Edge Finisher Machine

Model EF-3000

Instruction Manual

EFC

EF-3000 - 02/22

Congratulations on your purchase of the EF-3000 Acrylic Polishing Machine.

With a 4-1/4 inch capacity and the ability to bevel up to 60 degrees, the EF-3000 achieves an optically clear edge on larger sheets of acrylic with less labor hours than ever before.

EF-3000 is designed to make finishing acrylics and other types of plastics, such as Polycarbonate and PETG a quick and easy process with a high degree of accuracy. This automated unit combines a variable frequency electric spindle, and precise logic control circuit for a reliable, safe, and efficient method to get high-quality finishes. It has a convenient touch-screen control panel plus physical push button controls. This manual includes set up, operation and maintenance of the EF-3000 Polishing Machine.

Included Parts:

1	Toolbox
2	Roughing Blade MY01
1	Diamond Blade MY05003
1	Spindle Wrench 27 mm
1	Metric Hex Key Wrench Set
1	Screwdriver, Flat Head
1	Screwdriver, Philips Head
1	Air Gun with Hose
1	Air Supply Hose
1	Dial Indicator Gauge and Fixture

Contents

General Safety Instructions

Before installing, adjusting or operating this machine, be sure to review all of the instructions carefully and completely!

- Follow all local electrical and safety codes.
- Always disconnect power before working on or near a motor or its connected load. If the power disconnect point is out of sight, lock it in the open position and tag to prevent unexpected application of power.
- Be careful when touching the exterior of an operating motor as it may be hot enough to be painful or cause injury. With modern motors, this condition is normal if operated at rated load and voltage. Modern motors are built to operate at higher temperatures.
- Make certain that the power source conforms to the requirements of your equipment.
- When cleaning electrical or electronic equipment, always use an approved non-flammable cleaning agent.
- Do not attempt to operate this machine without guards and appropriate personal safety equipment.
- As with any high speed machine, safety is a foremost requirement. Never put hands near the blades when the machine is running.
- Keep guards in place.
- Remove adjusting keys and wrenches.
- Keep work area clear.

Operating Safety Warnings and Precautions

Keep hands, hair, and clothing clear of the rotating blade cutter tool.

Do not wear loose clothing or jewelry. Keep long hair covered or tied back.

When operating, this machine produces sound levels which may cause permanent hearing damage within 10 feet (3 meters) of the machine. Always wear approved ear protection when the machine is running.

Mechanical and electrical trouble shooting and maintenance are to be performed only by qualified personnel. Before opening the electrical cabinet or the main access door, the main disconnect switch must be off and locked out.

The EF-3000 Edge Finisher is designed and built to put a flat, clear finish on the edge of a saw-cut plastic workpiece. The spindle feed system utilizes a rack drive which provides rigidity and ultra-precise tracking for smooth operation and consistent performance. The spindle motor is mounted on guide rails for greater wear resistance and accuracy long into the equipment's service life.

The machine comes equipped with a 4" (100 mm) vacuum port for plastic debris removal during machine operation. Use of a vacuum system is strongly recommended to aid in keeping the unit clean and prevent plastic debris from interfering with the alignment of the workpiece with the guide (Fence). Quality of finish is one of the primary reasons behind the use of a vacuum system. If chips are not removed from the cutting area, the workpiece is prone to defects, such as drag marks across the surface of the material. Also, plastic debris may build-up on the cutting edge, which can lead to a reduction in "edge life" (the length of time the blade maintains a sharp cutting edge). Keeping surrounding area free of chips maintains a clean surface to locate the workpiece. A functional vacuum system is also desirable in terms of an orderly, clean, and safe working environment.

The machine has a protective sheet metal housing which can be opened for maintenance, adjustment of cutting depth, and should be latched closed for safe machine operation.

Each machine is built to the highest standards and comes with a 3-year limited warranty.

Main Technical Specifications

EF-3000	Standard	Metric
Overall Dimensions (except foundation)	6.742 x 3.772 x 5.019 ft.	2055 x 1150 x 1530 mm
Maximum Thickness	4.33" thick	110 mm thick
Machine Power	2.75 HP	2 KW
Main Motor Power	2 HP	1.5 KW
Main Motor Speed (RPM)	7,000 – 9,000 RPM (119–150 Hz)	
Speed Control Mode	Variable Frequency Control	
Feed Speed	0 – 6.5 ft/min (0 - 30 Hz)	0 – 2000 mm /min (0 – 30 Hz)
Tilt Angle	0 – 60 degrees	
Operating Voltage	220 v Single Phase, AC 50-60 Hz, 8 Amp	
System Air Pressure	80 – 120 PSI	5.5 – 8.2 Bar

Unpacking

The machine is shipped in an impact resistant reusable crate. This crate must be returned to Edge Finisher to avoid a charge. **Never allow the machine to be placed upside down or be transported at an angle of more than 15 degrees on either side.** On receipt of the machine, be sure to immediately remove all packing materials and inspect the machine fully for damaged or missing parts (please consult the checklist included in this manual).

When inspecting the new machine, please pay attention to:

1. Condition of the machine on arrival.
2. Observe whether any moisture has collected or affected the condition of the machine.
3. Inspect the machine exterior and interior components for any damage sustained in transit.
4. Consult the checklist included with this manual for any missing parts.

Should you find any issues with damaged or missing components, please contact Edge Finisher Company and the carrier who delivered the machine to your factory for a resolution to the problem.

Equipment Handling

The machine should only be placed on a flat surface. Never leave the packaged machine or install the machine on an angled or uneven surface.

We do not recommend transporting or installing the machine at its work location by means of overhead lifting (i.e. crane). The safest and best method is to only move or install the machine by forklift. If a forklift is impractical and a hoist must be used to move the machine, please follow these special precautions to ensure safe handling of the machine to avoid injury to operator or damage to the machine:

1. Before hoisting the equipment, be sure all movable parts are secured to prevent movement during hoisting.
2. Remove all loose items, such as the toolbox and leveling feet that may have been shipped with the machine.
3. Use a wire cable to hoist the machine and ensure that the wire cable doesn't kink or twist.
4. Be sure that the wire cable doesn't contact or rub against any components on the machine during lifting.
5. When hoisting the equipment, be sure to keep the machine balanced and stable. Make the appropriate adjustments to balance the equipment before lifting more than a few inches off the ground. Only allow further elevation after checking the balance of the unit and confirming the unit is balanced and stable.
6. Do not allow the hoisting wires to exceed an angle of more than 60 degrees.
7. When unwrapping and moving the machine, if you have additional people assisting you, be sure that they are aware of safe installation and moving guidelines. Before you begin, carefully coordinate the procedure with everyone assisting you to be sure they understand the process and to avoid potential injury or damage to the equipment.
8. When using a forklift for transporting and installing the EF-3000, use all safe operating procedures and common sense when operating a forklift.

Important: only trained and authorized forklift operators should be utilized when moving or installing the EF-3000 machine. When moving the equipment by forklift drive at a slow and steady pace. To prevent machine damage, avoid all sudden starts and stops. Ensure the route from your receiving bay to the final machine location is wide enough to accommodate the passage of the machine and is free of any obstructions that may impact the machine.

Clearly communicate all actions and procedures to individuals who may be assisting you in moving the machine. Take care when raising and lowering the machine to avoid any sudden impact or shocks to the equipment.

Installation Site and Environment

The equipment installation site must meet the following condition:

1. The site must be in a dry, ventilated area.
2. The area must be free of inflammable and corrosive liquid and gases
3. The site must be free of any risk of high impact collision or potential shocks to the machine.
4. The area must be free of any vibration.
5. Installed on a flat cement floor.

Leveling the Machine

To ensure precision operation of the machine it is very important to make sure that the machine is level on all axis.

To properly level the machine follow the steps listed below:

1. Adjust all leveler feet until they are firmly in contact with the floor.
2. Place a plumb level on the table.
3. Check for level on the horizontal and vertical axis on both ends of the machine, as well as the middle.
4. Adjust the leveler feet one by one until the machine is level on both the horizontal and vertical axis.
5. When the machine is uniformly level tighten the top nut on the levelers to lock the feet

Machine Guarding

All efforts have been made to make the machine as safe as possible. Blackstone Industries DBA Edge Finisher assumes no responsibility for injury or damage that may occur when using the EF3000. Guards must always be in place prior to starting the EF3000.

Preparation and Requirements for Use

Preparations Prior to operating the machine for the first time ensure that:

1. Be sure all bolts are tight and none are missing.
2. Check that the oiler is filled with lubricating oil such as Way Lube 68.
3. Remove the 90-degree angle bracket (for locking the spindle motor in place during transit).
4. Attach the black accordion dust cover to the spindle motor platform.
5. Remove the wood block from the front of the spindle motor to allow for adjustment of the spindle motor.

