SUPERIOR

FF-1100
I.D. Mount Flange Facer
Operating Manual

CONFIDENTIALITY STATEMENT

DOCUMENT NUMBER SPR-MAN-FF-1100

REV 02

SUPERIOR

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ABOUT US

Superior Plant Rentals, LLC. (SPR) specializes in portable machining, bore welding, line isolation, and testing solutions, providing equipment and tools manufactured under the highest standards of quality control and engineering expertise along with 24/7 service and support. Designed with the operator in mind, our tools and equipment deliver dependable and precise performance, providing cost-effective solutions and reduced downtime, making them beneficial resources in the Oil and Gas, Mining, Heavy Construction, Shipbuilding, Aerospace, Defense, and Power Generation industries.

SPR rents and sells equipment and tools; we offer our own line of portable ID/OD flange facers, linear/gantry and rotary mills, end prep bevelers, isolation and test plugs, line boring, and bore welders, as well as custom-designed equipment and tools.

Our team includes machining, test and isolation, and engineering experts, all with a thorough working knowledge of applications to support you with our equipment on any job. We understand the urgency of your projects and are committed to delivering the highest quality equipment and tools to satisfy the requirements of your clients.

SPR delivers outstanding customer service, specialized training by seasoned professionals, and tools as tough as the jobs you need them to do.

YORK
PORTABLE MACHINE TOOLS

SUPERIOR
PLANT RENTALS

CLIFF'S BITS
PRECISION GRINDING & TOOLING

WARNING:

SPR is committed to continued product improvement; therefore, the machine you received may be slightly different than the one described herein. This manual and the information provided is a basic guideline for our customers. SPR will do its best to ensure that the information and procedures contained in this manual are correct and up-to-date. Superior cannot guarantee that the information and procedures contained herein are correct for all applications or situations.

The contents of this manual are subject to change without notice. It is the obligation of the user to read all information in this manual, become familiar with the equipment to be used, and exercise the utmost care in equipment operation. **Do not make any modifications to this equipment. Any modifications will void all warranty claims, as well as increase the risk of injury or harm.** Do not operate this equipment if all parts are not functioning at 100% efficiency. Notify us immediately for any needed repairs.

Note: SPR will supply all repair and replacement parts necessary for maintenance and operation of this machine. For repair, service, or additional information, please locate repair and replacement part description/part numbers within the O&M manual in the exploded view section and contact us for ordering.

USA

Superior Plant Rentals LLC.
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Superior Plant Rentals LLC.
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SUPERIOR

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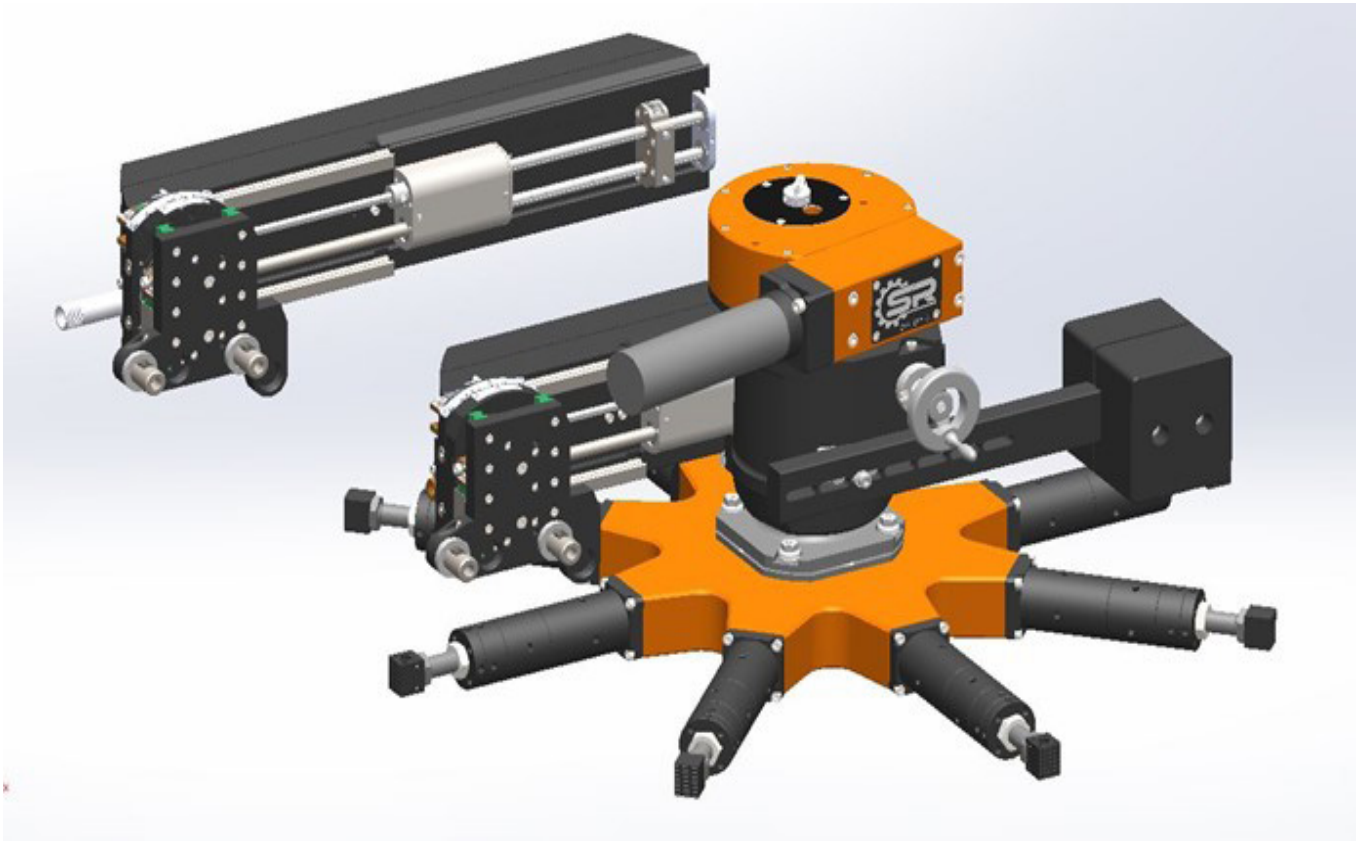
INTRODUCTION

This manual contains information necessary for the setup, operation, maintenance, shipping, and storage of your FF-1100. The manual must be read in its entirety to familiarize yourself with the FF-1100 before attempting to setup or operate the machine. Failure to do so may result in injury to the operator or damage to FF-1100.

RECEIPT AND INSPECTION

The FF-1100 was packaged in an aluminum crate anticipating normal shipping conditions. Upon receiving your FF-1100, you must:

1. Inspect the aluminum crate along with the machine for shipping damage.
2. Inspect all the components for damage.
3. If any components are missing, or if you have questions regarding your FF-1100, please contact an SPR location nearest you immediately.



SPECIFICATIONS CHART

Machining Performance Range		
ID Mounting Range:	Small Spider	5.7 in - 13.7 in (144.8 mm - 348.0 mm)
	Medium Spider	13 in - 23 in (330.2 mm - 584.0 mm)
	Large Spider	21.5 in - 37.5 in (546.1 mm - 952.5 mm)
Cutting Range		Refer to Drawing Below
Swing Diameter		Refer to Drawing Below

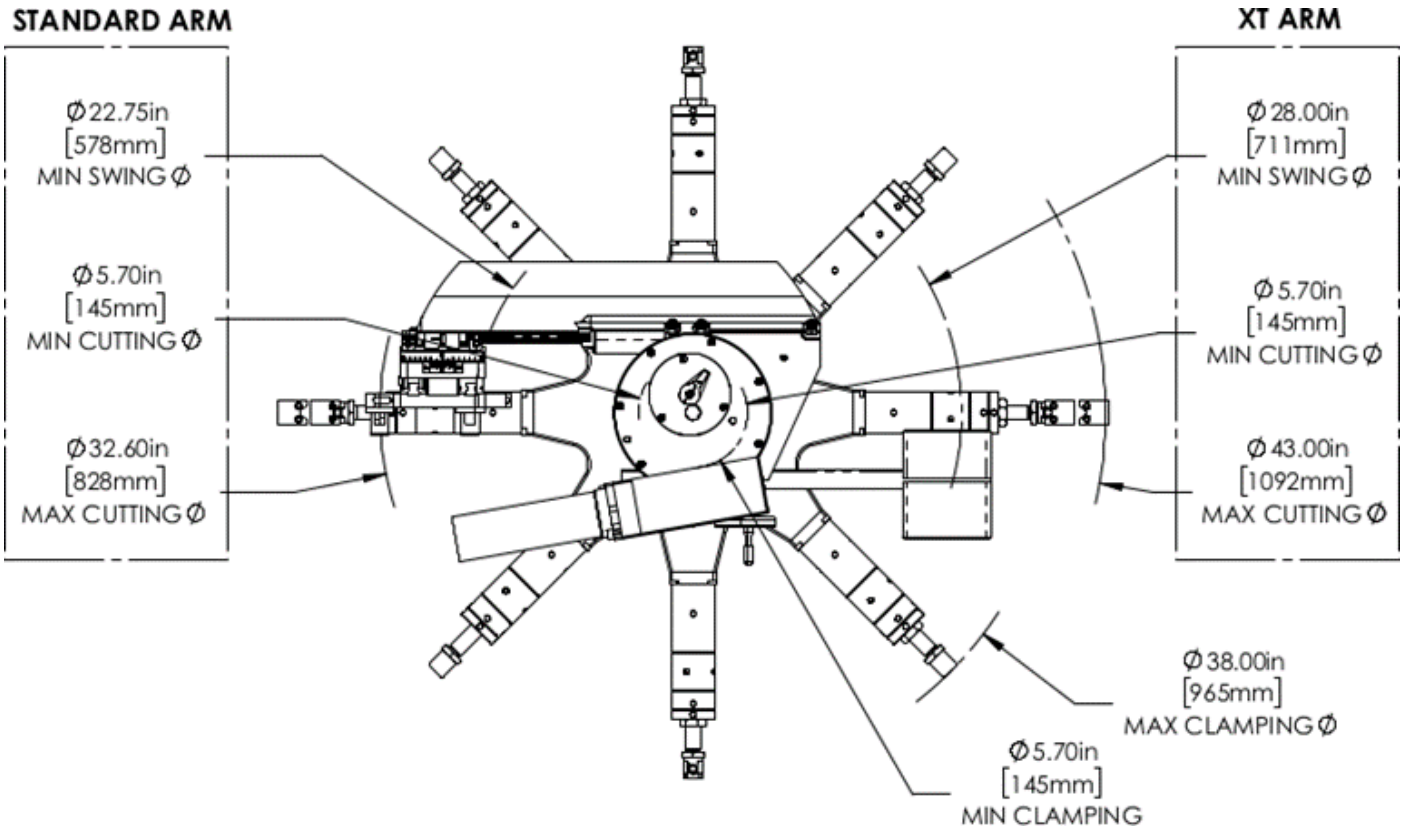
Drive System	
Motor	2.45 HP (1.83 kW)
Recommended Air Pressure	Max 70 CFM @ 90 psi
Speed	Speed at Max Output 310 rpm

