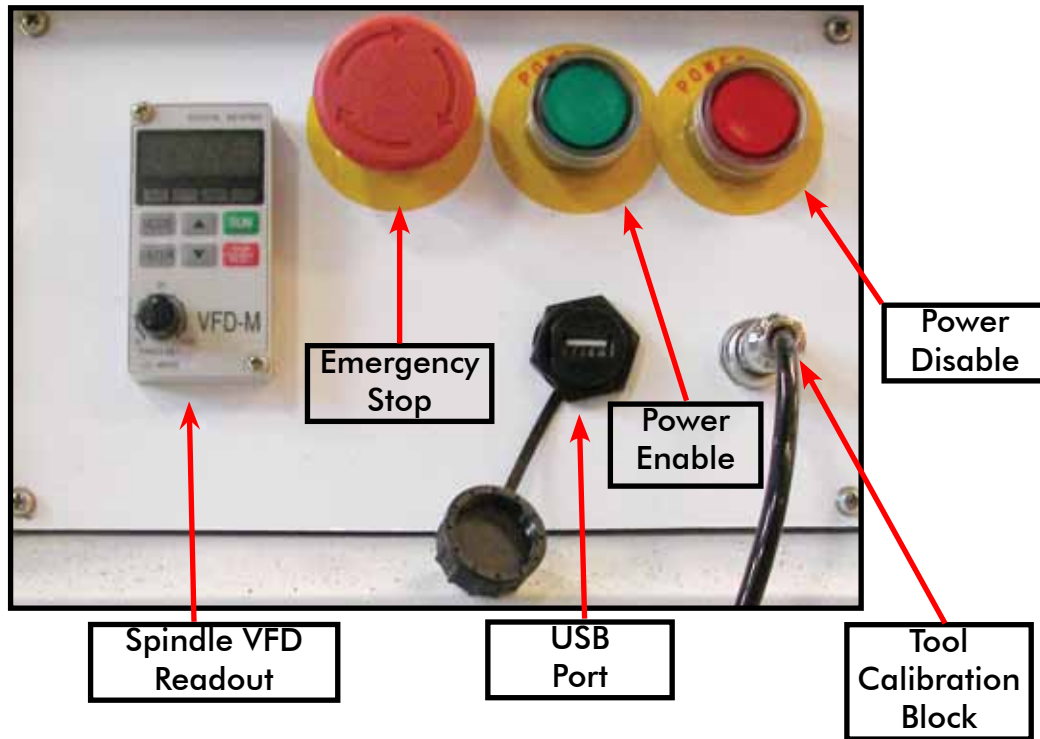


I. Enabling the HD Mini

1.4 Control Panel Functions.

Figure 1.4 shows the machine control panel buttons and functions.

Fig. 1.4



1.5 Enabling The Machine.

When the machine is plugged in, the red POWER button will light up indicating the machine is powered, but motors are not yet powered.

Fig 1.5a



Fig. 1.5a

(Note that the red POWER button will light up if the Emergency Stop is pressed during operation.)

Activate the machine by pressing the green POWER button.

Power is now applied to the machine. The green light will now light up and the red light will go off. Fig 1.5b



Fig. 1.5b

I. TECHNO HD SERIES QUICK SETUP

The Techno HD Series Router is powered by 220 Volt AC. 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 carrier that guides the cables to the motors.



Fig. 1.1

1.2

Open the rear of the controller using the provided key located around the emergency stop button.

You will now have access to the electronics that drive the CNC. They will be identical or like depending on the model issued. (shown in Fig. 1.2).

The terminals for the 220 volt connection are located at the bottom of the box (shown in Fig.1.3)



Fig. 1.2

1.3

Have a suitably qualified person connect the 220V to the shown terminals. Make sure that all local electrical codes are obeyed. For single phase machine, connect power to L1 and L3 only.



Fig. 1.3

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

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

I.1 Techno HD Installation

Fig.1.1



Carefully remove the HD from its wood pallet. Be sure to remove the brackets from its four feet as well as anything stowed under the HD during shipping.

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

Attached the provided leveling feet to the six legs and adjust accordingly until the table is level.

1.1

Remove the controller and place it on the floor to the left of the machine.

When unpacking the controller, avoid twisting the cable carrier that guides the cables to the motors.

1.1a

Remove the three brackets used to stabilize the gantry during shipping using a M3 or M4 allen wrench. (Fig. 1.1a)



Fig.1.1a

1.2

Open the back of the controller box (shown in Fig 1.2a) with the key provided. The electronics will now be exposed and components identified in Fig 1.2b.

- A- Controller Board.**
- B- 24Volt PSU.**
- C- Stepper Driver.**
- D- 220Volt In.**



Fig. 1.2a

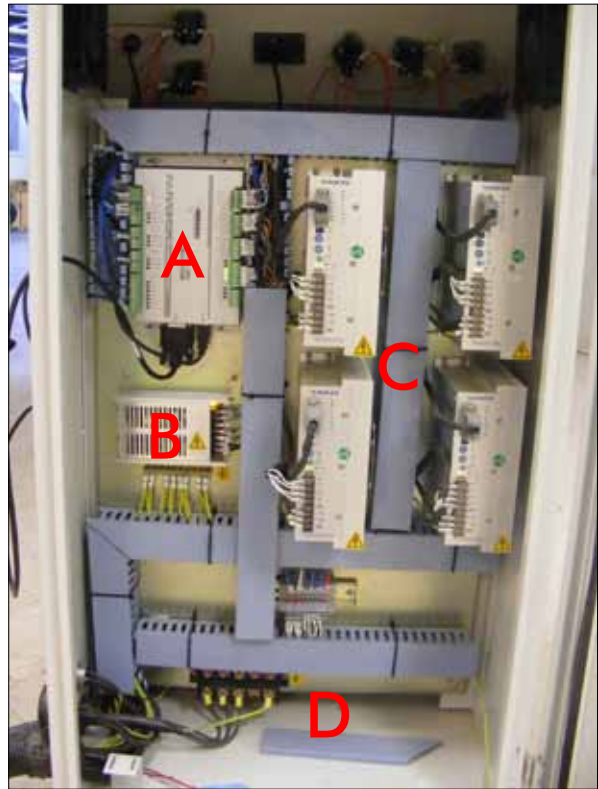


Fig. 1.2b

1.3

Take the black connector coming from the Hand-held controller (fig 1.3a,) and guide it through the hole in the side of the box.

Locate the controller board (fig 1.3b) and attach the block connector as shown by the red arrow.



Fig. 1.3a

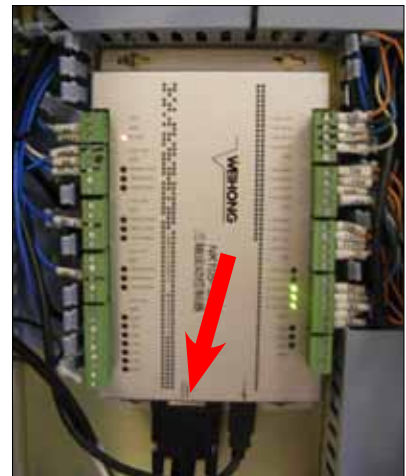


Fig. 1.3b

1.4

Have a qualified electrician attach 220 Volts to the terminal on the bottom of the box (Fig 1.4.) Unless specifically requested by the user, 3 Phase 220 Volt is needed.

If the machine has been modified for single phase operation, then L1, L3 and GND are used, and nothing is attached to L2.

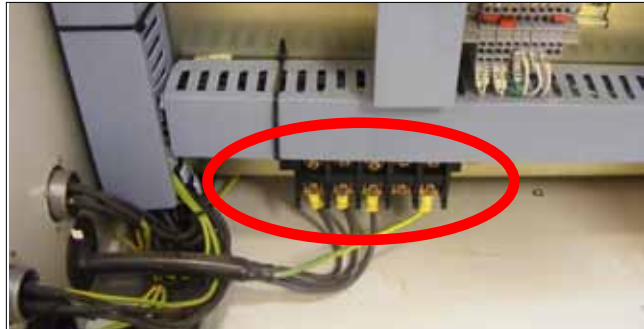


Fig. 1.4

1.5

If the machine has a vacuum table, the Vacuum Pump should be wired to 220V or 440V (depending on what is specified on the Unit,) by a qualified Electrician. (Fig 1.5a)



Fig. 1.5a

The starter box will have a round silver connector attached to a grey cable coming out of it, (Fig 1.5b).



Fig. 1.5b

This connector plugs into the socket on the side of the machine, (Fig 1.5c). This cable provides 220 volts to the starter coil to turn on the vacuum.

