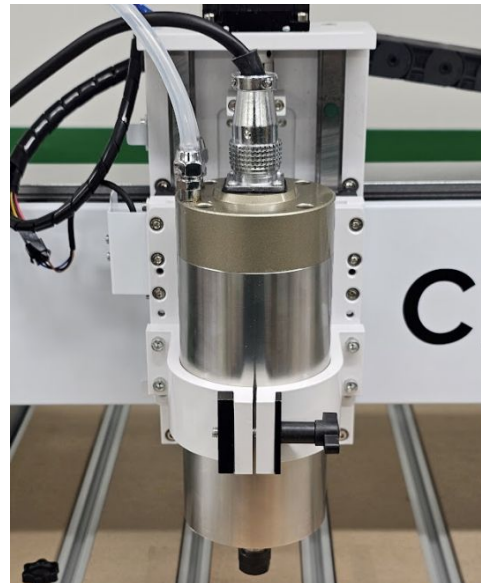




## YORAHOME CROSSRIVER/SILVERBACK BENCHTOP CNC ROUTER 6060

### VFD SPINDLE INSTALLATION

Version 1.0 • January, 2024



# Purpose

This Manual is intended for fitting the YoraHome VFD Spindle to the YoraHome SilverBack or CrossRiver Benchtop CNC Router; replacing the original 48VDC spindle motor.

This manual is designed to cover this process only, and is not a complete manual.

Before beginning assembly, we recommend conducting an inventory using the Packing List to ensure all components are present.

Please read these instructions carefully before assembling your machine to prevent possible damage to your machine.

# Contents


Part 1: Packing List

Part 2: Mechanical Assembly




Part 3: VFD Operation

Part 4: FAQs

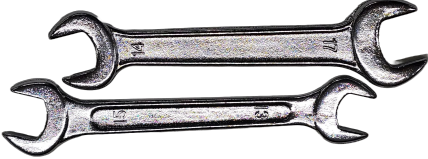

# Part 1 Packing List <sup>1/4</sup>

Item	Picture	Quantity
Spindle Motor - 1.5kW		1
Variable Frequency Drive (VFD)		1
Silicone Tubing		2

# Part 1 Packing List <sup>2/4</sup>

Item	Picture	Quantity
Submersible Water Pump		1
Spindle Cable		1
Power Cord		1

# Part 1 Packing List <sup>3/4</sup>

Item	Picture	Quantity
Wrench Set - 13/15mm & 14/17mm		1
ER11 Collet Set - 1/8" & 1/4"		1

# Part 1 Packing List 4/4

## Customer Supplied Items

The following items are NOT included in the kit, and must be provided by the customer.

- Water Reservoir - a standard 5 gallon bucket will provide ample water storage for the system. A lid for the reservoir is highly recommended to prevent water contamination.
- Distilled Water - Recommended minimum of 3 gallons. DO NOT USE TAP WATER - any minerals or contaminants in tap water may cause fouling of the cooling passages in the spindle motor.
- OPTIONAL - If not located in a freeze-protected area, RV Antifreeze will help protect your system, and is non-toxic.



# Part 2 Mechanical Assembly

## Preliminary Steps

- For ease of access, position the X axis near the middle of the machine; and the Y axis towards the front of the machine.
- After setting position, ensure that the Controller is turned off and the power cord unplugged.
- Ensure that your work area has ample room around the machine to place major components and access hardware attachments.
- If using a reservoir with lid, cut/drill a hole in the lid to allow for the pump power cord and tubing to pass through.



# Part 2 Mechanical Assembly

## Spindle Mount Installation

- If using this kit with the CrossRiver CNC, follow Step 1(CR) and Step 2(CR), starting on the Page 10.
- If using this kit with the SilverBack CNC, follow Step 1(SB), Step 2A(SB), Step 2B(SB), and Step 2C(SB), starting on Page 12.
- For either machine, continue with Step 3; starting on Page 16 - while the CrossRiver is shown in these steps, the instructions are specific to the VFD Kit, not the machine.