Power Requirements

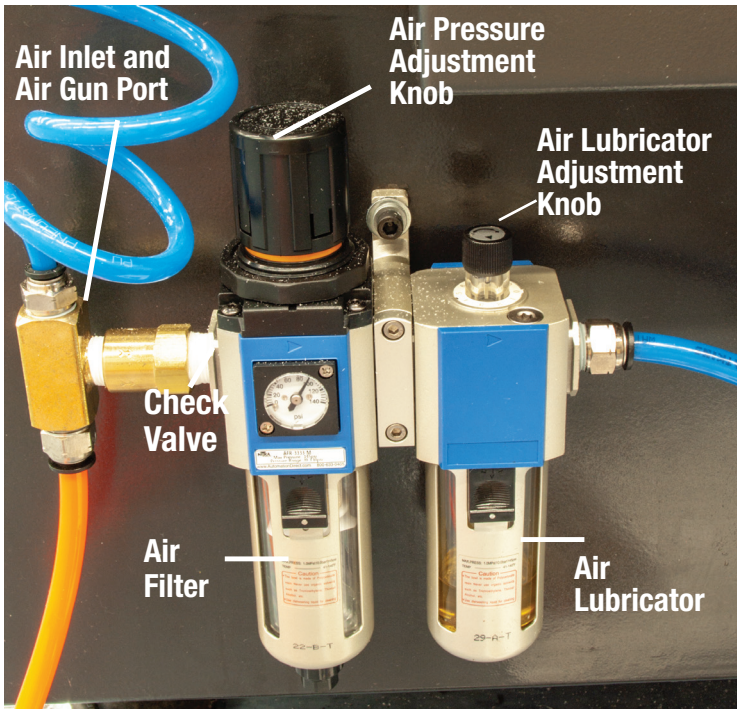
Before connecting the machine to an electrical outlet:

1. Inspect electrical components for any visible damage, loose wires, etc.
2. Connect the appropriate plug to the power cord.
3. **Inspect the oiler system.** Be sure that there is oil in the oil reservoir. If not, fill with oil such as Way Lube 68 or Mobil Vactra Oil No. 2 until the oil level is nearly 3/4 of the way to the top of the sight gauge on the oiler. Pump the handle three times to lubricate the system. Look for signs of any leaks.
4. I**nspect the pneumatic system** for any signs of damage to the filter, reducing valve, and lubricator.

Oiler system

The pneumatic system includes a Filter, Reducing Valve and Lubricator

Manual Valve for Clamp The toggle lever raises and lowers the clamp foot. The Toggle valve directs the air pressure to either end of the cylinder to raise or lower the clamp feet. As one side of the cylinder fills with high-pressure air it pushes the cylinder rod to move in one direction. While one side of the cylinder is being pressurized, the other side of the cylinder is venting (creating a low-pressure area) to a discharge port equipped with a silencer. The Check Valve (located between the air inlet and the air filter helps to maintain pressure in the system.



Notes: The Air Lubricator should be filled to about 3/4 of the way up the sight-glass on the side of the lubricator.

Do not overfill the lubricator.

If the lubricator needs oil, you can add a light pneumatic oil, such as Mobil DTE 24, by removing the socket set screw in the top of the lubricator after removing the air pressure.

When attaching the airline to the machine, make sure the end of the nylon airline is flat and smooth with no burrs. This will enable the end of the line to make a good seal. Similarly, attach the air gun to its proper port. To remove an airline from its compression fitting simply press the black plastic snap-lock of the fitting inward while gently pulling the pipe from the fitting.

The air pressure should be set to a minimum of 0.5MPa (5-8 kg/cm2 or 80 – 120 PSI) and should not exceed 0.8 MPa (6-8 Bar). **If you will be operating the machine on a factory air pressure system that also operates other pneumatic devices, be sure that your factory air has sufficient air capacity to completely operate all devices on the line without loss of pressure at any time. If there is any doubt, consider adding a dedicated line and compressor to the machine to avoid any malfunctions during use.**

To adjust the air pressure to the machine, use the Air Pressure Adjustment Knob located on the top of the filter. First, pull upwards on the knob and then turn the knob either clockwise to increase the air pressure or counterclockwise to reduce the air pressure.

Regularly inspect and clean the Air Filter screen and drain water and other contaminants from the water drain on the filter and lubricator.

Spindle System

When powering up the spindle system for the first time, observe the direction the spindle rotates. The spindle should rotate in a counterclockwise direction. **If the spindle rotates in the reverse direction, please contact Edge Finisher Company for instructions to change the rotational direction.**

Feed System

Set machine to manual mode and advance the spindle. Observe the side to side motion of the spindle on the rack-drive to confirm smooth tracking. Make sure that the spindle will stop automatically at the extreme ends of its allowable travel. Moving the spindle will also help to lubricate the racks, gears, and guide rails.

Spindle (Cutter) Advance

Before moving the spindle foreward to the cutting position, be sure that cutting blades are set to the proper height and locked into position (page 16). Turn the spindle's Depth Adjustment knob (the knurled knob at the rear of the spindle motor) a few turns to adjust the cutter away from the front work surface and toward the rear of the machine. This will prevent possible collision with the front work surface.

Equipment Operation Requirements and Precautions

Important: This machine may be operated by trained personnel only.

1. **Never unclamp the workpiece when the cutting process is engaged.**
2. **Before starting any work with the EF-3000 make sure the fence is in the down position.**

The fence is a positioning guide, cutting reference point, and guard. With the fence down, position the workpiece against the face of the fence. Be sure the surface of the table is free and clear of any plastic debris before placing the workpiece against the fence. When the workpiece is properly aligned, activate the clamp toggle to clamp the workpiece in place.

Remove the workpiece only after the cutting process is complete and the fence drops back into the down position.

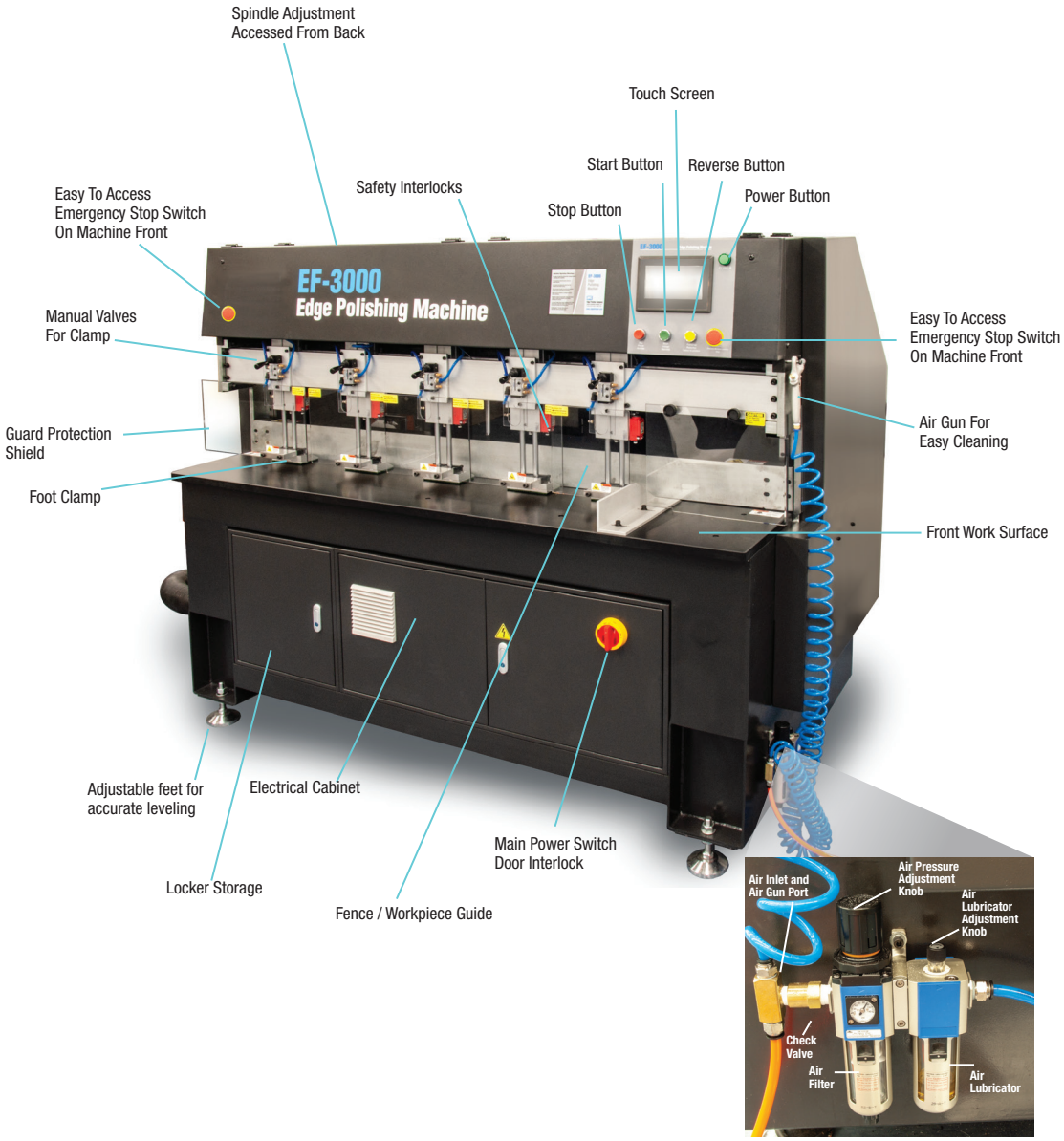
3. **Never leave any tools or personal items on the table of the machine during operation to prevent any accidental collision or injury resulting from loose items coming in contact with the spindle.**

EF-3000 Features and Components

Fence / Workpiece Guide: The fence serves as a reference benchmark to properly align your workpieces for accurate cutting. Five pneumatic manually operated clamps secure the workpiece against the fence to maintain proper and safe alignment during cutting. The position of the clamps can be adjusted as required.

Spindle Adjustment System: The spindle adjustment system allows you to set the depth of cut and control the angle of the cut. The spindle adjustment system is accessible by opening the **back panel** of the machine

Electrical Cabinet: All electrical hardware is located here. The power cable is attached to the main disconnect terminals.