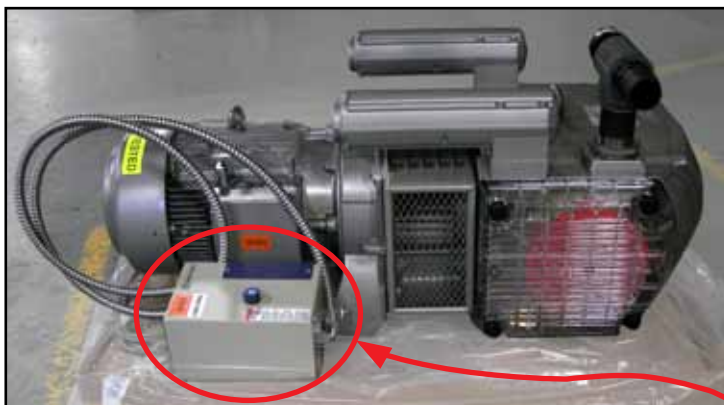


Fig. 1.5c

II. Vacuum Pump Installation



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.**



If a Vacuum Pump/Blower was part of your order, you will have an electrical starter box that looks like this. You should not need to wire the Vacuum Pump/Blower Motor, it has been wired and tested at the factory.



Vacuum Hose

Use the T-Connector to connect the vacuum pump to the vacuum hose under the machine.



Vacuum Hose Kit

Pump/Blower Motor Starter Box & Connector

NOTE:
The cover was removed from Motor Starter.



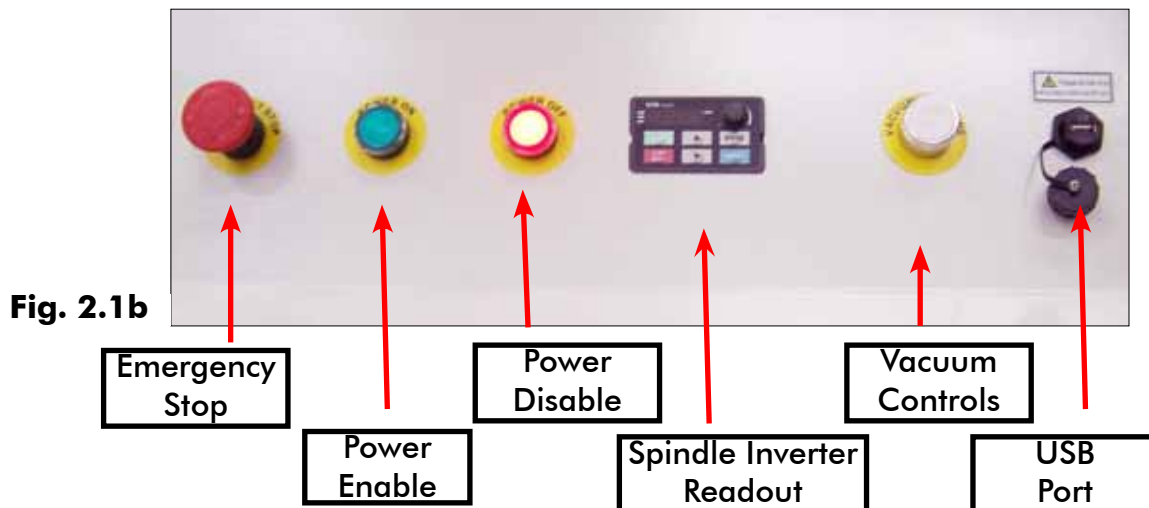
You will need to have the electrician connect AC power (220 or 440VAC) as specified on the unit here to the Motor Starter.

II. Enabling the HD Series

2.1 Control Panel Functions.

Figure 2.1 b shows the buttons and their functions.

IMPORTANT: DOORS MUST BE CLOSED FOR POWER TO ENABLE.



Once the main power switch has been engaged the controller is activated by pressing the green on switch on the front of the controller.

2.2 Powering On

Turn the machine on by turning the main power control switch to the upright position (Fig 2.2a)



Fig. 2.2a

(Note that the red POWER button will light up if the Emergency Stop is pressed during operation.)

Power is now applied to the controller box. The red light will now light up indicating the machine is powered, but motors are not yet enabled. (Fig 2.2b)



Fig. 2.2b

Press the green button to apply power to the controller and enable the motors. (Fig 2.2c)



Fig. 2.2c

II.1 HD Series / HD Mini Start-Up

When the machine first powers on, the display on the controller will light up and say "Starting System". (Fig. 3.1a)



Fig. 3.1a

Once the system has booted it will ask the user "Back to reference point?" Fig 3.2b



Fig. 3.2b



Fig. 3.3c

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.



This will abort the sequence and the machine will stay still.

There will be no reference position and break points, offsets and all functions that rely on a reference position will be invalid.



This will cause the machine to first move the Z-axis to the top of travel, then the X and Y axis will move simultaneously, to the home /reference position. A sensor on the gantry is used to locate this position. (Fig 3.3c)

The homing procedure can be canceled at anytime by pressing ESC.

Once the machine has moved to the end of travel on each axis, it will stop and enter an IDLE state and will be ready to use.

You should test all machine functions before beginning to cut. The functions are displayed in the next section.

Single Keystroke Functions on the Handheld Pendant

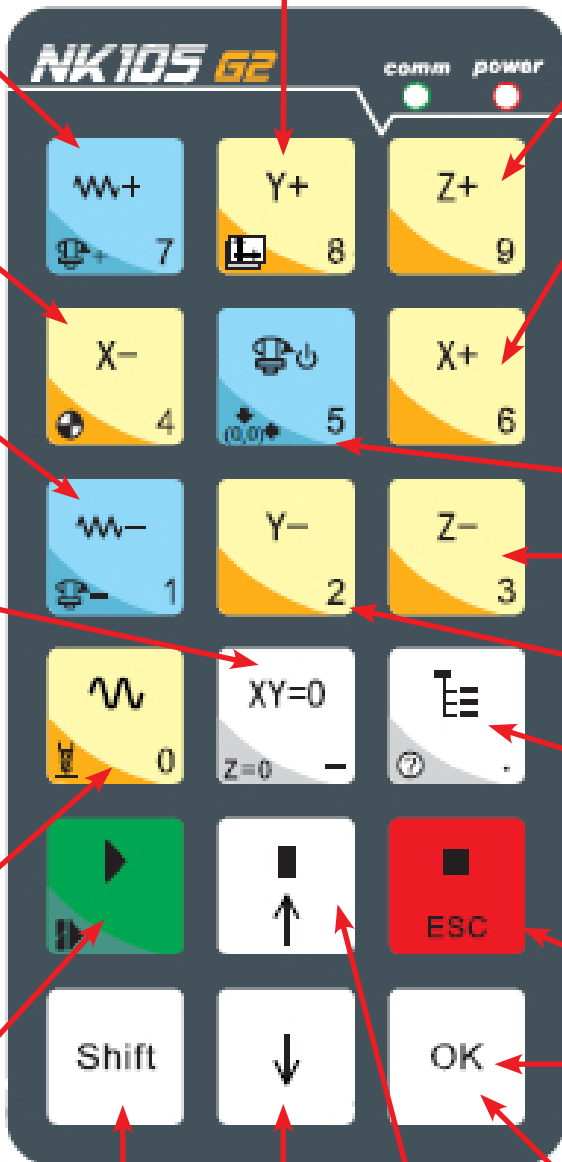
Bold Indicates Primary Function
(Parenthesis Indicates Secondary Function)

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)

Set XY Zero Position
(Input a minus sign)

Z- Movement
(Input the number 3)

Jog Speed Select
(Input the number 0)

Y- Movement
(Input the number 2)

Start key

Menu Screen
(Input a decimal point)

Stop
Cancel
Escape

OK
Select

Yellow Keys represent movement related keys
Blue Keys represent speed and feed related keys

Shift Key
Switch between Jog and Step modes



















Down Directional Key

Up Directional Key
Pause

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

Shift Commands / Combination Keystrokes

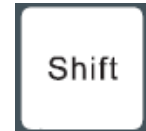
To use the shift commands, you must press and hold the shift key and then select a second key to use the Shift Command function.

Key icon	Function
 + 	Increase spindle RPM
 + 	Switch between work (relative) and machine (absolute)
 + 	Go to XYZ home (mechanical origin)
 + 	Go to current work (relative) origin
 + 	Decrease spindle RPM
 + 	Set Z zero position using Touch-Off pad
 + 	Set Z zero position manually not using Touch-Off pad
 + 	Resume from breakpoint M0 command
 + 	Open help screen

III Operating Tutorials.