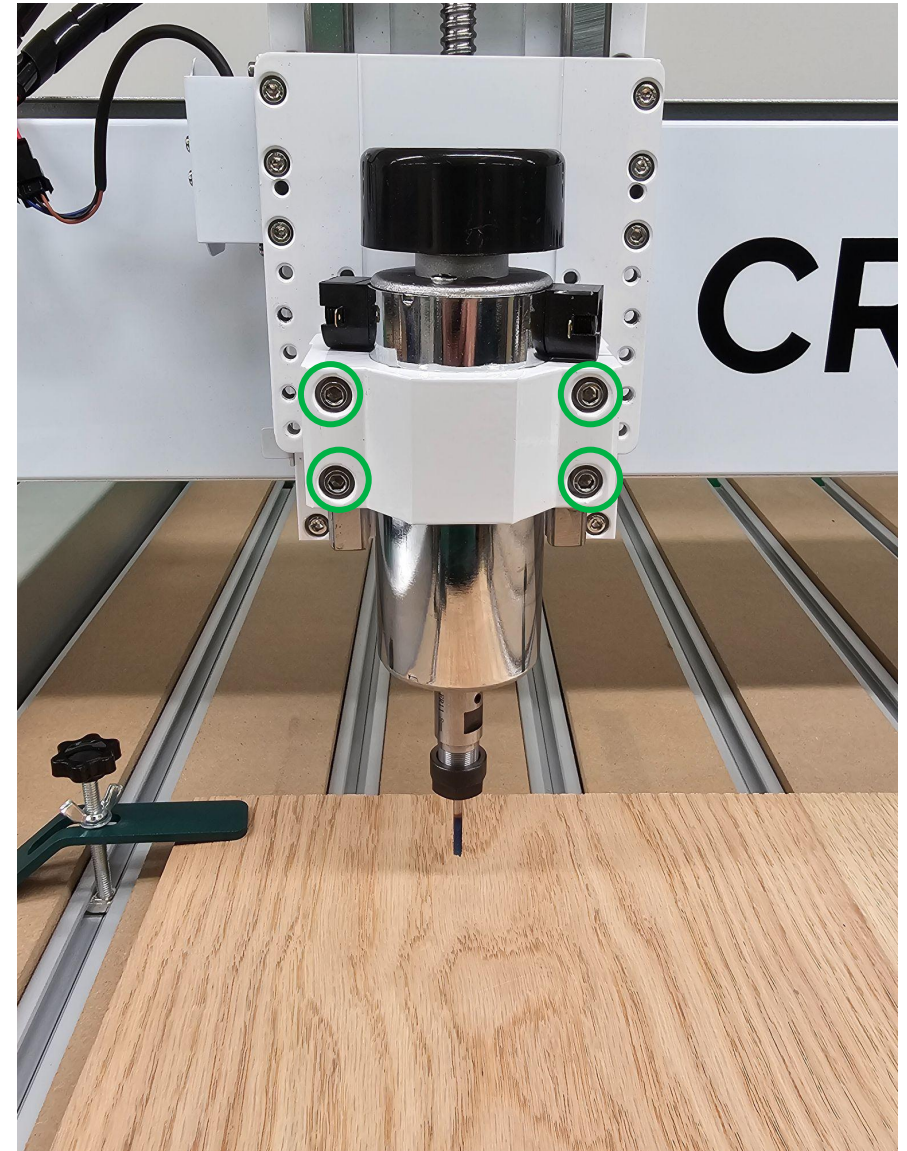
## Part 2 Mechanical Assembly

### Step 1(CR) - Removal of Stock Spindle/Holder

Remove the 4 M5 screws which attach the stock Spindle and Holder to the Z axis faceplate.

These screws will not be re-used; retain for reinstallation, if desired.

Ensure that the spindle motor is supported during this process, to prevent damage to the brush holders.



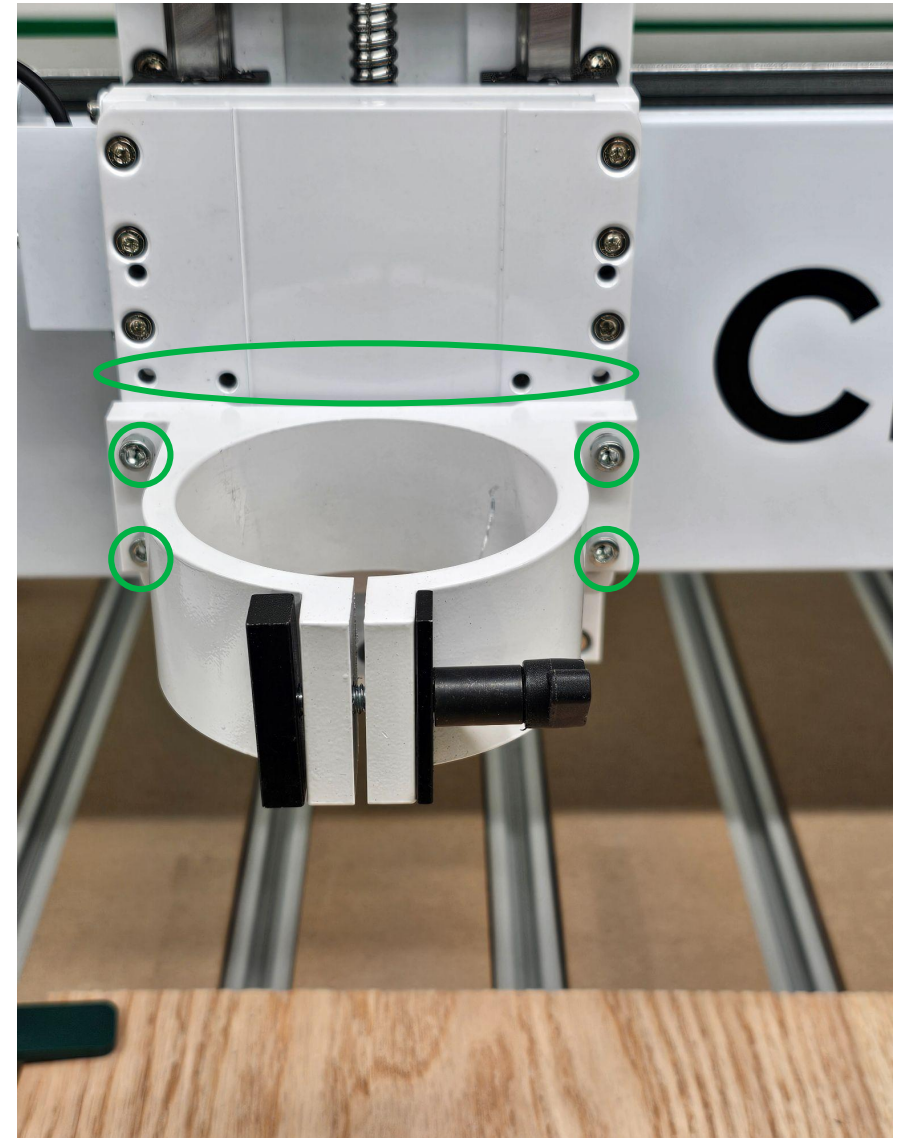
## Part 2 Mechanical Assembly

### Step 2(CR) - Install 80mm Spindle Holder

Using M5x16mm Socket Head Screws (supplied with the original CrossRiver Hardware); attach the 80mm Spindle Holder to the Z axis faceplate.

Note the 80mm Spindle Holder will only fit in one set of mounting holes on the faceplate; ensure you have it properly aligned before tightening screws.

When properly aligned, there will be 4 unused screw holes seen just above the mount.



