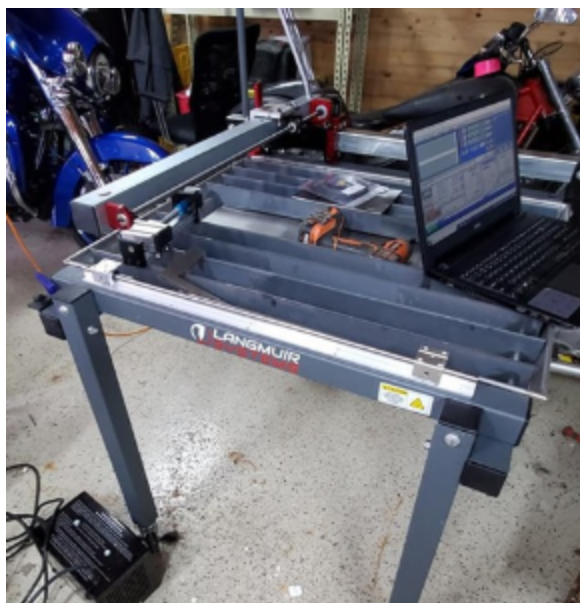


So where to begin.... This journey started with just wanting to have a machine to cut my parts out with, and after a lot of research and back and forth I decided the Langmuir seemed to be the best machine for the money. During all that research I seen all the posts about adding Z axis, and concerns about the weight being an issue with cantilever arm sagging. So once I got my machine built, I started ordering parts. Starting with the linear bearing. By the way, I have no electronic experience, so this was a learning experience! Luckily no magic smoke!

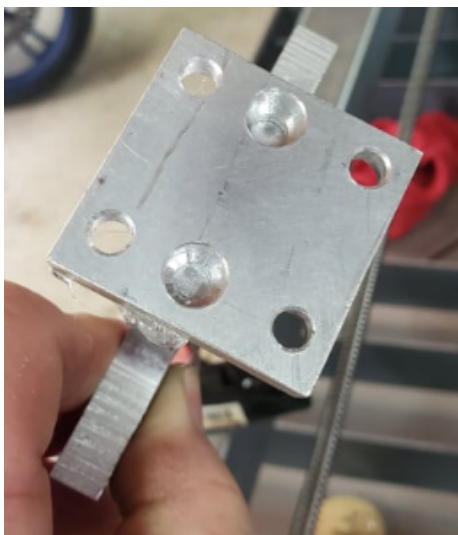
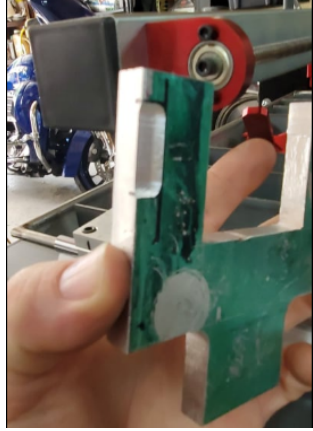
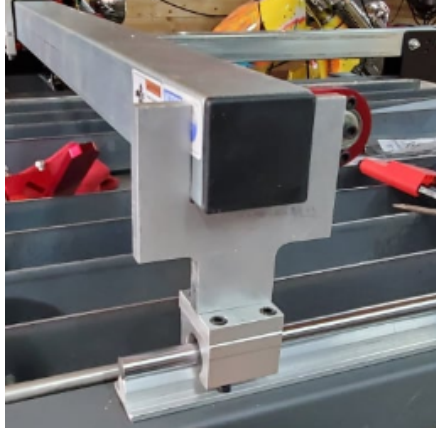
ORDER DATE Jun 20, 2019		ORDER TOTAL US \$27.89
1 item sold by rainbowring		
	SBR12-700MM Bearing Linear Rail Slide Guide Shaft w/ 2pcs SBR12UU Slider (143271166325)	\$ 
		ITEM PRICE: US \$27.89
 This item has been shipped.		

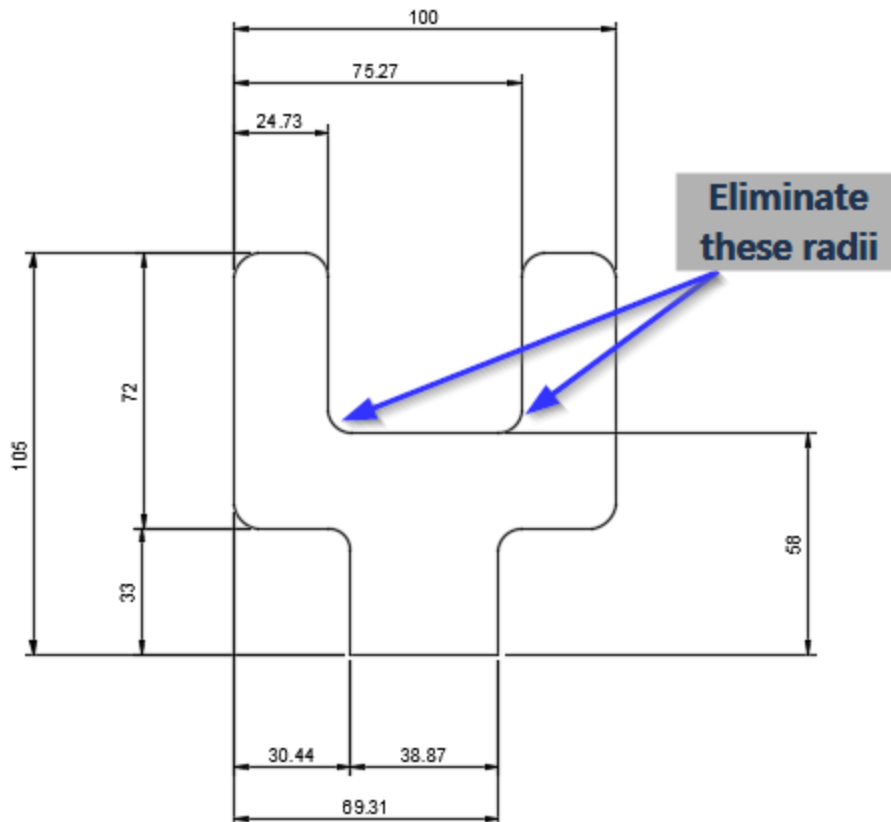


Once I installed that I had to devise a bracket to attach to the cantilever arm.

