harvest thermal

SERVICE MANUAL for HARVEST POD *DUO*©

I. REGULAR MAINTENANCE

A. Filter Changes

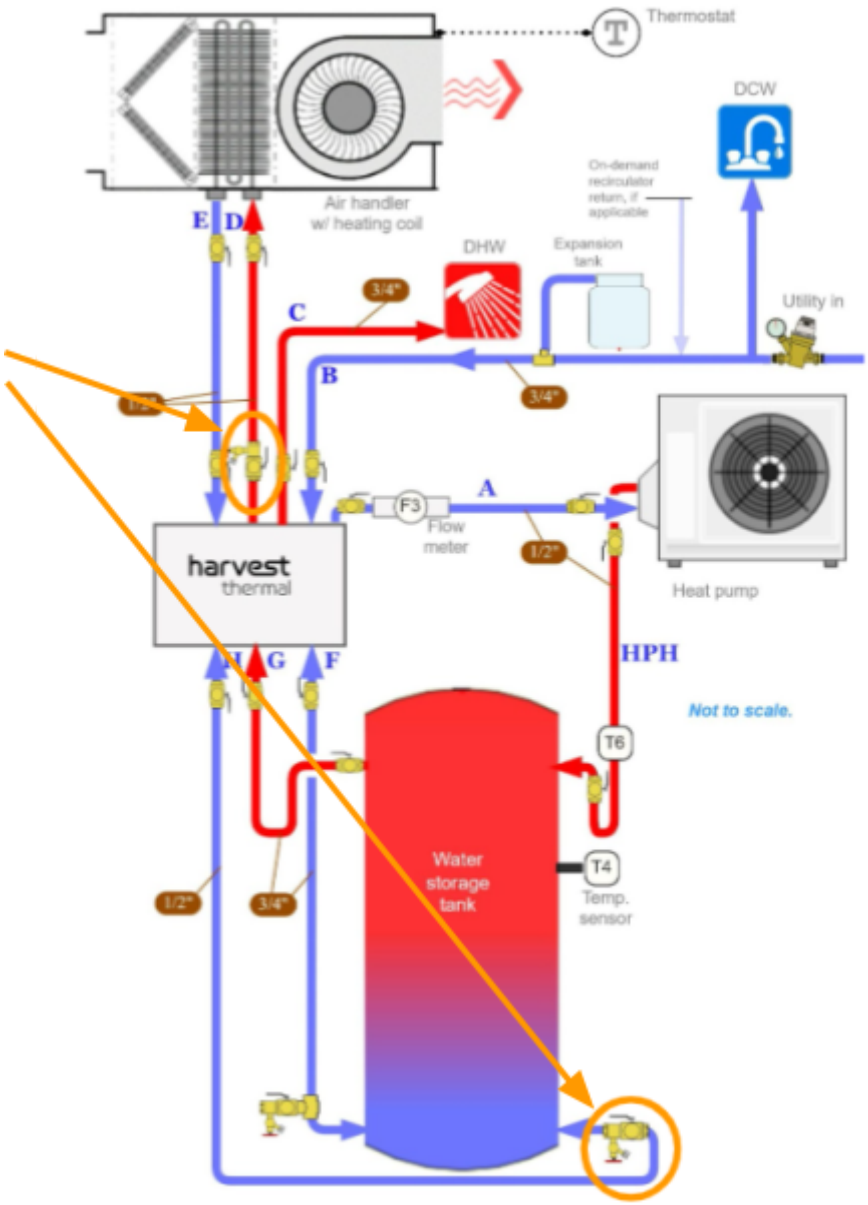
Change air filters regularly per the air handler manufacturer's instructions. This is important for good indoor air quality and system performance. Change (MERV 13) filters at a minimum:

- Every 12 months if system used mostly for heating
- Every 6 months if heavy use of air filtration and night cooling features

B. Descaling

Descale the heating coil **every 3 to 5 years** depending on water hardness to maintain good heat exchanger performance.

Use a **tankless water heater descaler kit** and the drain taps on **valves D and H**.



C. Real-Time Clock Battery Replacement

The Pod contains a real-time clock with battery backup to keep track of time when it loses power and isn't connected to the internet. The battery is a CR1220 coin cell. Replacement is recommended every 20 years. Replacement parts must be a high quality brand name part such as Murata P/N CR1220 or Digikey P/N 490-18640-ND, and must be performed by a certified and trained professional, not by the homeowner.

CAUTION:

- There is a risk of explosion if the battery is replaced by an incorrect type.
- Dispose of used batteries according to battery manufacturer instructions.

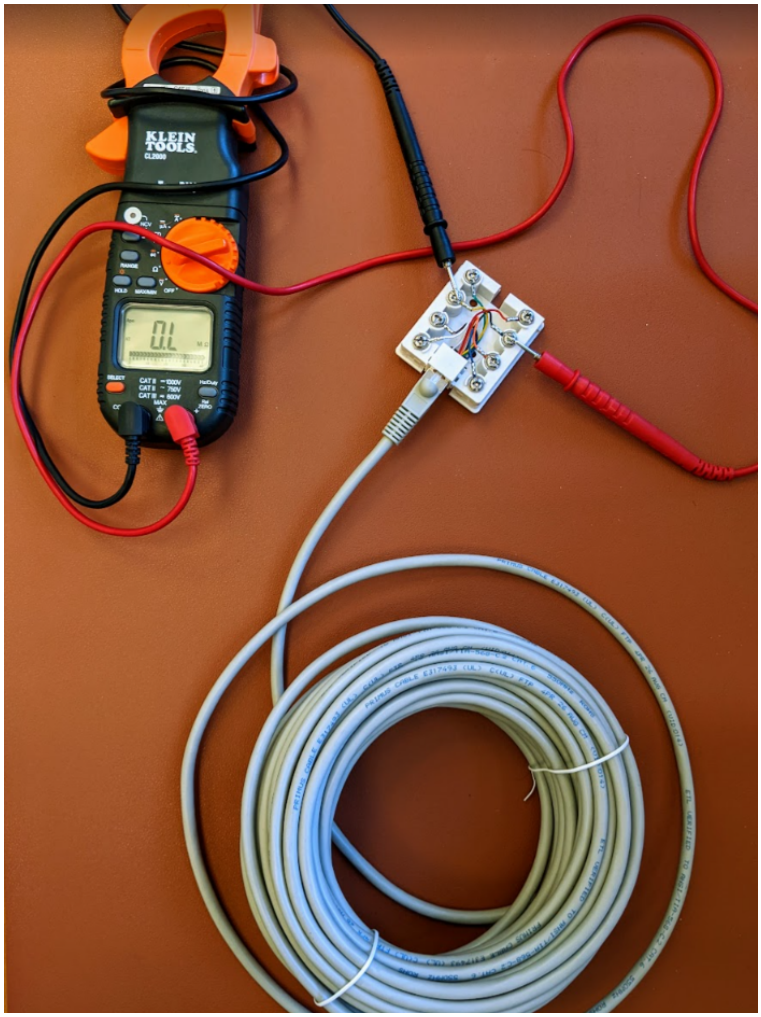
II. TROUBLESHOOTING

A. Field Troubleshooting Tools

Cat 5 Tester

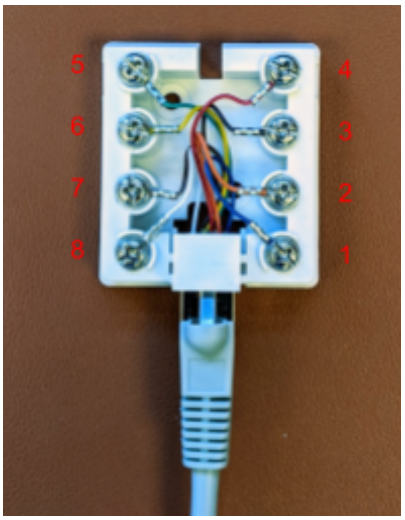
To test if the cat 5 cable and any junctions in the cable are working as expected. Can also be used to measure what the Pod and AHU board are signaling on each line.

Cat5 tester shown with multimeter measuring resistance on pins 3 and 6:



Heat Pump Pin-Out:

Cat5 pin		Tester pin
1 2		Blue Orange
3		Black
4 5		Red Green
6		Yellow
7 8		Brown White



[10k ohm thermistor chart]: Print it out, or click this link, it could be useful for troubleshooting.

Temp(°C)	Temp(°F)	Resistance Ohms	Temp(°C)	Temp(°F)	Resistance Ohms
-40	-40	239,686.00	60	140	2,488.00
-35	-31	242,660.00	65	149	2,083.00
-30	-22	176,960.00	70	158	1,752.00
-25	-13	130,410.00	75	167	1,479.00
-20	-4	97,072.00	80	176	1,255.00
-15	5	72,951.00	85	185	1,070.00
-10	14	55,326.00	90	194	915.4
-5	23	42,326.00	95	203	786.6
0	32	32,650.00	100	212	678.6
5	41	25,391.00	105	221	587.6
10	50	19,899.00	110	230	510.6
15	59	15,711.00	115	239	445.2
20	68	12,492.00	120	248	389.6
25	77	10,000.00	125	257	341.9
30	86	8,057.00	130	266	301.0
35	95	6,531.00	135	275	265.8
40	104	5,326.00	140	284	235.4
45	113	4,368.00	145	293	209.0
50	122	3,602.00	150	302	186.1
55	131	2,986.00			

B. SANCO2 Heat Pump Won't Start Or Has An Error Code

- ☐ **Does the heat pump have power?** (light blinking)
- ☐ **Error code H7**
  - ☐ If the SANCO2 has error code H7, check IDC connectors and other connections on orange/white wires. IDC heads must be pushed fully in and completely flat.
  - ☐ **Is the heat pump receiving the right tank temperature signal?** - Disconnect the **orange white** and **orange** cat 5 wires (pins 1 and 2) from the heat pump terminals and use a multimeter to measure resistance between the two wires. If the Pod is in control mode, the resistance will be approx 7,550 ohms. If it is in failsafe mode, it should signal the temperature of the tank at the thermowell (use this 10k ohm thermistor chart to decode the temperature), it should be between 15 kOhm (60 F) and 2 kOhm (150 F). If the resistance is higher than expected check for bad connections.
- ☐ **Other SANCO2 has error codes:** look them up in the SANCO2 manual
- ☐ **Does the heat pump start if dry contact is closed?** - Unplug dry contact connector (white wire), short the heat pump dry contact by inserting a closed loop wire into the female connector. Wait 3 minutes for the heat pump to start.
- ☐ **Is the Pod sending "Heat Pump ON" signal?** - Disconnect the heat pump cat 5 cable at the Pod. Plug in a short Cat 5 cable and plug in the Cat **5 Tester** at the other end. Measure resistance between **pins 3 and 6**. It should be **less than 15 ohms** if the Pod is sending the Heat Pump ON signal. If it is not, check IDC and other connections on dry contact wires (green/white)
- ☐ **Is the heat pump receiving the Heat Pump ON signal? -** Disconnect the dry contact connector. Push two wires into the male piece and use a multimeter to measure the resistance. It should be **less than 15 ohms** if the Heat Pump ON signal is received. If it is sent from the Pod but not received at the heat pump:
  - ☐ Check cat 5 cable integrity (not cut or pinched) and any junctions for bad connections.
  - ☐ Check cat5 cable is properly inserted at the Pod
- ☐ If none of this works, fill in the Support Request at the bottom of this form and email it to support@harvest-thermal.com, we'll get back to you within 24 hours, earlier if we can.