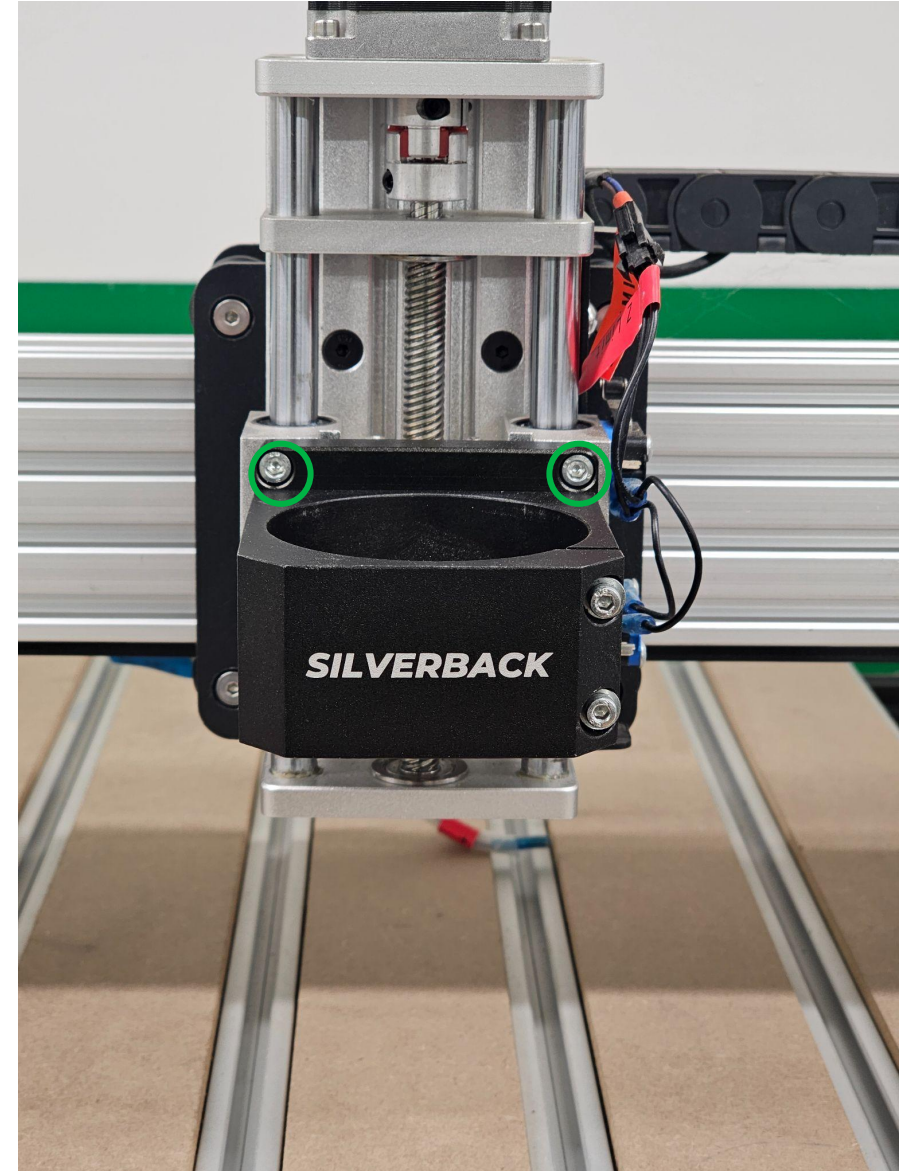
## Part 2 Mechanical Assembly

### Step 1(SB) - Removal of Stock Spindle/Holder

Remove the 4 M5 screws which attach the stock Spindle and Holder to the Z axis. (Top 2 screws shown in this picture)

These screws will not be re-used; retain for reinstallation, if desired.

Ensure that the spindle motor is supported during this process, to prevent damage to the brush holders.



## Part 2 Mechanical Assembly

### Step 2A(SB) - Install 80mm Spindle Holder

The 80mm Spindle Mount for the SilverBack includes a mounting plate, spacers, and hardware:

- (4) M5x20 Socket Head Screws
- (4) M5x25 Socket Head Screws
- (4) M5 Flat Washers
- (4) M5 Spring Washers

Note - hardware not pictured.



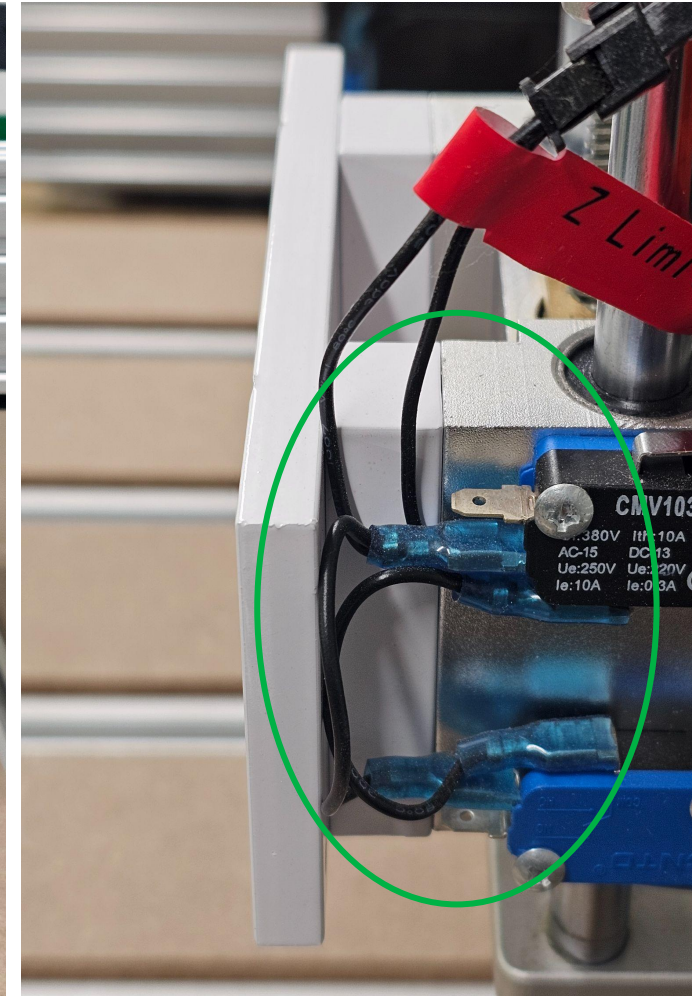
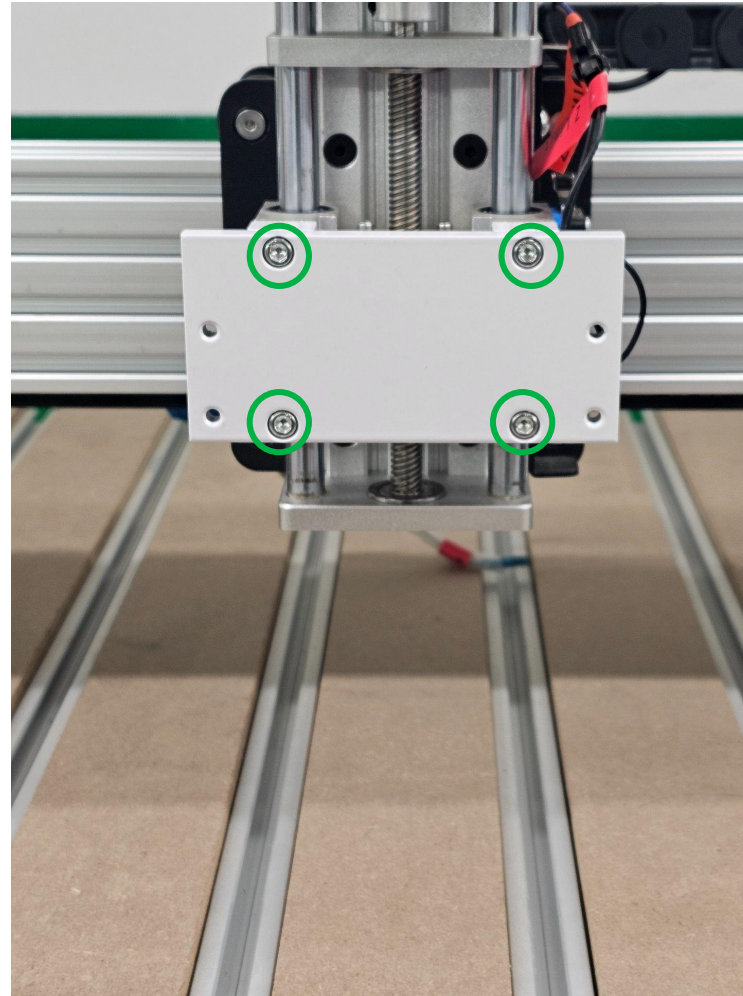
## Part 2 Mechanical Assembly