***** EDIT *****

This bearing setup lasted 6 months, then was shot and started binding up... With the THC it's not required, so in retrospect, save your money and time for something else....





On to the Z axis.... The mechanical part....

ORDER DATE
Jun 18, 2019

ORDER TOTAL
US \$63.89

1 item sold by [ecamcity](#)



Ball Screw Linear CNC Z Axis Slide Stroke Long Stage
Actuator Stepper Motor !
(382954257715)

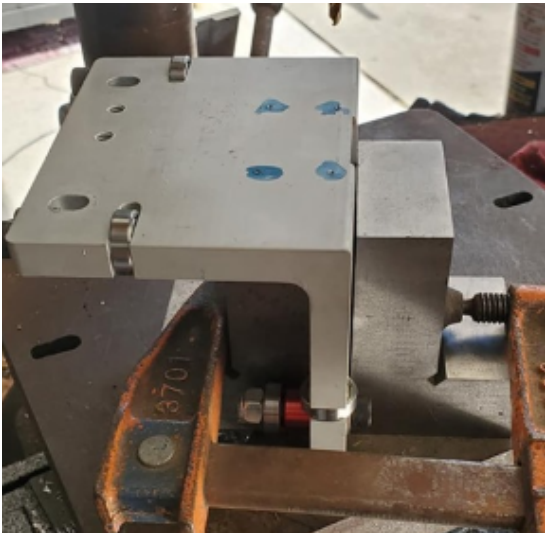
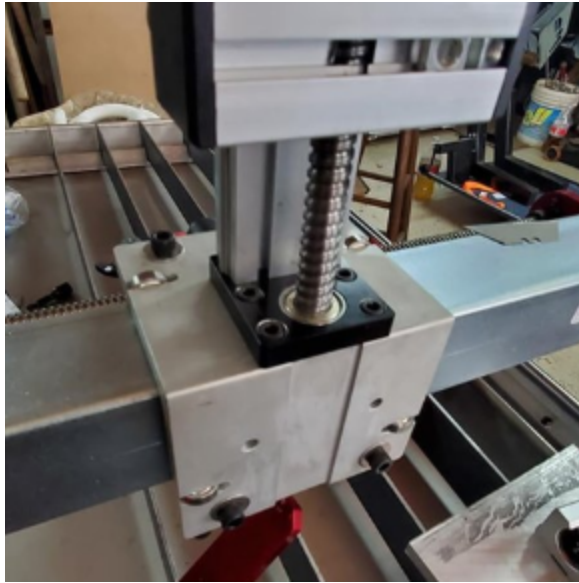
Choose: Ball Screw Linear Slide 100Mm

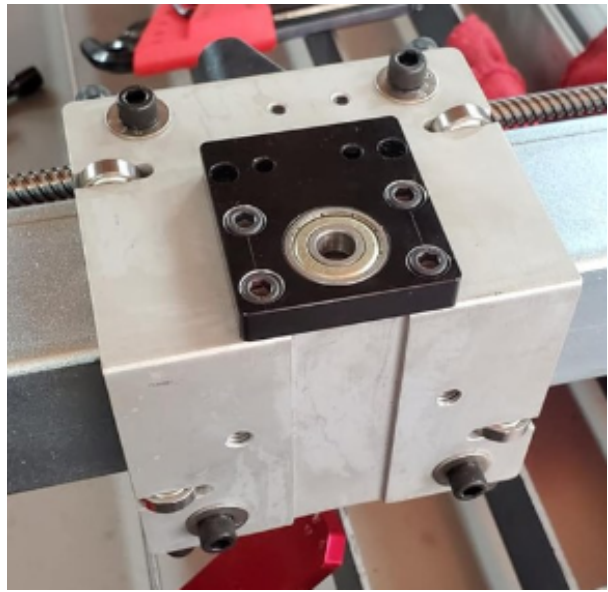
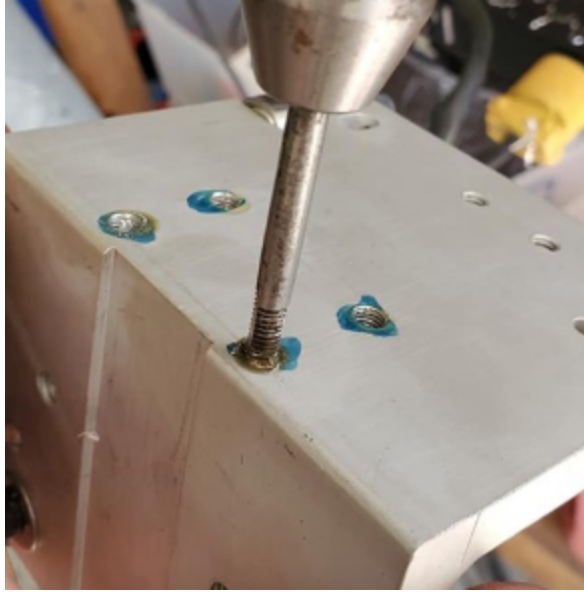
\$