C. SANCO2 Heat Pump Running But Water Is Not Circulating

- ☐ It is most likely an obstruction on the heat pump loop: valve closed or not properly open, check valve, too many elbows or pipe too long\

D. Air Handler Not Turning On, Or Fan Speed Not Modulating

- ☐ **Wait for the AHU On delay (default: 45 sec) -** There is a built-in delay between thermostat ON and AHU ON (and between thermostat OFF and AHU OFF).
- ☐ **Does the fan have power?** - Flip the AHU control switch to the right (local/knob control). The fan should turn on. DO NOT adjust the knob or you will have to recommission Basic mode.
- ☐ **Does the AHU have power?** - Use a multimeter to measure DC voltage coming out of the AHU control board. It should be approximately 12 V.

E. Pod Circulator Humming But No Flow

- ☐ Check if there is air trapped in the heating loop. Purge heating loop through H drain valve, with tank side closed, until water gets hot
- ☐ Circulator speed may be too low. If setting up Basic mode, increase Basic mode circulator speed (D4)

F. Harvest Pod Not Working

If the heat pump or heating won't turn on despite no error code on SANCO2, AHU powered on, and all signals received as expected, there may be an issue with the Pod hardware or software.

- ☐ Check that the Pod is powered on and LED light below Pod is deep green. If not lit or yellowish/green, power Pod *off* to place the system in Basic mode:
  - ☐ If Pod powered locally, unplug the power supply
  - ☐ If powered from AHU, disconnect one of the power wires
- ☐ Contact support@harvest-thermal.com

III. POD FIELD SERVICE PROCESS STEPS

A. Repair Tool List

- Wrench, adjustable, at least 1 1/2”
- Wrench, 1 1/2”
- Wrench, 1-5/16”, Recommended Harvest PN#201116
- Wrench, 7/16”
- Wrench, 3/16”
- Wrench, 7/8”, for pump bushings
- Hex tool, 1/16” drive
- Hex tool, 1/8” drive
- Hex tool, 3/32” drive
- Hex tool, 2mm
- Philips screwdriver
- Pliers, Needle nose
- Pliers, diagonal cutter

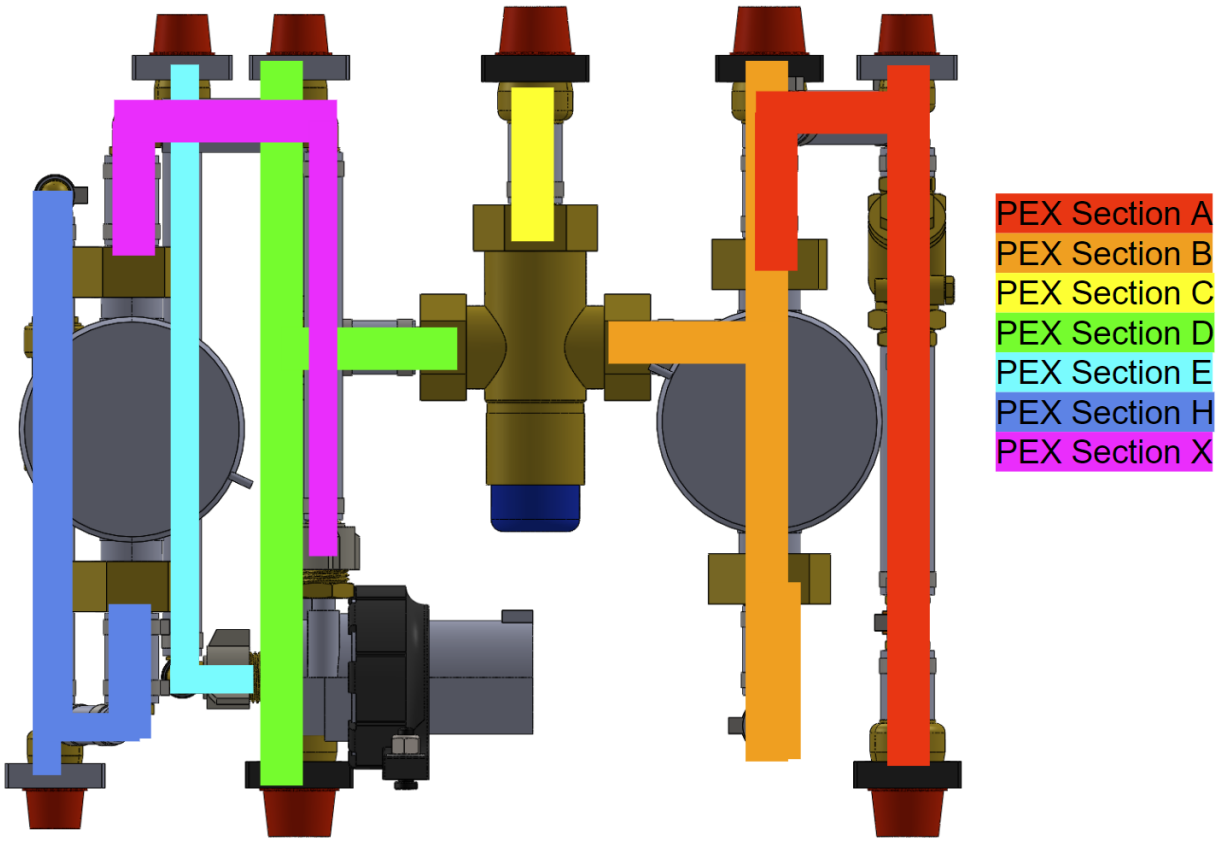
B. Repair Consumables List

- Zip ties (PN 200903) or Twist ties (PN 200906)
- Pipe Thread sealant - Blue Monster 76007 (PN 200669)
- Isopropyl alcohol (PN 201100)
- wire labeling tools (PN 201112)

C. Diagnostic Tool List

- Digital manometer (201110)
- Cat 5 or 6 cable (qty 2)
- Cat 5 breakout junction box (qty 2)
- Digital multimeter and current clamp (ac capable, with low amp measurement)
- Pod internal sensor wiring - jumper cables
- Kill-a-Watt Power measurement device
- Outlet splitter
- Kamstrup tool
- USB extender
- Thermocouple
- Spare Thermostat

D. PEX Section Identification Guide



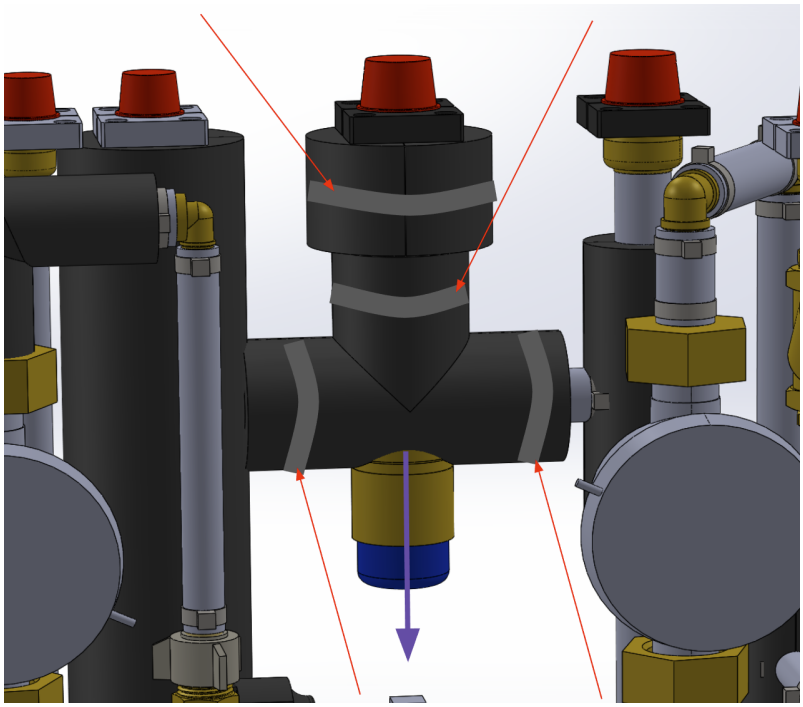
E. Mixing Valve

Adjustment:

- ☐ Open front panel
- ☐ Refer to mixing valve service manual for full adjustment instructions:
  100489 Install and Service Resideo AM-1.pdf
- ☐ Loosen screw on locking cap (requires short screwdriver)
- ☐ Pull down locking cap to free the adjustment mechanism.
- ☐ Rotate clockwise for hotter, counter-clockwise for colder mix. 125 F is 180 degrees from max. The resolution is 30 degrees rotation per 4 degree F
- ☐ Replace locking cap to locked position

Removing:

- ☐ Drain the system
- ☐ Open front panel
- ☐ Remove velcro straps from insulation around mixing valve and DHW line (red arrows)