### Step 2B(SB) - Install 80mm Spindle Holder

Using M5x25mm Socket Head Screws, Mounting Plate, and Spacers; attach the Mounting Plate to the Z axis.

The Mounting Plate should be oriented with the Spindle Mount holes towards the bottom of the plate.

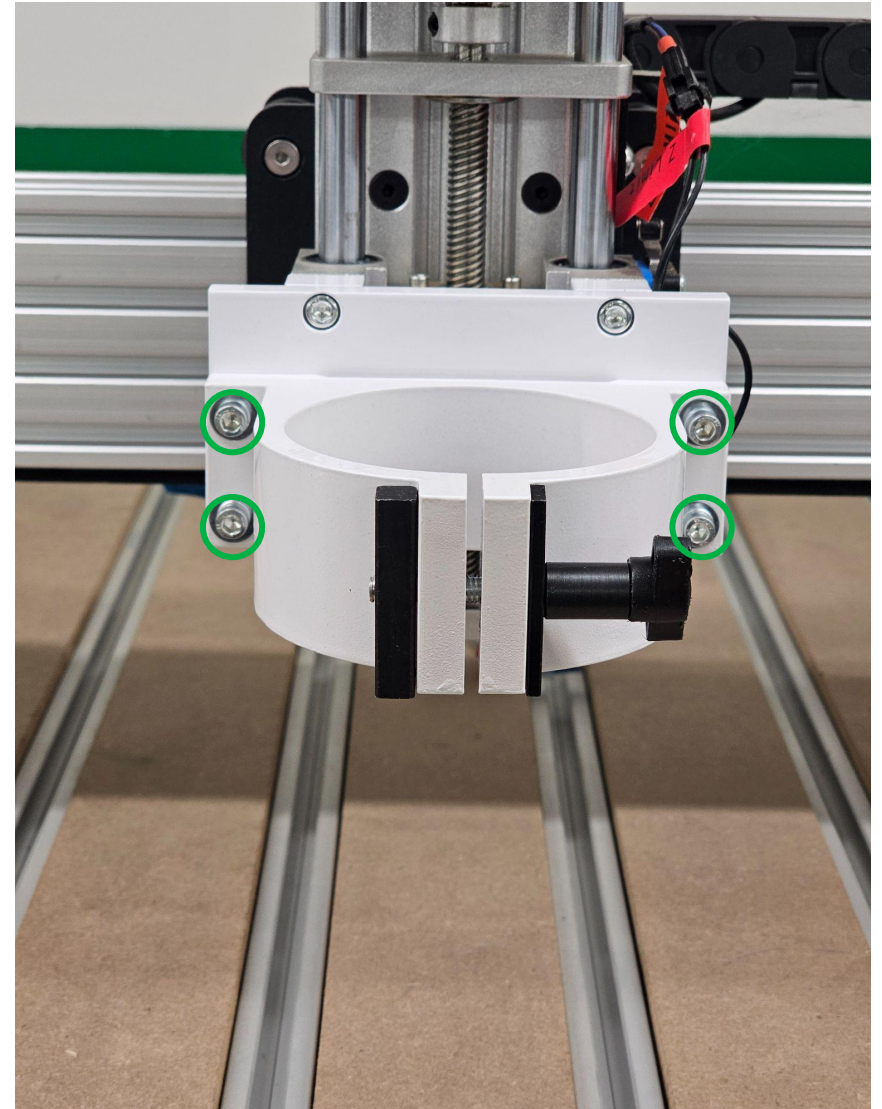
Ensure that the Z Axis Limit Switch wires are not pinched during installation.



## Part 2 Mechanical Assembly

### Step 2C(SB) - Install 80mm Spindle Holder

Using M5x20mm Socket Head Screws, Flat Washers, and Spring Washers; attach the 80mm Spindle Mount to the Mounting Plate.