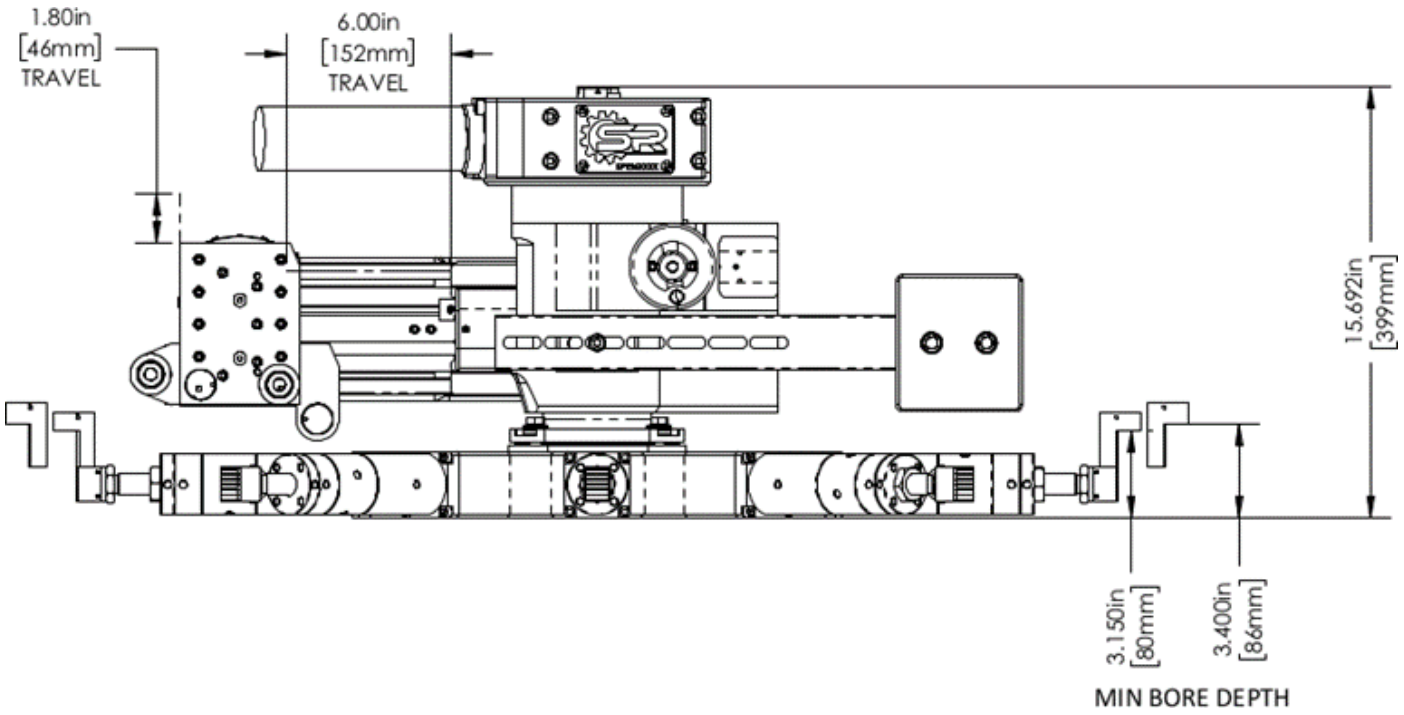
Measurements	
Machine Weight	Refer to table below

Component Weights		
	LBS	KG
Rotor	78.0	35.5
Max. Small Spider	75.0	33.0
Max. Medium Spider	87.0	38.0
Max. Large Spider	102.0	45.0
Radial Arm 828 mm (32.6")	67.9	30.8
Radial Arm XT 1092 mm (43.0")	79.8	36.2
Counterweight Arm	42.4	19.2
Pneumatic Motor	7.5	3.4
Air Caddy	15.5	7.0
Aluminum Shipping Container	143.6	65.0
Total Shipping Weight	**593**	**267**

Shipping Dimensions			
	Length	Width	Height
Aluminum Crate	58-1/4in (1480 mm)	27-1/2in (699 mm)	26-3/4in (680 mm)

DIMENSIONS


STANDARD ARM
XT ARM
Ø22.75in
[578mm]
MIN SWING Ø
Ø5.70in
[145mm]
MIN CUTTING Ø
Ø32.60in
[828mm]
MAX CUTTING Ø
Ø28.00in
[711mm]
MIN SWING Ø
Ø5.70in
[145mm]
MIN CUTTING Ø
Ø43.00in
[1092mm]
MAX CUTTING Ø
Ø38.00in
[965mm]
MAX CLAMPING Ø
Ø5.70in
[145mm]
MIN CLAMPING


1.80in
[46mm]
TRAVEL
6.00in
[152mm]
TRAVEL
15.692in
[399mm]
3.150in
[80mm]
3.400in
[86mm]
MIN BORE DEPTH

SAFETY PRECAUTIONS

The customer shall ensure that only people thoroughly trained in safe work procedures operate this machine. Safe working procedures are required when operating rotating machine tools. The misuse of this machine could result in severe injury or death.

Before operating this machine, read the entire operating manual. Inspect machine, hoses, and accessories for any damage.

WARNING! DO NOT leave machine unattended while in operation.

WARNING! Beware of pinch points. Keep all body parts clear of the machine while it is running.

WARNING! Do not operate unless securely mounted to a workpiece.

WARNING!
MOVING PARTS.
Keep hands, loose clothing, and hair away from rotating or moving parts. Disconnect the air supply from the machine and unplug all equipment prior to adjusting or servicing. If electric, remove power from the machine prior to adjusting or servicing.

WARNING!
ELECTRICAL SHOCK.
Possible shock if not handled properly.

WARNING!
KEEP DRY.
Keep all equipment and components away from any water source.

WARNING!
EYE PROTECTION.
Eye protection must be worn while operating or working near powered equipment.

WARNING!
EAR PROTECTION.
Ear protection should be worn while operating or working near loud equipment.

WARNING!
FOOT PROTECTION.
Foot protection must be worn while operating or working near heavy equipment.

OVERVIEW

FEATURES AND COMPONENTS

SPR's FF-1100 is a versatile and rigid flange facer which can also bevel, bore, and cut grooves at user defined angles. This flange facer has a modular design for easy handling, with a precision rotating assembly that is pneumatically driven. This SUPERIOR design provides precise feeding in a compact and easy to handle package with rotating tool carriage, allowing for a SUPERIOR range of facing applications.

SUPERIOR SAFETY
Feed can be adjusted while machining without contact of any moving components.

SUPERIOR CONVENIENCE
With no shear-pins to replace, Slip Clutch acts as torque limiter and protects mechanics from overloading.

SUPERIOR CONFIGURATIONS
The FF-1100 comes with three spider sizes and two arm lengths to achieve SUPERIOR results in wide range of applications.

SUPERIOR CLAMPING
The modular clamping arms maximize machine rigidity while easily being reconfigured for varying flange sizes.

SUPERIOR LEVELLING
With 4X adjustable feet tabs for coarse levelling and a conical plate for fine, levelling is quickly and easily achieved.

SUPERIOR SET UP
The modular design is composed of four components allowing for easier handling, setup, and storage. Each component of the FF-1100 can easily be lifted by hand, or with their designated lifting points for versatility.

The radial arm(s) and counterweight arm are adjustable for the desired swing clearance and machining range. The adjustable counterweight allows easy balancing of the machine in vertical applications.

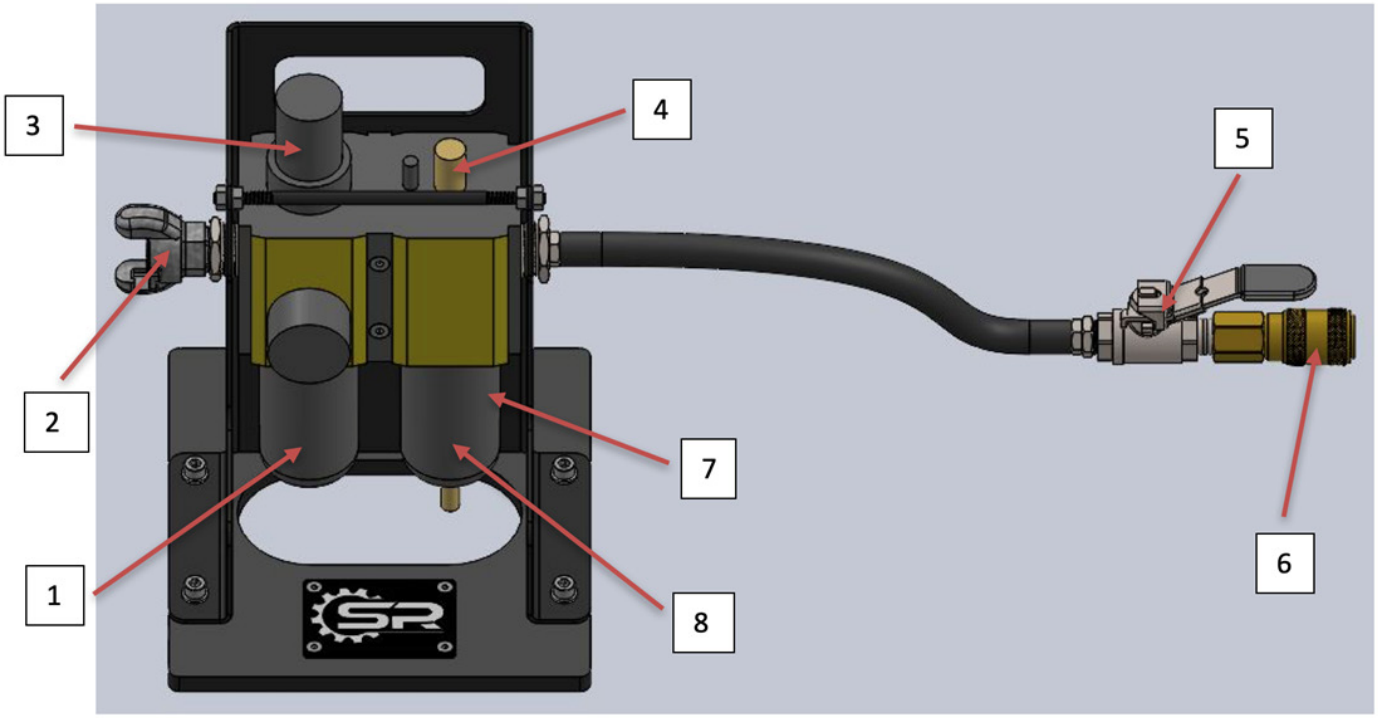
SUPERIOR REACH
The FF-1100 can machine over 32 inches with its standard arm and over 43 inches with its XT Arm.

SUPERIOR HIGH TORQUE MACHINING
The worm gear drive provides smooth high torque rotation even through welds or over bolt hole patterns.

CONTROLS

The FF-1100 has operational controls both on the air caddy and on the machine itself. These controls and their functions are as follows:

Air Caddy Controls



Item	Component	Function
1	Filter	Removes foreign particulates from the air supply.
2	Air hose inlet	Connects the Air Caddy to the compressed air source.
3	Regulator	Controls the air pressure supplied to the FF-1100.
4	Oil drip rate	Adjusts the air lubricator drip rate.
5	Ball valve	Controls the FF-1100's rate of rotation.
6	Air hose outlet	A quick disconnect supplying air to the FF-1100.
7	Oil reservoir	Holds lubricating oil (AW-32)
8	Oil reservoir sight glass	Shows the amount of oil in the reservoir.

The ball valve is used to adjust the air flow which adjusts the FF-1100's RPM.

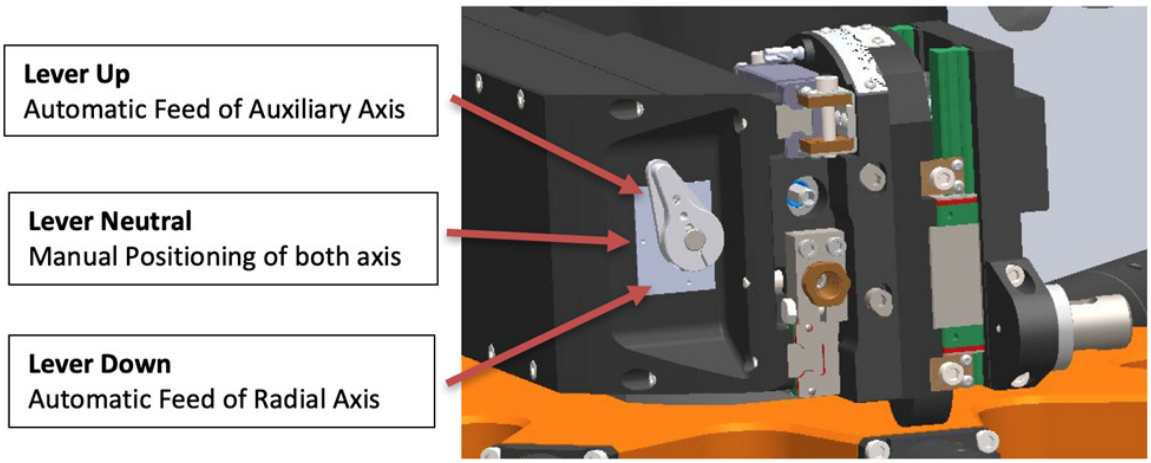
The Oil Drip Rate should be turned to produce one oil drip every 8-10 seconds. This rate can be increased to shorter intervals in colder temperatures.

Warning: The air motor can operate unexpectedly when the air hose is re-connected. Close the valve to the air motor before connecting the air hose.