WARNING: COMPONENTS MAY STILL BE HOT

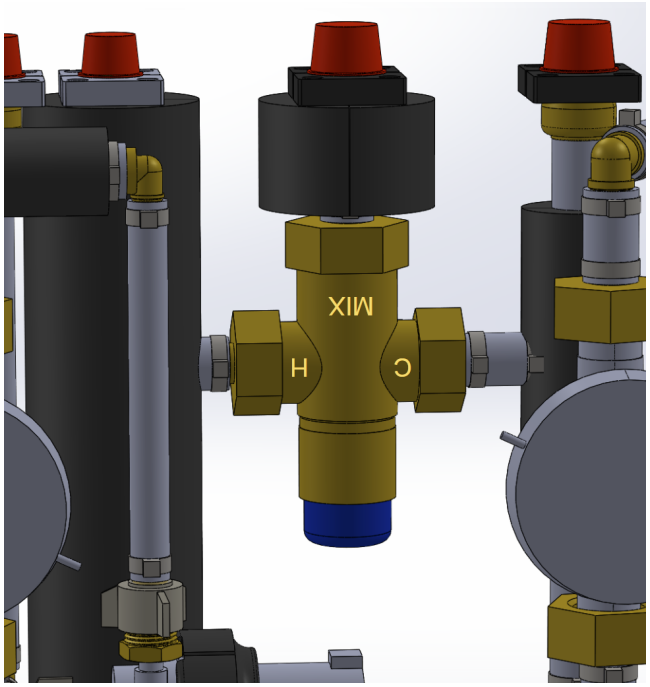
- ☐ Remove insulation from around top segment
- ☐ Pull down carefully on insulative tee to remove from mixing valve (purple arrow)
- ☐ Optional: place towel at bottom of enclosure to catch excess moisture during disassembly
- ☐ Unscrew 3 couplers on mixing valve (1 1/2” wrench)
- ☐ Remove mixing valve from enclosure

Service:

- ☐ For information on how to:
  Clean or replace check valves
  Clean or replace thermostat mechanism
- ☐ Refer to mixing valve service manual:
  Resideo Braukman AM-1 Series Installation Manual
  https://customer.resideo.com/resources/Techlit/TechLitDocuments/62-0000s/62-3098.pdf

Replacing:

- ☐ Use FRU # 201088
- ☐ Use new gaskets:
  Mfr PN: AMU200-RP
  Manufacturer: Resideo Braukmann
  HT#: 201059
- ☐ Put mixing valve into enclosure, and tighten the coupler nuts (1 1/2” wrench)
- ☐ Check the orientation - Hot port goes to left when facing the Pod (marked ‘H’)

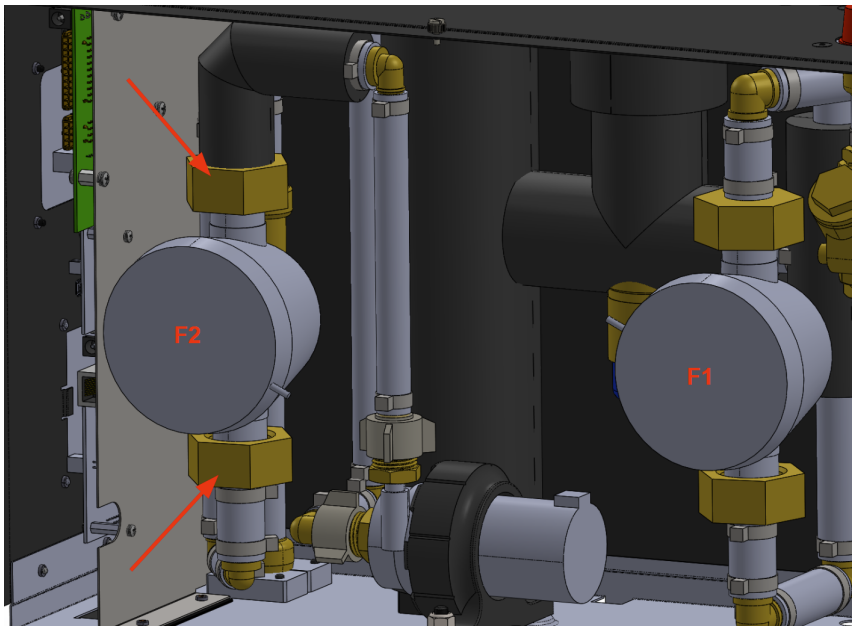


- ☐ Fill system, check for leaks
- ☐ Adjust to target temperature setting
- ☐ Add back insulation around valve and DHW line
- ☐ Add velcro clasps to insulation
- ☐ Close and secure front panel

F. Flow Meters

Removing:

- ☐ Drain system
- ☐ Open front panel
- ☐ F1 is the meter on the **Right**, F2 is the meter on the **Left**.
- ☐ Find the connector labeled “F1” or “F2” depending on which you are replacing, and unplug it.
- ☐ Untangle the wire from the cable management. Cut cable zip ties where necessary
- ☐ If removing F2, remove the insulation on the elbow immediately above the meter. You will need to undo the two velcro straps to do this.
- ☐ Unscrew coupler nuts (red arrows) using a wrench (1 1/2” wrench) , while holding the meter in place. You can use Harvest PN#201116, a thin-profile 1-5/16”, wrench to hold on to the flow meter hex profile.
- ☐ Remove meter



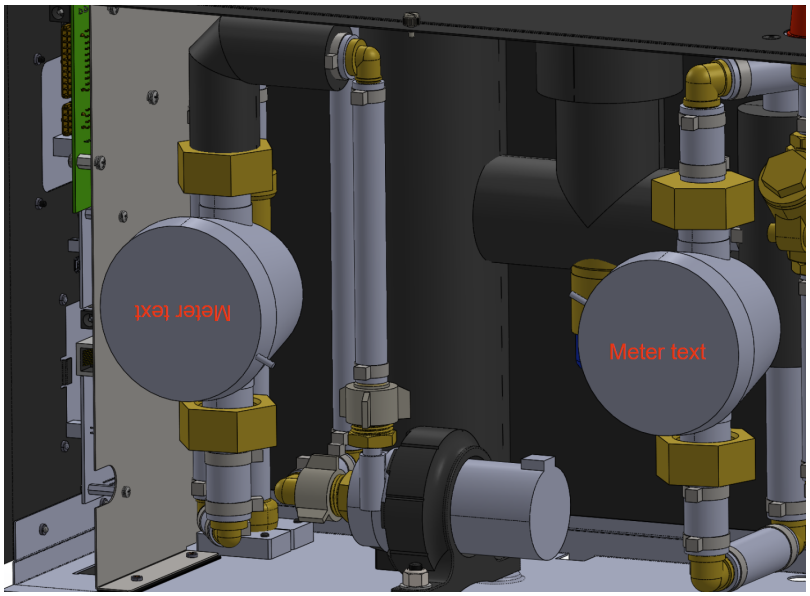
Service

- ☐ Limited service is possible, a clog at the inlet screen could be gently cleaned, but associated particles should not be pushed into the meter. Rinse with clean water afterwards

Replacing:

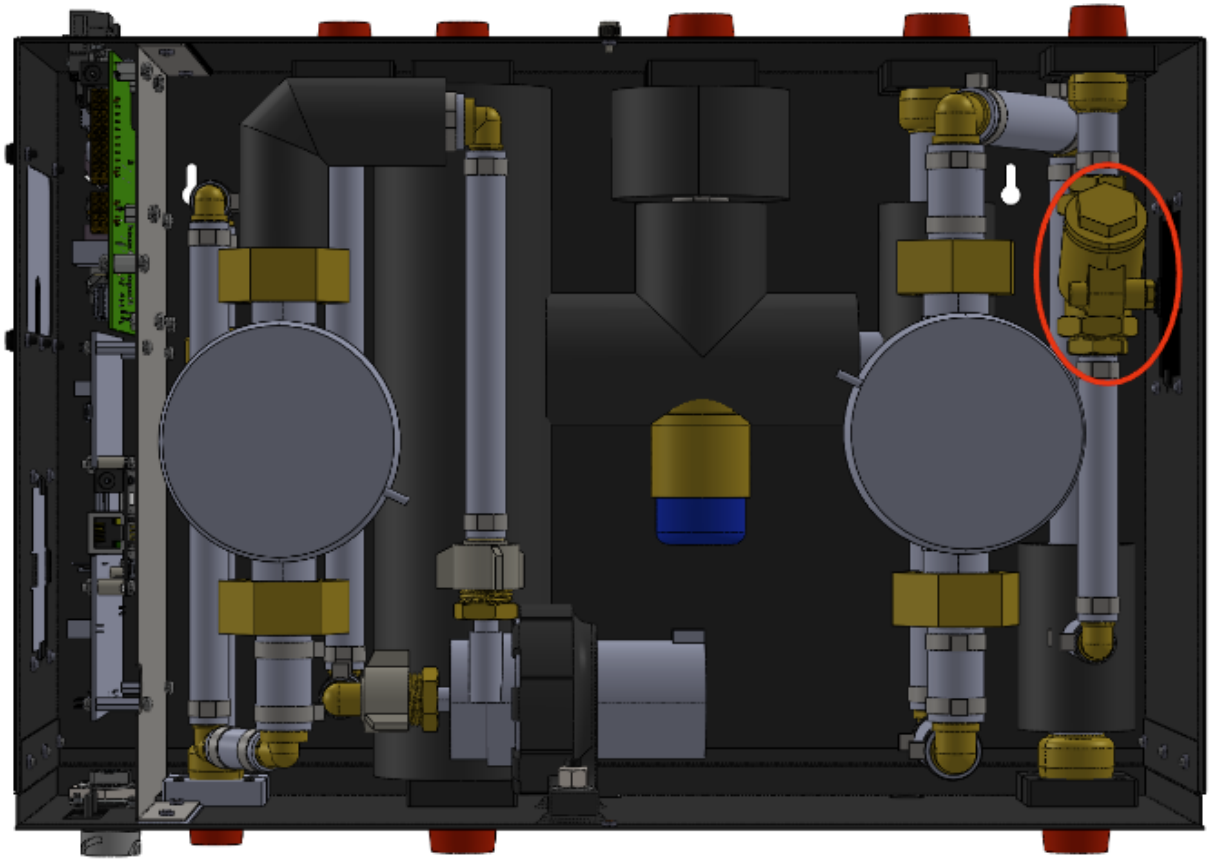
- ☐ Use FRU PN# 201083
- ☐ Put meter in place, noting orientation.
  - ☐ F2 (the left meter) must be installed with the display upside down and facing toward the front panel. Arrow on the side will be pointed DOWN.

- ☐ F1 must be installed upright with the display facing toward the front panel. Arrow on the side will be pointed UP. See below image.