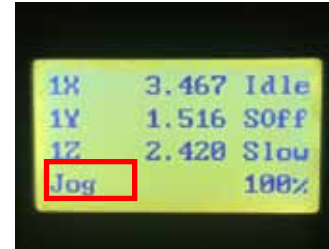
3.0- Switching Movement to Step or Jog.

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.



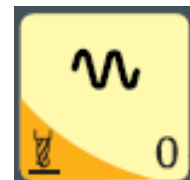
3.1- Jogging the machine and changing from High/Low Jog Speed.

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 Low. When the machine starts it will be in the Low 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 Low on the right of the screen.

Press 'OK' to change high and low speeds, see section 3.3.



Select between high and low Jog speeds

3.2- Stepping the machine.

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

This will move the machine in predetermined increments in the axis selected. By default, the X and Y axes will move in .005 inches and the Z axis will move in .001 inches.

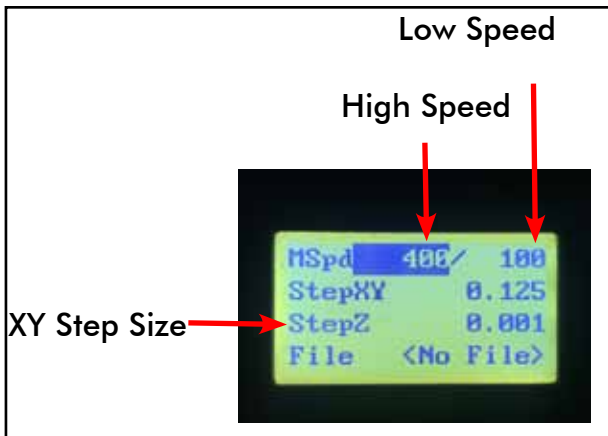
Press 'OK' to change step size, see section 3.3

3.3- Modifying the Jog Speed and Step Size

The machine can be jogged at two speeds, low 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



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 Low 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.



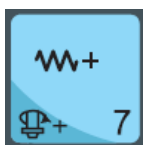
Warning: Adjust the step size carefully. If you set the step size to an excessive value, the machine will move by that value and could damage the machine.

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

3.4- Feedrate Override.

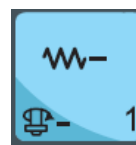
While running a G-Code file, the user can manually override the feedrate or cutting speed of the program. The range of the override goes from 10% to 120% of the original feedrate.

The user can override the feedrate using the following keys:



Increase
Feedrate

OR



Decrease
Feedrate

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 3.3a the letters are located away from the XY zero, all points representing positive integers.

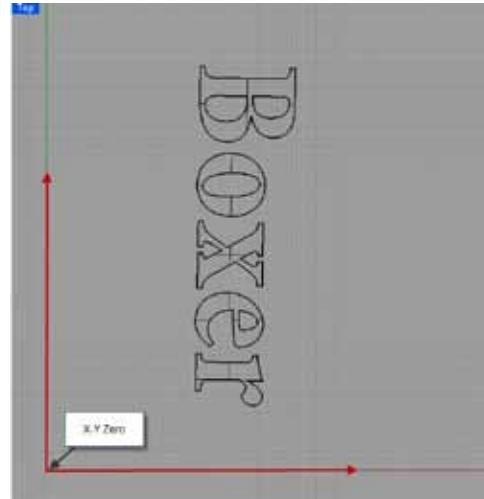


Fig. 3.3a

In Fig 3.3b 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.

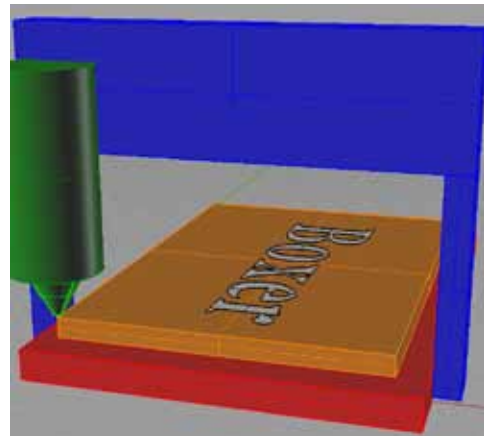
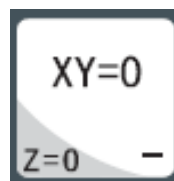


Fig.3.3b

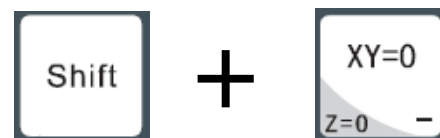


There are two methods for setting the Z-axis zero position:

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 Block: Place the touch off block on top of the material and under the cutter. Press shift/aux 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.

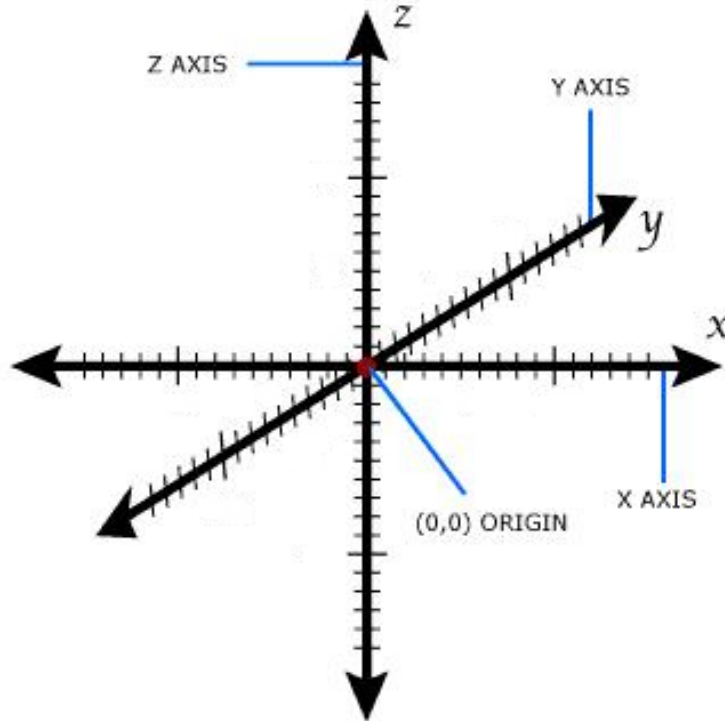
The Z coordinate will now read 'Z 0.000'



Zero Z-axis



Activate Z-Touch off procedure.



3.6- Loading a G-code File.

Press the Menu button.

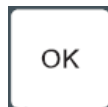


Select "2.USB files" to access the flash drive.
Only a G-code file with an "nc" extension will show.

Scroll through the files with



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

3.7- Running a G-code file.

Once the XYZ origin has been set as per section 3.4 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 speed the machine will move into position to start the first cut.

The file can be paused while running by pressing



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.

When using multiple tools it is best to create separate files for each tool.

The last file can be resumed at a breakpoint by pressing.






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  to enter the menu screen .

Use the   key to scroll the cursor and highlight **4. oper param**

Press OK to select.

Use the  and  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.

Note:
"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.



Use the arrow keys to move the cursor and highlight

4. oper param



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

Use the arrow keys to move between each option and 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.



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.

More parameters in

5. MFR param

4.3 Setting the Table Size.

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



Use the arrow keys to move the cursor and highlight

5. MFR param



Press OK to select.

Password: 33587550

The MFR parameters screen will now open.

Use the arrow keys to move the cursor and highlight.

4. Machine stroke



Press OK to select.

Use the arrow keys to highlight a value, press OK to edit the value, and press OK to save it.



Press Cancel when the value is highlighted to abort the edit.

Use the arrow keys to scroll down the screen until the negative values are displayed.

When all the edits are complete, press Cancel to exit out of this screen. Keep pressing cancel until you return to the main screen.

The asterisk * on this setting indicates that the machine must be powered down and the axes homed in order for these new values to take affect.

If these values are incorrect it will effect the running of the machine.

If the values are too small, the machine will stall/stop when it reaches the value entered.

If the value is too big, it is possible for the machine to hit the end of travel and damage could occur.

Changing to a Different Offset (a new X Y Zero location)

There are 6 available X Y Zero locations that can be set up.