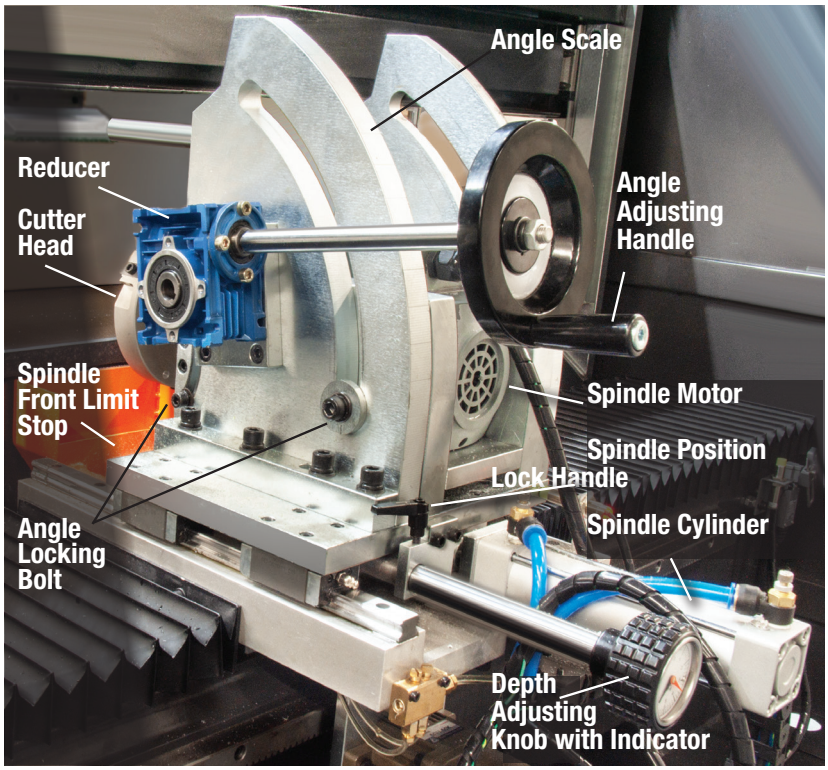
Spindle Adjustment System

The Spindle Adjustment System is accessible from the back panel of the EF-3000.

Spindle Front Limit Stop prevents the spindle from advancing beyond the desired cutting depth. You can adjust how far the spindle travels forward with the depth control handle. All adjustments should be used in conjunction with the **SPINDLE FWD/BWD** Button.

Before cutting for the first time or any time you make a depth or angle adjustment make sure the cutter will not travel forward excessively and hit the deck of the machine.

Spindle Position Lock Handle locks the spindle at the desired depth setting for accuracy and repeatability of every cut.



Angle Adjustment Handle adjusts the angle of the cutter head. The handle has a hand wheel, shaft, and pinned key. **The entire handle mechanism must be removed before cutting to prevent making contact with the workpiece when returning to home position.**
To remove the angle adjustment handle, slide it out of the reducer.

Adjusting the Angle of the Cutting Head

First, loosen the four Angle Locking Bolts. There are two bolts on each side of the spindle motor. They lock the angular position of the cutter in place and prevent any deviation from the desired setting.

Next rotate the **Angle Adjustment Handle** clockwise to increase the angle or counter-clockwise to reduce the angle. The angle can be adjusted from 0 to 60 degrees. After selecting the desired angle, lock the Spindle into place by tightening the four Angle Locking Bolts. Adjust the position of the Spindle Front Limit Stop to prevent the spindle from moving too far forward as it moves toward the workpiece. Cutting Depth must also be set before using the EF-3000.

Depth Control Knob and Adjustment Indicator controls how far the spindle advances to the work area of the machine. With this knurled knob, you can first adjust the spindle limit stop to ensure the spindle doesn't collide with the material support deck. This knob controls the cutting depth of the spindle. The dial adjustment indicator on the face of the knob is graduated to 0.01millimeter at the smallest adjustment. One full turn of the knob equal 1mm (.040"), each division (0-9) equals 0.1mm (.004"), the ten hash marks dividing each division is 0.01mm (.0004"). To adjust the cutting depth, turn this knob clockwise to increase the depth of the cut or counterclockwise to reduce the depth of cut.

Angle Scale with engraved position marks from 0 to 60 degrees for easy adjustment of spindle angle.

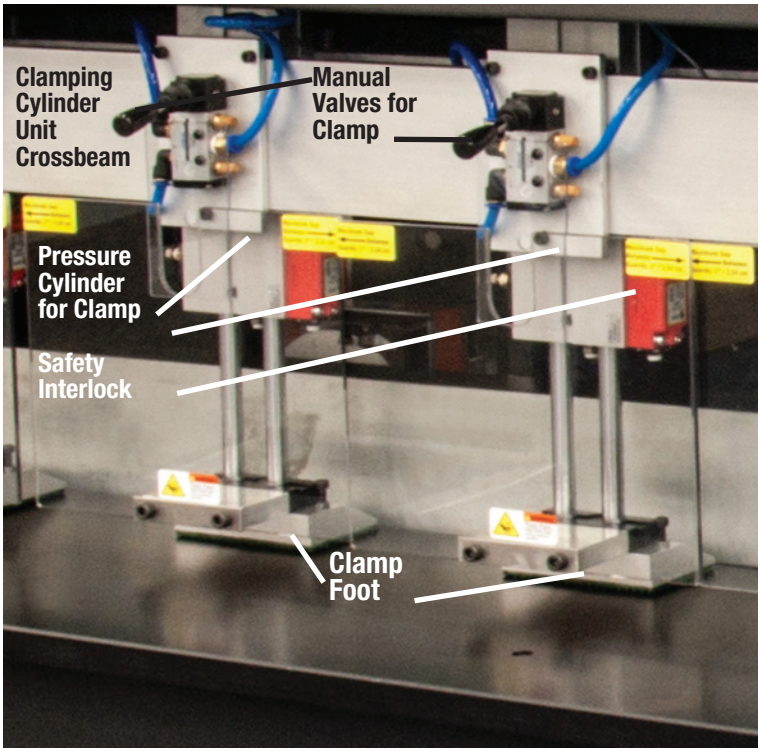
IMPORTANT: The spindle limit positions may vary depending on the angle of the Cutting Head. Never allow the spindle to collide with the deck of the machine. Perform Cutting Depth Procedure on page 14, Step #6.

Fence / Workpiece Guide System

Manual Valve for Clamp The toggle lever raises and lowers the clamp foot.

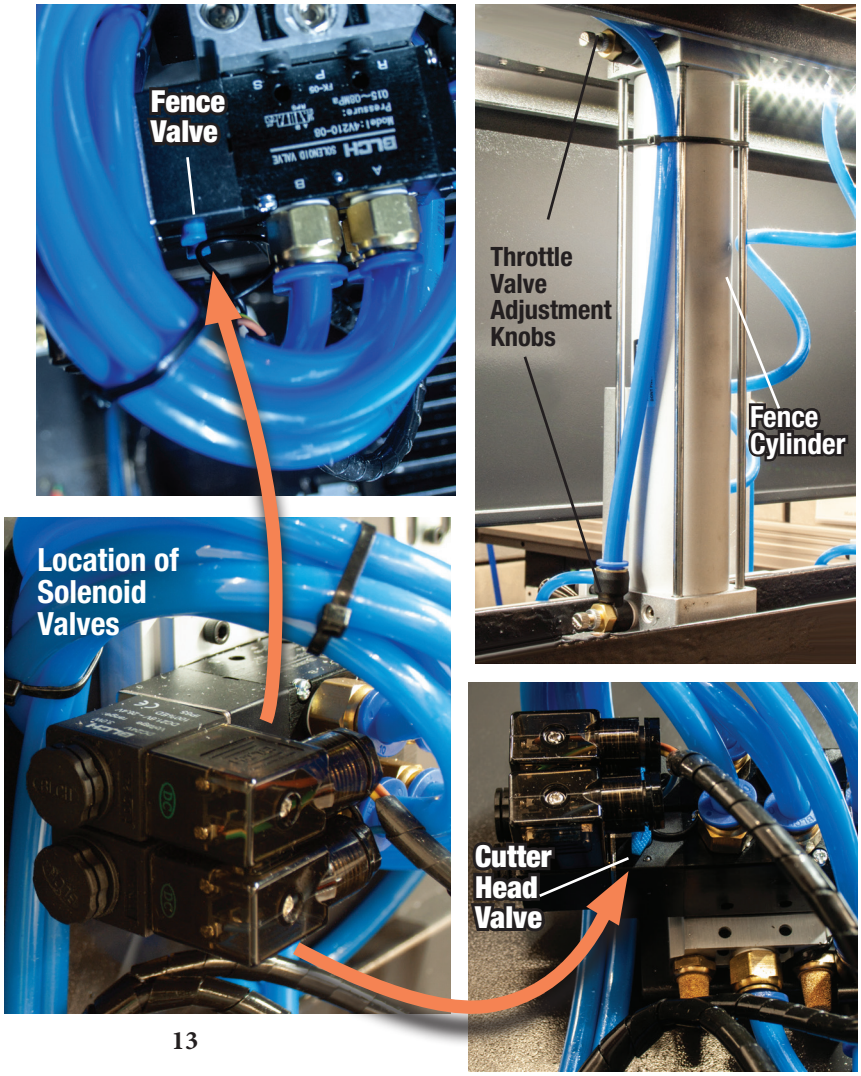
Clamp Foot clamps the workpiece to the material support deck during the cutting process. To adjust the position of the clamp foot, loosen the two upper bolts and one lower bolt on the clamp foot bracket. Slide the clamp foot to the desired position. The clamp must be flat on the clamp guide rail prior to re-tightening the screws. This insures that the clamp will make level contact with the work piece. Clamp guards should never be more then 1/2" apart.

Safety Interlocks
The EF3000 is equipped with safety interlocks. All clamps must be down for the machine to run.