- ☐ Screw on and tighten couplers (1 1/2” wrench), while holding the meter in place. You can use Harvest PN#201116, a thin-profile 1-5/16”, wrench to hold on to the flow meter hex profile.
- ☐ Refill system, checking for leaks, tighten further as needed
- ☐ Plug in sensor to corresponding labeled connector. Either “F1” or “F2”, depending.
- ☐ Secure wire in place with cable tie
- ☐ Reattach front panel

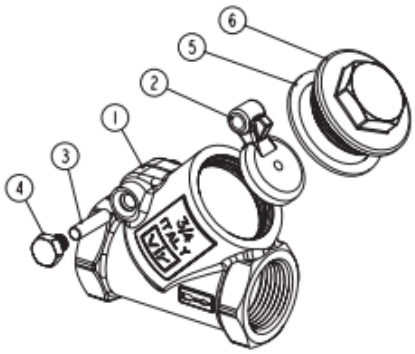
G. Swing Check Valve Servicing



Removing:
In general, removal of the swing check valve is not recommended. The check valve contains an integrated service port, through which maintenance and repair can be performed.

Material

	Part	Material	Specification
1	Body	Lead Free Brass	ASTM B927 C28500
2	Disc	Lead Free Brass	ASTM B927 C28500
3	Stem	Lead Free Brass	ASTM B927 C28500
4	Screw	Lead Free Brass	ASTM B927 C28500
5	Gasket	PTFE	PTFE
6	Cap	Lead Free Brass	ASTM B927 C28500



Service or Repair

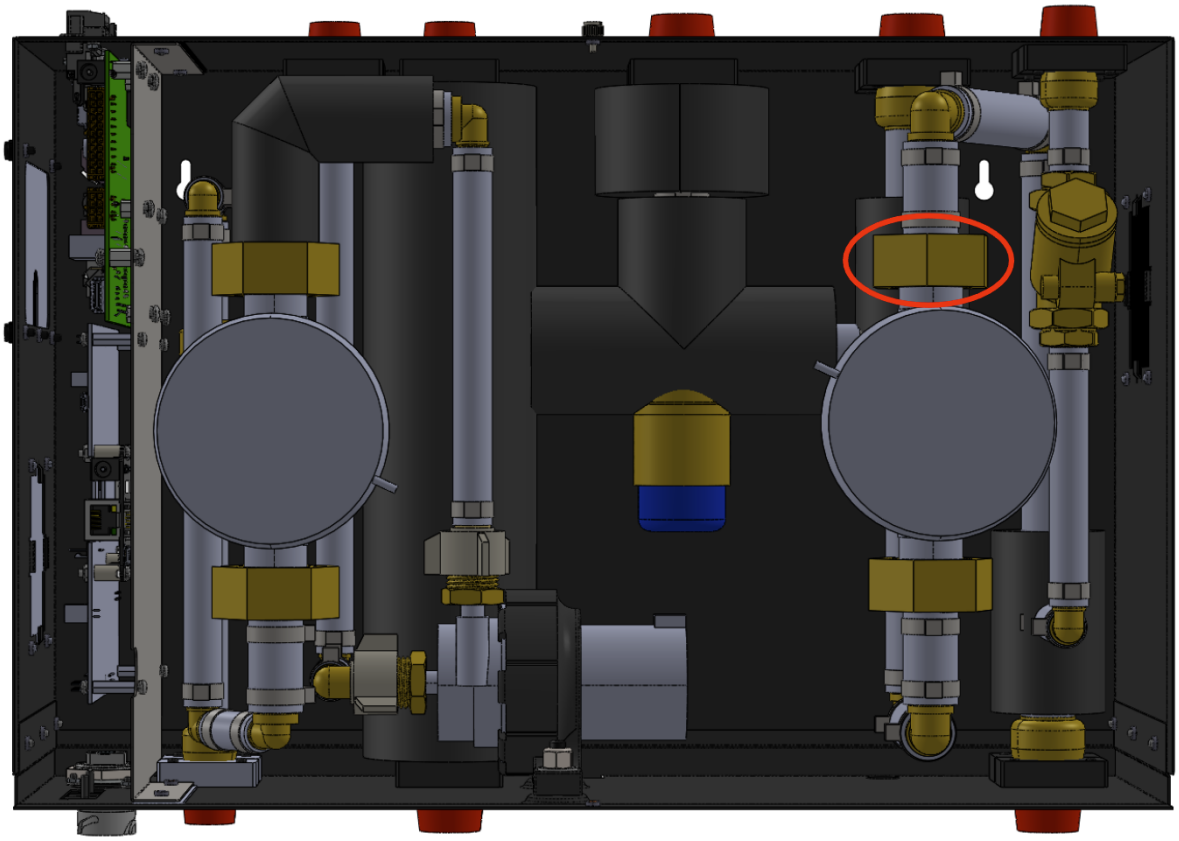
- ☐ Drain the system
- ☐ Remove service port cover (6)
- ☐ Remove and clean valve disc (2)
- ☐ Clean valve seat (inside of body (1))
- ☐ Clean and reinstall stem (3), replace if necessary
- ☐ Re-install service port cover, use replacement gasket (5)
  Mfr PN: AMU200-RP
  Manufacturer: Resideo Braukmann
  HT#: 201059
- ☐ Fill and pressurize system, check for leaks and adjust as necessary

H. PEX Section A

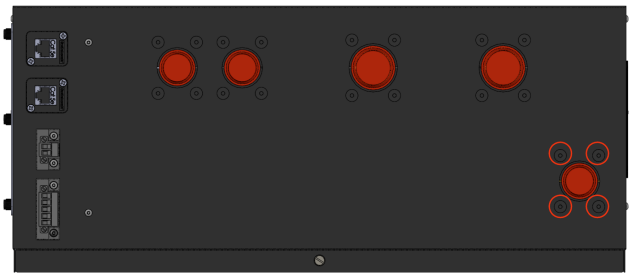
Use FRU PN# 201097

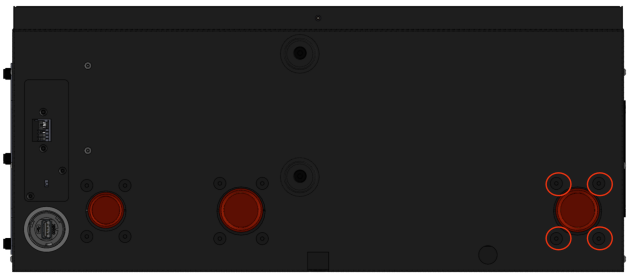
Removing:

- ☐ Drain the system
- ☐ Remove external connections to ports A and F
- ☐ Open the front panel
- ☐ Find the connector labeled “T5” in the main plumbing compartment, and unplug it Remove cable from any cable management ties inside the pod, so it is only attached on the one end buried in the pex insulation
- ☐ Unscrew the right Flow meter top coupler nut (1 1/2” wrench) shown below. You will need to hold the flow meter to provide counter rotation



- ☐ Unscrew the flat head hex screws from around ports A and F (circled in red below)





- ☐ Remove the 4 black brackets from behind the ports.
- ☐ You should now be able to remove Pex Section A

Replacing:

- ☐ Insert the PEX section into the pod
- ☐ Loosely screw in the Flow Meter
- ☐ Add the black brackets onto the brass bulkhead adapters. The smaller brackets go on the inside of port A, the larger brackets inside port F. Make sure the brackets fit snugly and are aligned with the holes in the enclosure wall.
- ☐ Secure the brackets using the flat head screws
- ☐ Fully screw on the coupling nut attaching the flow meter (1 1/2” wrench)
- ☐ Reattach external connections to ports A and F
- ☐ Fill the system and check for leaks
- ☐ Locate the cable end in the plumbing compartment labeled “T5” and connect the wire coming off the segment with it.
- ☐ Secure the cable using the wire tie attach points
- ☐ Close the front panel

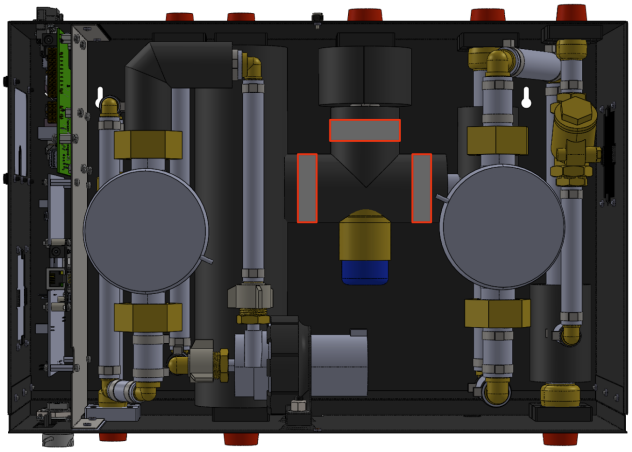
I. PEX Section B

Use FRU PN# 201096

Removing:

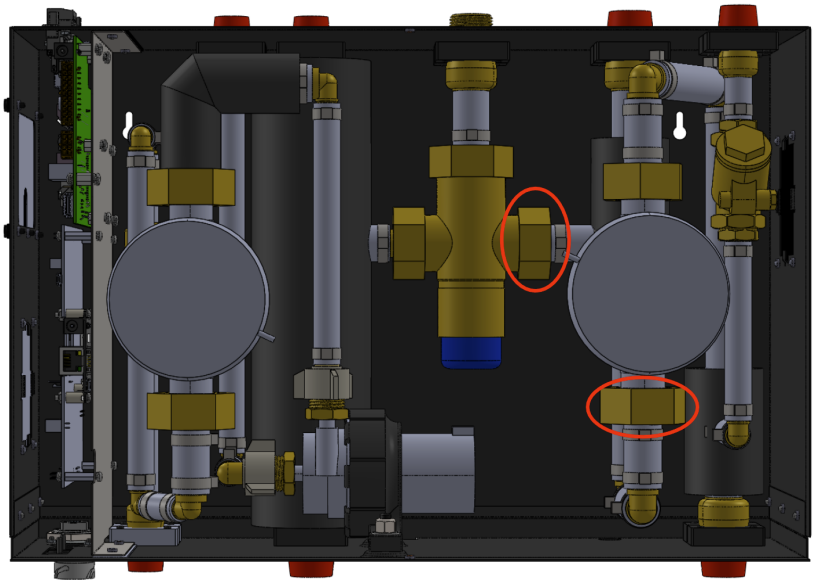
- ☐ Drain the system
- ☐ Remove external connections to port B
- ☐ Open front panel

- ☐ Find the connector labeled “T2” in the main plumbing compartment, and unplug it. Remove cable from any cable management ties inside the pod, so it is only attached on the one end buried in the pex insulation
- ☐ Remove velcro straps from insulation around mixing valve (shown outlined in red) Remove the insulation on the mixing valve by pulling gently down on it

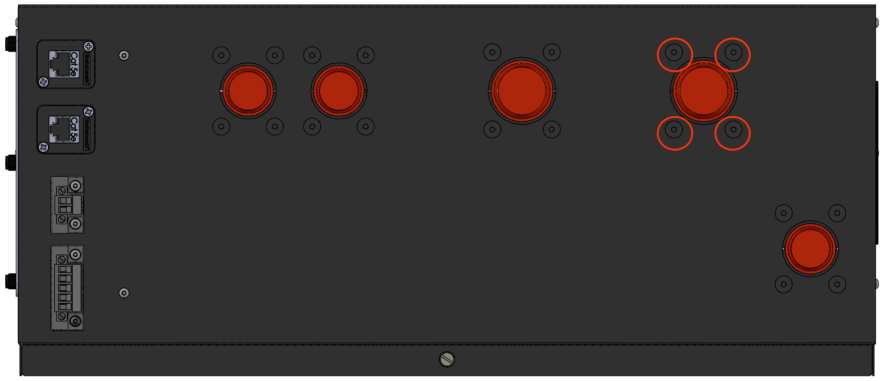


WARNING: COMPONENTS MAY STILL BE HOT

- ☐ Pull down carefully on insulative tee to remove from mixing valve
- ☐ Unscrew coupler at the bottom of the right side flow meter, and also the coupler on the right side of the mixing valve (1 1/2” wrench).