The offset number is displayed to the left of the Z X Z display 1 through 6 as shown below

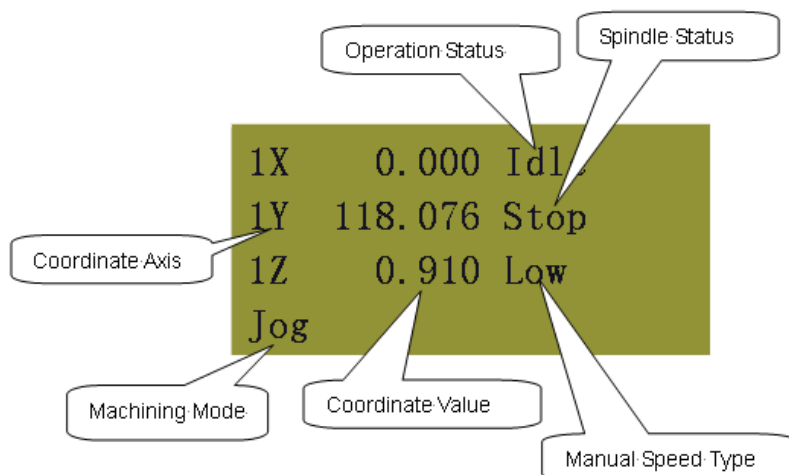
Press Menu



→ Operations

→ Select 'WCS

G54 Origin 1
G55 Origin 2 . . .



Each offset can have its own X Y and Z Zero

These additional offsets can be used to locate parts on different locations on the table

however for ease of use you can use just one offset as we did in training.

If the machine ever starts to cut in what appears to be the wrong location on the table, there is a chance you have accidentally selected a different offset.

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.

See the NK105 G2 manual for more details on these 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	100

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



V. Appendix

HD 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



Settings (continued)

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 (HD Series)	400.00 in/min (HD Mini)
----------------------------------	--------------------------------
 2. GXX Speed

400.00 in/min (HD Series)	250.00 in/min (HD Mini)
----------------------------------	--------------------------------
 3. Back REF First
 - YES
 4. Lifts on Pause*
 - 0.25 inch
 5. Offset →
 1. Public Offset
 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



Settings (continued)

- 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*



Settings (continued)

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/sec²

4. Max Turn Acc
100.00 in/sec²

5. Jerk
300.00 in/sec³

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: 0.0078125 (HD Series)	0.005000 (HD Mini)
Y: 0.0078125 (HD Series)	0.005000 (HD Mini)
Z: 0.0025000 (HD Series)	0.002500 (HD Mini)



Settings (continued)

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



Settings (continued)

- 0.291 rad/s
- 6. Rotary Y Acc
6.98 rad/s²
- 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 Increment
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



Settings (continued)

- 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



HD Mini Tabletop Settings

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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 = 0.004
Each Depth = 0.004
Tool Dia = 0.118
Nose Gap = 0.079
Height3 = 3.937
Width = 3.937
X Init = 0.000
Y Init = 0.000
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



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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]
7. Array Process
 - Rows = 2
 - Columns = 2
 - Rowspace = 1.969
 - Colspace = 1.969
 - Delay = 50
8. Origin List
9. Nearby Process
4. Oper Param
 1. G00 Speed
 - 250.000 in/min
 2. GXX Speed
 - 100.000 in/min
 3. Back REF First
 - YES
 4. Lifts on Pause*
 - 0.394 inch
 5. Offset →
 1. Public Offest
 1. X
 2. Y
 3. Z
 2. Work Offset
 1. G54 Offset →
 1. X = 0.000



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2. Y = 0.000
3. Z = 0.000
2. G55 — G59 →
 1. X = 0.000
 2. Y = 0.000
 3. Z = -1.939
6. Cycle Process →
 1. Cycle Process
NO
 2. Cycle Times
2
 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* = 0.039 in
 2. Process Depth* = - 0.039 in
 3. 1st Point as 0*
YES
 4. Shape Process*
NO
 5. Bottom Process*
NO
 6. Metric Size*
NO
13. ENG Params →
 1. Lifting Height*
0.039



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2. Tool Change Tip*
YES
3. Cycle Times*
1
4. Deep Hole Mode*
0
5. Retract Amount*
0.039 in
6. Select Tool No*
YES
14. PLT Params →
 1. Lifting Height = 0.197
 2. PLT Unit = 40.000
 3. Tool Stop = 0.001
 4. Process Depth = -0.039
15. 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)*
 4. Tool Change Tip
NO
 5. Cali Coor
 1. X: Cali Coor = 0.000
Y: Cali Coor = 0.000
Z: Cali Coor = -0.039
16. Process End Tip = NO
17. Cali Tool Height = 0.250
18. 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/sec²
 4. Max Turn Acc



HD Mini Tabletop Settings

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- 100.00 in/sec²
- 5. Jerk
300.00 in/sec³
- 6. Max Speed of Z
125.00 in/min
X/Y = 393.701
- 7. Short Seg Spd Lmt
YES
- 8. SPDLMT Length
0.1 inch
- 9. Z down option = 0

- 10. Z Plunge Cut Spd
11.811 in/min
- 11. REF Circle Radius
0.1 inch
- 12. REF Circle Speed
20.000 in/min
- 13. Jump Speed
0.000 in/min
- 14. Look ahead Dis
0.000 in/min
- 2. Axis Output Dir →*
X: Negative
Y: Negative
Z: Negative
- 3. Pulse Equiv →*
X: 0.0062500 (Tabletop)
Y: 0.0062500 (Tabletop)
Z: 0.0031250 (Tabletop)
- 4. Machine Stroke →
 - 1. Strk Upper Lmt →
X: 23.750
Y: 39.500
Z: 0.000
 - 2. Strk Lower Lmt →
X: 0.000
Y: 0.000
Z: -3.937
- 5. Change Tool St →
 - 1. Strk Upper Lmt →
X: 15.748
Y: 15.748
Z: 0.000



HD Mini Tabletop Settings

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2. Strk Lower Lmt →
X: 0.000
Y: 0.000
Z: -3.937
6. Ref Point Set →
 1. RefP Speed →
X: 70.866 in/min
Y: 70.866 in/min
Z: 59.005 in/min
 2. RefPDir
X: Negative
Y: Negative
Z: Positive
 3. Retract Dist
 1. X Retract Dist
0.079 in
 2. Y Retract Dist
0.079 in
 3. Z Retract Dist
0.079 in
7. Spindle Set →
 1. Spindle Gears*
8
 2. On/Off Delay
5000 ms
 3. Initial Gear*
1
 4. Max Spdl Speed*
24000 r/min
8. 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/s²
 7. Max Rotary Vel
30 r/min



HD Mini Tabletop Settings

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9. Backlash Set
 1. Compensation on
NO
 2. Axis Backlash →*
X: 0.0
Y: 0.0
Z: 0.0
10. Calib Thickness
0.590 inch (will vary slightly)
11. Enable S Algo
YES
12. Arc Increment
YES
- 12 ARadiu Tolerance = 0.079 in
13. Forward Look Seg
50
14. Sign of BK REF
YES
15. Safety Height*
0.394 inch
16. Lube →
 1. Enable Auto Lube
NO
 2. Time Interval
5000s
 3. Duration
5s
17. G00 Feed 100%*
YES
18. Smoothing Time
0.0s
19. Corner Option
0
20. Corner Toler
0.004
21. Setting Contro
NO
6. Param Upkeep
 1. Backup Params
 2. Restore Params
 3. Factory Params
 4. Export Params
 5. Import Params
7. System Upkeep



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1. Language
 1. Chinese
 2. English
2. Export Log
3. System Update
4. Register
5. Help
 - Spec: Help Message Show Delay
 - Value: 600
 - 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

Using the 4th Axis on the Techno HD Series Machines

Note: The 4th axis on the Techno HD series 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.
2. Go to and press OK to select “3. Pulse Equiv”. Make note of the X-axis value, it should be 0.0078125.
3. Calculate the new pulse equivalent value based on the diameter of the cylindrical stock being used through the following equation:

$$\text{Rotary Pulse Equivalent} = (25.4 * \pi * D) / 50000$$

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, 0.0078125, into the X-axis pulse equivalent variable, then reboot the machine to apply the changes.

Using the 4th Axis on the Techno HD Mini Machines

Note: The 4th axis on the Techno HD Mini 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.
2. Go to and press OK to select “3. Pulse Equiv”. Make note of the X-axis value, it should be 0.005.
3. Calculate the new pulse equivalent value based on the diameter of the cylindrical stock being used through the following equation:

$$\text{Rotary Pulse Equivalent} = (25.4 * \pi * D) / 130000$$

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, 0.005, into the X-axis pulse equivalent variable, then reboot the machine to apply the changes.