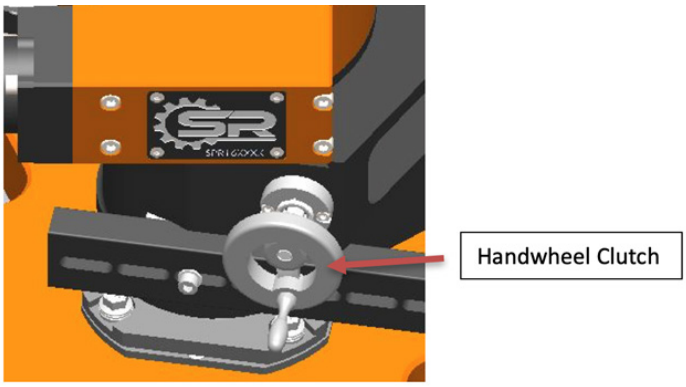
Machine Controls
There are three main controls located on the FF-1100: a Hand Wheel Clutch, a Feed Rate Lever, and a Feed Axis Selector. In addition, one can manually feed the two axis directly by inserting the supplied 5mm T-Handle into the end of each axis shaft to quickly and precisely position the tool for desired cutting.

Note: There are two brakes on both the Radial and Auxiliary Axis that must be loosened for feeding or adjusting depth of cut. The brakes on the axis not being fed or used should be re-tightened before cutting.

Feed Axis Selector - The Feed Axis Selector can be found on the end of the arm (see image below). Position the selector down for the Radial Axis, up for the Auxiliary Axis, or horizontal to put both axis in neutral for easier feeding with the 5mm T-Handle. The Auxiliary Axis is typically used as a Z-axis for plunge cuts, but can also be rotated to cut bevels or angled cuts.



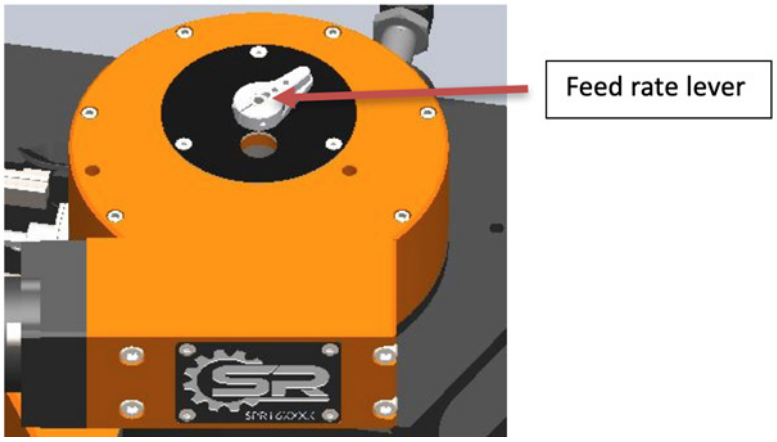
Hand Wheel Clutch - The Hand Wheel Clutch controls the feed direction for both automatic and manual feeding of both the Radial and Auxiliary axis. It can be pushed all the way into the machine to feed inwards, pulled all the way out to feed outwards, or half-way out (neutral) which allows manual feeding in either direction.



Note: To more easily position the hand wheel in or out, turn the hand wheel slightly while pulling or pushing on it.

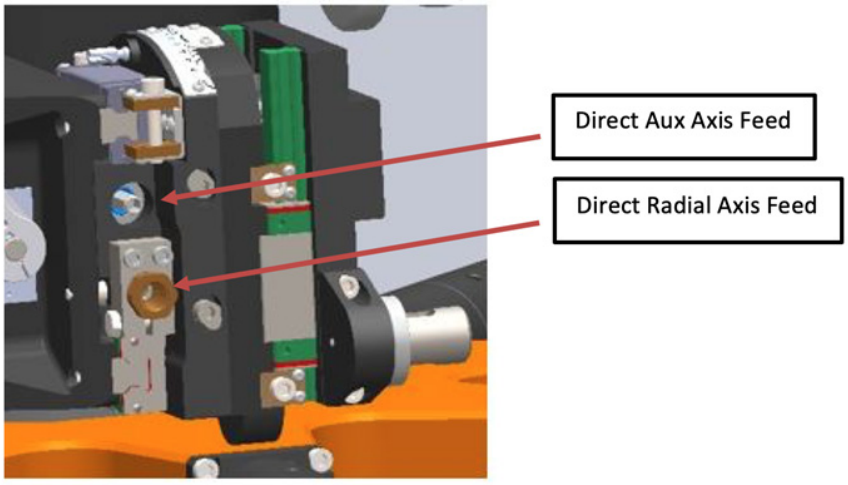
- **Automatic Feeding Inwards** – To automatically feed the carriage inwards in the radial direction (or plunge cut in the auxiliary direction), push the hand wheel all the way inwards. In this position, the hand wheel can be manually rotated, but only in the direction to feed the carriage inwards.
- **Automatic Feeding Outwards** – To automatically feed the carriage outwards in the radial direction (or away from the cut in the auxiliary direction), pull the hand wheel all the way outwards. In this position, the hand wheel can be manually rotated, but only in the direction to feed the carriage outwards.
- **Manual Feeding Both Directions** – If the hand wheel is positioned in the middle of its stroke, it will allow manual feeding of the carriage in either direction on the selected axis.

Feed Rate Lever – The feed rate lever is used to select how much the machine automatically feeds while rotating. The scale shows both an estimated feed per rev and a surface finish. If the surface finish is different than indicated, adjust the Feed Rate Lever accordingly.

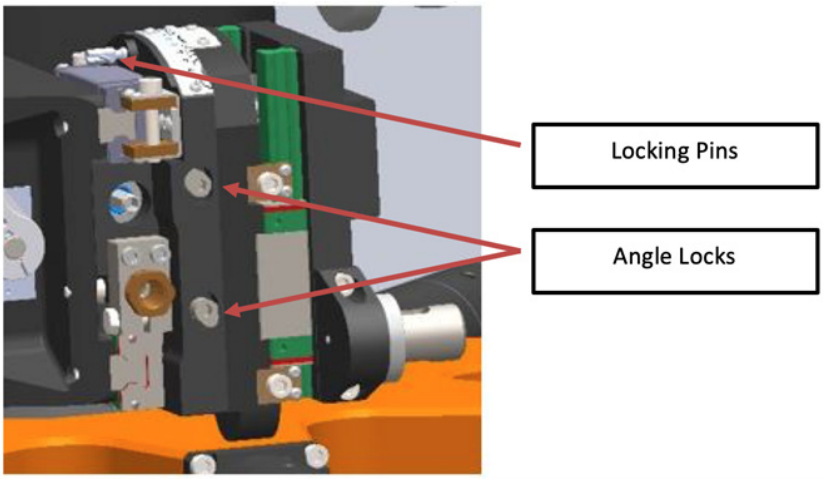


Manual Radial Feed – The easiest way to adjust the radial position of the carriage is to loosen the brakes on this axis and then place the Feed Axis Selector in the neutral position, and using the provided 5mm T-handle Hex Key turn the lower of the two shafts on the end of the arm in either direction (see photo below).

Manual Auxiliary Feed – The easiest way to adjust the auxiliary position of the carriage is to loosen the brakes on this axis and then place the Feed Axis Selector in the neutral position, and using the provided 5mm T-handle Hex Key turn the higher of the two shafts on the end of the arm in either direction (see photo below).



Adjusting Carriage Angle - For beveled or angled cuts the angle of the Auxiliary Axis can be adjusted. To do this unlock the two Angle Locks and pull out the Locking Pin to reposition the carriages angle. The scale on the top shows degrees. Always relock the Angle Locks prior to taking a cut or the angle will change under tool pressure.



OPERATIONAL SPECIFICATIONS

AMBIENT TEMPERATURE
The recommended ambient operating temperature of the FF-1100 is -4 to 113°F (-20 to 45°C). During operation, individual machine components may exceed these temperatures.

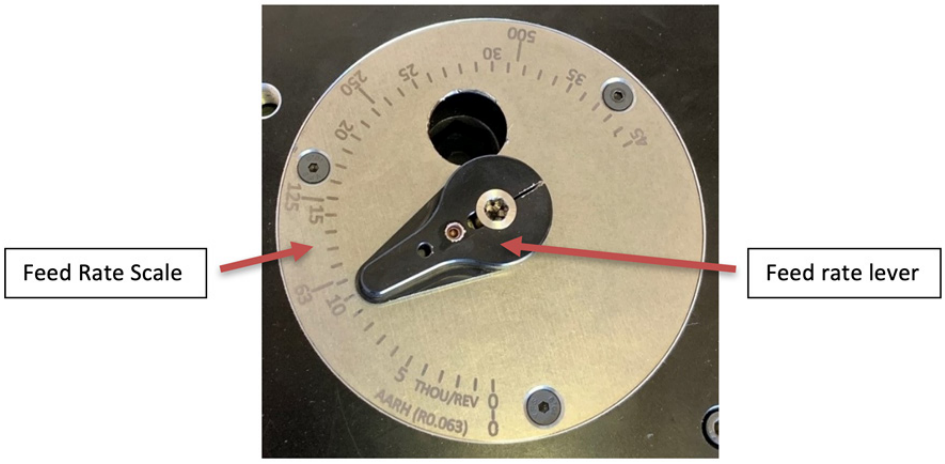
Note: Before making any critical final machining cuts, it's recommended that the FF-1100 has been running continuously for at least 15 minutes.

AIR PRESSURE
The manufacturer of the air motor recommends a max air pressure of 90 psi (6.2 bar) @ 70 CFM (2000 liters per min)

FEED RATE
The feed rate is mechanically driven by the rotation of the machine. Both the radial and auxiliary feed rates are adjusted by the lever on top of the rotor housing from a rate of 0 to 0.045 thou/rev. This feed rate can be adjusted while cutting.

Note: Variation in RPM will not affect the feed rate.

Clutches – The system has independent clutches on both the Radial and Auxiliary Axes. If too heavy a cut is taken the clutches can slip which can result in a lower feet rate than expected.



ITEMS REQUIRED BUT NOT SUPPLIED

The following items are required but not supplied with your FF-1100
1. Tape measure, dial indicator, calipers, micrometers.
2. Personal Protective Equipment
3. Cutting lubricants
4. Cleaning supplies
5. Maintenance lubricants

SETUP

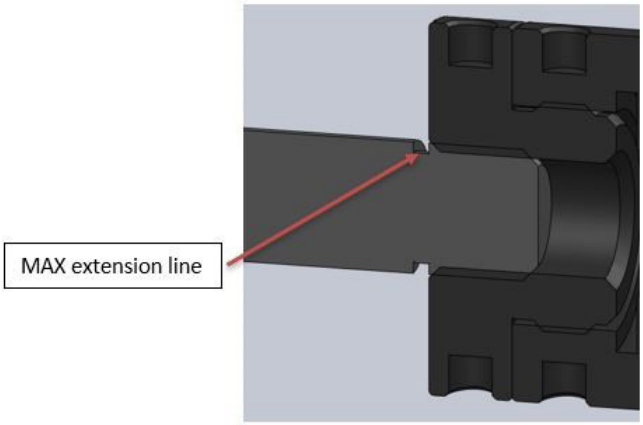
INSTALLATION HAZARDS

Proper installation of your FF-1100 requires that any operators follow the recommended safety precautions. Please consider the following:

1. Clamp Screws must be adequately tightened to the workpiece.
2. To maximize rigidity, do not have more than 1in of exposed threads on the Clamp Screws. Additional legs sections can be added to accommodate larger flanges. See the Configuring the Spider section to choose the correct legs.

Warning – Do not extend the threaded foot past that the max extension line, as per the image below.

3. If required, add additional extensions legs to minimize the length of the Clamp Screw that is exposed.
    a. It's recommended to keep the clamp screw thread exposed less than 1 inch for rigidity.
    b. DO NOT extend past the MAX extension line on the clamp screws.