ITEM PRICE:
US \$63.89

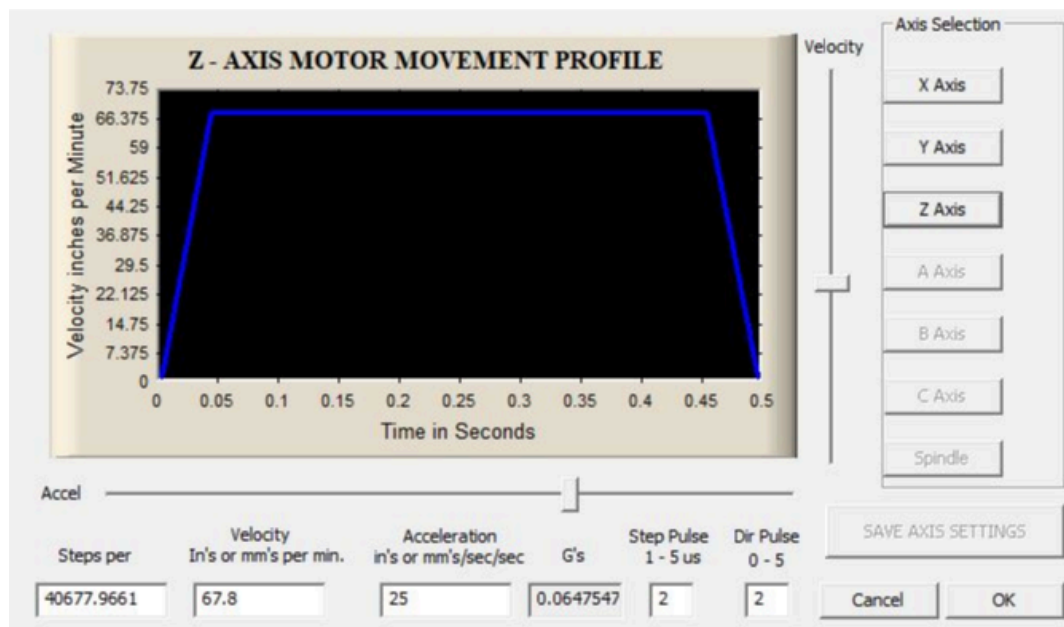
✓ Delivered on **Jun 21, 2019**
Tracking number: [9405510200829065097314](#)

i This item has been shipped.





These are the settings I ended up with. The Z step low active was required for the Z axis to work through the THC. More on that later...



Engine Configuration... Ports & Pins

Port Setup and Axis Selection							
Signal	Enabled	Step Pin#	Dir Pin#	Dir LowActi...	Step Low A...	Step Port	Dir Port
X Axis		2	3			1	1
Y Axis		4	5			1	1
Z Axis		6	7			1	1
A Axis		0	0			0	0
B Axis		0	0			0	0
C Axis		0	0			0	0
Spindle		0	0			0	0

OK Cancel Apply

Z-Axis Electrical Including THC. Will do this in 2 parts, because it was pretty much trial and error... The parts...

This THC works for both the Up/Down style, and the Step/Dir style. They don't tell you that, but I figured this out based on the instruction manuals for both. There is also a wiring step they do not tell you about, I'll get into that later.

ORDER DATE
Jun 20, 2019

ORDER TOTAL
US \$120.00

1 item sold by [robot3t2019](#)



Compact THC With UP/DOWN Output for Hyperthem Plasma
(254190493712)

\$

Estimated delivery **Fri, Jul 19 - Tue, Aug 06**

ITEM PRICE:
US \$90.00

This item has been shipped.

ORDER DATE
Jun 18, 2019

ORDER TOTAL
US \$7.99

1 item sold by [fasttobuy2012](#)



TB6600 Stepper Motor Driver Controller 9-42VDC 4A Micro-Step for 57BYG250H Motor
(123554326786)

\$

Delivered on **Jun 22, 2019**
Tracking number: **74892700245231841187**

ITEM PRICE:
US \$6.99

This item has been shipped.

Delivered Jul 3, 2019



QEBIDUL LM2596S DC-DC Buck Converter DIY 4-40V to 1.25-37V Step-down Regulator
Power Module Volt Stabilizer with LED Voltmeter Display

Sold by: GLOBAL QEBIDUL Store
Return eligible through Aug 2, 2019

\$8.99

[Buy it again](#)

Delivered Jul 2, 2019



2 of HiLetgo 4 Channel 24V Relay Module with OPTO-Isolated Support High and Low Level Trigger for PLC Automation Equipment Control