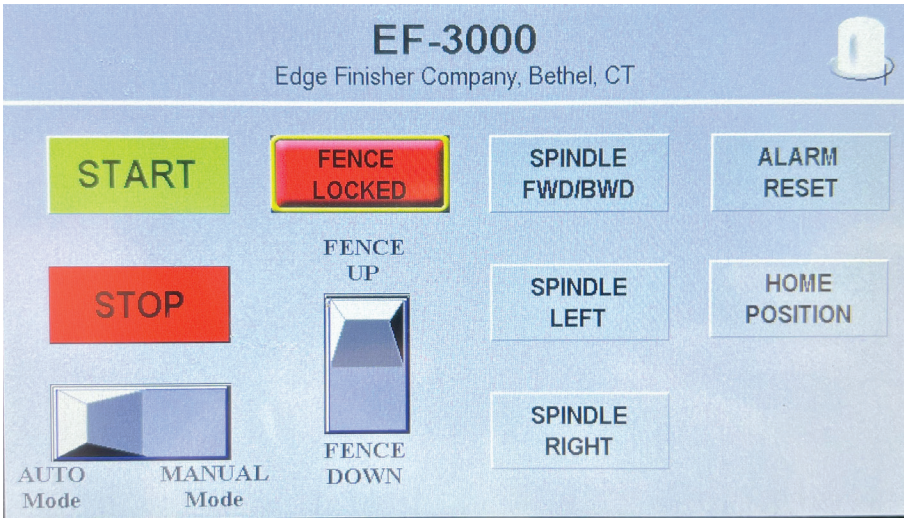


Adjusting the Cylinder Speed of Fence

1. Connect the air source to the pneumatic system of the machine.
2. To make the fence extend or retract manually trigger the Solenoid Fence Valve (the upper blue valve) located on the inside wall of the EF-3000, on the left as you face it from the back. Observe the cylinder speed.
3. To adjust the speed, turn the Throttle Valve Adjustment Knob (on the Fence Cylinder) counterclockwise to slow it or clock wise to speed up.
4. **Repeat steps 2 – 3 until the speed is at the desired setting.**



Using the Touch-Screen Control



1. MANUAL or **AUTO**

• **MANUAL:** All the steps must be performed manually by the operator

OR

• **AUTO**: All the steps are performed automatically by the machine in sequence after adjusting and clamping the workpiece and pressing the START Button.

2. FENCE LOCK enables or disables the Fence.

3. FENCE UP or **FENCE DOWN** pressing this button will lower or raise the Fence.

4. ALARM RESET will Reset the Alarm and recover the working state of the machine.

5. SPINDLE LEFT: Touch and hold this button to move the Spindle toward the left side of the machine. Releasing it will stop the spindle movement.

6. SPINDLE RIGHT: Touch and hold this button to move the Spindle towards the Right side of the machine. Releasing it will stop the spindle movement.

7. SPINDLE FWD/BWD: Pressing this button will move the Spindle Forward (towards the work surface) and Backward (to the home position).

8. HOME POSITION: Pressing this button will move the Spindle to the home position from any position.

CAUTION: The Spindle forward limit position must be adjusted and confirmed before pressing START. See page 19.

AUTO: Auto Mode: Pressing START, the Fence rises, the Spindle moves forward from its home position and begins polishing. After polishing, the Spindle stops and returns to home position. The Fence lowers. **To take full advantage of auto mode** you must set the adjustable collar on the hex bar behind the machine to the edge of your material. This will stop the machine from making a full cycle when the full length of the machine is not required.

Setup Cutter Travel Length:

1. Move cutter head to the far left edge of the material being polished.

2. Slide collar on hex rod to the spindle motor.

3. Adjust collar so that the proximity switch light below the spindle has illuminated.

MANUAL: Pressing START, The Fence rises, the Spindle moves forward from its home position and starts polishing. At the end of the polishing, the Spindle stops, moves back and stays at that position.

10. STOP: In AUTO Mode: The Spindle stops polishing and returns to home position. The fence lowers.

In MANUAL Mode: The Spindle stops, moves back and stays in its current position.

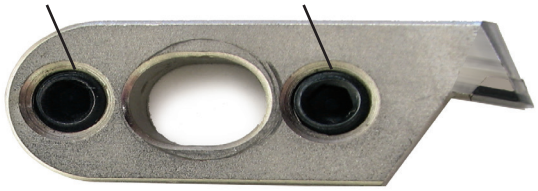
Cutting Blades

Three types of cutting blades are used with the EF-3000 to achieve a quality finish on the workpiece.

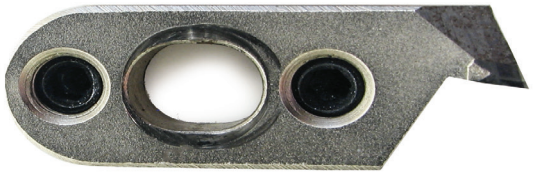
Roughing Blade

Finishing Blade

Diamond Blade



Roughing Blade



Finishing Blade

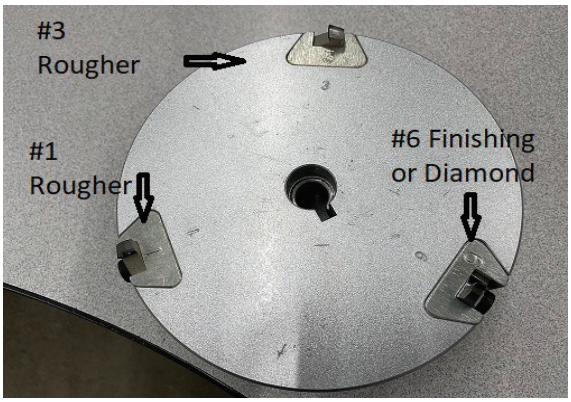
Diamond Blade

1. The **Roughing Blades** are marked as MY01. Two MY01s are used in each three-insert cutting head. The roughing blades remove the highest volume of material as the cutting head is polishing the workpiece. A roughing blade face is shaped in a radius or arc shape for the best cut.
2. The **Finishing Blade** is marked as MY02. The finishing blade removes a much smaller amount of material. The face of the finishing blade is also uniquely shaped to render the surface of the workpiece see-through clear. The face of the finishing blade is flat in the middle with curved or a slight arc on either edge. Finishing blade MY02 is a PCD diamond blade, this produces a clear finished on cast acrylic.
3. The **Diamond Blade** is marked as MY05. The diamond blade is recommended for achieving the best possible finish on both cast and extruded acrylic.

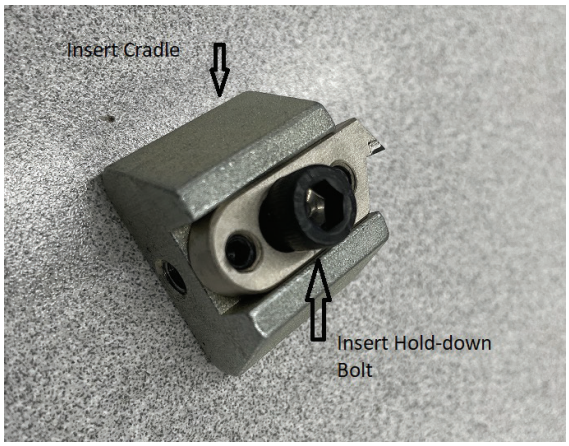
Setting-up the Cutter

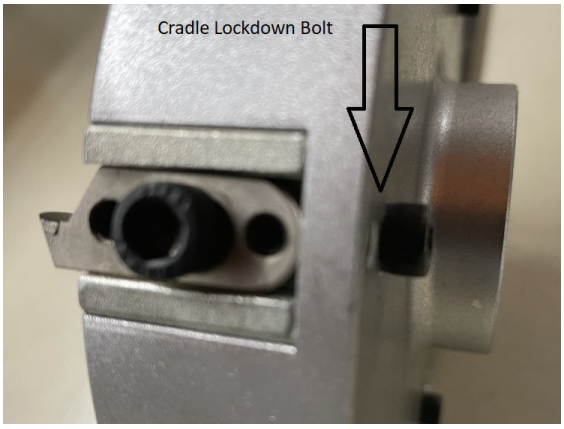
To set-up the inserts in the hub:

1. Each diamond insert is secured in a triangle-shape insert cradle is slid into the matching slot (Insert cradle #1 to cradle slot #1, etc.) on the hub and secured in place by a screw in the back of the hub.



2. To remove the insert cradle, remove the lock-down screw from the back of the hub. The screw can be accessed by a hole in the cutter's guard back-plate with a hex key Allen wrench.
3. Slide the insert cradle out of the cutter hub and remove the screw that secures the insert in the cradle.
4. To install the new inserts, you will need to place them in the appropriate cradles. The two roughers (MY01 series) will go be installed in slot # 1 and slot # 3. The Diamond (MY05 series) will be installed in the # 6 slot.
5. Before installing the cutters back into the cutter hub, the inserts will need to be set-up with the bench dial indicator to achieve the correct cutting depth.
6. Remove the insert hold-down bolt in the middle of the insert cradle and slide the # 1 rougher into the # 1 insert cradle. Thread the hold-down bolt back into the cradle through the inserts slot.
   DO NOT TIGHTEN.





The bench dial indicator is a two piece assembly consisting of the immobile Dial Indicator and the Insert Cradle Positioning Block. The insert cradle positioning block is mounted on the dial indicator base by two screws.

7. Loosen the two bolts securing the insert cradle positioning block and remove the block from the indicator base.

8. Slide the # 1 insert cradle into the insert cradle positioning block and replace the block back onto the dial depth indicator's base. Tighten both screws to clamp block into proper position.

NOTE: Draw back the dial indicator's stem to avoid contacting the edge of the blade until the positioning block is secured.