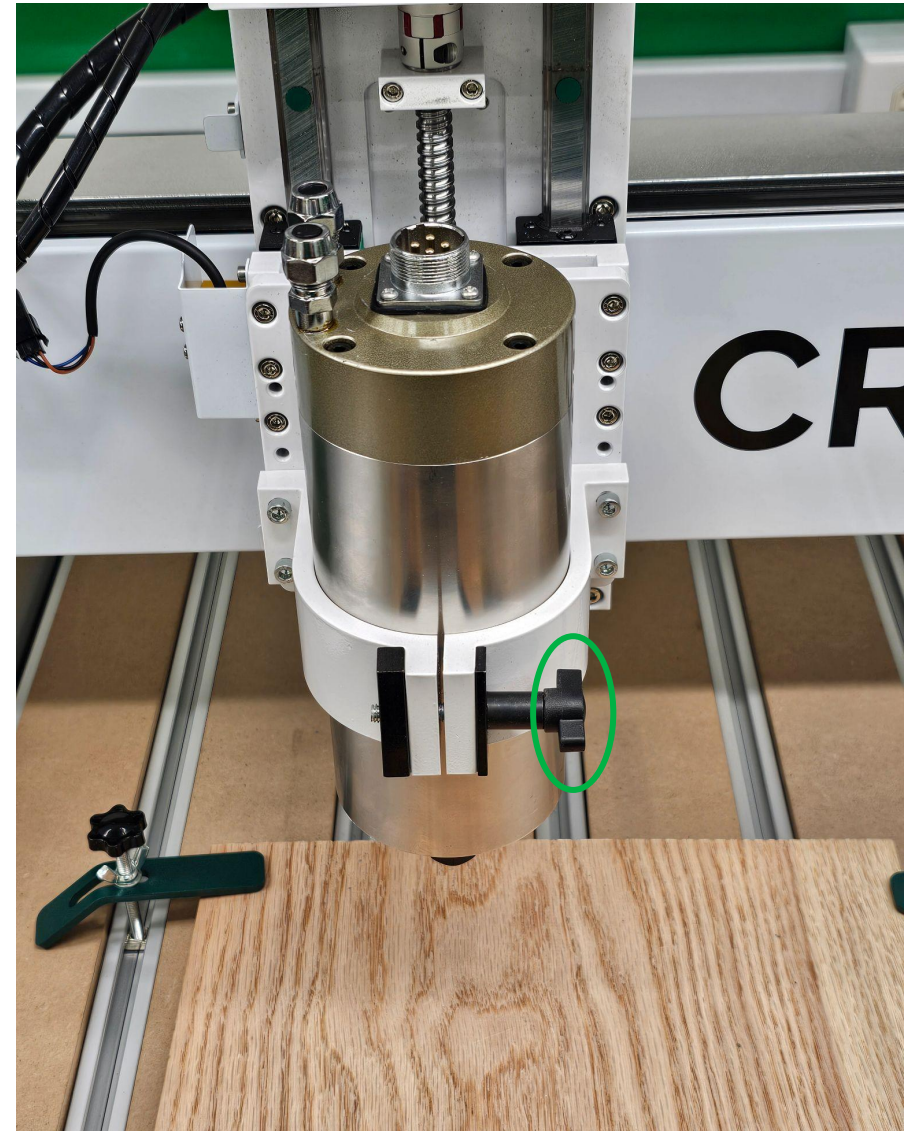


# Part 2 Mechanical Assembly

## Step 3 - Install Spindle Motor

Install the Spindle Motor in the holder, ensuring that the motor is supported safely (NOTE - Motor Weight is approximately 8 lbs/3.6 kg).

Tighten the thumb screw to secure the Spindle Motor - height can be adjusted as needed.



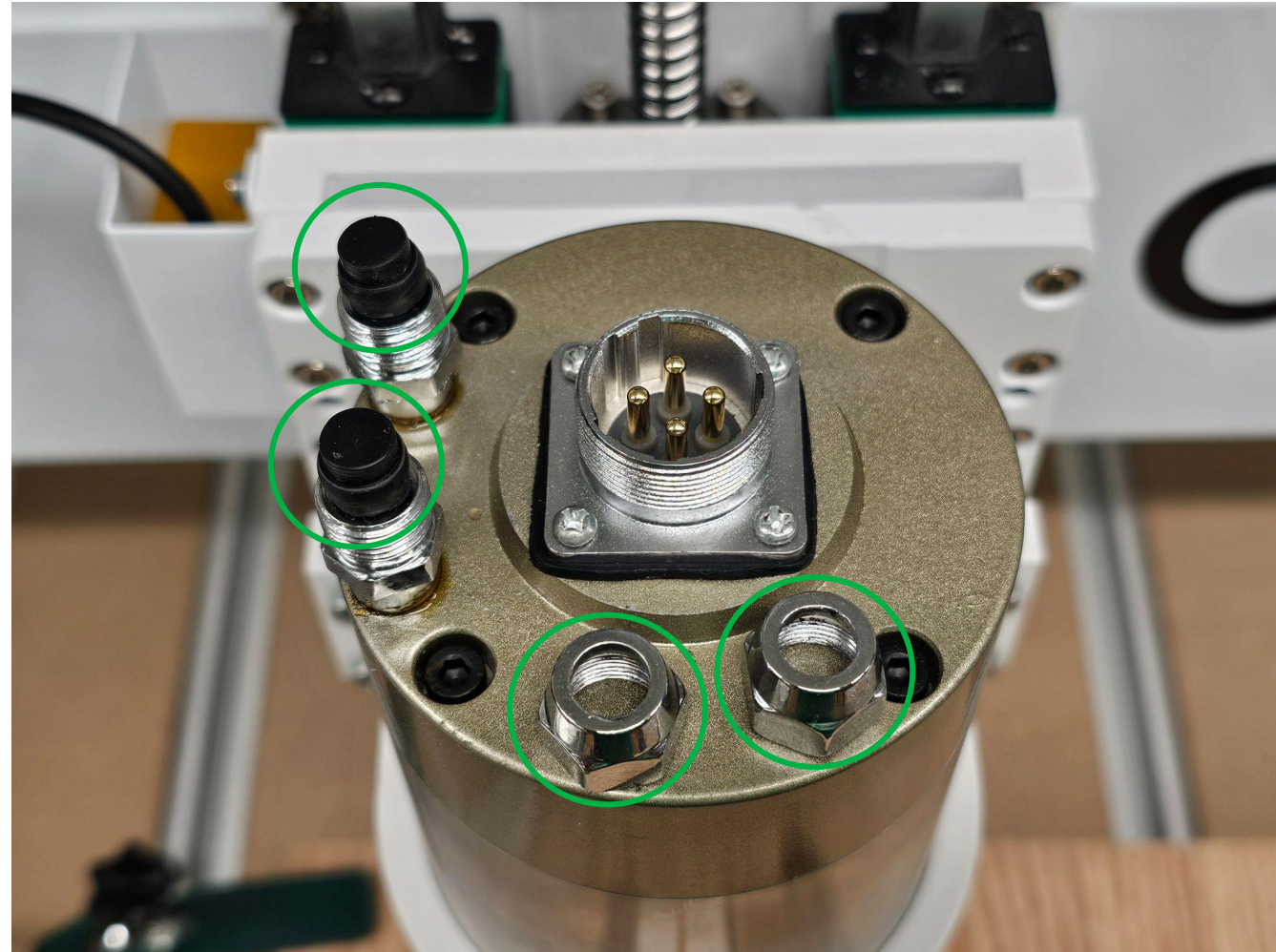


## Part 2 Mechanical Assembly

### Step 4 - Motor Tubing Connections <sup>1/4</sup>

Remove the 2 compression fittings from the tubing connectors (14mm wrench).