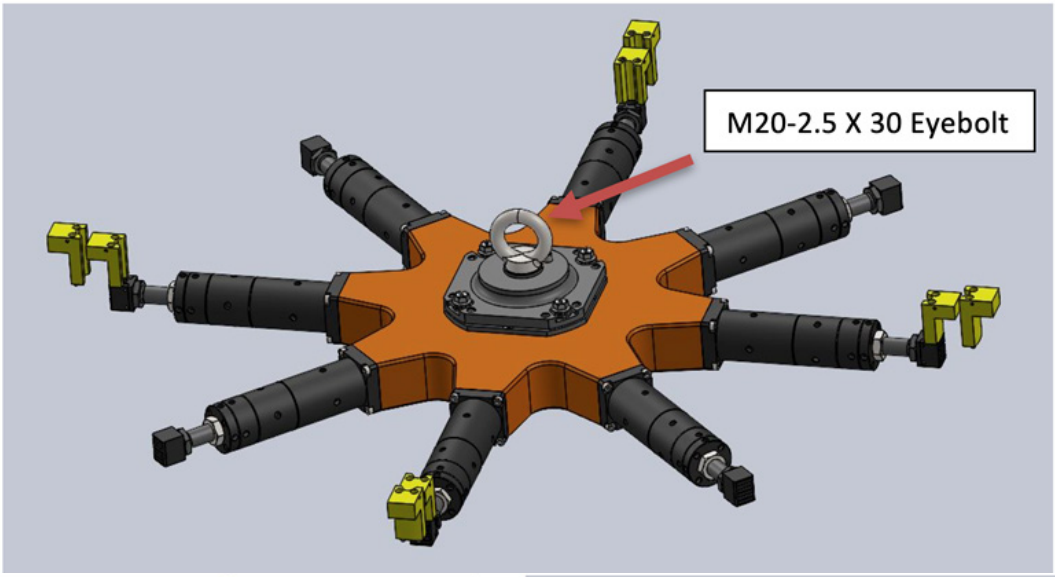
PREPARING THE MACHINE FOR OPERATION

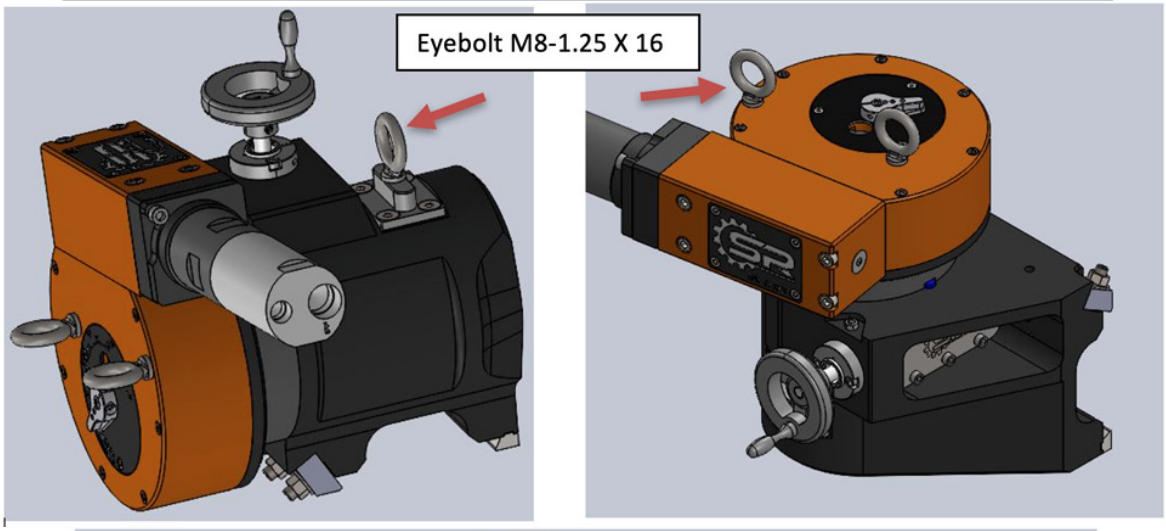
The FF-1100 can be setup and mounted horizontally, vertically and inverted. Before starting the setup procedure of the FF-1100, check that there is adequate room to position a fully assembled FF-1100 and its individual components on or near the workpiece for ease of assembling.

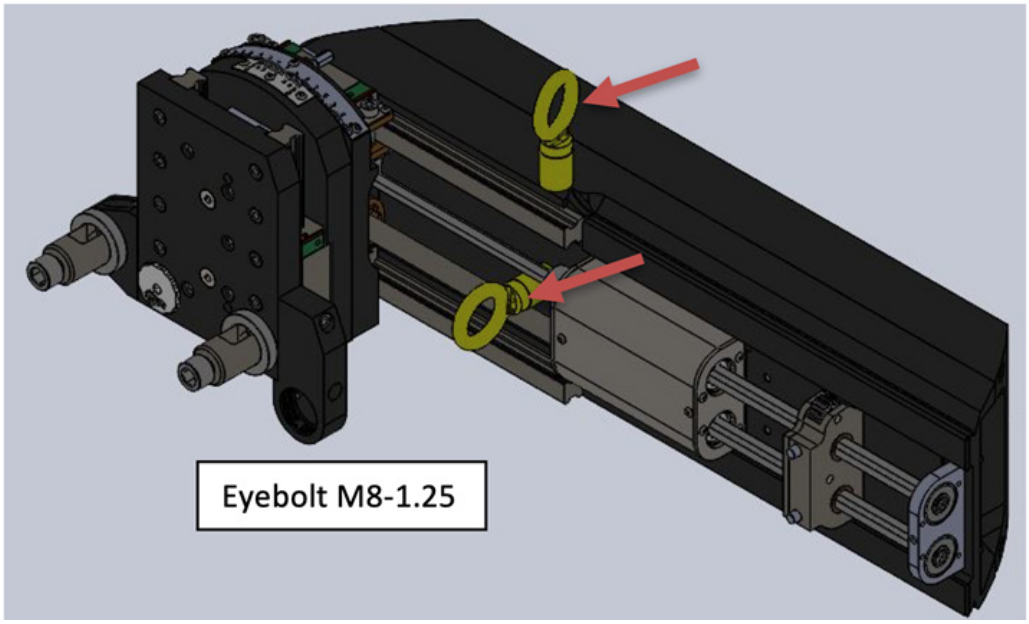
LIFTING

When fully assembled in the largest configuration, the FF-1100 can weight up to 300 lbs (136 kg).

1. The Spider can be hoisted using the supplied M20-2.5 X 30 Eyebolt.
2. The Rotor can be lifted vertically with the 2X M8-1.25 Eyebolts. When mounting the FF-1100 in a vertical workpiece, the rotor will need to be lifted in a horizontal position using 3x M8-1.25 Eyebolts.
3. Radial arms can be hoisted by placing the yellow M8-1.25 Extended Eyebolts in either position depending on the orientation of the machine.


M20-2.5 X 30 Eyebolt


Eyebolt M8-1.25 X 16

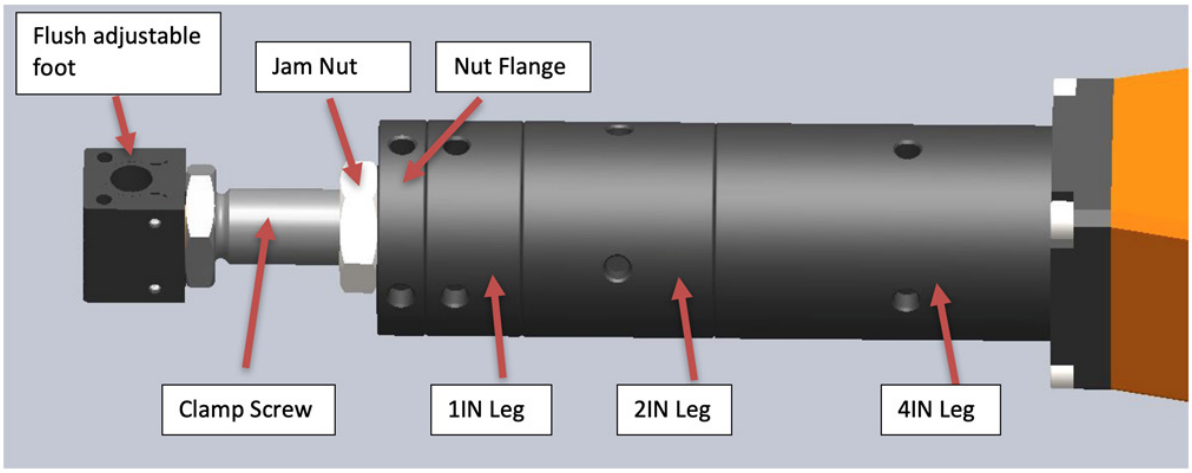

Eyebolt M8-1.25

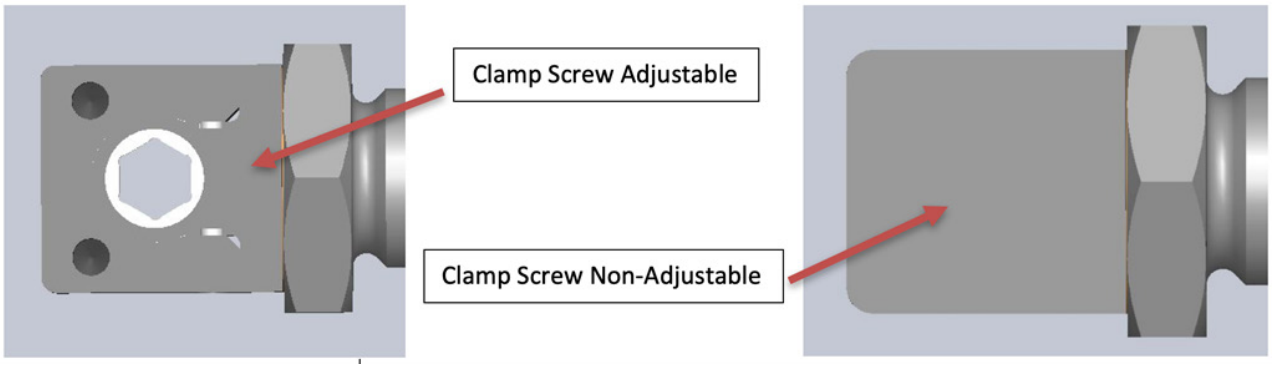
CONFIGURING AND INSTALLING THE SPIDER

Measure the ID of your workpiece and then refer to the table below to find the recommended spider and extension leg configuration.

MIN	MAX	SPIDER	EXTENSION LEG		
			1IN	2IN	4IN
5.7" (145mm)	7.7" (196mm)	SMALL			
7.7" (196mm)	9.7" (246mm)	SMALL	X		
9.7" (246mm)	11.7" (297mm)	SMALL		X	
11.7" (297mm)	13.7" (348mm)	SMALL	X	X	
13" (330mm)	15" (381mm)	MEDIUM			
15" (381mm)	17" (432mm)	MEDIUM	X		
17" (432mm)	19" (483mm)	MEDIUM		X	
19" (483mm)	21" (533mm)	MEDIUM	X	X	
21" (533mm)	23" (584mm)	MEDIUM			X
21.5"(546mm)	23.5" (597mm)	LARGE			
23.5" (597mm)	25.5" (648mm)	LARGE	X		
25.5" (648mm)	27.5" (699mm)	LARGE		X	
27.5" (699mm)	29.5" (749mm)	LARGE	X	X	
29.5" (749mm)	31.5" (800mm)	LARGE			X
31.5" (800mm)	33.5" (851mm)	LARGE	X		X
33.5" (851mm)	35.5" (902mm)	LARGE		X	X
35.5" (902mm)	37.5" (953mm)	LARGE	X	X	X

1. Assemble the spider with the required extension legs and apply anti-seize compound on the threads and contacting faces of each extension leg.
2. Thread the Nut Flange into the last extension leg with the Face Spanner provided.
3. Thread the Clamp Screws into the Nut Flange.
4. Install the 4x yellow Setup Tabs to align to the flange. The Setup Tabs will aid in safely placing the spider within the workpiece and roughly level the spider.