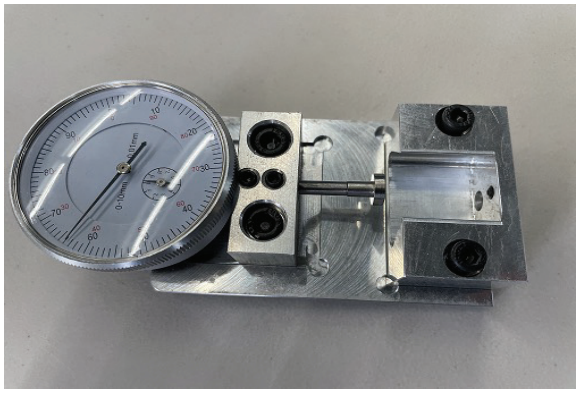
9. The number 1 insert is used as the zero reference point or baseline upon which the other two cutting blades are referenced. To set the "zero point" observe where the large black needle is located on the dial. Next loosen the silver thumbscrew on the dial indicator to allow the indicator's dial plate to rotate. Turn the dial plate until the black arrow is lined-up with zero on the dial plate. Lock the dial plate in place and observe the location of the small needle. Note: On setting the # 1 cutter to zero, tighten the bolt holding the insert in the cradle to secure the insert from moving. Check the dial indicator's needle to ensure the reading is still zero.

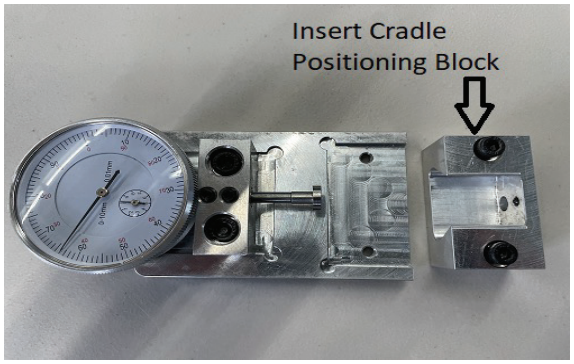
10. Remove the #1 insert cradle from the indicator's positioning block and slide the # 1 insert cradle back into the # 1 slot on the cutter hub. Lock the cradle into position using the cradle's lock-down screw and tighten.

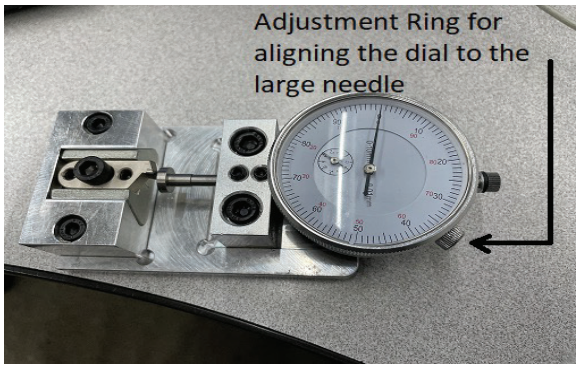
11. Repeat by removing # 3 insert cradle, installing the next rougher in the cradle as previously done before with the first rougher. Install the cradle into the indicator's positioning block and mount the block on the indicator's base. Note the position of the large and small needles on the dial. The correct position of the large needle should point to 20 or 0.2mm.

Use the black numbers on the dial indicator to see whether the cutter is being raised or lowered. If the needle shows increasing numbers from 1 to 100, the height is increasing. Decreasing numbers from 100 to 1 mean the height is decreasing.

The small needle should not move much beyond its initial setting. For instance, if the small needle on the cutter blade in slot #1 is lined-up with 2, and the large needle is lined-up with zero, the correct position of the needles for the cutter position # 3 would be large needle on 20, and the small needle will have hardly moved (should hover around 2).







If the blade installed in the # 3 insert cradle is too high or low, adjust the height of the cutter by using the steps below:

A. Slightly loosen the cutter's hold-down bolt to allow adjustment of the cutter within the cradle. Mount the cradle on the dial depth indicator base as previously with cutter # 1.

B. Use a 2.5mm hex key wrench to adjust the cutters height jack screw. The cutter height jack screw is the small set screw threaded into the back of the dial depth indicator's cradle positioning block. By threading-in the jack screw you increase the height of the cutter or decrease it by threading the jack screw outward.

C. When the large needle is on the "black" 20 and the small needle is near its initial position, gently tighten the insert hold-down bolt to fix the cutter in position. Be sure when tightening the bolt that the readings remain the same.

D. Next mount the # 6 insert cradle, with the diamond insert (MY05), into the indicator base like the previous two cutters. The correct height setting should be 0.05mm taller than the rougher in position # 3. The correct reading on the dial depth indicator would have the large needle on black 25, and as before, the small needle wouldn't have moved much.

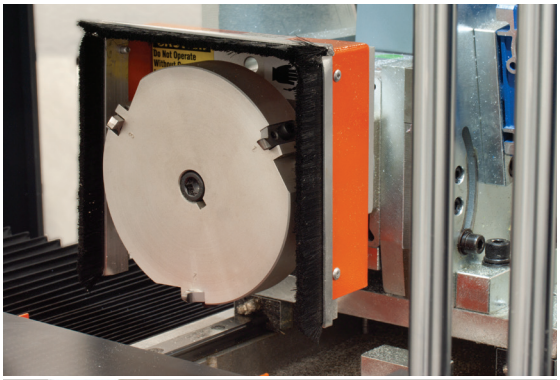
To recap, position #1 is 0, position # 3 is 20, and position #6 is 25 as indicated on the dial indicator.

Using the Dial Indicator

Before mounting the dial indicator assembly, remove the Orange Cutter Guard by loosening the two guard bolts accessible from the rear of the machine and sliding the guard upwards.

When all three cutter blades are properly adjusted re-mount the Cutter Guard by sliding it downwards in the guard slots and re-tighten the two guard screws.

Never operate the EF-3000 without the Cutter Guard in place!



Orange cutter Guard from front of EF-3000

Guard Bolts from rear of EF-3000

Slide UP Orange cutter guard to remove.

Slide DOWN Orange cutter guard to replace.

The dial indicator must be used to set the cutter blade heights.

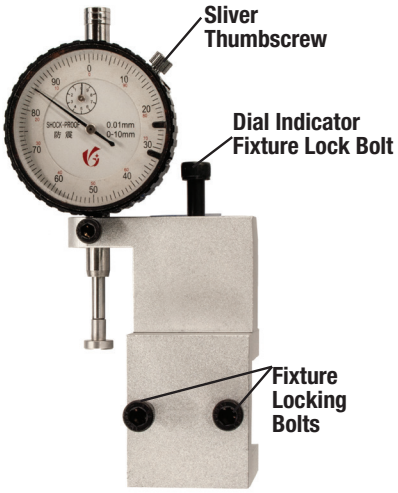
Dial Indicator Fixture Lock Bolt

One Revolution of the Large needle = 1 mm or .040 inches

One Revolution of the Small needle = 10 mm or .400 inches

Scale:
Small needle 0-10 mm
Large needle 0.01 mm

Adjusting Blade Height

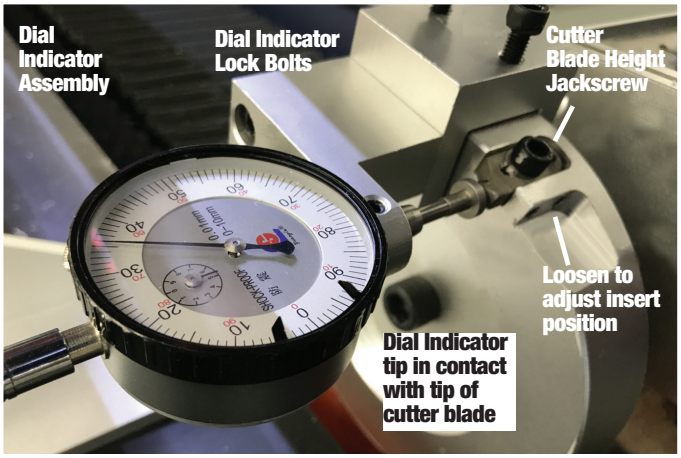


1. Carefully place the dial indicator assembly over the rim of the cutter head and gently tighten the Dial Indicator Fixture Lock Bolt.

Note: The two indicator fixture locking bolts shown in the middle photo are used to make sure the dial indicator's tip will be properly positioned when lowered on to the edge of the cutting blade.

2. Position 1 is the zero reference point or baseline upon which the other two cutting blades are referenced. To set the "zero point", mount one MY01 roughing blade in the cutting blade slot at Position 1 and lock it into place. This cutter blade extends well above the cutter head and adjusting it is not usually required. Next, loosen the silver thumbscrew on the dial indicator to allow the black dial to rotate. Turn the black dial on the indicator until the large needle is on "zero". Lock the dial in place with the silver thumbscrew and observe the location of the small needle.

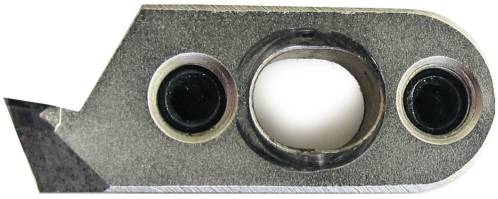
3. Remove the dial indicator assembly from Position 1 and mount it at Position 2 as described in step 1.



When the dial indicator assembly is correctly mounted (locked in place with the indicator tip on the MY01 roughing blade in Position 2), note the position of the large and small needles on the dial indicator. The correct position of the large needle should point to 20 or 0.2mm.

Use the black numbers on the dial indicator to see whether or not the cutter blade is being raised or lowered. If the needle shows increasing numbers from 1 to 100, the height is increasing, Decreasing numbers from 100 to 1 mean the height is decreasing.

The small needle should not move much beyond its initial setting, for instance, if the small needle on the cutter blade in position 1 is lined up with 10, and the large needle with 0 (zero), the correct position of the needles for cutter blade position 2 would be large needle on 20, and the small needle will have hardly moved (should be at about 10).