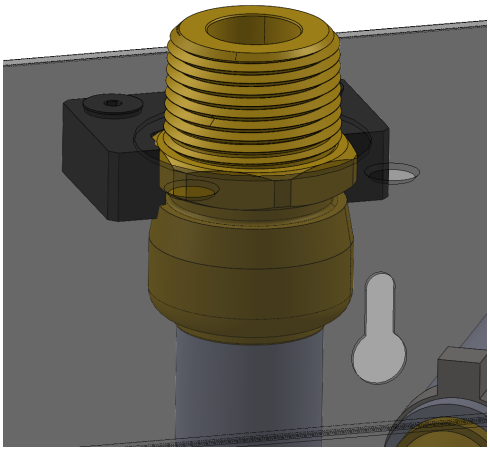
- ☐ Unscrew the 4 screws from the top of the pod that are located around port B. Circled in red below



- ☐ Collect the screws and mounting brackets for later assembly.
- ☐ Remove Segment B from the Pod.
- ☐ Remove the velcro clasps around the insulation, and carefully remove the insulation from the pex junction. Collect insulation and velcro for later assembly.

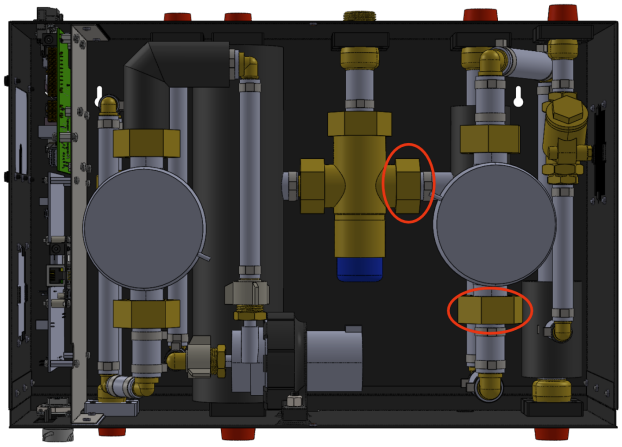
Replacing:

- ☐ Screw in the rear bracket under the B port halfway to use as a guide for realignment. Add in PEX Section B. It should fit snugly against the bracket, without rotating. Screw in the loose bracket

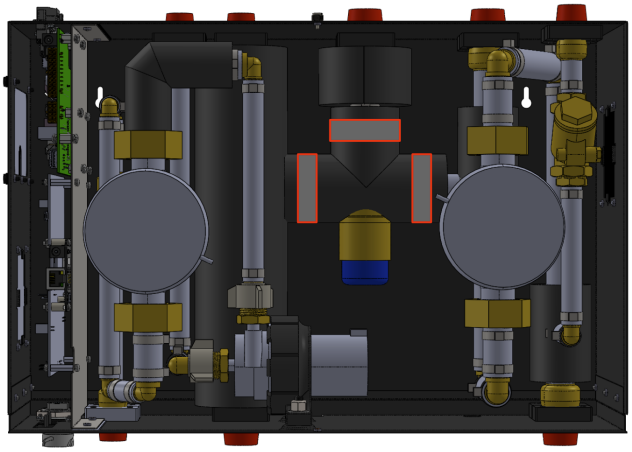


- ☐ Add the second bracket on, and screw in fully.
  Note: The section may not be perfectly aligned with the other coupling connection points. You can rotate the connection to the port on the top to align it better. This will not damage the section.
- ☐ Screw on the coupler to the mixing valve. Use the included gasket inside the mixing valve coupler:
  Mfr PN: AMU200-RP
  Manufacturer: Resideo Braukmann
  HT#: 201059

- ☐ Screw on the coupler to the flow meter (1 1/2” wrench), holding the flow meter body when attaching to provide counter rotation.



- ☐ Refill the system and test for leaks. Tighten further if needed.
- ☐ Add the insulation back on to the Mixing Valve, securing with the velcro clasps.



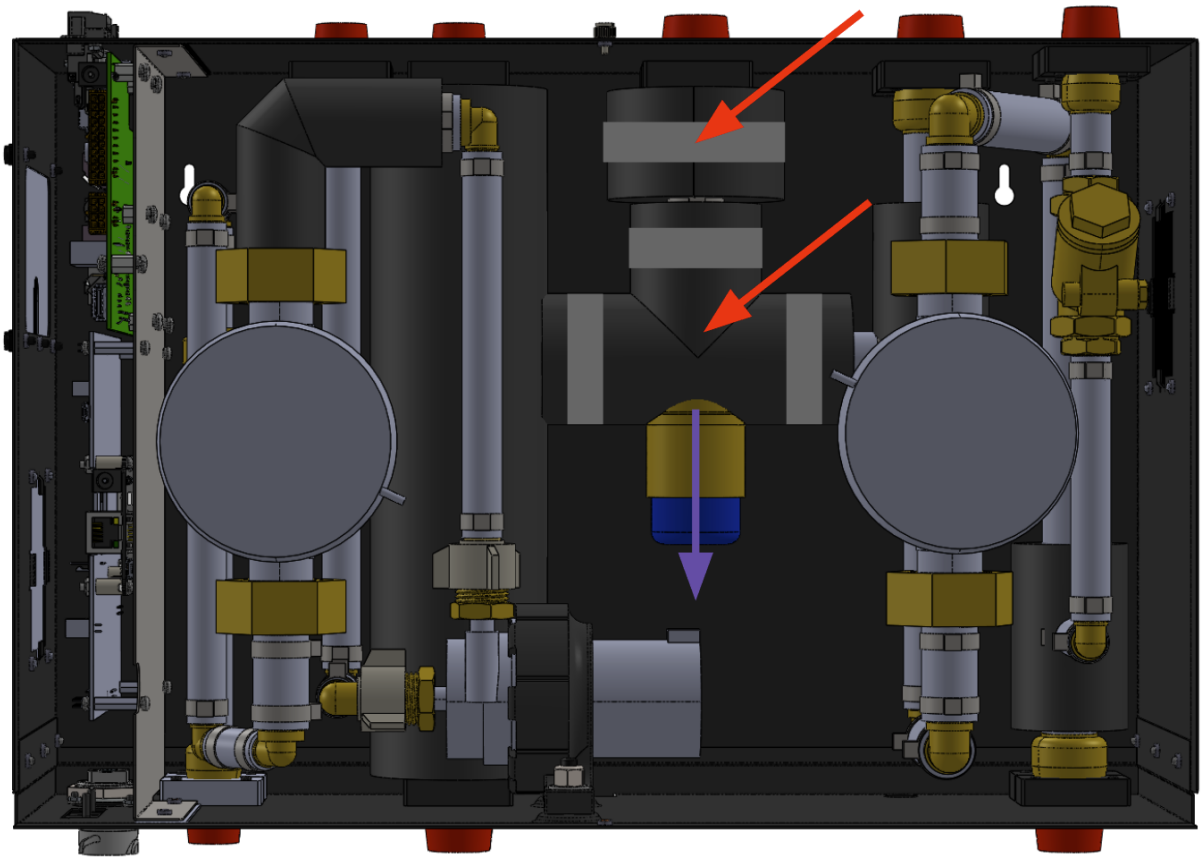
- ☐ Connect the loose wire to the connector labeled T1, and secure with cable ties
- ☐ Close Front panel

J. PEX Section C

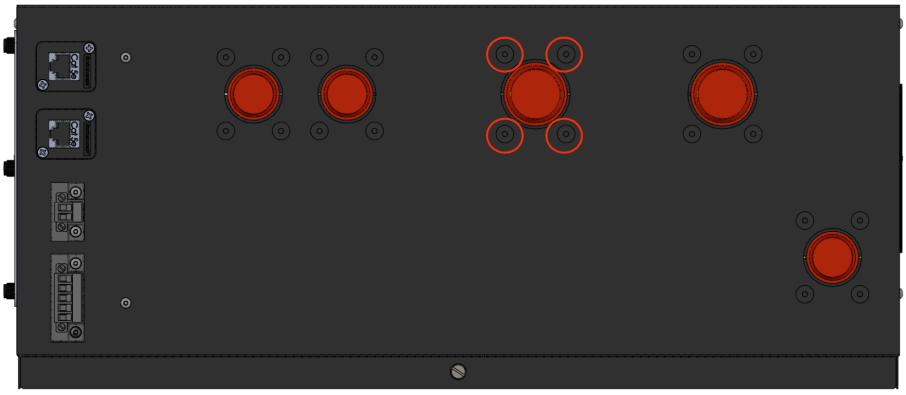
Use FRU PN# 201095

Removing:

- ☐ Drain the system
- ☐ Remove external connections to port C
- ☐ Open the front panel
  WARNING: COMPONENTS MAY STILL BE HOT
- ☐ Remove the insulation sections indicated below (red), by first removing the velcro straps (shown in grey) holding them on.



☐ Unscrew the four hex screws around port C, circled in red below



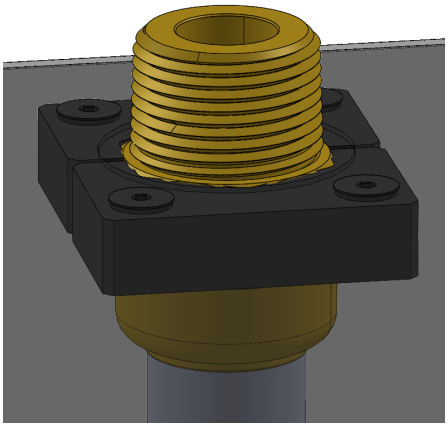
☐ Remove the black brackets on the inside of port C.