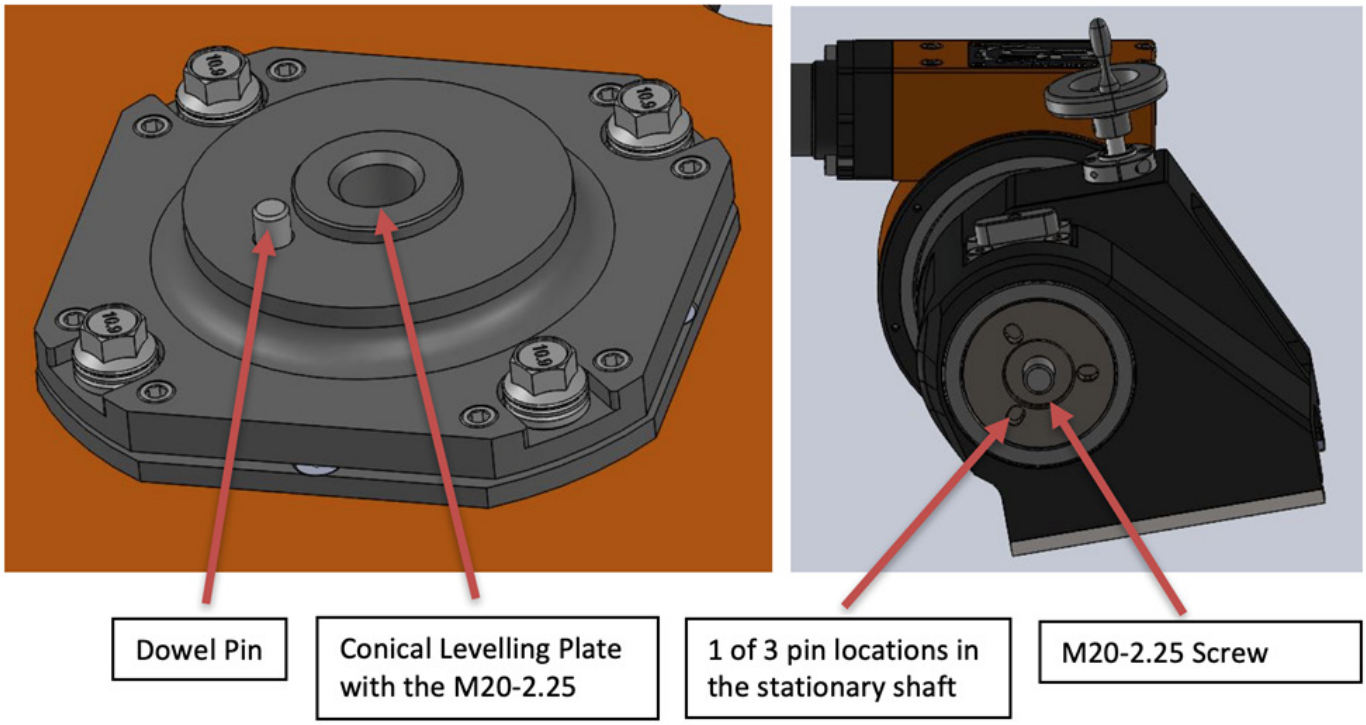


5. Adjust the Clamp Screws to be approximately ¼ inch (6MM) smaller than the ID of your workpiece, ensuring all the leg screws are equally positioned.
6. Hoist the spider by the lifting eye and place the spider within the ID of your workpiece with the yellow Set-Up tabs on the face of the flange.
7. Use the supplied 30mm open ended wrench to extend the leg screws equally to clamp to the ID bore.
8. Tighten the Clamp Screws sufficiently to ensure the spider won't slip in the flange.
9. Remove the four Yellow Set-up Tabs

INSTALLING THE ROTOR TO THE SPIDER

To install the Rotor to the Spider:

1. Clean the interface between the Rotor and Spider to ensure there are no chips or debris on either surface.
2. Hoist the Rotor using two or three of the provided Eyebolts depending on the orientation.
3. Lower the Rotor onto the Spider aligning the M20 Screw on the bottom of the Rotor with the Conical Plate.
4. There is a dowel pin sticking out of the conical plate, which aligns with one of three locators on the bottom of the Rotor. Rotate the Rotor unit the dowel pin aligns with one of the three locating holes, spread apart in 120 degree increments.
5. Thread in the M20-2.5 Screw into the Conical Plate by inserting the provided 17mm Hex Socket into the head of the screw located on the top of the Rotor in the middle of the feed adjust plate and torque to a minimum of 100 ft-lbs (135 Nm).



INSTALLING THE RADIAL ARM/RADIAL ARM XT

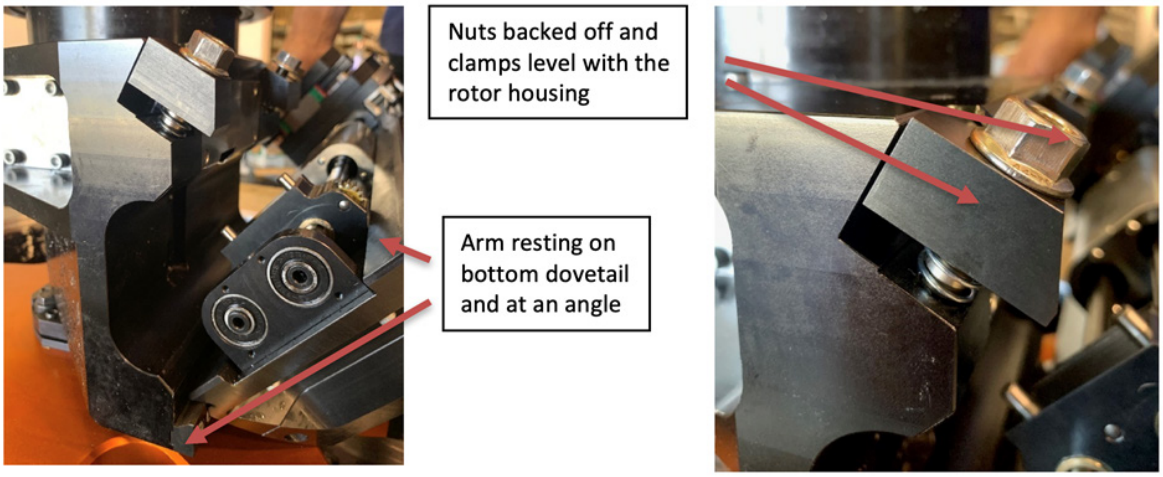
The FF-1100 comes with two radial arm sizes, choose the arm needed for your application based off the specification of each arm listed in table below.

Note: To increase rigidity, use the XT arm rather than reaching out with an adaptor or tool when nearing the end of travel of the standard arm.

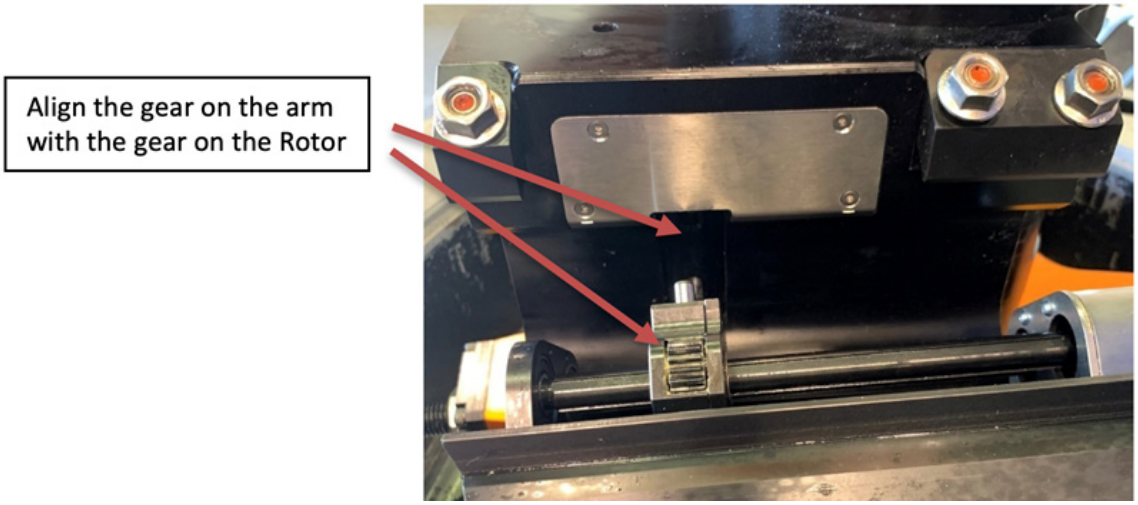
Name	Machining Diameter Range	Minimum Swing Diameter
Radial Arm	5.7 to 32.6in (145 to 828mm)	22.75in (578mm)
Radial Arm XT	5.7 to 43.0in (145 to 1092mm)	28.0in (711mm)

After selecting the arm for your application, install either arm by:

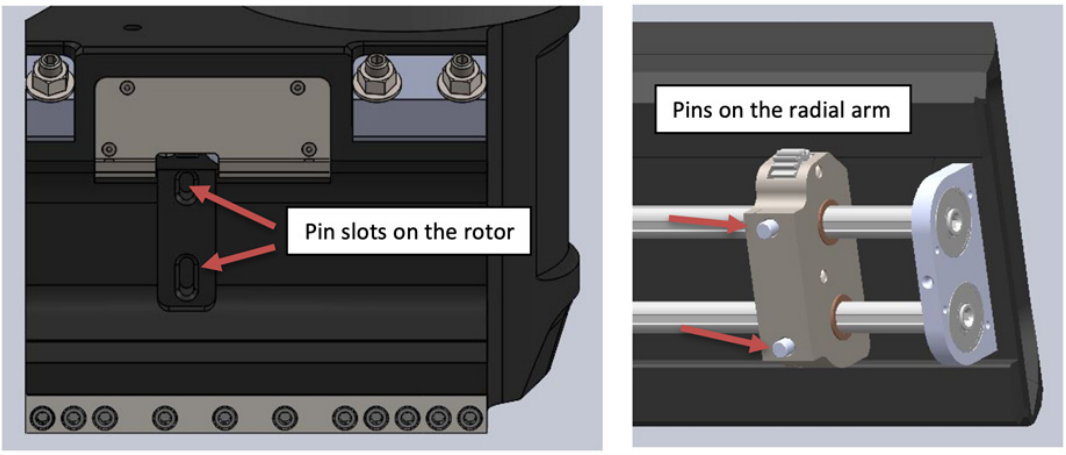
1. Put both the clutches in their neutral position.
2. Ensure the three nuts are backed off and the clamps are level with the rotor housing.
3. Positioned the radial arm at a slight angle away from the rotor and resting on the bottom dove tail.



4. Rotate the radial arm in towards the rotor, lining up the gear on the arm with the gear on the rotor.



5. Ensure the pins on the radial arm seat into the slots on the rotor.

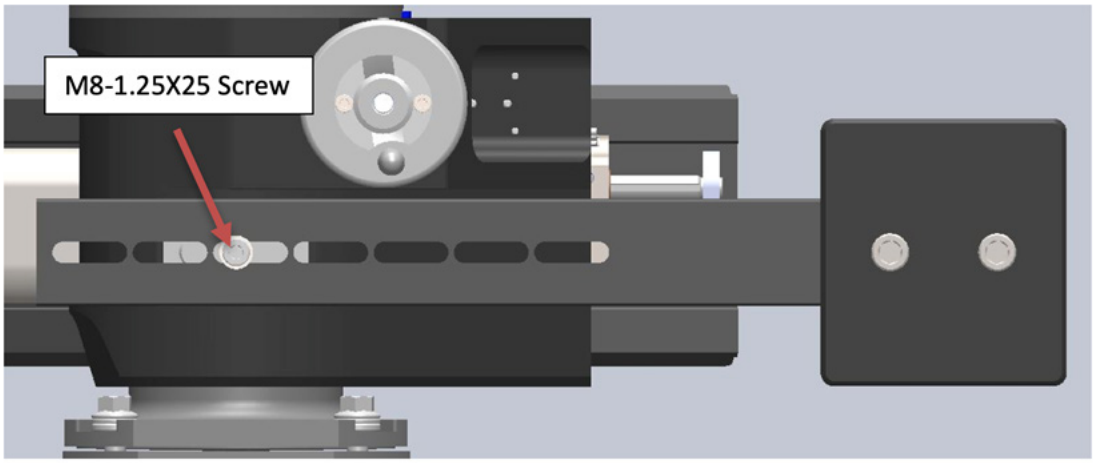


6. Finger tighten the left nut to secure the radial arm.
7. Finger tighten the remaining two nuts.
8. Adjust the arm in the radial direction to the desired position depending on any potential constraints, while ensuring the back of the arm is flush or protruding from the back of the Rotor.
9. Tighten the 3x nuts.

INSTALLING AND BALANCING THE COUNTERWEIGHT ARM

The counterweight is only required for flanges whose faces are vertical, although its inertia can be helpful for interrupted cuts in all positions.

The easiest way to position the counterweight is to position the counterweight in the central position. With the air motor removed, rotate the arm to judge if its balanced, adjusting accordingly. Finally tighten the M8-1.25 X 25 screw.

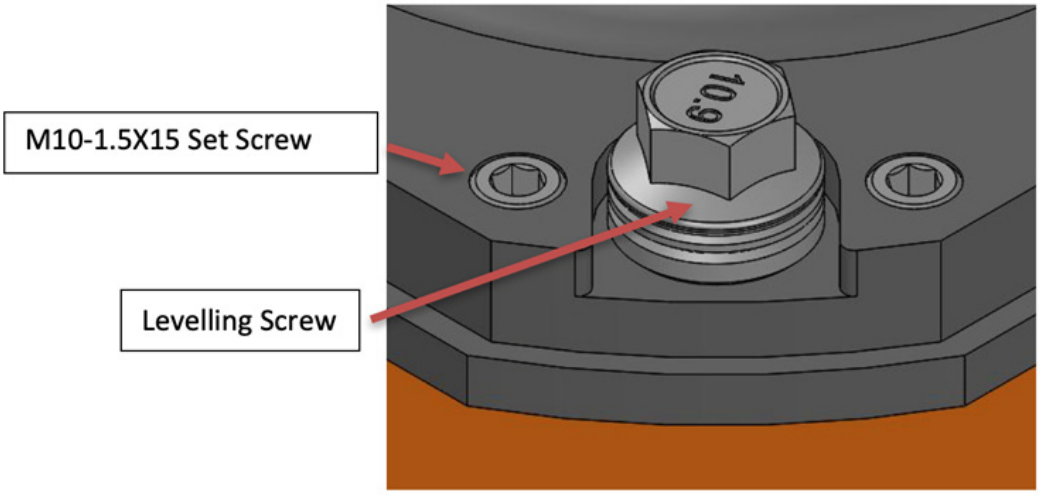


LEVELLING THE SPIDER

The use of the Yellow Setup Tabs will make levelling your FF-1100 quicker and easier. The FF-1100 has several features for levelling, the adjustable legs can be used for coarse levelling and the conical levelling plate screws can be used for fine adjustment.