Sold by: HiLetgo

Return eligible through Aug 1, 2019

\$5.99

Buy it again

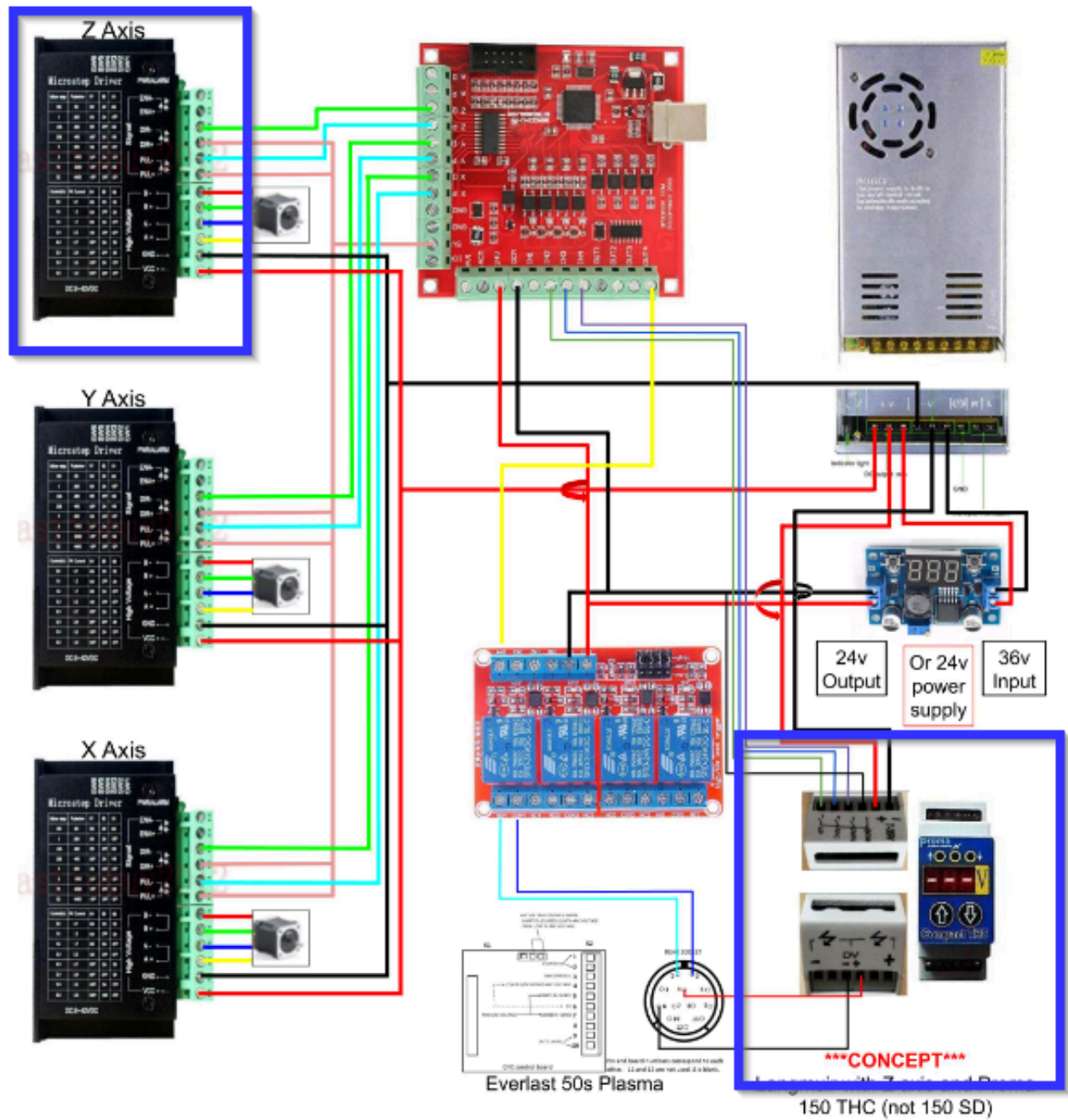
Let's get to it... I'm gonna skip all my redundant installs and kinda fast forward a bit.

Relocate the power supply upward to make room for some more electronics..



I installed the step down converter below the power supply, and the 24v relay under the existing motor controller (X or Y, whichever it is)

Ignore the areas in the blue rectangles for now, they were wired for the UP/Down style THC which will not work with the Langmuir breakout board.



Let's tear apart the THC, if you want it to be installed inside the cabinet...

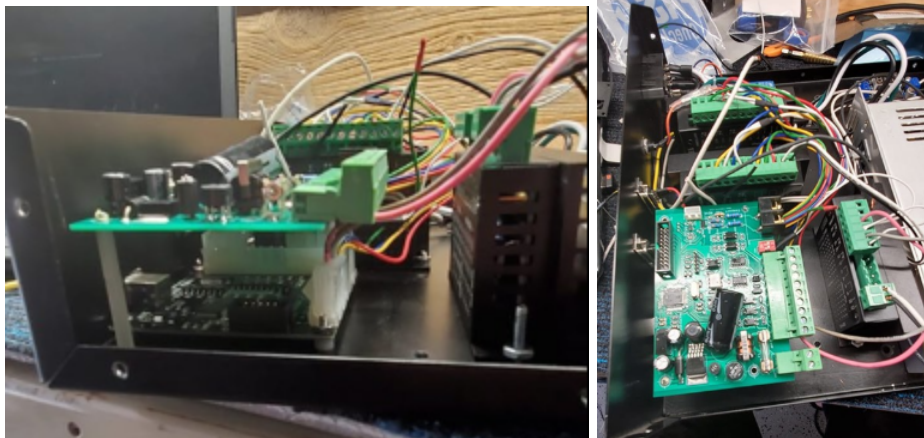
This is what you get...



This is what it looks like taken apart...

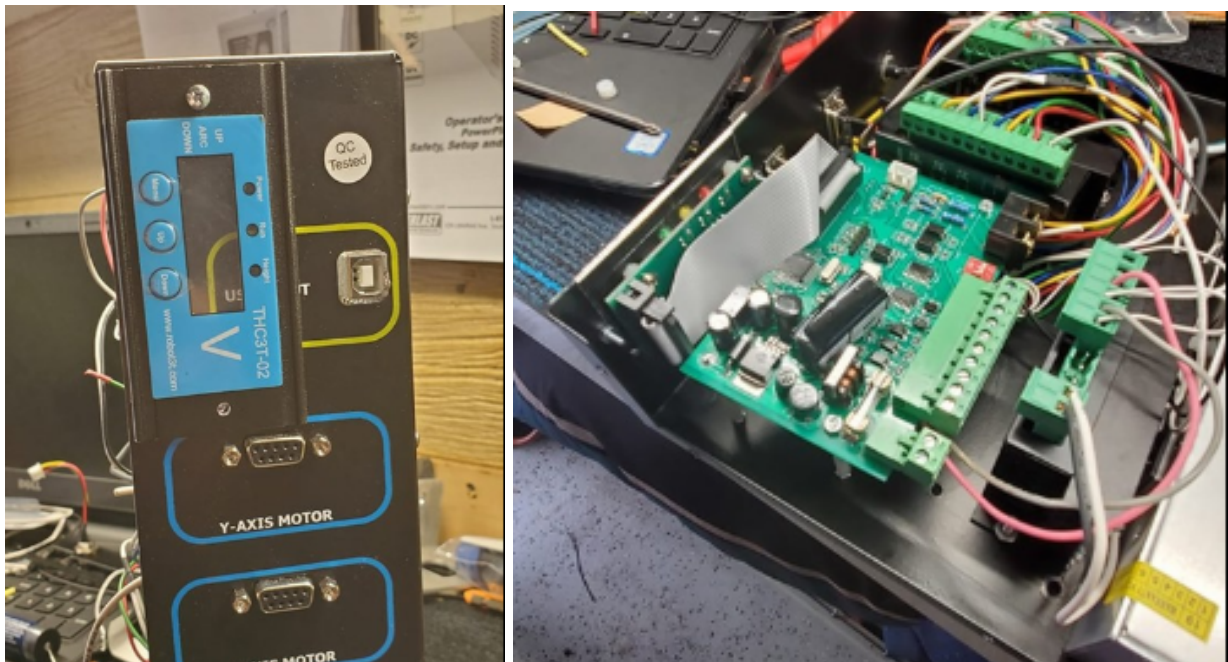


I decided to mount it above the Langmuir break out board, it was the only place it would fit. The disconnected ribbon cable goes to the controllers display and control buttons. There is also a rheostat which I initially thought I wouldn't need but it is required...