☐ Using two wrenches to minimize counter-rotation, unscrew the top union nut on the mixing valve (1 1/2” wrench). This port is labeled “MIX.”

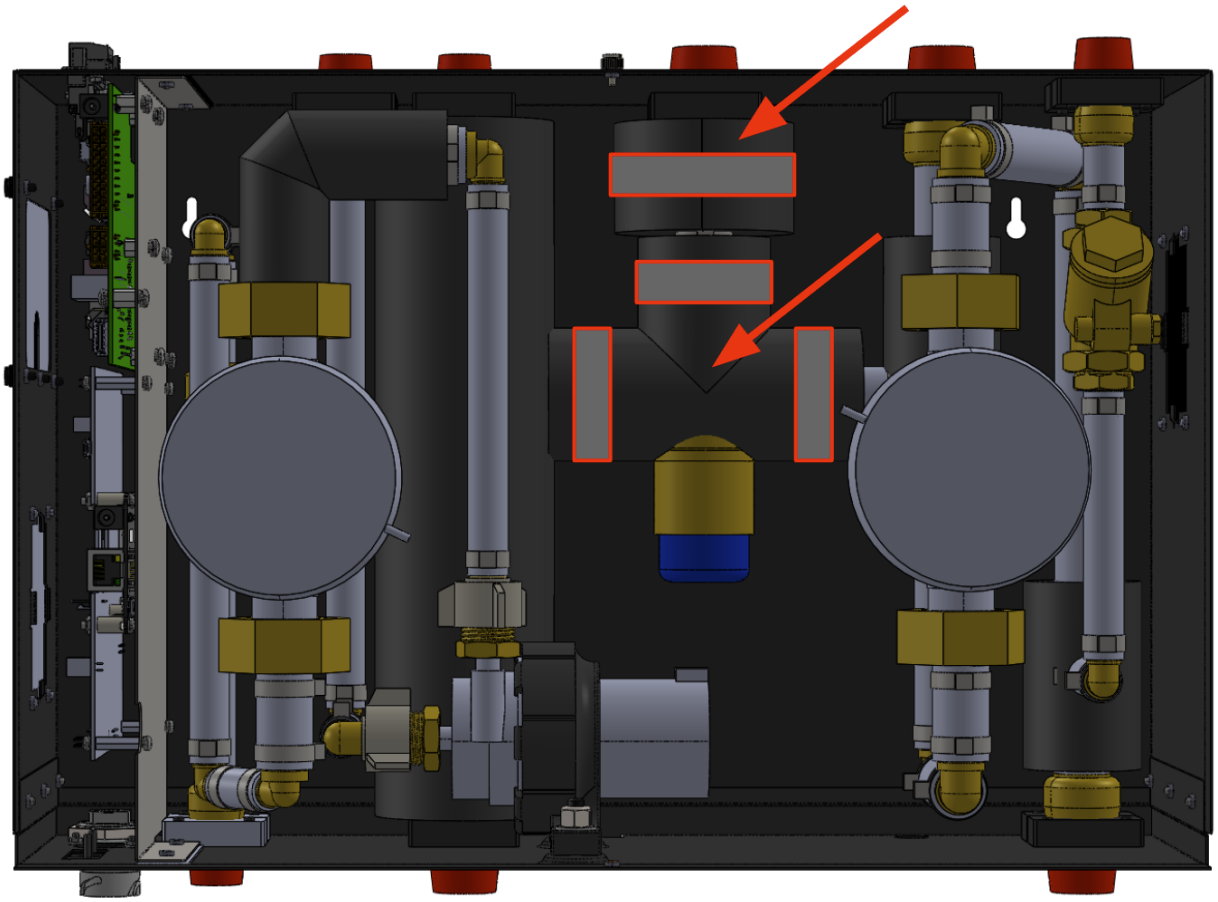
☐ Remove PEX Section C

Replacing:

- ☐ Insert PEX Section C into place, and loosely screw onto the mixing valve.
- ☐ Add the two black brackets into place. They should fit snugly around the brass adapter. You may need to rotate the Section slightly to align the holes in the brackets with the holes in the top Pod wall. Screw them in from the outside of the pod.



- ☐ Tighten the nut attaching to the mixing valve (1 1/2” wrench), using a second wrench to provide counter-rotation. Fill the system and check for leaks before continuing.
- ☐ Add back the insulation, and secure with the velcro straps as shown:



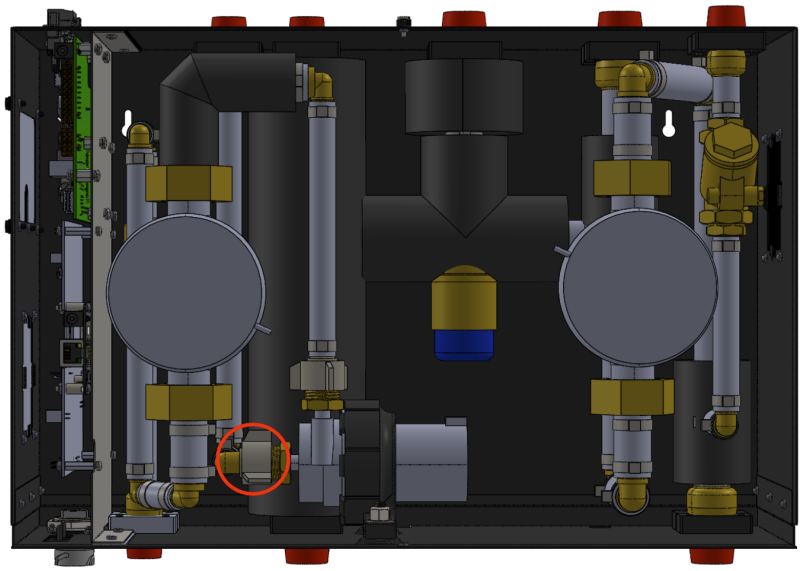
- ☐ Close the front panel.
- ☐ Reattach external connection to port C

K. PEX Section E

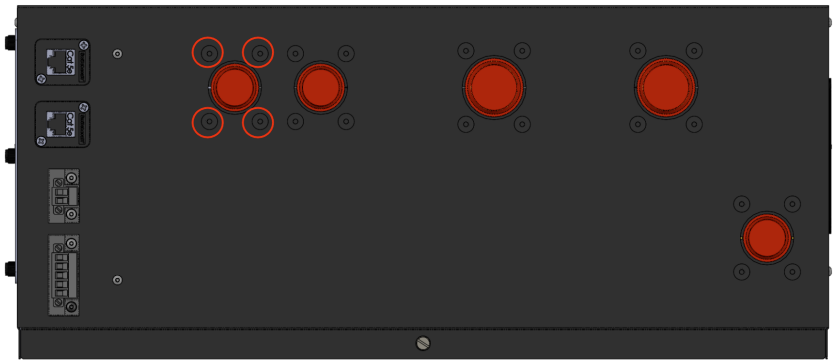
Use FRU PN# 201094

Removing:

- ☐ Drain the system
- ☐ Remove external connections to port E
- ☐ Open the front panel
- ☐ Unscrew the union elbow attaching this pex section to the pump, circled in red below. You will need to use a wrench to prevent rotation of the threaded bushings attached to the pump.
  WARNING: Pump housing is fragile and breaks easily. take care to put as little stress on the pump threads as possible.



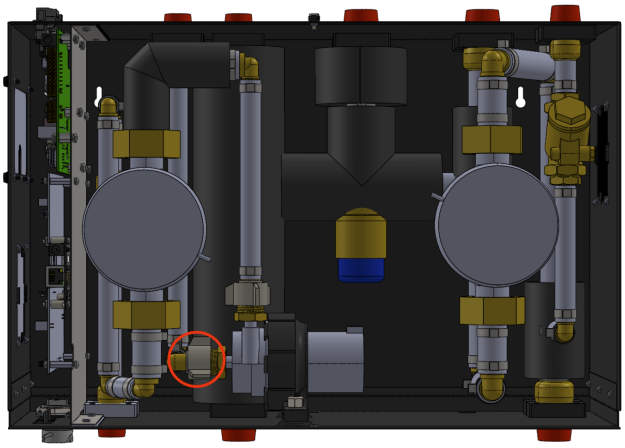
- ☐ Unscrew the four hex screws around port E, circled in red below.



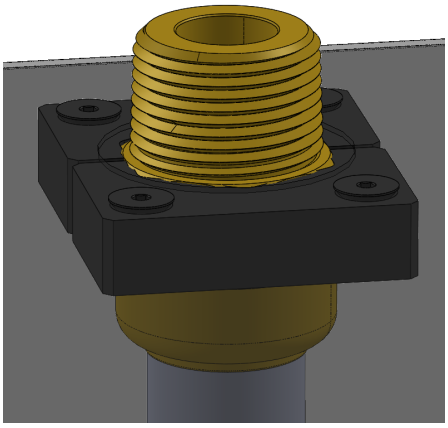
- ☐ Remove the brackets from under port E. Keep for future assembly.

Replacing:

- ☐ Move Section E into position within the pod,
- ☐ Attach the elbow adapter loosely by hand-tightening



- ☐ Add brackets to the front and back of the fitting. You may need to rotate slightly to get the holes to line up with those on the enclosure.