To level the machine:

1. Back off all eight M10 Set Screws to ensure they aren't interfering with the levelling process.
2. Ensure the 4 Levelling Screws are finger tight
3. Mount a dial indicator onto the Tool Carriage or Arm and touch it to the workpiece surface and set it to 0. (this point should be in line with 1 of the 4 levelling plate bolts)
4. Label this location "1", and label a second location 180° away as "2".
5. Level the Spider between these two locations only by adjusting the two Levelling Screws in line with location 1 and 2.
6. Once your level between location 1 & 2, mark locations "3" & "4" 90° degrees from 1 & 2. (These locations should be in line with the remaining 2 Levelling Screws)
7. Level the Spider between locations 3 & 4 by adjusting the two Levelling Screws.
8. The FF-1100 should now be levelled radially around the entire workpiece.
9. Lightly tighten the 8 Set Screws, keeping an eye on the dial indicator as to not put the machine out of level.
10. Go around and tighten the 4 Levelling Screws, about 1/4 turn at a time until the 4 screws are tight, again keeping an eye on the dial indicator as to not put the machine out of level.
11. Your FF-1100 is now rigidly levelled.

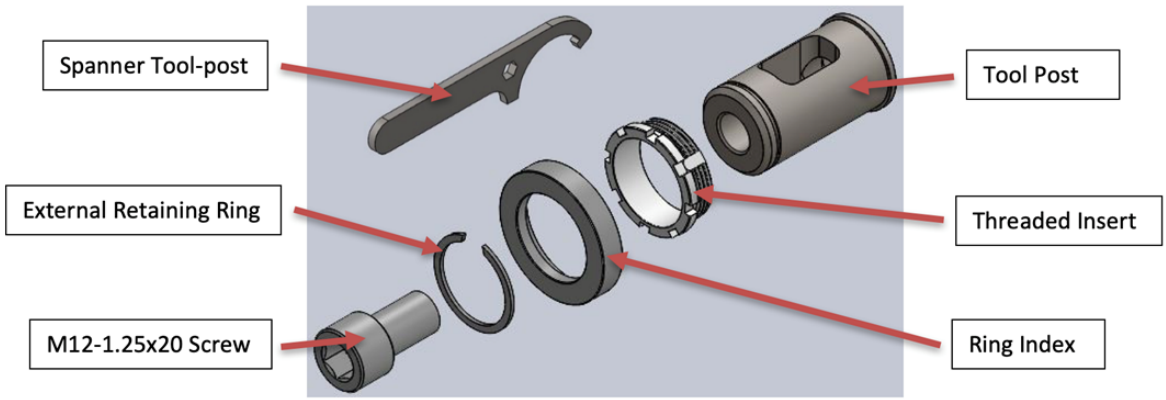


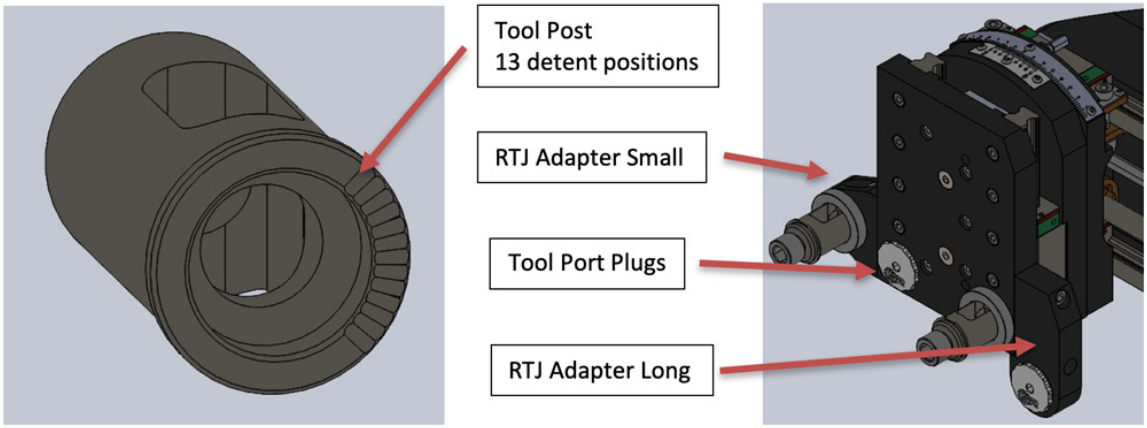
INSTALLING THE CUTTING TOOL

The FF-1100 has 4 cutting tool locations located on the carriage. 2 permanent cutting positions which we recommend using when possible, and 2 bolt-on adapter positions. The RTJ Adapter Small is used to extend the reach of the Tool Carriage, or for when the auxiliary axis is used at an angle (for RTJ cuts as an example). The RTJ Adapter Long is used for smaller diameters when the auxiliary axis is turned at a significant angle. Once you've chosen your cutting tool location, follow these steps for installing the cutting tool.

Warning: The RTJ Adaptor Long should be removed when the carriage is in its standard vertical position to avoid collisions with the work piece or Extension Legs.

1. Always clean chips and debris from the Tool Post and carriage threads prior to inserting the Tool Post.
2. Only if necessary, bolt on either the RTJ Adapter Small using two M6-1 X 16 screws or RTJ Adapter Large using two M6-1 X 30 screws. If not in use, remove one or both of the RTJ adapters.
3. While holding the Index Ring away from the Threaded Insert, thread the Threaded Insert into the desired tool location and lightly tighten with the supplied Tool Post Spanner to hold the Tool Post in location.
4. Place your ½" shank tool bit inside of the Tool Post. Ensure the insert / cutting tool is sharp.
5. Tighten the M12-1.25 X 20 Screw to firmly hold the cutting tool and tool post in place.

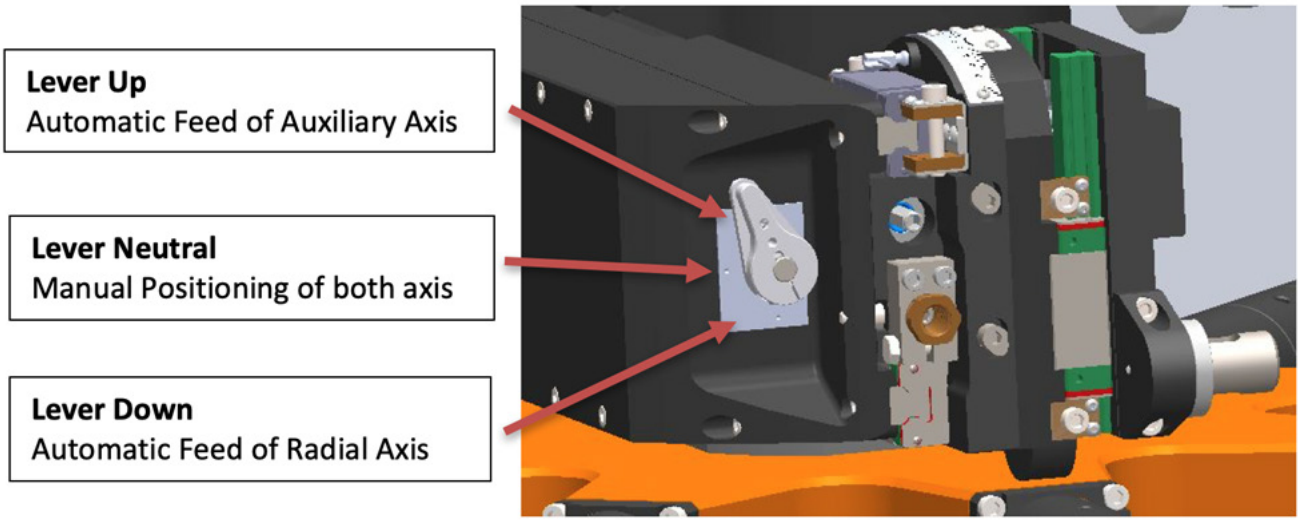




SELECTING A FEED AXIS

The FF-1100 has automatic feeding of the carriage in both the Radial and Auxiliary directions. To select the axis to automatically feed, position the Feed Axis Selector:

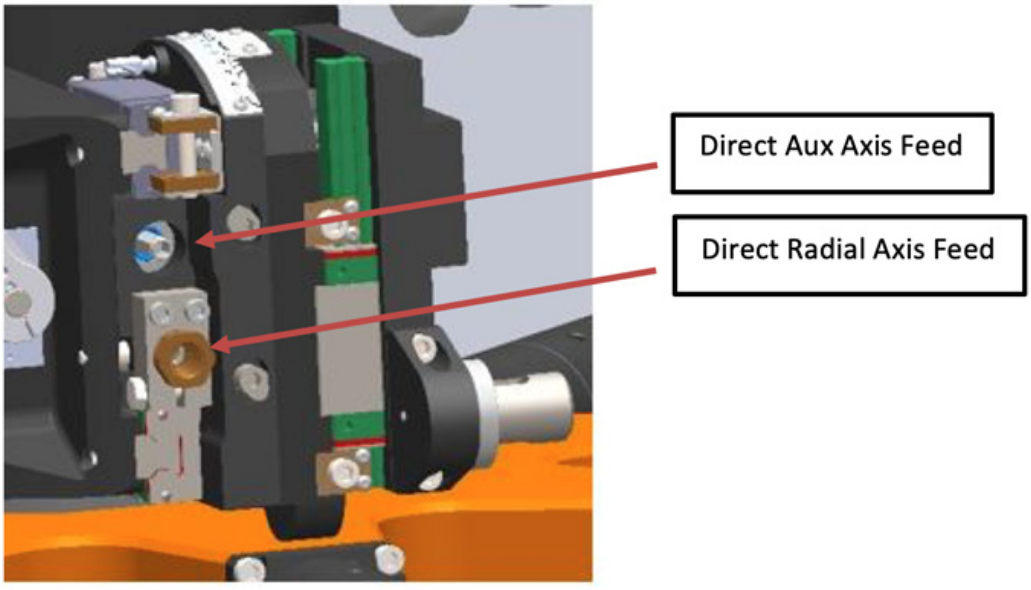
- Upwards for the Auxiliary Axis
- In the middle for neutral
- Downwards for the Radial Axis



MANUALLY POSITIONING THE CARRIAGE

Manual positioning of the carriage can be done with either the Handwheel (in its neutral position), or the easier way is to put the Feed Axis Selector in its neutral position and adjust either of the two Axis shafts with the provided 5mm T-handle.

Note: Always ensure the carriage brakes are released prior to positioning the carriage.