Remove the black protective covers that are on the tubing connectors.

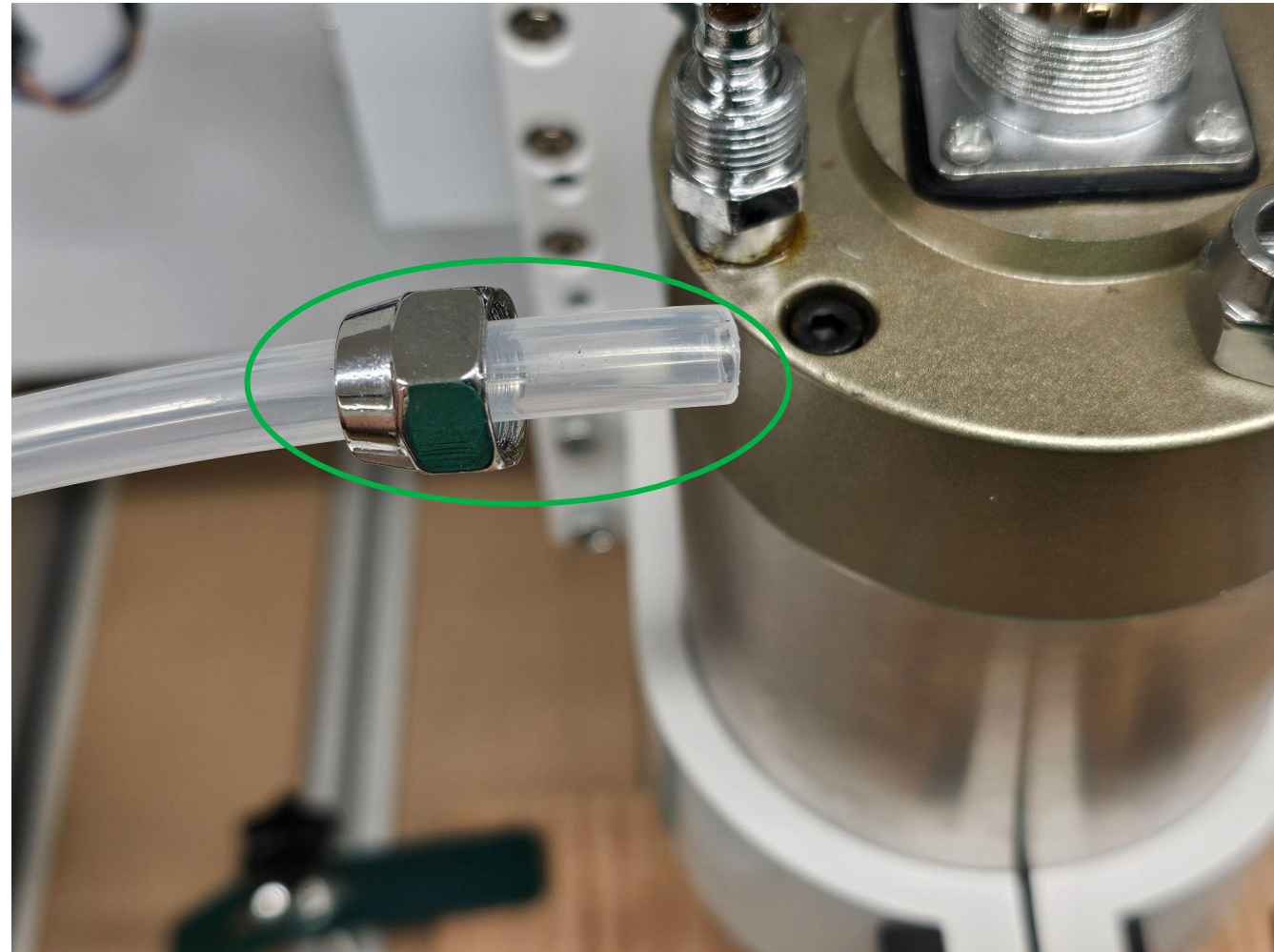


## Part 2 Mechanical Assembly

### Step 4 - Motor Tubing Connections 2/4

Slide a compression fitting over one end of one of the lengths of tubing, as shown.

Repeat with the other compression fitting, and other length of tubing.



## Part 2 Mechanical Assembly

### Step 4 - Motor Tubing Connections <sup>3/4</sup>

Push the end of the tubing onto the fitting on the motor.

Ensure that the end of the tubing sits flush against the shoulder on the fitting, as shown.



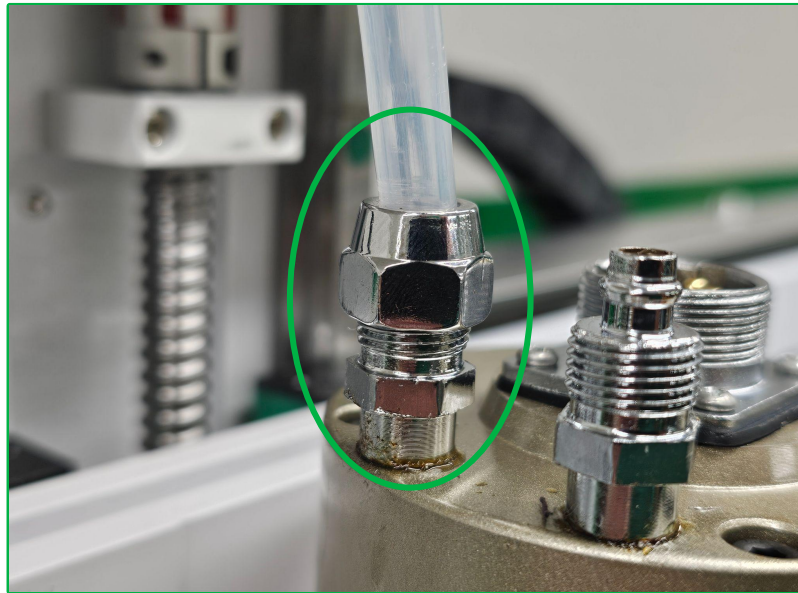
# Part 2 Mechanical Assembly

## Step 4 - Motor Tubing Connections 4/4

Slide the compression fittings down onto the fittings, and tighten securely (14mm wrench).