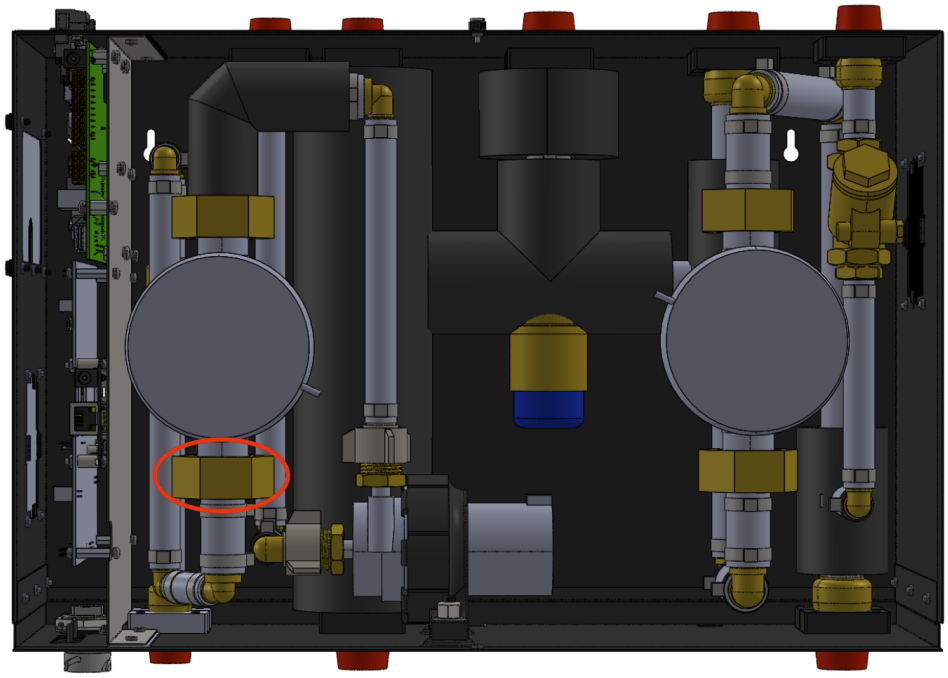
- ☐ Screw in the brackets using the screws
- ☐ Fully tighten the adapter to the pump by hand
- ☐ Fill the system and check for leaks
- ☐ Close the front panel
- ☐ Reattach external connections to port E

L. PEX Section H, With Spring Check Valve

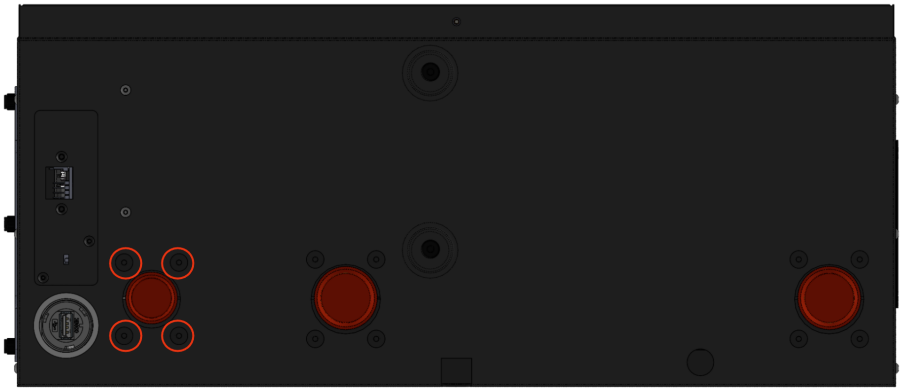
Use FRU PN# 201093

Removing:

- ☐ Drain the system
- ☐ disconnect external NPT connection to port H
- ☐ Open front panel
- ☐ Disconnect the bottom coupler from the left mixing valve (1 1/2” wrench), shown in red below



☐ Unscrew the 4 screws around port H, circled in red in the following view of the bottom of the Pod.



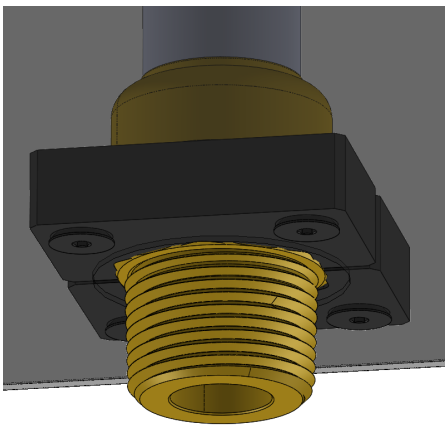
☐ Remove PEX Segment H from the pod, along with the pair of brackets that go on the inside of port H.

Perform maintenance/replacement
Options

1. Use compressed air and clean water to blow debris or clogs out of the check valve, and re-establish secure seating of the plunger.
2. Replace.

Replacing:

- ☐ Put the PEX Section into place in the pod, and screw on the nut loosely to the flow meter.
- ☐ Add the brackets around it. You may need to rotate the PEX section downstream of the spring check valve to match the hex profile on the bracket.



- ☐ Screw in the brackets.
- ☐ Tighten the flow meter coupling (1 1/2” wrench), holding the meter in place for counter rotation.
- ☐ Refill system, checking for leaks
- ☐ close front panel

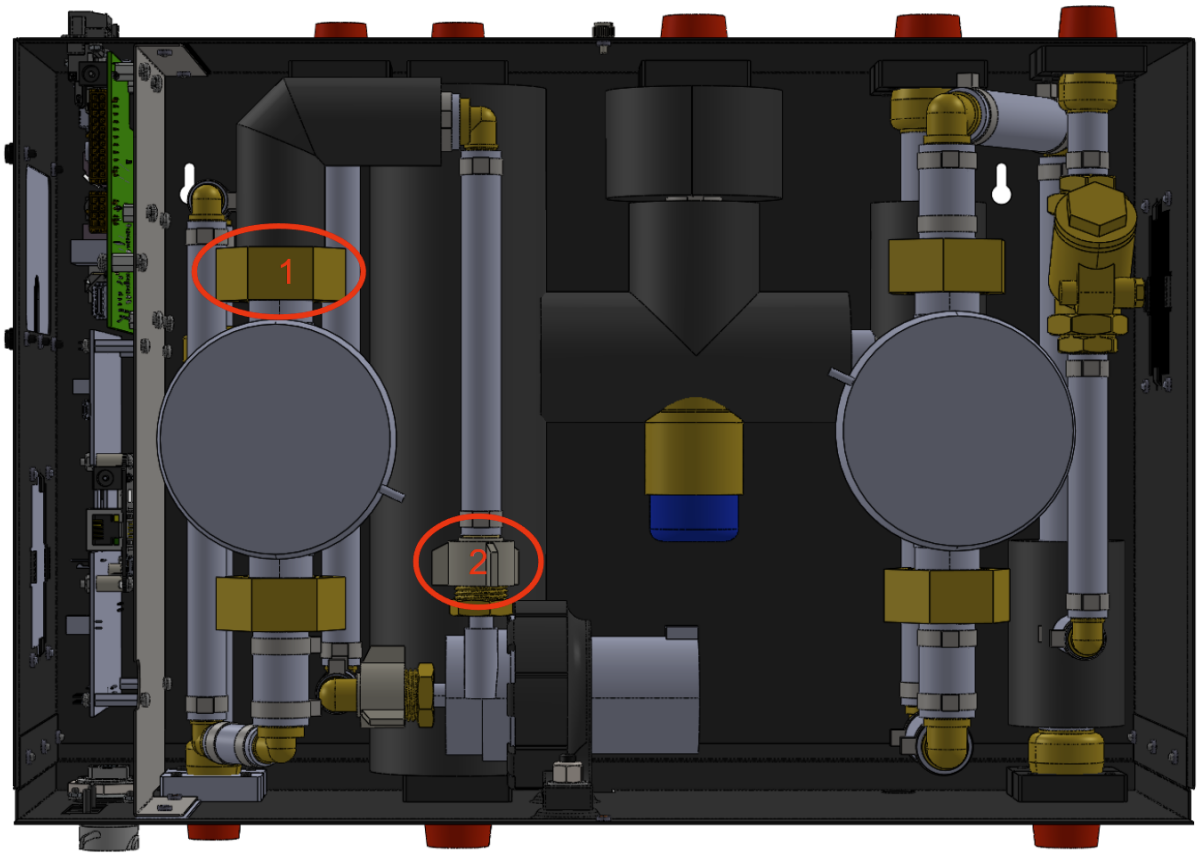
M. PEX Section X

Use FRU PN# 201092

Removing:

- ☐ Locate the connector labeled T3 in the plumbing compartment, and unplug it. Remove the wire to the plumbing from any cable management on that side.
- ☐ Unscrew the adapters shown below in red. You will need to use a 7/8” wrench to provide counter rotation on “2” so that the pump to brass bushing connection remains. You will need to hold on to the flow meter to prevent counter rotation of the meter when removing “1.”

  WARNING: Pump housing is fragile and breaks easily. take care to put as little stress on the pump threads as possible.



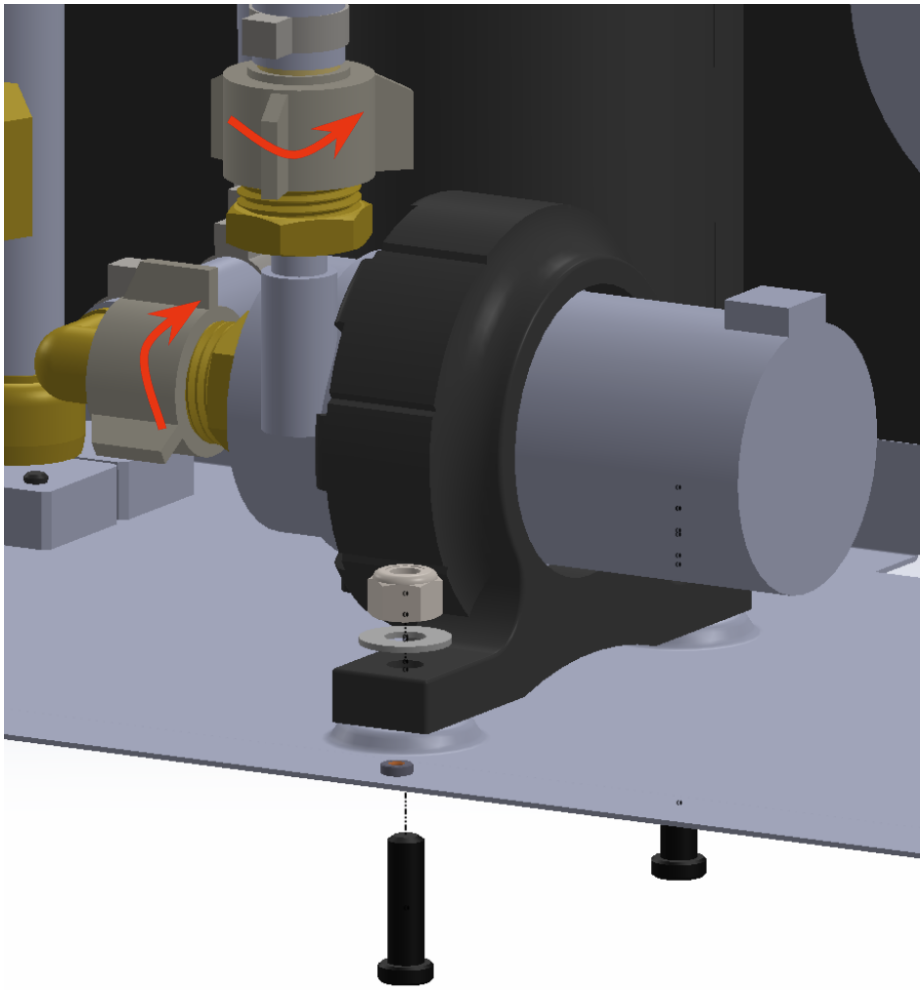
Replacing:

- ☐ Position Section X in place, and loosely screw on both adapters. Adapter “1” must be tightened with a 1 1/2” wrench, holding on to the flow meter for counter rotation. Adapter “2” must be hand-tightened.
  WARNING: Pump housing is fragile and breaks easily. take care to put as little stress on the pump threads as possible.
- ☐ Refill the system and check for leaks.
- ☐ Connect the loose cable marked “T3” to the correspondingly labeled receptacle that was unplugged early. Secure the wires using existing tie points.