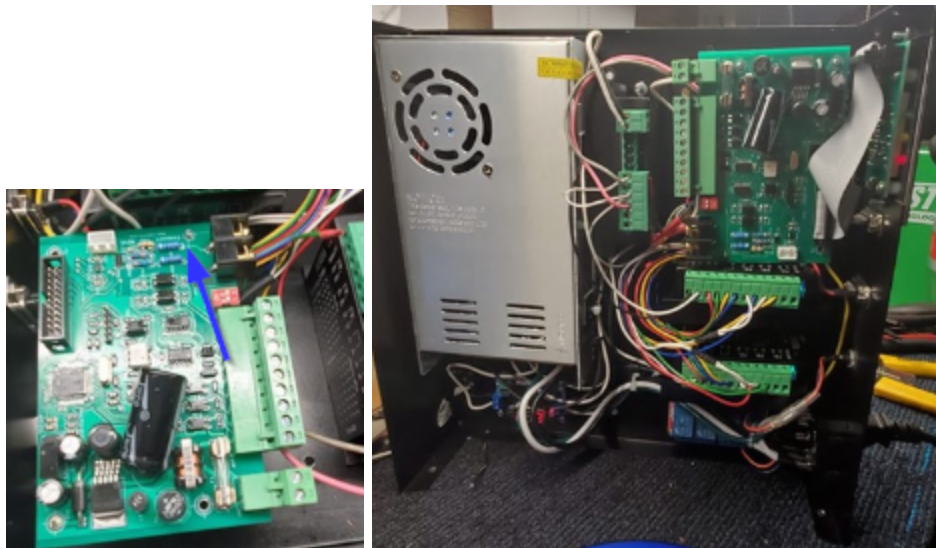


Notice the Z axis control is positioned right next to the power supply. You will need the space for the wiring...

I took the faceplate to a bandsaw and cut it to fit on the front, ended up vertically because the ribbon cable wouldn't fit to mount it horizontally. I thought about ordering a longer one, but didn't want to wait.

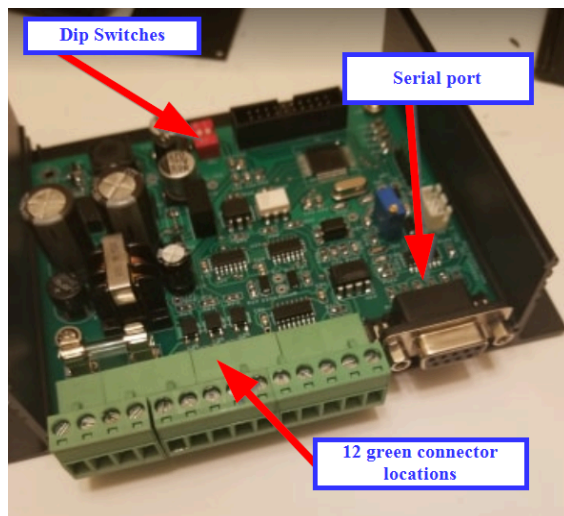


I used some nylon spacers to raise it up and some 3mm screws. I did have to drill another hole in the board, I found a place that had no circuits printed on it, it worked...



So this is the wiring diagram for the THC supplied by the manufacturer:

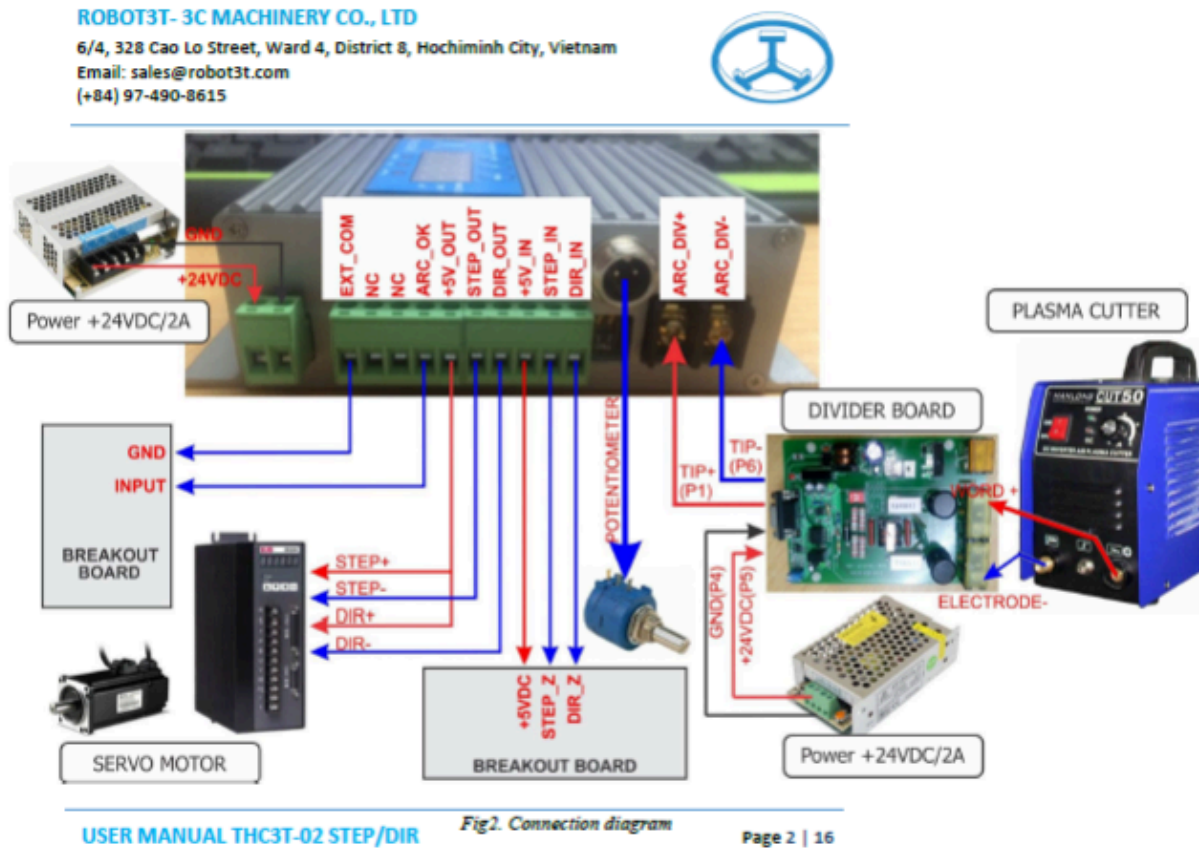
***** EDIT ***** 2/24/2020 It appears they are shipping a new version of this board which I have no experience with, so the wiring I show here may not work. I have no knowledge of the newer board. But I did some digging for another user who was asking me about this and this is what I found, if your board looks like this:



Here is the Wiring diagram, I would start out following these directions:

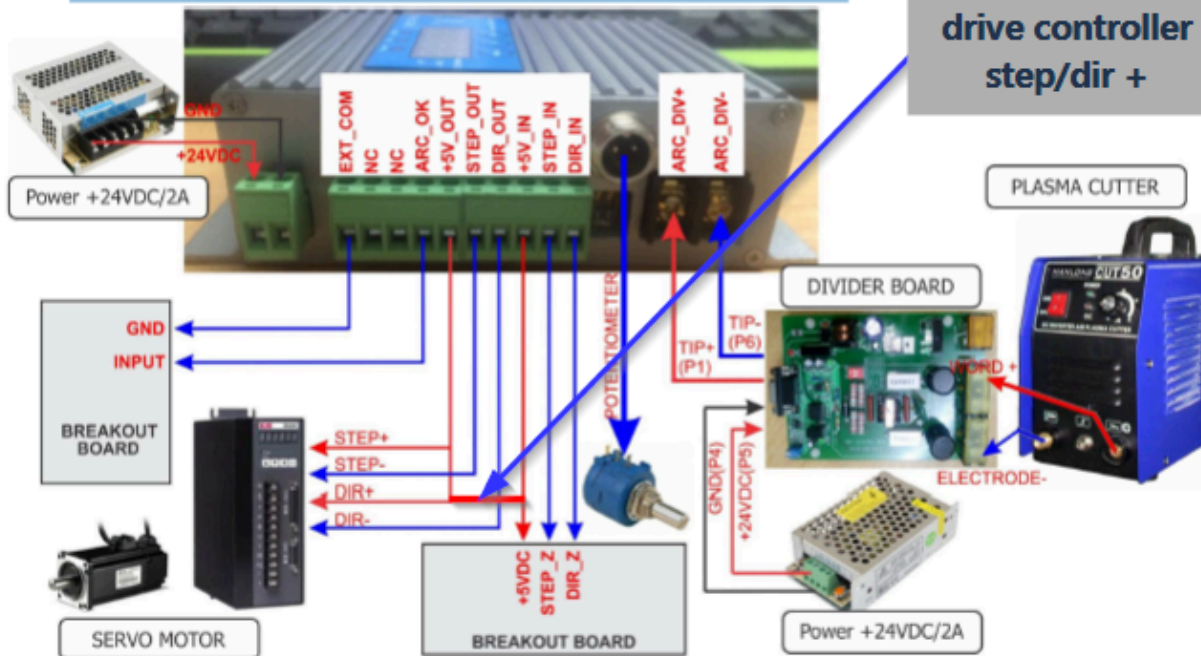
<https://drive.google.com/file/d/1qnDrr8e3vaOCKdmw0if8b6ohaQhBtWFZ/view?usp=sharing>

This actually looks like a better board, more included functions... ***** END EDIT *****
Back to my original write up.....

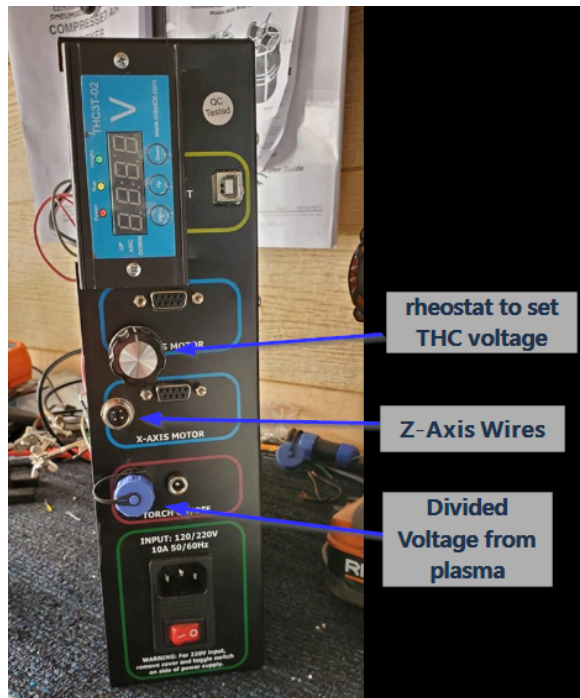


If your plasma cutter has a built in divider board, like the Everlast 50s that I have, you will not need that.

If you wire it like the manufacturer's drawing, the Z axis will not work. I found that there is one more wire you need to connect to make everything function.