HD Mini 4th Axis Settings

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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 = 0.004
Each Depth = 0.004
Tool Dia = 0.118
Nose Gap = 0.079
Height3 = 3.937
Width = 3.937
X Init = 0.000
Y Init = 0.000
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

HD Mini 4th Axis Settings

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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
 - 400.000 in/min
 2. GXX Speed
 - 250.000 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 = 0.000
 2. Y = 0.000
 3. Z = 0.000
 2. G55 — G59 →
 1. X = 0.000
 2. Y = 0.000
 3. Z = -7.126
 6. Cycle Process →
 1. Cycle Process

HD Mini 4th Axis Settings

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- NO
- 2. Cycle Times
- 2
- 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* = 0.039
 - 2. Process Depth* = - 0.039
 - 3. 1st Point as 0*
 - YES
 - 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

HD Mini 4th Axis Settings

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- 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: _____
 - 4. Tool Change Tip
NO
- 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/sec²
 - 4. Max Turn Acc
100.00 in/sec²
 - 5. Jerk
300.00 in/sec³
 - 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
11.811 in/min
 - 11. REF Circle Radius
0.1 inch
 - 12. REF Circle Speed
100.00 in/min
 - 2. Axis Output Dir →*
X: Negative

(settings repeat through tool 10)

HD Mini 4th Axis Settings

Website: support.technocnc.com | Call: 631-648-7481



- Y: Negative
- Z: Negative
- 3. Pulse Equiv →*
 - X: 0.005000 (Mini)
 - Y: 0.005000 (Mini)
 - Z: 0.002500 (Mini)
- 4. Machine Stroke →
 - 1. Strk Upper Lmt →
 - X: 23.622
 - Y: 35.433
 - Z: 0.000
 - 2. Strk Lower Lmt →
 - X: 0.000
 - Y: 0.000
 - Z: -5.900
- 5. Ref Point Set →
 - 1. RefP Speed →
 - X: 70.866 in/min
 - Y: 70.866 in/min
 - Z: 59.055 in/min
 - 2. RefPDir
 - X: Negative
 - Y: Negative
 - Z: Positive
 - 3. Retract Dist
 - 1. X Retract Dist
 - 0.079 in
 - 2. Y Retract Dist
 - 0.079 in
 - 3. Z Retract Dist
 - 0.079 in
- 6. Spindle Set →
 - 1. Spindle Gears*
 - 7
 - 2. On/Off Delay
 - 5000 ms
 - 3. Initial Gear*
 - 6
 - 4. Max Spdl Speed*
 - 24000 in/min
- 7. Y Rotary Axis →
 - 1. Y as Rotary Axis*
 - NO
 - 2. Rotary Y Pulse

HD Mini 4th Axis Settings

Website: support.technocnc.com | Call: 631-648-7481



- 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 Increment
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

HD Mini 4th Axis Settings

Website: support.technocnc.com | Call: 631-648-7481



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

VI. HD Mini Machine Lubrication.

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

The X and Y axis should be lubricated every 100 hours of use, the Z axis lubricated every 200 hours.

Before applying lubrication, clean off any debris from the machine and parts to be lubricated.

Apply oil with a clean cloth or brush. Do not put a heavy amount of oil on the machine, just a light layer will be sufficient.

Recommended Lubricants.

Oil:
Vactra No. 2(mobile)
Tonner Oil or Equivalent.
Techno Part No.
H90200-LUBE002

Lubrication:

The HD Mini contains a ball screw on each axis.



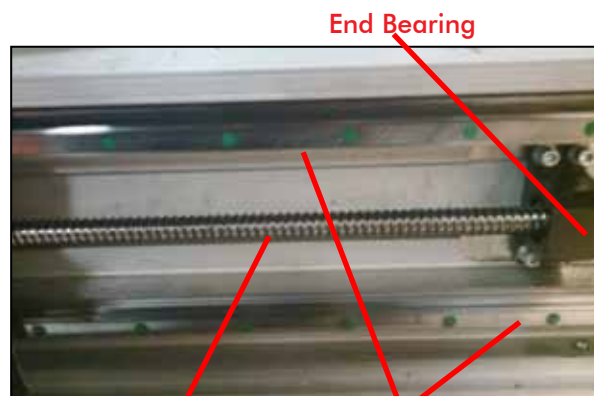
Lubricating the X Axis.

To access the X axis ball screw and rails, you must remove the covers by taking off the screws shown below.



Screws

Once the screws are removed, pull back the accordion style covers to expose the ballscrew, rails and end bearing.



End Bearing

Ball Screw

Rails

Apply a light coat of oil on each of these locations.

Remove the screws on the other side of the gantry and oil that side, too.

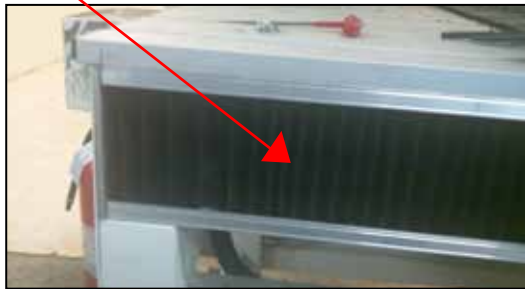
Lubricating the Y Axis.

The Y axis ball screw is located under the machine. It can be accessed from the back of the machine, or by taking off the side panels.



Clean off any debris and apply a light coat of oil on the ball screw.

Access the rails by removing the covers on each side of the machine.



Clean off any debris and apply a light coat of oil on the rails.



Lubricating the Z Axis.

To access the Z axis ball screw and rails, first jog the Z axis down to the lowest point it can go.



Remove the screws that hold the black covers in place.

Clean off any debris and apply a light coat of oil on the ballscrew and rails.

Ballscrew



Rails

VI. HD Machine Lubrication.

5.1 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 5.1



Fig 5.1

5.2 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 5.2

5.3 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 5.3a



Lubrication
Point.

Fig 5.3a

Lithium grease is pumped into the lubrication point with the application gun provided with the machine. Fig 5.3b



Fig 5.3b

5.4 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

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



Betriebsanleitung
Operating Instructions
Instructions de service
Istruzioni d'uso
Handleiding
Instrucciones para el manejo
Manual de instruções
Naudojimosi instrukcija
Kasutusjuhend
Lietošanas instrukcija
Οδηγίες χρήσης
取扱説明書
사용설명서

Driftsinstruks
Driftsinstruktioner
Käyttöohje
Driftsvejledning
Instrukcja obsługi
Kezelési útmutató
Návod k obsluze
Navodilo za uporabo
Návod na obsluhu
El Kitabi
Инструкция по эксплуатации
使用说明书