If the blade installed in position 2 is too high or low, adjust the height of the blade using the steps below:

A. Slightly loosen the Cutter Lock Bolt and Side Lock Screws (do not remove the bolts).

B. Use a 2.5mm Hex Key Wrench to adjust the cutter blade height jack screw by passing the 2.5mm hex key through the cutter blade access port located in the plate behind the cutter head. By threading in the cutter blade jack screw, at the bottom of the blade slot in the cutter head, you can increase the height of the cutter blade or decrease it by threading the jack screw outwards.

C. When the large needle is on the black 20 and the small needle is near its initial location, gently tighten the cutter lock bolt and side lock screws to fix the position of the cutter blade in place.

4. Move the dial indicator assembly to cutter blade Position 3 and mount it in the same fashion as the previous steps above. Position 3 is the location of MY02 finishing blade. The correct height settings should be 0.05mm taller than the roughing blade in position 2. The correct reading on the dial indicator would be the large needle on black 25, and as before the small needle would not have moved much.

To recap, Position 1 is 0, Position 2 is 20, and Position 3 is 25 as indicated on the dial indicator.

5. When all blades are correctly set, remove the dial indicator assembly from the cutter hub and replace the brush-guard.

Adjusting the Cutting Depth

When all blades are set at the correct height, depth of cut can be set. **For best results set the depth of cut by following the steps below:**

1. **Power on the machine**. On the Touch Screen, check to see if the machine is in manual mode. If not, switch from auto to manual mode.
2. **Lower the fence/workpiece guide** with the Fence Up/Down button on the Touch Screen if the fence isn't already in its down position.
3. **Place the workpiece squarely against the fence and clamp the workpiece into place** with the manually controlled pneumatic clamp foot.
4. **Raise the fence with the Touch Screen control.**
5. **Using the Touch Screen** control, press the Manual button to move the spindle to the left until the cutter head is aligned with the workpiece.
6. **Before advancing** the Spindle forward (toward the workpiece), turn the depth control knob counterclockwise (returning the spindle motor toward the back of the machine) to ensure that when the Spindle is advanced toward the workpiece that it doesn't strike the workpiece or the deck of the work area.
7. **Line up** the Position 1 Roughing Blade with the workpiece clamped on the deck of the work area. See photo on page 16.
8. **Press the Spindle FWD** button to move the cutter head toward the workpiece.
9. **Carefully turn the depth control knob** clockwise while observing the advancing position of the MY01 roughing blade. When the Position 1 Roughing Blade just touches the workpiece, stop adjusting the depth control knob.
10. **Take note of the position** of the orange needle on the dial indicator. This will be your "zero point" or reference for setting the depth of your cut.
11. **Press the Spindle BWD** (Backward - toward the back of the machine) to move the spindle away from the workpiece.
12. To set the proper cut (usually about 0.75mm or .029 inches), turn the depth control knob clockwise one-half turn or 0.5mm (.020 inches) to set the depth.

To review how the proper depth of cut is set: When the cutting height is adjusted, the Position 1 Roughing Blade is the zero reference point. Keep in mind that the tallest blade in the cutter head is the Position 3 Finishing Blade. The difference between the tallest and lowest blade in the cutter head is 0.25mm or .009 inches. Always add 0.25mm (.009 inches) to whatever depth is set on the dial control knob.

For example: The Cutter Head is set with Position 1 Roughing Blade as zero. Position 2 Roughing Blade is 0.2mm taller than Position 1.

Position 3 Finishing blade is 0.05mm taller than Position 2.

The total difference in height is 0.25mm (.009"). With the Position 1 Roughing Blade as your zero-reference point touching the workpiece, the machine would remove a total of 0.25mm or .009 inches from the workpiece. The goal is to remove enough material to polish off all saw marks in the material in one pass, but not so much that the blades become damaged or prematurely dull.

The recommended amount material removal is 0.75mm (.029").

To remove 0.75 mm (.029"), advance the spindle forward and turn the dial control knob clockwise until the blade at position 1 just touches the workpiece. Paying attention to the position of the orange needle, turn the dial control knob counterclockwise one-half turn, 0.5 mm (.020") with the orange needle 180 degrees from its starting position.

With depth of cut at 0.5 mm using position 1 as the zero reference point and with the difference in blade heights, the cutter will removing a total of 0.75mm or .029 inches of material in each pass.

Depth of cut	**+**	**Difference in blade heights**	**=**	**total material removed**
0.5 mm (.020")		**0.25 mm (.009")**		**0.75mm (.029")**

13. After making height adjustments, check both the depth of the cut and the quality of the finish. Return the spindle to the home position and lower the fence. Precisely measure the workpiece as a comparison. Next, re-set the workpiece against the fence and clamp it. Press the START button and allow the spindle motor to perform one pass. When the part is finished, measure again and confirm the amount of material removed.

Adjusting Clarity of the Polished Surface

The clarity of the polished surface depends on the angle of the finishing blade. Each blade has two jack screws. The upper jack screw (closest to the blade) for adjusting the angle of the finishing blade in relation to the workpiece surface. **Note that the upper jack screw typically extends beyond the bottom surface of the blade shank by about 0.2 – 0.4 mm (.008” – .016”).**

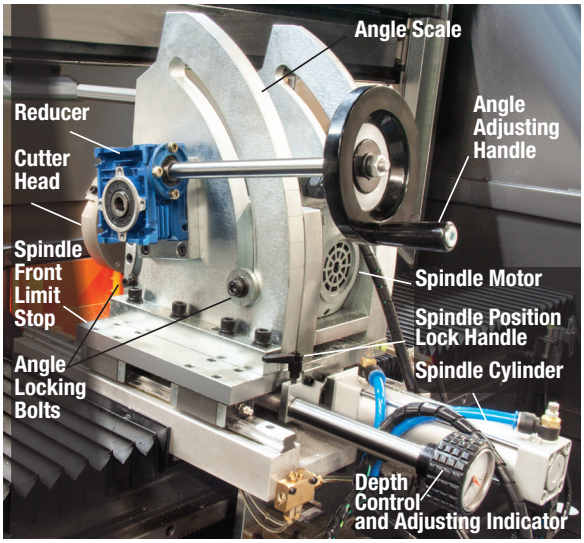
If the workpiece is foggy or dull looking: Increase the blade angle by increasing the amount the upper jack screw extends beyond the bottom of the blade shank.

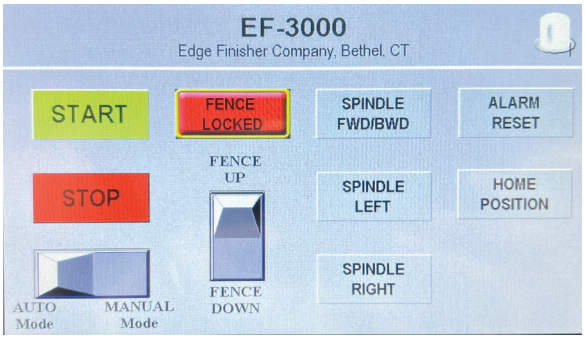
I**f the workpiece is bright but leaves streaks or white marks:** Decrease the blade angle by decreasing the amount the jack screw extends beyond the bottom of the blade shank.

To make adjustments:

1. Loosen and remove the cutter lock bolt. Loosen the two cutter head jack screws in the side of the cutter head position 3 slots.
2. Remove the cutter blade and using a Vernier caliper or micrometer, measure between the bottom of the upper jack screw and the top of the blade shank.
3. Turn the upper jack screw slightly in either direction to increase or decrease the distance the upper jack screw extends beyond the blade shank.
4. Measure the change and remount the blade on the cutter head. Adjust the blade’s height with the dial indicator to be sure that the Finishing Blade is 0.05 mm higher than the Position 2 roughing blade.
5. Check the quality of the finish. If the issue persists, repeat steps 1 through 5 until the result is acceptable.

Setting-up for Angle Cutting





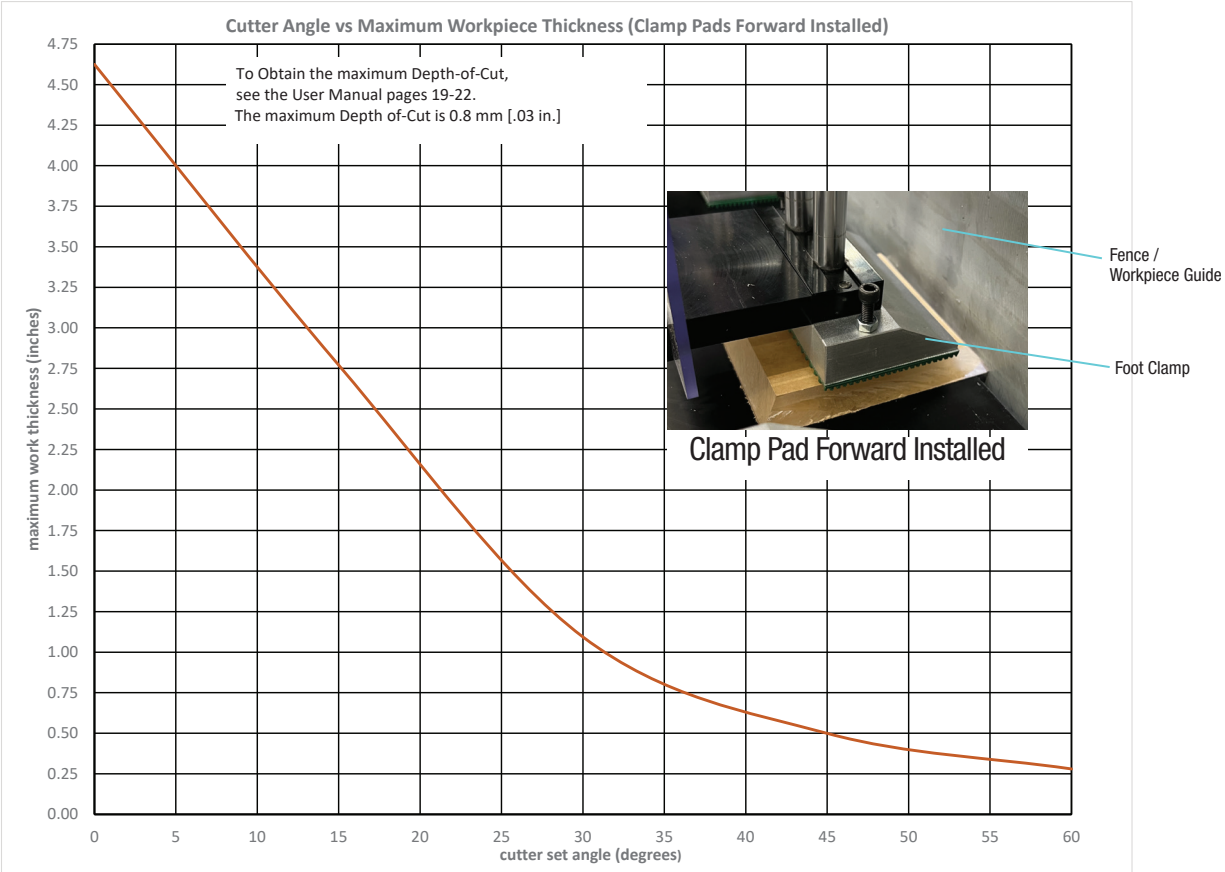
Note: It is advisable to only polish angles on workpieces that have had angles precut on them. Please consult the chart on page 22 for cutter angle vs maximum workpiece thickness to determine the range of angles that can be polished according to the material's actual thickness.