At the end of the day, This is the front of my box....



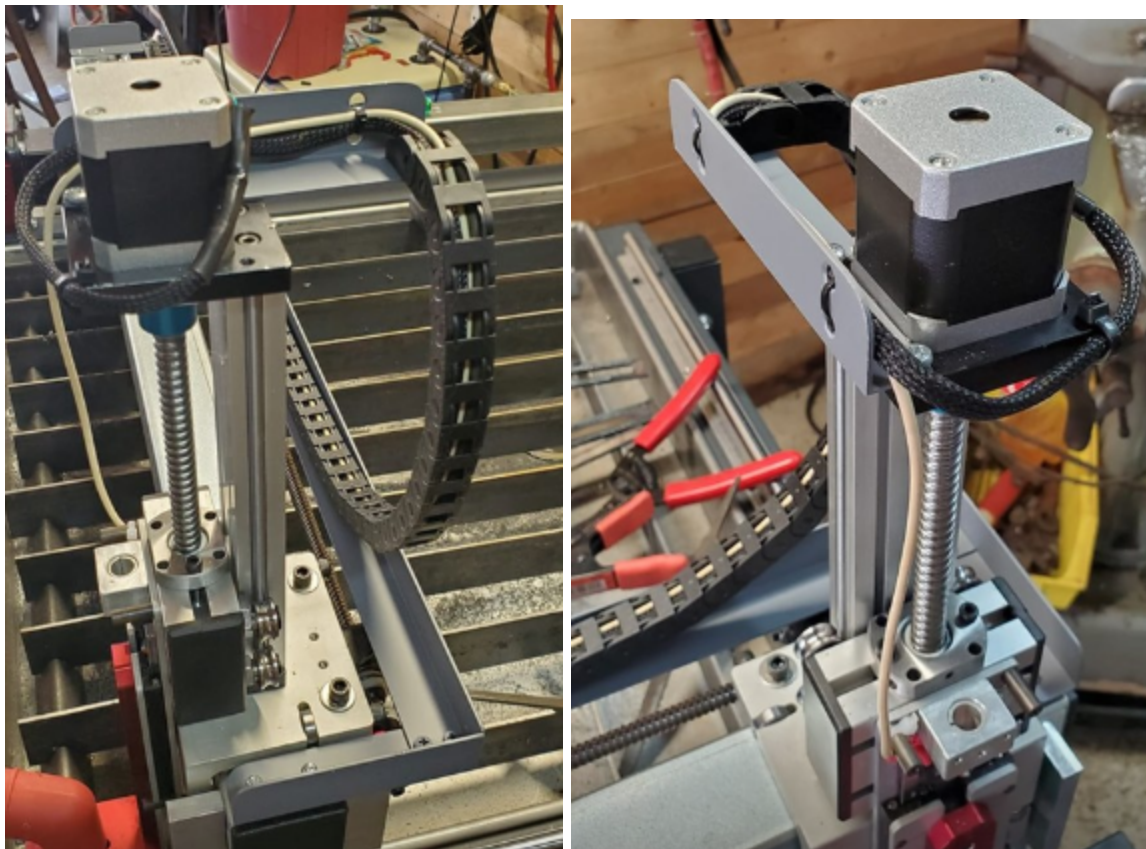
There is another 3 pin connector on the back which is for the probe, and the limit switches (not yet installed). It has a common ground, and then a positive for each of the switches. Limit switches will be wired in series.

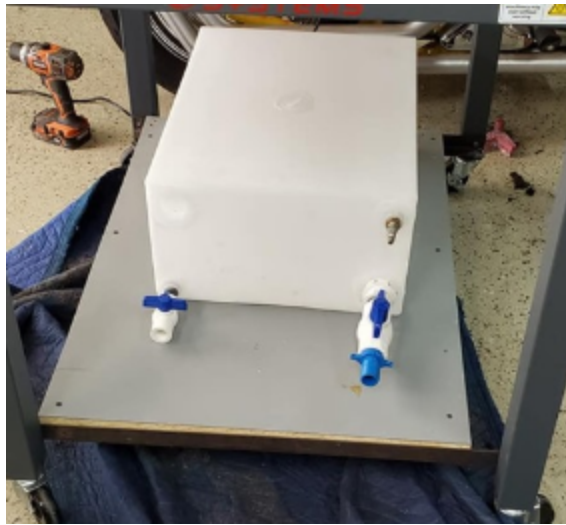
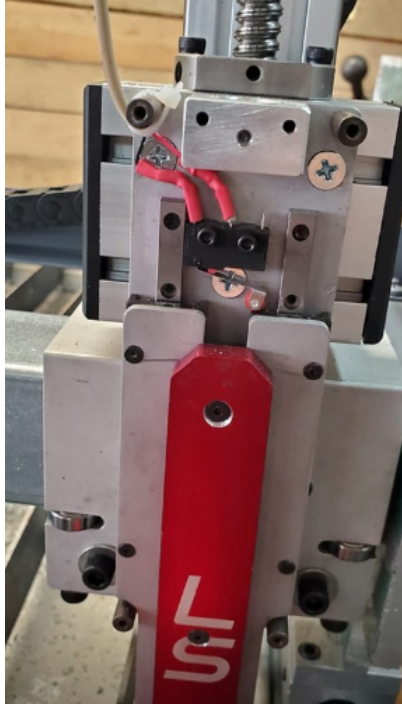
EDIT The divided voltage connector I used is the plastic kind, don't waste your money, I have replaced this one with a metal housing, similar to the one I used for the Z axis wires. I had nothing but trouble with 2 of the plastic ones.

There's other stuff like the water tank and cable management but I think that's the easy stuff to figure out, if you need help please feel free to contact me. The rest of pics are all the stuff I ordered, and pics of how I set everything up.