VTLF 2.200
VTLF 2.250

98/37 EG
2006/95 EG



DIN EN ISO 14001:2005

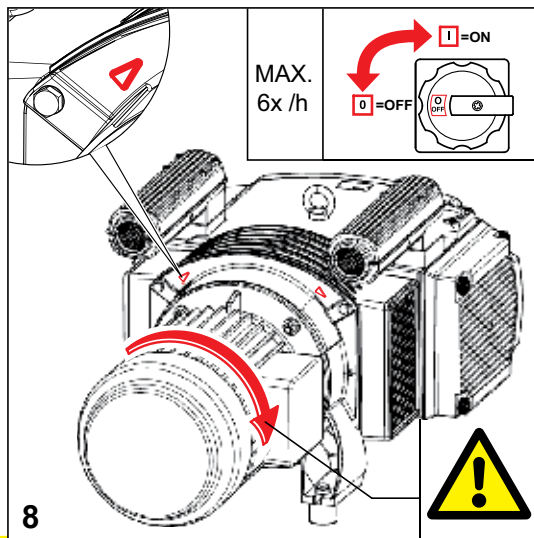
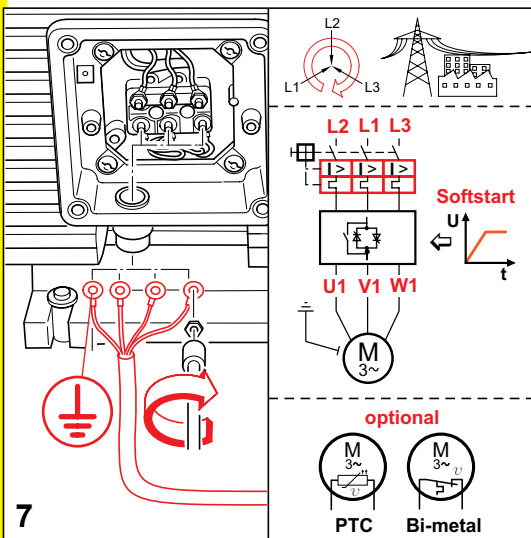
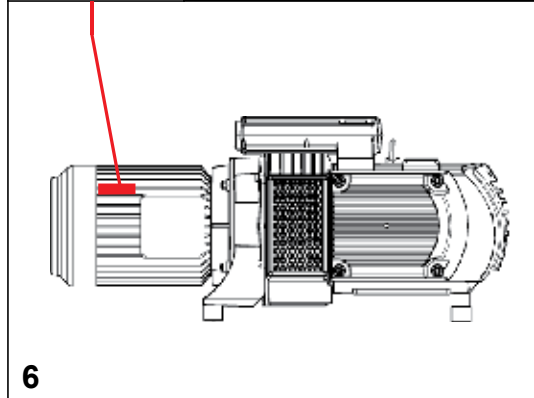
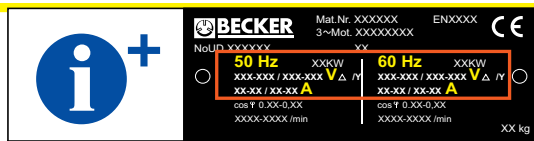
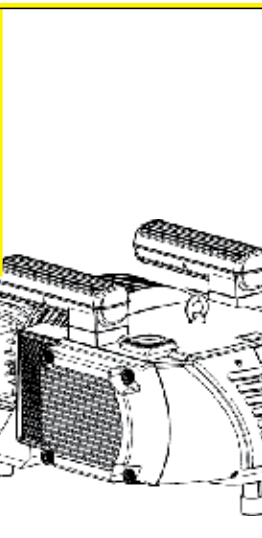
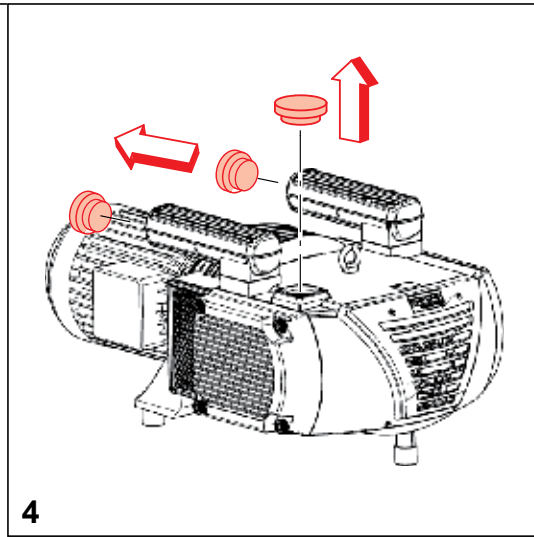
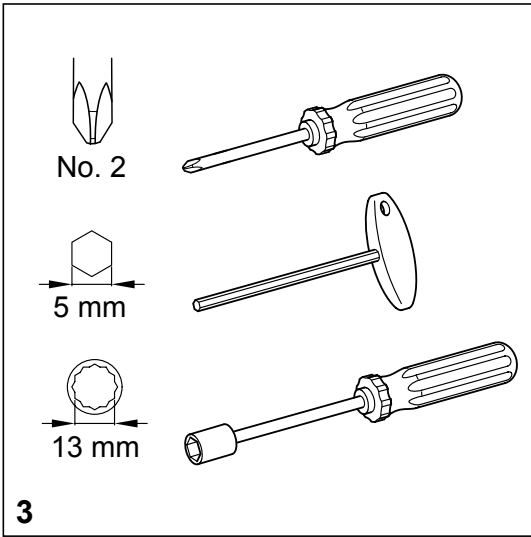



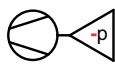


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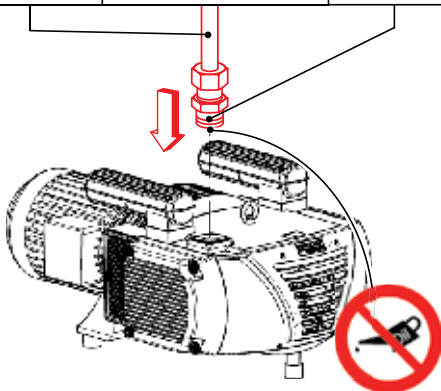
				mbar
<p>AIR</p>		<p>DIN EN ISO 2151</p> <p>DIN EN ISO 3744</p>	<p>L_{pA} = 75-77 dB(A) - 50Hz</p> <p>L_{pA} = 77-79 dB(A) - 60Hz</p> <p>K_{pA} = 3 dB(A)</p>	

	<p>250 kg 551 lbs</p>	<p>A > 400mm A > 16"</p>	<p>> 5°C/41°F < 45°C/113°F</p>	<p>max. 90%</p>	<p>max. 800m</p>
<p>1</p>		<p>2</p>			

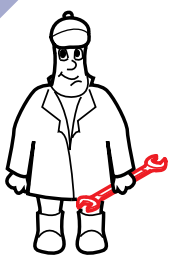
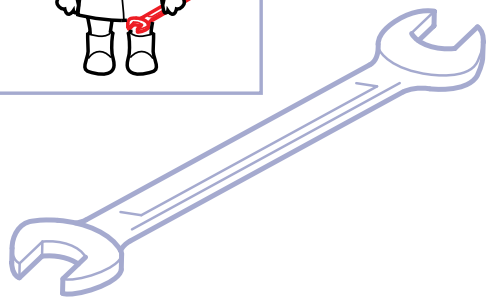
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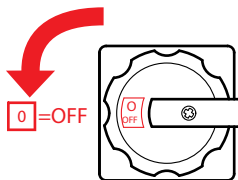
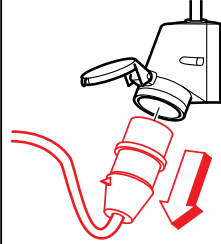
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2m...3m	$\phi 2\frac{1}{2}''$	+ 	VACUUM
> 3m...10m	$\phi 3''$	+ 	