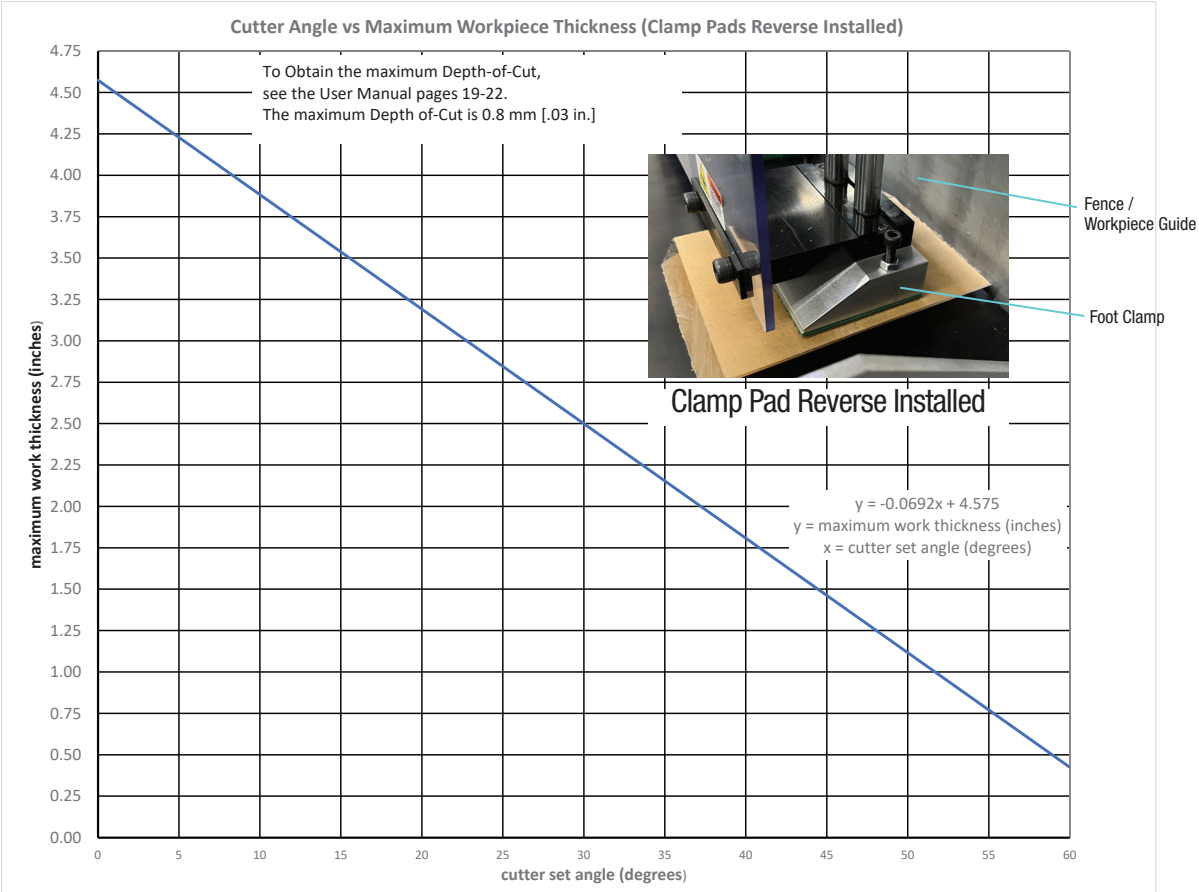
1. Select **MANUAL** mode via the Auto/Manual button on the Touch Screen.
2. If the Fence isn't in the lower position, press the **FENCE DOWN** button on the Touch Screen.
3. Clean the work deck of plastic debris and place the workpiece firmly against the fence.
4. Clamp the workpiece with the pneumatic clamp foot.
5. Press the **FENCE UP** button to raise the fence.
6. Press the **SPINDLE LEFT** button to move the spindle to a position opposite the workpiece.
7. Insert the Angle Adjusting Handle into the reducer mechanism.
8. Loosen all four Angle Locking Bolts slightly to allow adjustment of the cutter head angle.
9. Turn the Depth Control Knob counterclockwise to return the spindle motor backward to prevent collision with the workpiece or deck of the machine when advancing the motor to set the initial cut.
10. With the Angle Adjusting Handle, turn the handle clockwise to increase the angle or counterclockwise to decrease the angle.

Note: the angle scale is marked-off in 5-degree increments and the spindle motor has a position mark engraved on it. Line up the position mark on the spindle with the angle mark on the angle scale to set the angle. When the angle is correctly set, re-tighten all four Angle Locking Bolts to hold the angle during polishing.

11. Press the Spindle **FWD/BWD button** to move the spindle toward the workpiece.
12. Rotate the cutter head until the Roughing Blade in Position 1 is hovering over the angle to be polished. Turn the Depth Control Knob gently clockwise until the Roughing Blade in Position 1 contacts or scrapes the angle of the workpiece. This is the "zero position".
13. Press the **SPINDLE FWD/BWD button** again to move the spindle away from the workpiece.
14. Turn the Depth Control Knob clockwise about 1/2 – 3/4 of a turn (roughly 0.5 mm – 0.75 mm or .020" – .029"). **Remember the difference in height between the three cutting blades and add about 0.25mm (.010 inches) to the depth of cut to properly calculate the amount of material removed during each pass.**
15. Lock the depth of cut by turning the Spindle Position Lock Handle.
16. Lower the Fence.
17. Select **AUTO** mode on the Touch Screen and start the cutting process.
18. When the cutting process is complete, press **STOP**, the fence will lower and the spindle will return to the home position.

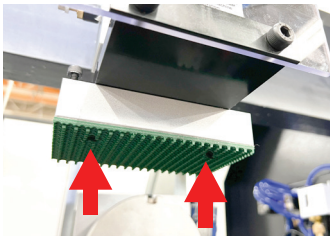
Cutter Angle VS Maximum Workpiece Thickness



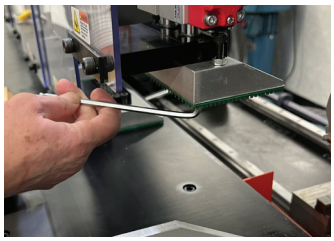


To adjust Foot Clamp Pads See Page 23.

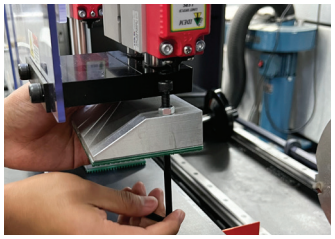
Adjusting the Foot Clamp Pads



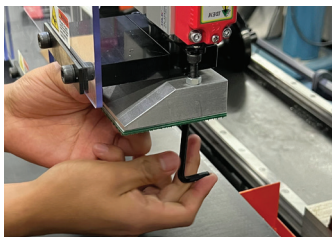
1- There are two screws located under each foot pad.



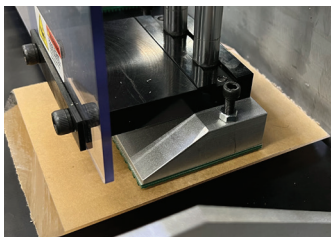
2- Place foot in the “up” position. Using a 5mm Allen Wrench unscrew both screws and remove pad.



4- Rotate foot pad to the desired position.