EDIT The floating Z mechanically works great, functionally however it's better than nothing, but not optimal.. If your sheetmetal is warped at all, and flexible the Z axis pushes it down till it stops and then lifts the amount of travel of your limit switch distance. But, the sheetmetal springs back and that distance is false and you could be starting right on the surface of your metal. I am switching to a touchless probing system like tooljunkie (youtube) has on his. Will be much better...

Cable Management, Probe setup, and Water Tank







The parts list...

ORDER DATE
Jun 27, 2019

ORDER TOTAL
US \$36.00

1 item sold by [cloudray-laser](#)



CNC Cable Chain Track L.1M Non Snap-Open Plastic Towline
Transmission Drag Chain
(123073228893)

Inner Size: 10x10 mm
Bending Radius: 28mm
Quantity: 4

\$ 📦 ⭐ 📧

ITEM PRICE:
US \$23.96

i Estimated delivery **Tue, Jul 16 - Thu, Jul 25**
Tracking number: **ES1000326754896NG01010001F0A**

i This item has been shipped.

ORDER DATE
Jun 20, 2019

ORDER TOTAL
US \$8.99

1 item sold by [eoncable_8](#)



SP2110/S Female Plug 4Pin Circular Aviation Waterproof
connector plug and socket
(152951721560)

\$ 📦 ⭐ 📧

ITEM PRICE:
US \$8.99

✓ Delivered on **Jul 05, 2019**
Tracking number: **ES1000320395378NG01010001B0A**

i This item has been shipped.

+ Add note

ORDER DATE
Jun 20, 2019

ORDER TOTAL
US \$27.89

1 item sold by [rainbowring](#)



SBR12-700MM Bearing Linear Rail Slide Guide Shaft w/ 2pcs SBR12UU Slider
(143271166325)

\$

ITEM PRICE:
US \$27.89

✓ Delivered on **Jun 24, 2019**
Tracking number: **9405510200830277755961**

This item has been shipped.

ORDER DATE
Jun 20, 2019

ORDER TOTAL
US \$120.00

1 item sold by [robot3t2019](#)



Compact THC With UP/DOWN Output for Hyperthem Plasma
(254190493712)

\$

ITEM PRICE:
US \$90.00

Estimated delivery **Fri, Jul 19 - Tue, Aug 06**

This item has been shipped.

ORDER DATE
Jun 18, 2019

ORDER TOTAL
US \$7.99

1 item sold by [fasttobuy2012](#)



TB6600 Stepper Motor Driver Controller 9-42VDC 4A Micro-Step for 57BYG250H Motor
(123554326786)

\$

ITEM PRICE:
US \$6.99

✓ Delivered on **Jun 22, 2019**
Tracking number: **74892700245231841187**

This item has been shipped.

ORDER DATE
Jun 18, 2019

ORDER TOTAL
US \$63.89

1 item sold by [ecamcity](#)



Ball Screw Linear CNC Z Axis Slide Stroke Long Stage
Actuator Stepper Motor !
(382954257715)

Choose: Ball Screw Linear Slide 100Mm

✓ Delivered on **Jun 21, 2019**
Tracking number: **9405510200829065097314**

i This item has been shipped.

Add note



ITEM PRICE:
US \$63.89

ORDER DATE
Jun 17, 2019

ORDER TOTAL
US \$43.49

1 item sold by [classacustoms](#)



13 GALLON Fresh Water Tank New NSF food truck holding
wash tiny concession rv
(201407706134)

✓ Delivered on **Jun 21, 2019**
Tracking number: **9405509898642314665330**

i This item has been shipped.

Add note



ITEM PRICE:
US \$43.49

ORDER DATE
Jun 12, 2019

ORDER TOTAL
 US \$25.45

1 item sold by [globedealmark](#)



4 Axis USB Handle Wheel Engraving Numerical Remote
Control For Mach3 CNC ark
(253967668651)

✓ Delivered on **Jun 25, 2019**
Tracking number: **ES1000312722026NG01010001G0A**

i This item has been shipped.



ITEM PRICE:
 US \$24.16

Out for delivery

Arriving today by 9 PM



HangTon HE13 2 Pin Power Connector Circular Waterproof Male Plug Female Panel Socket

Sold by: Hangton connect | Product question? Ask Seller

\$8.99

Buy it again

Delivered Tuesday

Your package was delivered. It was handed directly to a resident.

>



URBEST AC 250V 5A SPDT 1NO 1NC Momentary Hinge Roller Lever Micro Switches 3 Pins 10 Pcs

Sold by: iauto

Return eligible through Aug 8, 2019

\$6.99

Buy it again

Delivered Tuesday



Motor Guard M-30 1/4 NPT Submicronic Compressed Air Filter

Sold by: Amazon.com Services, Inc

Return eligible through Aug 8, 2019

\$69.98

Buy it again

Delivered Jul 3, 2019



QEBIDUL LM2596S DC-DC Buck Converter DIY 4-40V to 1.25-37V Step-down Regulator Power Module Volt Stabilizer with LED Voltmeter Display

Sold by: GLOBAL QEBIDUL Store

Return eligible through Aug 2, 2019

\$8.99

Buy it again

Delivered Jul 2, 2019



Aiposen 110V/220V AC to DC 24V 2A 48W Switch Power Supply Driver,Power Transformer for CCTV Camera/Security System/LED Strip Light/Radio/Computer Project(24V 2A)

Sold by: Aiposen

Return eligible through Aug 1, 2019

\$11.97

Buy it again

Delivered Jul 2, 2019



2 of HiLetgo 4 Channel 24V Relay Module with OPTO-Isolated Support High and Low Level Trigger for PLC Automation Equipment Control

Sold by: HiLetgo

Return eligible through Aug 1, 2019

\$5.99

Buy it again

Delivered Jun 14, 2019



5 Packs Collapsible Funnel, YuCool Foldable Silicone Funnel for Liquid & Powder Transfer with 2 Brush, 100% Food Grade Silicone-5 Colors(3Large+2)

Sold by: YuCool | Product question? Ask Seller

Return eligible through Jul 14, 2019

\$8.99

Buy it again