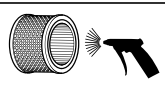
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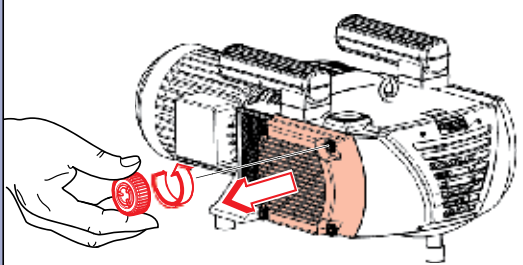
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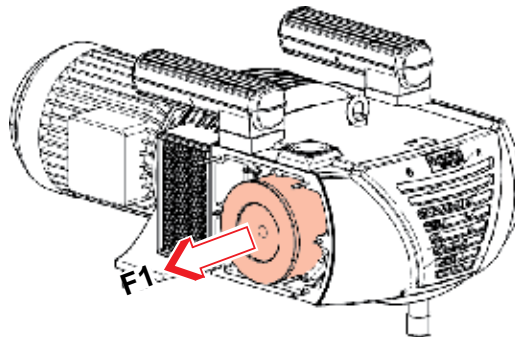
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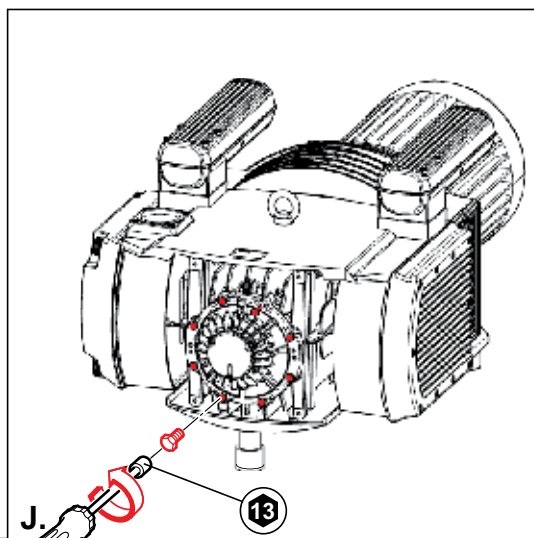
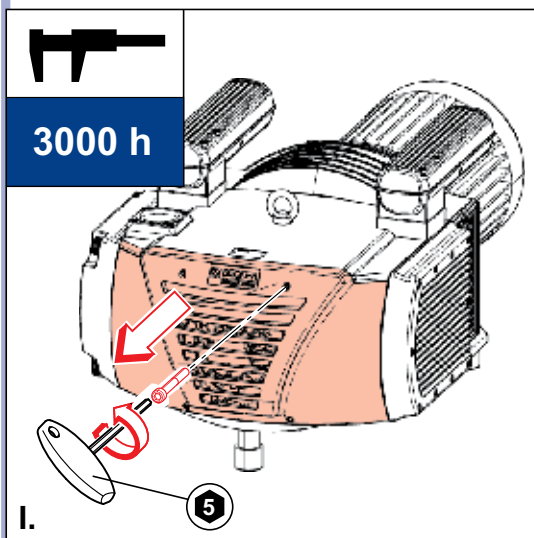
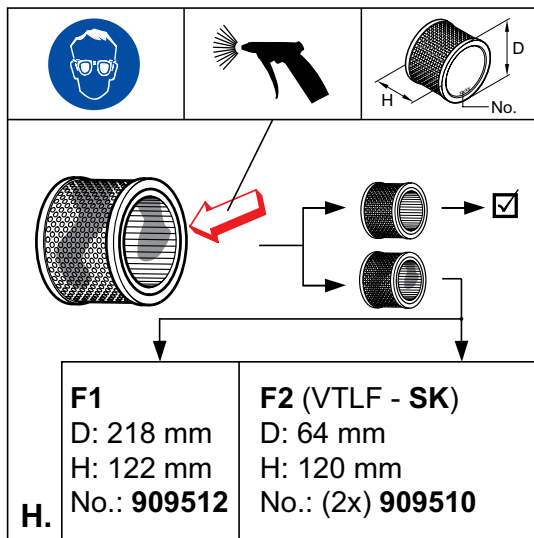
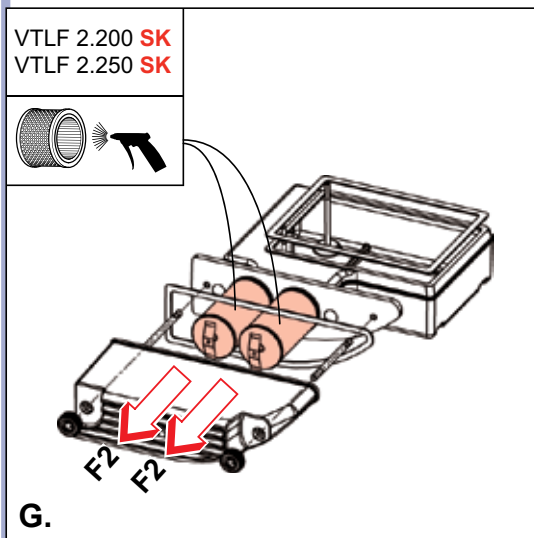
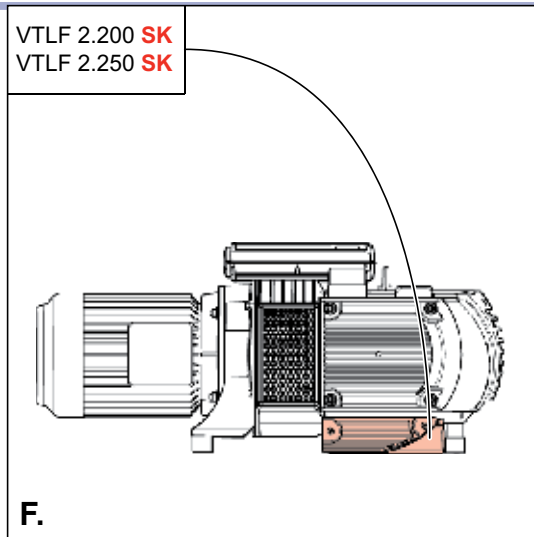
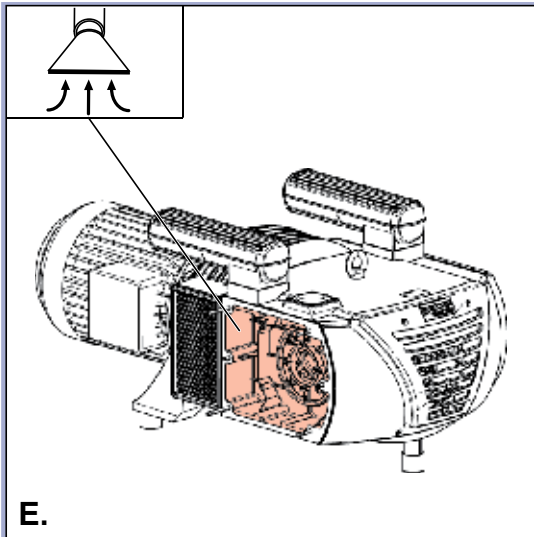
40 - 200 h **AIR ?**

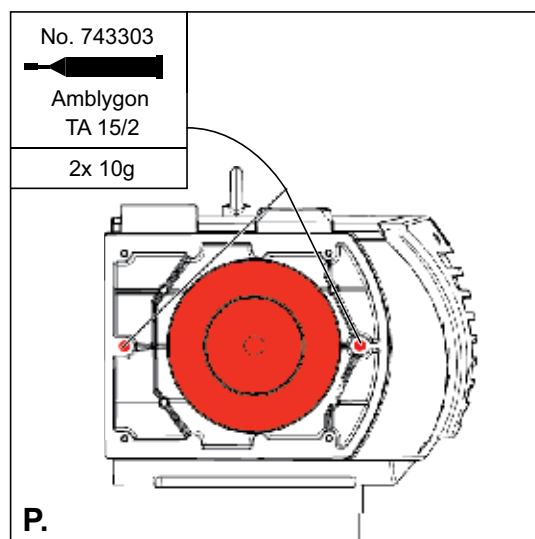
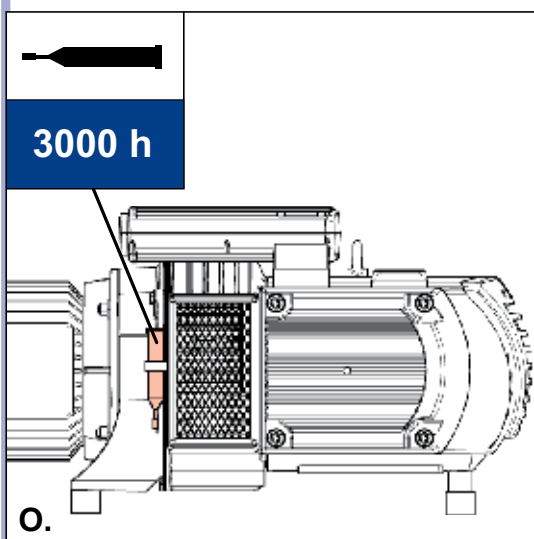
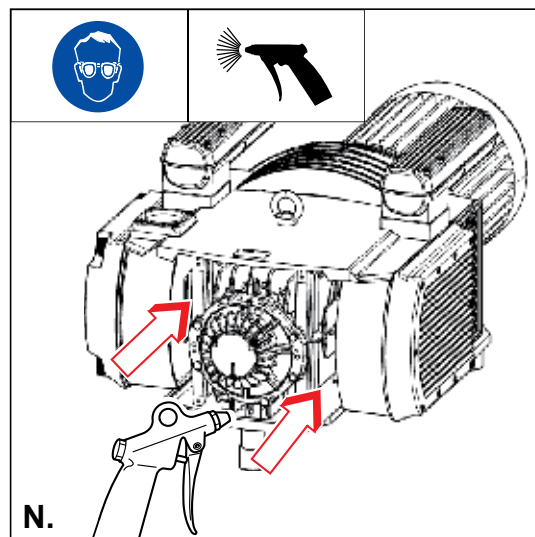
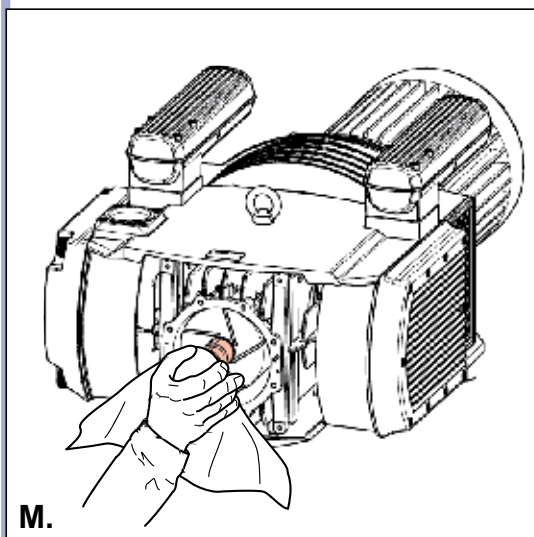
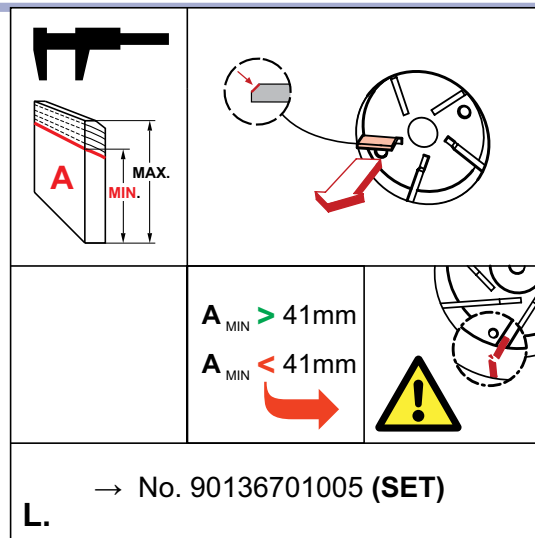
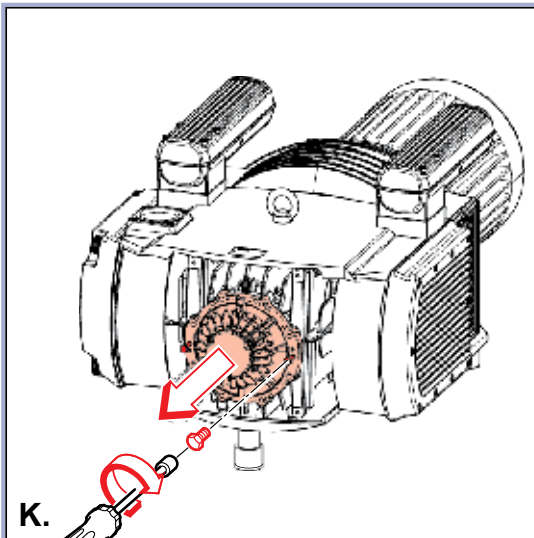