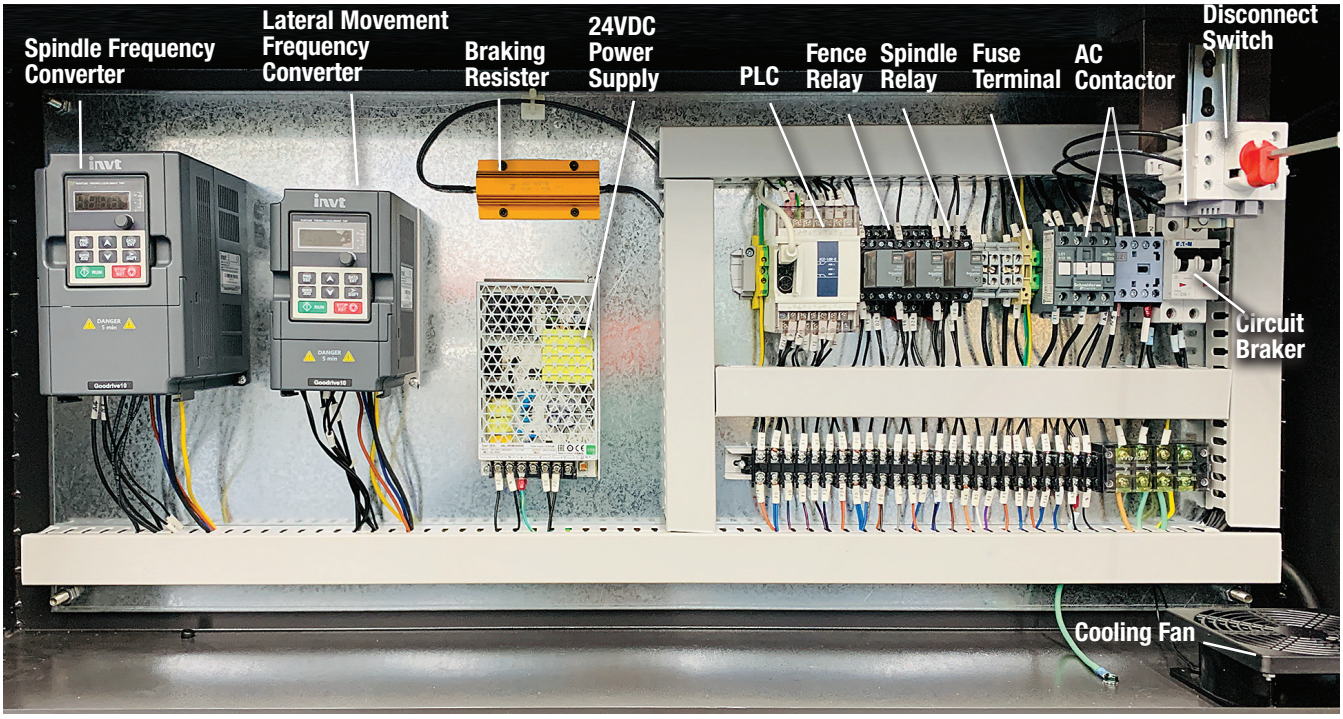


5-Using the Allen Wrench tighten the screws.



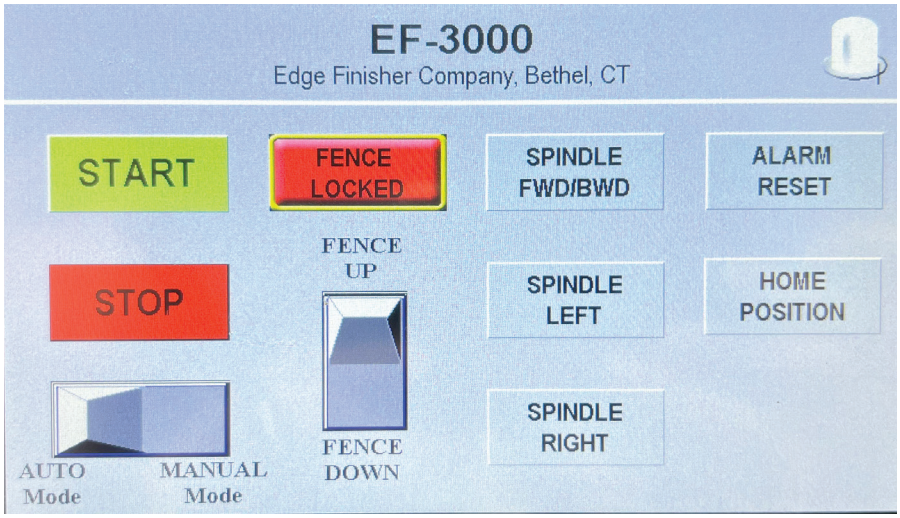
6-Done!

Electrical Components



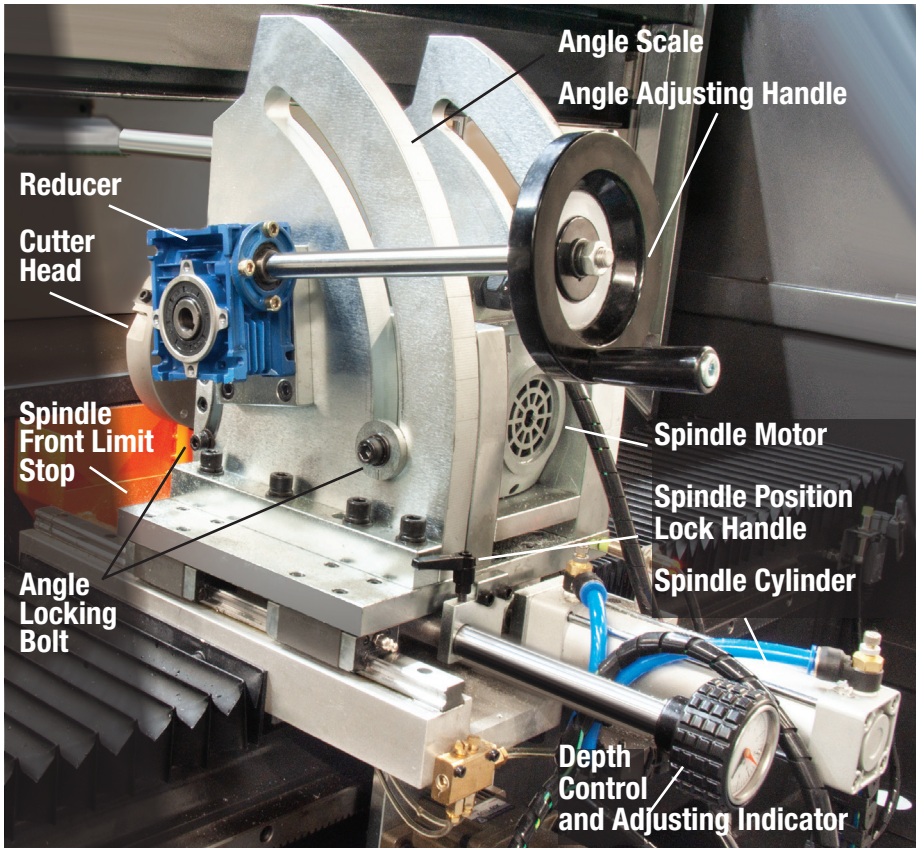
Before You Run the EF-3000

1. Connect the power supply
2. Connect the air source
3. Make sure the spindle locking device is removed



Review Panel Operation:

Spindle Left	☐	Make sure all motion is correct
Spindle Right	☐	Make sure all motion is correct
Press the Fence button	☐	Check to see if the raising and lowering of the fence is smooth if needed adjust cylinder speed
Press the spindle move advancing	☐	Make sure all lateral motion is smooth
Check clamp foot action	☐	Check for motion of clamp foot
Press the Stop button	☐	Check for proper stop operation
Alarm State Function	☐	Make sure the alarm light is on. Press alarm-reset to clear.
Stop Function	**Stop**	



Setting the Cutting Blade

1. Move the Spindle Backward
2. Lower the Fence
3. Place the workpiece against the Fence
4. Clamp the workpiece
5. Move the Spindle Forward

Make sure the blades won't contact the machine deck or workpiece

1. Loosen the Spindle Position Lock Handle.
2. Turn the depth control clockwise to move the cutter blades closer to the workpiece
3. Use the Depth Control to place the roughing blade in Position 1 touching the workpiece
4. Move the Spindle Backward
5. Adjust the cutting depth to remove the desired amount, and lock the Spindle Position Lock Handle.

Polishing Procedure

1. Lower the Fence

2. Position the workpiece against the Fence

3. Clamp the workpiece

- **If necessary press the Home Button**, this will ensure that the spindle motor is in the home position
- Select auto mode, then press the start button. The fence will rise and the spindle will move forward and begin the cutting process.
- **If in manual mode**, when the cutting process is complete press the stop button, then press the home button. This will send the spindle motor back to its home position.
- **If in auto mode** press the stop button and spindle motor will return to home position.

Troubleshooting and Equipment Maintenance

Possible Issues

- Most faults encountered in the equipment stem from the pneumatic system, such as air leaks around any of the fittings.
- If the cylinder rebounds (not staying in the required position), the cylinder's inner seal-ring may be worn and should be replaced.
- In the event of any pneumatic and/or electrical problem, shut down the machine and do not operate until the equipment has been fully repaired.

Maintenance

- After every shift change, check for any air leaks and resolve any issues before using the machine.
- Be sure to clean the workpiece deck of all dirt and debris. Clean up any excess oil.
- Once a week, operate the lubricator to lubricate the guide rails, racks, and moving parts. Check the fluid level in the lubricator.
- Add light oil, such as Mobil ˆ 24 to the lubricator in the pneumatic system to ensure a longer cylinder life.

Limited Warranty

Edge Finisher Company will repair or replace, at our discretion, any EF-3000 machine or part thereof that is defective in materials or workmanship for a period of three years forward from purchase date. This warranty is inclusive of parts, labor and if necessary, upon our determination, transportation costs from our factory. Customer is responsible for inbound freight.

Tooling is excluded and not covered under this warranty. Use of the machinery other than described in the related operations manuals, alterations to, or repair work performed by persons other than authorized Edge Finisher Company technicians or subcontractors will render this warranty void.

Edge Finisher Company assumes no responsibility or liability for machinery damaged due to circumstances beyond our control, inclusive of but not limited to fire, theft, flood, electrical power surge, natural disasters, or other act of God.

This warranty covers only the original purchaser of the product. Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages so the above limitations may not apply in all instances. This warranty gives you specific legal rights, and you may have other legal rights that vary from state to state.

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