Note in the picture that when the fitting is tight, you will not be able to see any exposed threads on the fitting, and the barbed fitting will be barely visible above the compression fitting.

Failure to properly tighten these fittings will result in water leakage.



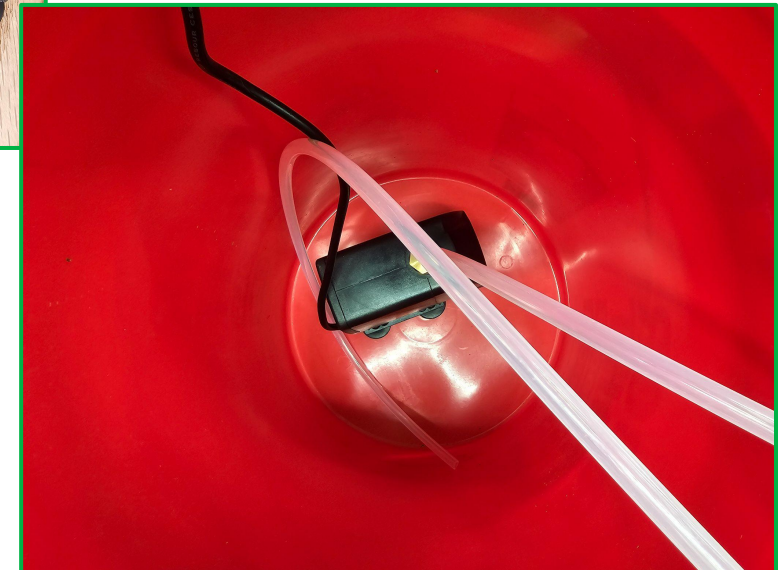
# Part 2 Mechanical Assembly

## Step 5 - Pump Tubing Connection

Route both lengths of tubing through the lid of the water reservoir.

Attach one length of tubing to the pump outlet fitting as shown; the other length of tubing simply needs to be permitted to flow into the reservoir (can be secured with cable ties if desired).

The suction cup feet on the pump will allow it to be placed at the bottom of the reservoir, and will prohibit movement.



# Part 2 Mechanical Assembly

## Step 6 - Pump Test / Leak Check

Add distilled water to the reservoir; if antifreeze is required, use RV antifreeze as noted in Part 1 (Packing List - Customer Supplied Items)

Route pump power cord through hole in reservoir lid, and plug into a standard 120VAC outlet.

Check all motor tubing fittings for leaks, and tighten compression fittings if necessary.

Secure lid on reservoir to minimize contamination.



## Part 2 Mechanical Assembly

### Step 7 - Motor Cable Connections <sup>1/2</sup>

Connect the 4-pin connector of the motor cable to the Spindle Motor.

Cable connector has indexing points, and will only attach to the Spindle Motor in one orientation.

Secure cable with threaded lock ring.



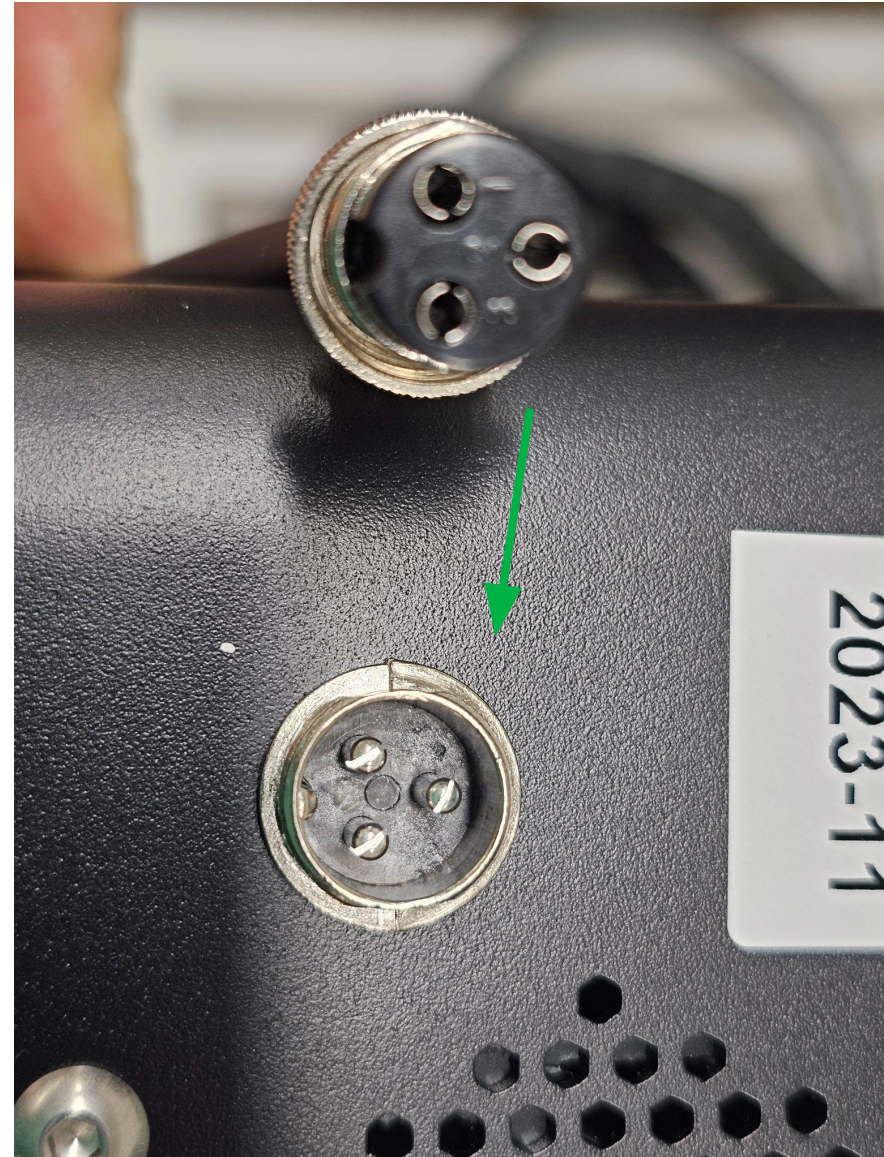
# Part 2 Mechanical Assembly

## Step 7 - Motor Cable Connections <sup>2/2</sup>

Connect the 3-pin connector of the motor cable to port on the rear of the VFD Enclosure.