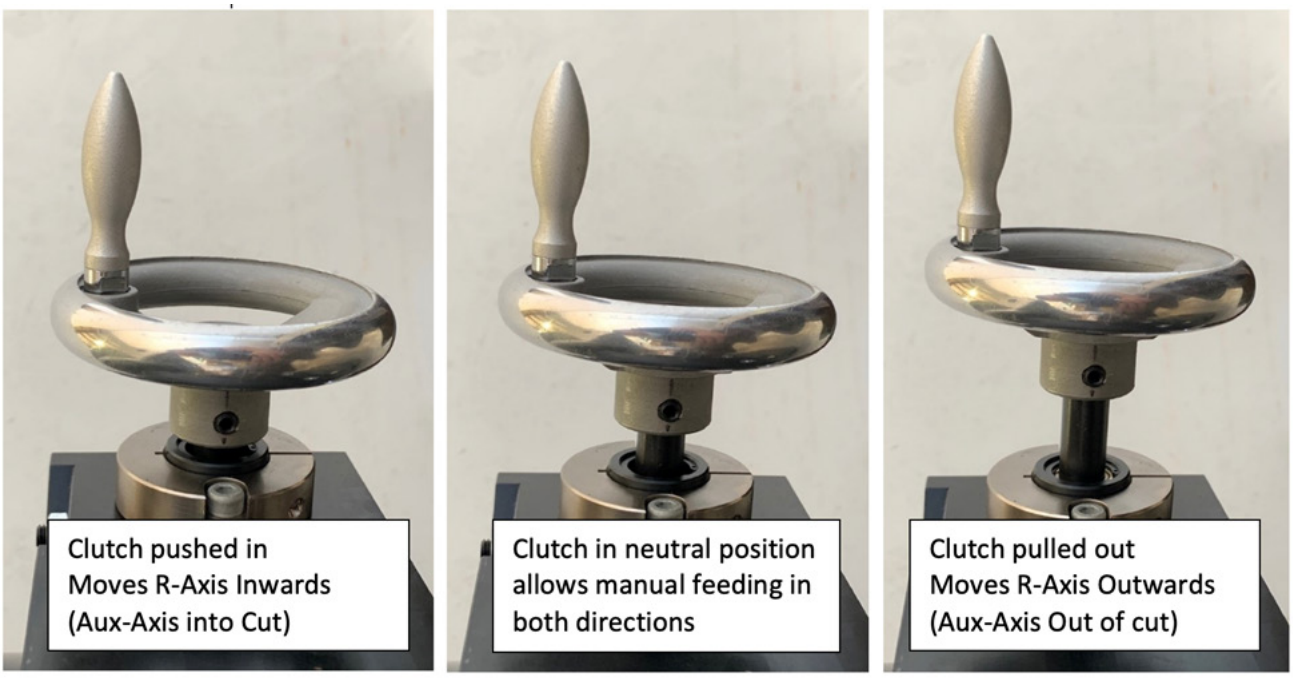


ADJUSTING THE AUTOMATIC FEED DIRECTION

The FF-1100 will feed automatically while rotating. The direction of feed is adjusted by positioning the Handwheel Clutch located on the Rotor within its 3 positions (In, Neutral and Out).

Note: The middle neutral position allows manual feeding in either direction, but will disengage the automatic feed.

Note: Turning the handle while pulling in or out can assist in positioning the Handwheel Clutch if it sticks.

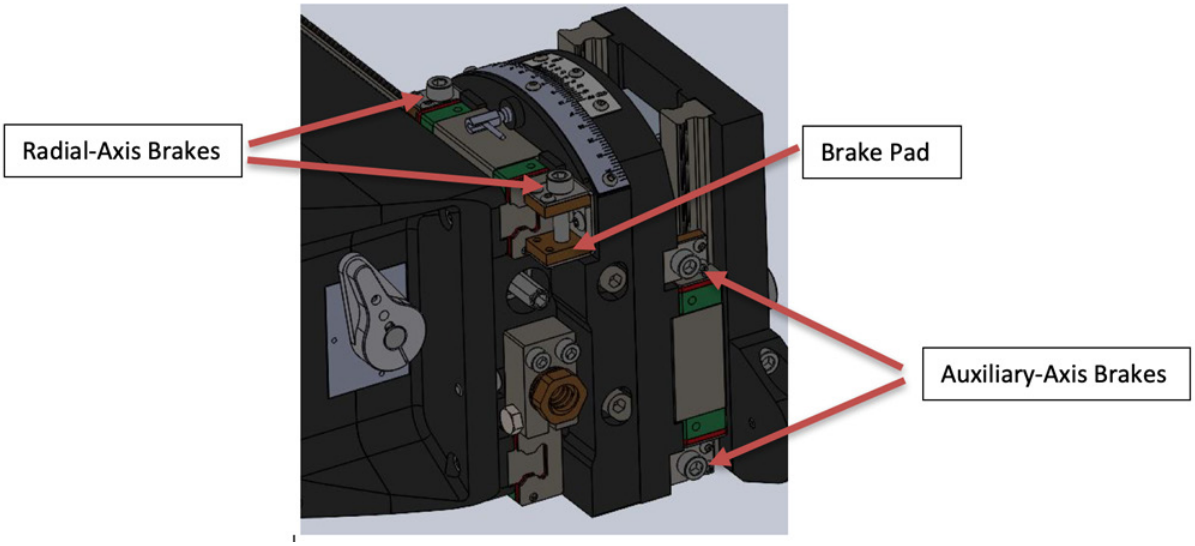


- **Inner Handwheel Position** - moves the carriage either inwards if the Radial Axis is selected or towards the work piece if the Auxiliary Axis is selected.
- **Neutral Handwheel Position** - allows manual feeding in either direction.
- **Outer Handwheel Position** - moves the carriage either outwards if the Radial Axis is selected or away from the work piece if the Auxiliary Axis is selected.

CARRIAGE BRAKES

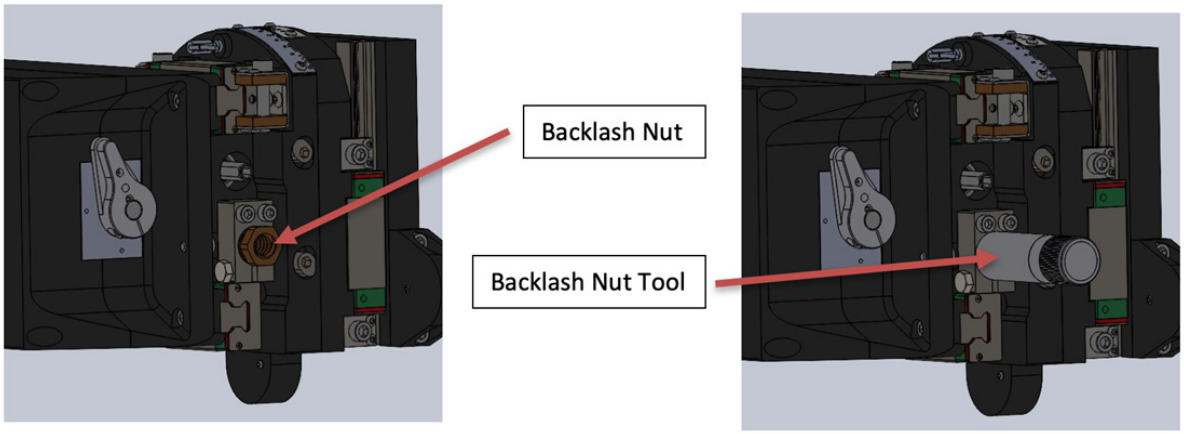
The FF-1100 has 4 brakes, 2 in the Auxiliary Axis and 2 in the Radial Axis. To ensure SUPERIOR results, you must lock out the Axis not being used by tightening both brakes. Each brake has a M6-1 X 30 Screws which can be tightened using the provide 5mm Hex Key.

Note: The brakes pads are designed to wear and will eventually need to be replaced.



ADJUSTING THE CARRIAGE BACKLASH

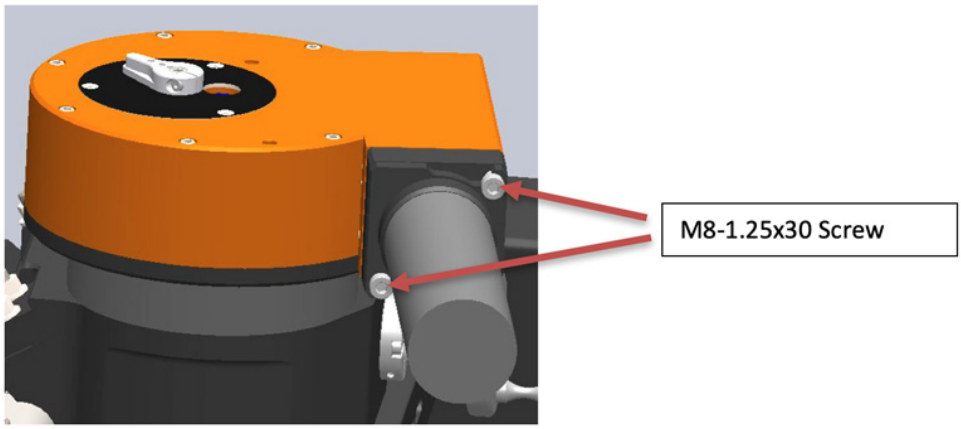
The FF-1100 has a backlash adjustment which you are able to tighten or loosen depending on your application with provided Backlash Nut Tool.



CONNECTING THE AIR MOTOR TO ROTOR, AIR CADDY AND AIR SOURCE

The following steps are required to connect the air motor to the rotor, air caddy and air supply:

1. Install the Air Motor onto the rotor using two M8-1.25x30 Socket Head Cap Screws and tighten with a 6MM Hex Key.
2. Connect the air hose from the air caddy to the air motor
3. Connect the air caddy to an air source with a maximum 90 psi (6bar) pressure with a ½" (12 mm) air hose or larger.



OPERATION

PRE-MACHINING CHECKS

1. Ensure all clamping screws are adequately torqued to the workpiece.
2. Ensure all components of the FF-1100 are tightly installed.
3. Ensure all pneumatic lines are connected correctly.
4. Lock out both BRAKE PADS in the non-feeding axis when cutting material.
5. Choose the feed axis with the Feed Axis Selector on the end of the arm.
6. Choose the feed direction by positioning the Handwheel Clutch either In or Out.
7. Choose a feed rate on the top of the Rotor.
8. Rotate the arm by hand to check clearance.
9. Adjust rotational speed and feed rate to suit tooling and material.

MACHINING

The FF-1100 will rotate clockwise when looking down on the machine.

Warning: Do not reach inside the swing diameter of the radial arm during operation or while the airline is connected.

Warning: Turn off the ball valve and disconnect the airline before removing chips.

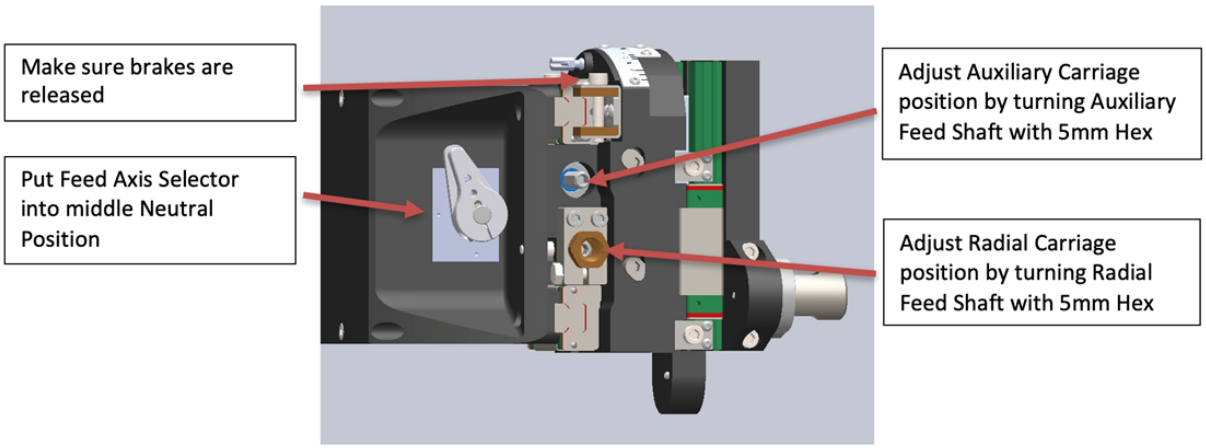
If the FF-1100 stops unexpectedly, disconnect the air line from the air motor before proceeding to trouble-shoot.

TIPS FOR SUPERIOR RESULTS

1. Slower feed on cuts will produce less vibrations and a SUPERIOR surface finish.
2. For larger diameters or interrupted cuts use the Counter Weight even in the horizontal flange position.
3. Slower feed rate will produce SUPERIOR flatness by minimizing misalignment of the cutting tool.
4. A max depth of cut of 0.020” or less will achieve SUPERIOR results.
5. Position the carriage as close to the work piece as possible rather than reaching out further with the 1/2in insert holder.
6. Clear chips in-between machining using a tool or vacuum ***NEVER USE YOUR HAND***.

ADJUSTING THE FF-1100 AFTER A CUT

When adjusting the carriage position for additional cuts, move the Feed Axis Selector to the neutral center position (image shows upper position), then manually feed either axis using a 5mm hex key either the upper Auxiliary Feed Shaft or the lower Radial Feed Shaft.



REMOVING THE FF-1100 FROM A WORKPIECE

Removing the FF-1100 from a workpiece can either be done as a whole assembled unit or one component at a time. Each method of removing the FF-1100 from a workpiece is detailed below:

Removing the FF-1100 from a workpiece as a whole assembled unit:

1. Disconnect air line from the air caddy.
2. Disconnect airline from air caddy to the FF-1100
3. Retract the cutting tool from workpiece and remove the cutting tool.
4. Install the 4 safety tabs on the adjustable clamping legs.
5. Install the 2 lifting eyes on the rotor, connect rigging and make the lines tight.
6. Loosen clamping legs approximately ¼ inch (6mm) smaller than the bore ID.