C.



D.





TLF 2.250-2.500 Internal Filter Inspection

-Tools required-
Flashlight

ATTENTION

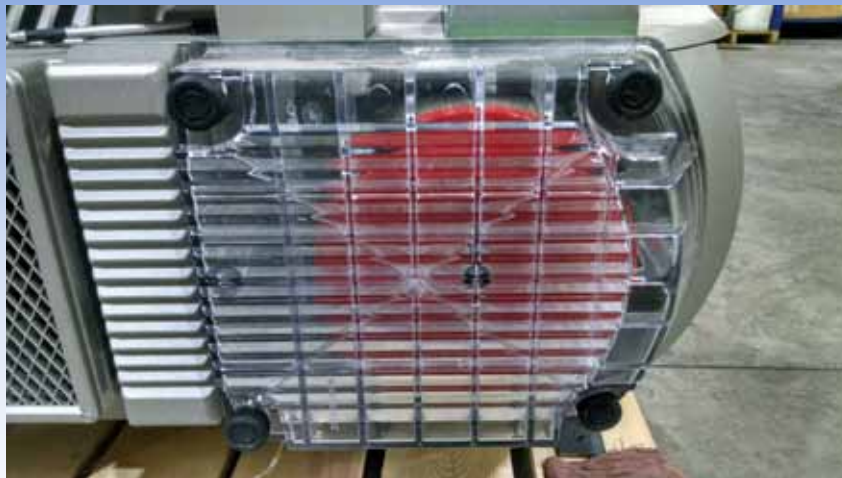
VISUAL CLUES REGARDING VTLF 2.250 FILTER MAINTENANCE SHOULD NOT ALWAYS BE THE SOLE INDICATOR OF WHETHER A FILTER IS "CLEAN".

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-



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)



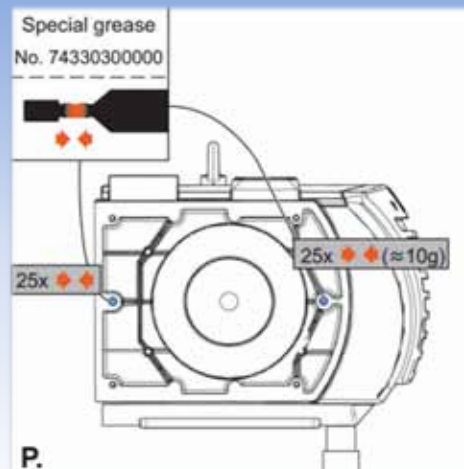
Author: Mike Ruff
Becker Pumps Corp.

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



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)



Author: Mike Ruff
Becker Pumps Corp.

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



Author: Mike Ruff
Becker Pumps Corp.

Techno CNC Systems, LLC., Terms and Conditions For Limited Warranty and Repairs Warranty

WARRANTY

All Techno CNC Systems, LLC., mechanical components are warranted against manufacturer's defects in material and workmanship for a period of one (1) year from the time of shipment from Techno CNC Systems, LLC., facilities. All Techno CNC Systems, LLC., electrical components are similarly warranted for a period of one (1) year from the time of shipment from Techno CNC Systems, LLC., facilities. Techno CNC Systems, LLC.,'s sole obligation under this warranty is limited to repairing the product or, at its option, replacing the product without additional charge, provided the item is properly returned to Techno CNC Systems, LLC., for repair as described below. The provisions of this warranty shall not apply to any product that has been subjected to tampering, abuse, improper setup or operating conditions, misuse, lack of proper maintenance, or unauthorized user adjustment. Techno CNC Systems, LLC., makes no warranty that its products are fit for any use or purpose to which they may be put by the customer, whether or not such use or purpose has been disclosed to Techno CNC Systems, LLC., in specifications or drawings previously or subsequently provided, and whether or not Techno CNC Systems, LLC.,'s products are specifically designed and/or manufactured for such a purpose. NOTE: Drive motors (servo or stepper) are considered "mechanical components".

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 HEREOF.

LIMITATION OF REMEDY

In no event shall Techno CNC Systems, LLC., be liable for any incidental, consequential, or special damages of any kind or nature whatsoever. Techno CNC Systems, LLC., is in no way liable for any lost profits arising from or connected to this agreement or items sold under this agreement, whether alleged to arise from breach of contract, expressed or implied warranty, or in tort, including, without limitation, negligence, failure to warn, or strict liability.

RETURN PROCEDURE

Before returning any equipment in or out of warranty, the customer must first obtain a return authorization number and packing instructions from Techno CNC Systems, LLC.,. No claim will be allowed nor credit given for products returned without such authorization. Proper packaging and insurance for transportation is solely the customer's responsibility. After approval from Techno CNC Systems, LLC., the product should be returned with a statement of the problem and transportation prepaid. If, upon examination, warranted defects exist, the product will be repaired or replaced at no charge, and shipped prepaid back to the customer. Return shipment will be by common carrier (i.e., UPS). If rapid delivery is requested by customer, then such transport is at the customer's expense. If an out-of-warranty situation exists, the customer will be notified of the repair costs immediately. At such time, the customer must issue a purchase order to cover the cost of the repair or authorize the product to be shipped back as is, at the customer's expense. In any case, a restocking charge of 20% will be charged on all items returned to stock.

FIELD SERVICE

Repairs are ordinarily done at Techno CNC Systems, LLC.,'s Ronkonkoma, New York facility, where all necessary instrumentation is available. This instrumentation is difficult to transport, so field service is severely limited, and will only be supplied at Techno CNC Systems, LLC.,'s discretion. If field service is required and is performed at Techno CNC Systems, LLC.,'s sole discretion, all relevant expenses, including transportation, travel time, subsistence costs, and the prevailing cost per hour (eight hour minimum) are the responsibility of the customer.

UNFORESEEN CIRCUMSTANCES

Techno CNC Systems, LLC., is not liable for delay or failure to perform any obligations hereunder by reason of circumstances beyond its 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 CNC Systems, LLC.,'s control.

ENTIRE AGREEMENT/GOVERNING LAW

The terms and conditions contained herein shall constitute the entire agreement concerning the terms and conditions for the limited warranty described hereunder. No oral or other representations are in effect. This Agreement shall be governed in all respects by the laws of New York State. No legal action may be taken by any party more than one (1) year after the date of purchase.

TECHNO CNC SYSTEMS, LLC., RESERVES THE RIGHT TO CHANGE DESIGNS, SPECIFICATIONS, PRICES, AND ANY APPLICABLE DOCUMENTATION WITHOUT PRIOR NOTICE.