Cable connector has indexing points, and will only attach to the VFD Enclosure in one orientation.

Secure cable with threaded lock ring.





# Part 3 VFD Operation

## General Usage

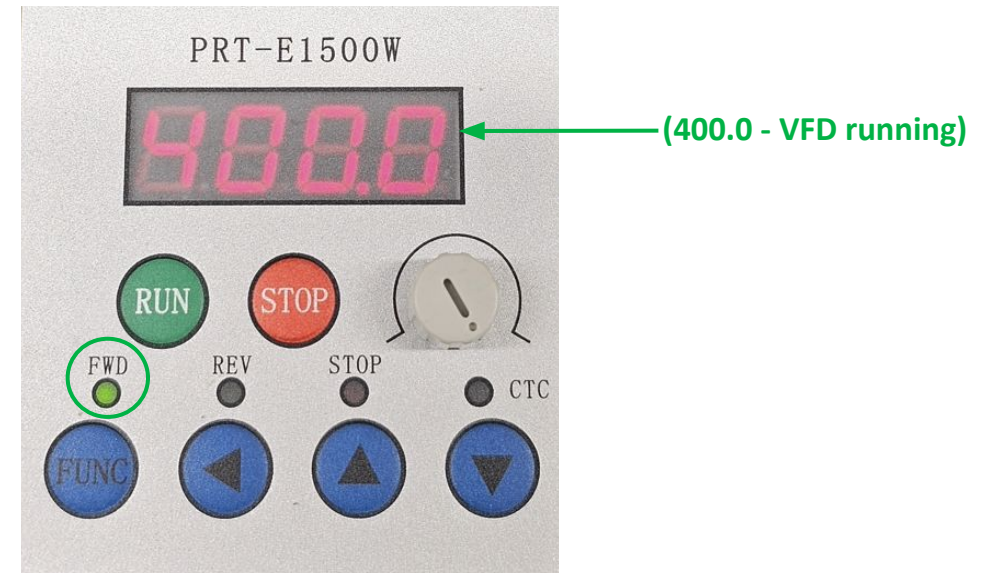
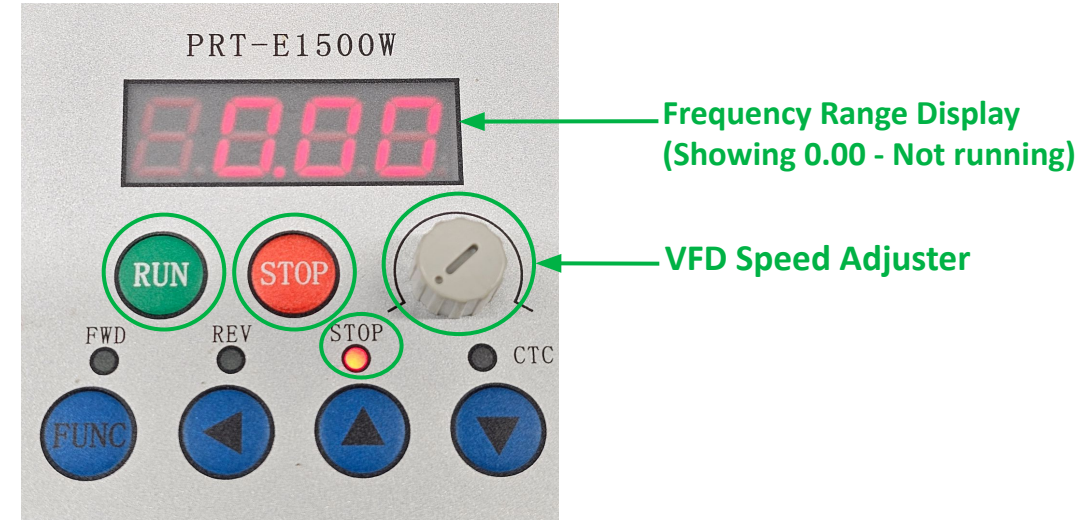
Ensure software is set to use **Manual Spindle Control**.

To start spindle, press the “RUN” green button and adjust speed. To stop spindle, press the “STOP” red button.

It is recommended to reduce speed control prior to starting the spindle.

The display will reflect the frequency value between 0-400 Hz.

*Note: The blue buttons are for programming the controller's internal settings, which you should only require to be used if under extreme circumstances.*



## Part 4 FAQ

### Q. What if my VFD does not start the spindle?

A. Please do not attempt to alter programming of the VFD using the blue buttons, without the guidance of YoraHome Technical Support. If you need help, please send an email to [support@yorahome.com](mailto:support@yorahome.com) to initiate a support ticket.

### Q. What RPM and Feed Rate do I need to use?

A. This is not a firm value we can provide for every situation. It is advised that slower feed rates are used initially, and adjust as conditions permit.

### Q. What if we have missing or broken parts?

A. Please notify: [support@yorahome.com](mailto:support@yorahome.com)

### Q. Where can I find additional resources for the YoraHome VFD Spindle Kit, CrossRiver, or SilverBack CNC Router?

A. In our Blog <https://yorahome.com/blogs/news>, Knowledge Base <https://my.yorahome.com/>, and Facebook group <https://facebook.com/groups/YoraHome.CNC>.

# YoraHome

---



<https://YoraHome.com>



[support@yorahome.com](mailto:support@yorahome.com)



<https://My.YoraHome.com>



<https://Facebook.com/groups/YoraHome.CNC>