Removing the FF-1100 from a workpiece one component at a time

1. Disconnect air line from the air caddy.
2. Disconnect airline from air caddy to the FF-1100
3. Retract the cutting tool from workpiece and remove the cutting tool
4. Remove the radial arm
5. Install the 4 safety tabs on the adjustable clamping legs.
6. Install the 2 lifting eyes on the rotor and connect rigging.
7. Loosen and unscrew the M20 screw on the rotor and lift the rotor away from the spider.
8. Install the lifting eye on the spider, connect rigging, and remove any slack from the lines.
9. Loosen clamping legs approximately ¼ inch (6mm) smaller than the bore ID.
10. Lift the spider away from the workpiece.

MAINTENANCE AND TROUBLESHOOTING

MAINTENANCE CHECKLIST

Ensure during setup and operation that the FF-1100 (Figure 1) is in an unstressed state. Failure to do so may result in damage to the machine components and undesired results to the work.

Ensure all machined surfaces are cleaned and lightly lubricated as assembled. Wipe off excess oil as oil will attract dirt and debris.

DO NOT weld directly to any part of the machine.

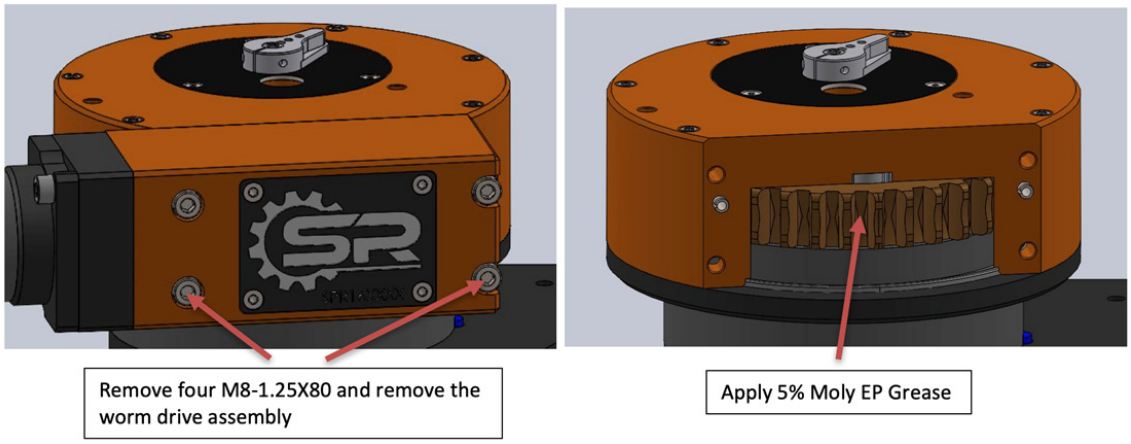
DO NOT use air to clear debris as debris may be forced into running components resulting in damage.

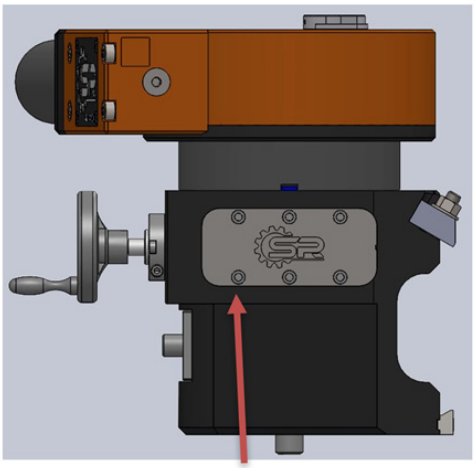
When not in use, the FF-1100 should be stored in its aluminum crate and kept in a clean and dry environment.

LUBRICATING THE MACHINE

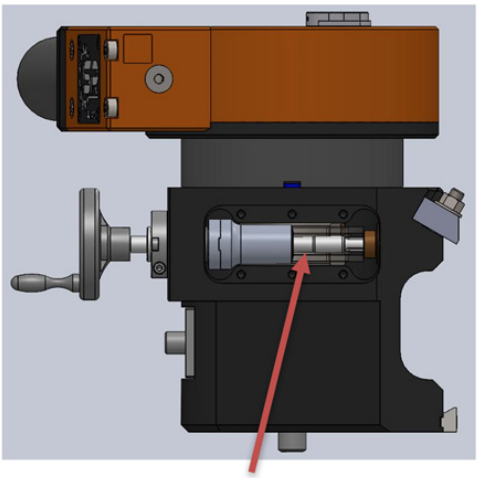
The more frequent you lubricate the exposed components, the longer they will last.
The most critical point of lubricating is the worm gear. To do so;

1. Remove cover
2. Apply a generous amount of 5% Moly EP Grease
3. Replace cover





Remove six M6-1.0X12 Screws and remove the PTO Cover Plate



Light application of 5% Moly EP 2 Grease

APPROVED LUBRICANTS

SPR recommends using the following lubricants on the following components. Failure to use the appropriate lubricants can result in damage and premature wear of the FF-1100.

APPLICATION AREA	LUBRICANT
Frequently	
Dovetail	AW 32 Hydraulic Oil
Leadscrew	AW 32 Hydraulic Oil
Weekly	
PTO	5% Moly EP 2
Clamping Screws	Moly Grade Anti-Seize
Adjustable Feet	Moly Grade Anti-Seize
Yearly	
Feed Drive Gearbox	5% Moly EP 2
Shaft Bearings?	5% Moly EP 2

MAINTENANCE TASKS

EMPTY THE AIR FILTER WATER TRAP

Drain the water from the air filter trap.

DOVETAIL MAINTENANCE

After each work session, clean the dovetail ways and lubricate accordingly.

LEADSCREW MAINTENACE

After each work session, clean the leadscrew and then lubricate the leadscrew accordingly.

TROUBLESHOOTING

This section's purpose is to solve basic machine performance problems. For serious maintenance or if you have any questions on the following procedures, contact SPR.

THE FF-1100 ISN'T TURNING

If the machine isn't rotating, check the following:

1. The airline is connected properly.
2. The air regulator is open and not broken.
3. The airline has air pressure.
4. The tool is free of the work piece.
5. The radial arm can manually be rotated by pushing on the end of the radial arm.

THE FF-1100 ISN'T FEEDING

If the machine isn't feeding properly, check the following:

1. The brake pads are not locked in the axis that isn't feeding.
2. The Feed Axis Selector is in the upper or lower position.
3. The Handwheel clutch is in the Inner or Outer position.
4. Too heavy a cut will cause the clutches on the two feed axis to slip.

THE FF-1100 IS CUTTING POORLY

If the machine is cutting poorly, check the following:

1. The cutting tool is installed correctly and is tight, see Section 3.11.
2. The cutting tool or insert is sharp and has the correct geometry for the material and type of cut.
3. The machines feed rate and depth of cut are set correctly. Slower speeds and shallower cuts typically produce less tool chatter.
4. The modular sections are tightly connected to each other.
5. The brake pads on the axis that is not being used are tight.

THE FF-1100 IS NOT CUTTING FLAT

If the machine is not cutting flat, check the following:

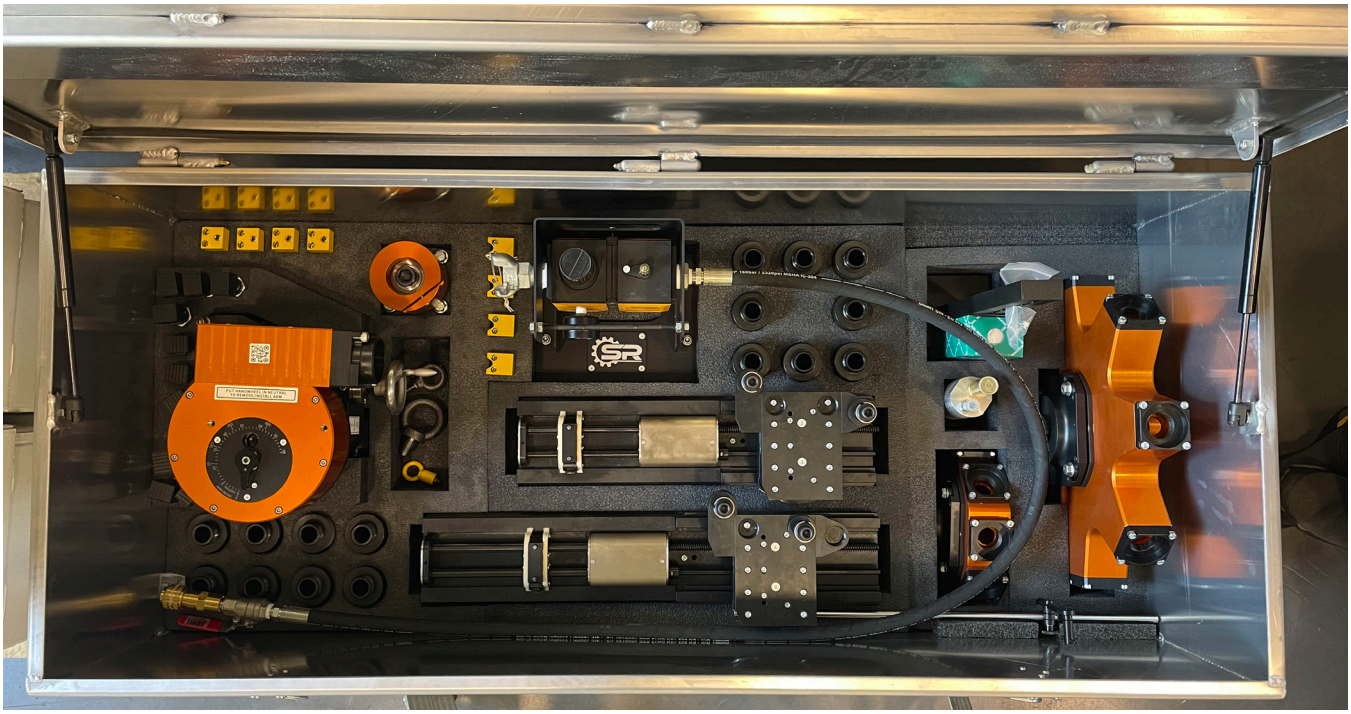
1. The spider is level to the workpiece.
2. The clamping screws are adequately torqued.
3. The rotor is seated on the conical levelling plate without any debris in-between surfaces.
4. The radial arm is seated on the dovetail without any debris in-between surface.

STORAGE AND SHIPPING

Proper storage and shipping of the FF-1100 will extend its life-span, prevent damage & ensure SUPERIOR customer satisfaction.

Before placing your FF-1100 back in its original aluminum crate, we recommend:

1. Clean the FF-1100 components to remove metal chips, moisture or debris.
2. Place clutches in their neutral positions.
3. Drain all liquids from the pneumatic motor and air caddy.
4. Place components in their designated cut-outs in the supplied foam packaging.



WARRANTY

Superior Plant Rentals, LLC (SPR) warrants that the equipment manufactured by it will: (i) conform to SPR's written specifications and descriptions, and (ii) be free from substantial defects in design, materials, and workmanship for a period of one year from date of shipment to the original buyer, or six months from date of placing in service by buyer, whichever date is earlier.

During this period, if any equipment is proved to SPR's satisfaction to be defective, SPR will, at our sole and absolute discretion, and as SPR's sole warranty liability and buyer's sole remedy, repair, replace, or credit buyer's account for any equipment that fails to conform to the warranties, provided that: (i) SPR is notified in writing within 10 days following discovery of such failure with a detailed explanation of any alleged deficiencies; (ii) SPR is given a reasonable opportunity to investigate all claims; and (iii) SPR's examination of such equipment confirms the alleged deficiencies and that the deficiencies were not caused by accident, misuse, neglect, improper use, unauthorized alteration, repair, or improper testing.

Shipping cost of the alleged defective equipment to SPR is to buyer's account. However, if SPR agrees that the equipment is defective, then pursuant to this warranty, SPR will reimburse buyer its shipping cost to return the equipment to SPR.

The warranty against defects does not apply to: (1) consumable components or ordinary wear items, and (2) use of the equipment with equipment, components, or parts not specified or supplied by SPR or contemplated under the equipment documentation.

The following actions will void the one-year warranty:

1. Repairs or attempted repairs have been made by persons other than SPR personnel, or authorized service repair personnel;

2. Repairs are required because of normal wear;

3. The tool has been abused or involved in an accident;

4. There is evidence of misuse such as overloading of the tool beyond its rated capacity, use after partial failure, or use with improper accessories.

5. Damage to the motor due to lack of oiler/mister while tool was in use (pending motor type).

NO OTHER WARRANTY IS VALID

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