N. Circulator Pump

Removing:

- ☐ Drain the system
- ☐ Open the front panel
- ☐ Unscrew pex-npt swivel couplers by hand - use 7/8” wrench to prevent rotation of the threaded bushings attached to the pump.
  WARNING: Pump housing is fragile and breaks easily. take care to put as little stress on the pump threads as possible.



- ☐ Untangle cable from routing, unplug
  Cut cable zip-ties as necessary
- ☐ Unscrew lock nuts from pump mount, collect fasteners for later reassembly
- ☐ Remove pump

Maintenance:

- ☐ No maintenance is recommended, replace pump if required

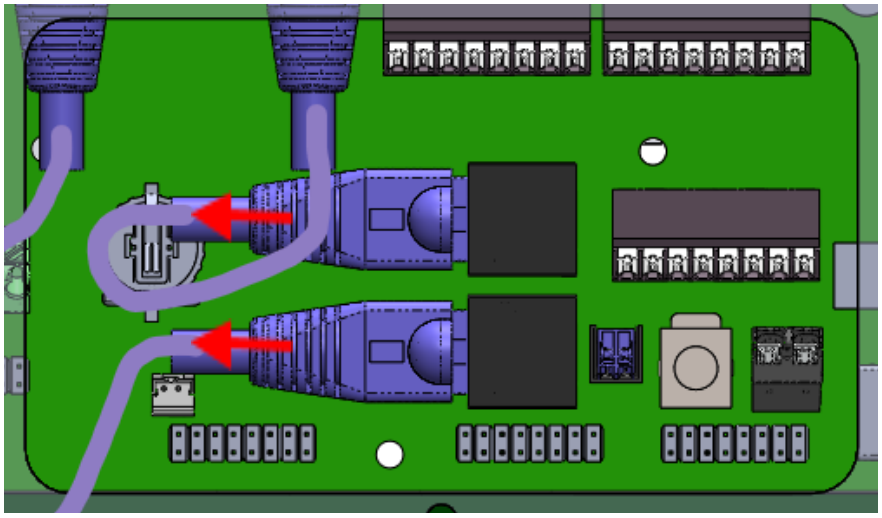
Replacing:

Use FRU PN# 201074
Insert pump, securing with hex screws from the outside of the pod and lock nut and washer from above. (see pic from pump removal section)
Hand-tighten pex-npt swivel couplers - use wrench to prevent rotation of the threaded fittings of the pump.
Refill system, checking for leaks
Tighten further only if necessary
Plug in pump cable to “C” connector, secure cable using twist tie.
Reattach front panel

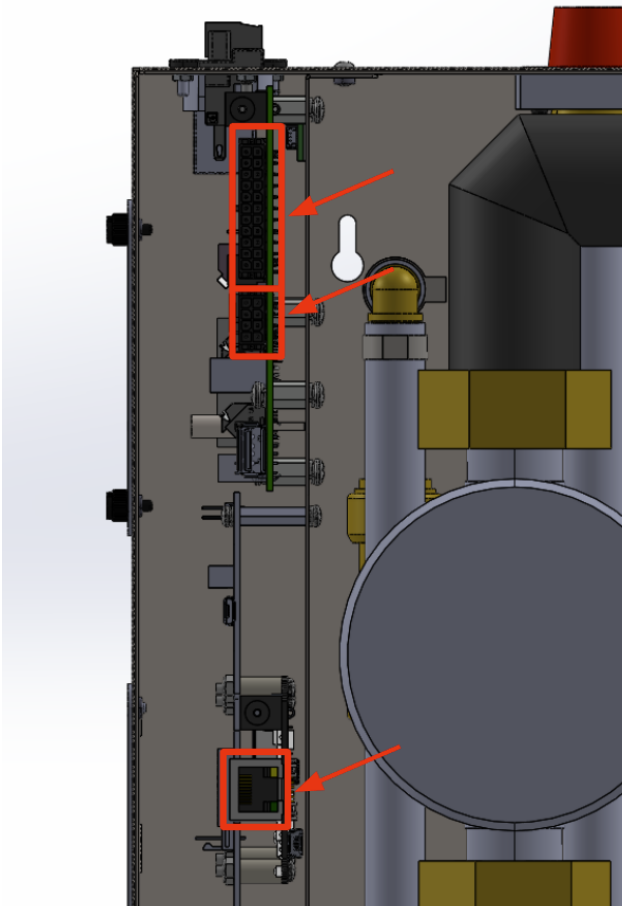
O. Pod Board

Removing:

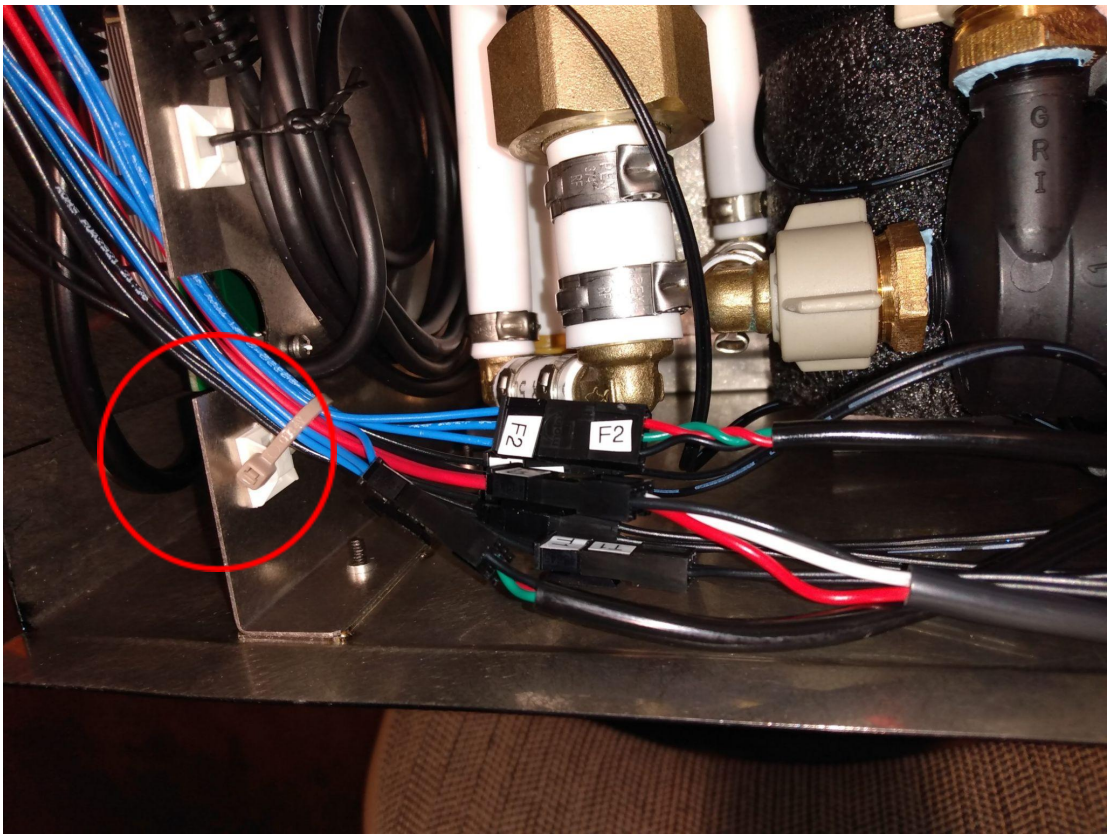
- ☐ Turn off power to device
- ☐ Open side access panel
- ☐ Disconnect all wires exiting through the panel.
  Tip: label wires before disconnecting for easy reattachment later
- ☐ Disconnect the two ethernet cables visible in the panel
- ☐ Verify that the board is labeled “200584.” If it does not match, contact the factory.



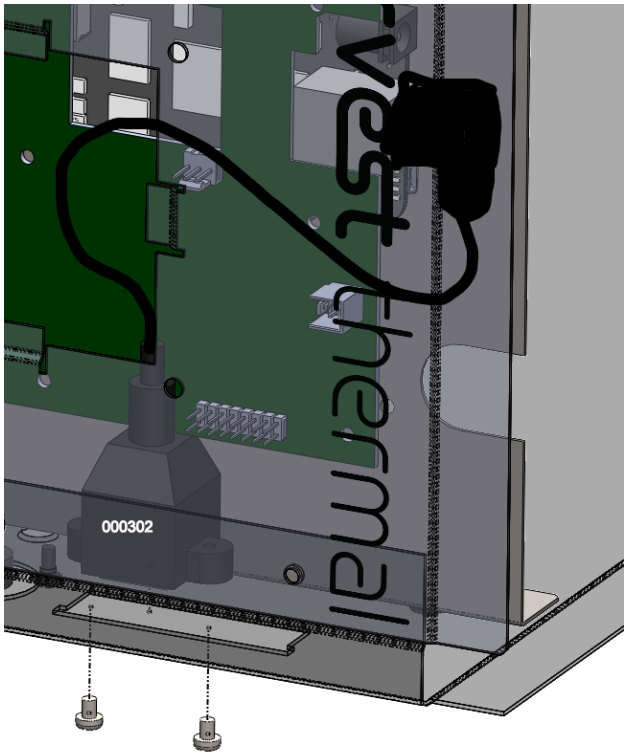
- ☐ Open front panel
- ☐ Disconnect large black connectors (22-pin and 8-pin) near top of pod from the side headers on the board by pressing on the release catch and pulling
- ☐ Disconnect ethernet



☐ Remove any cable ties holding wires to the plumbing side of the metal mounting plate dividing plumbing and electronics.

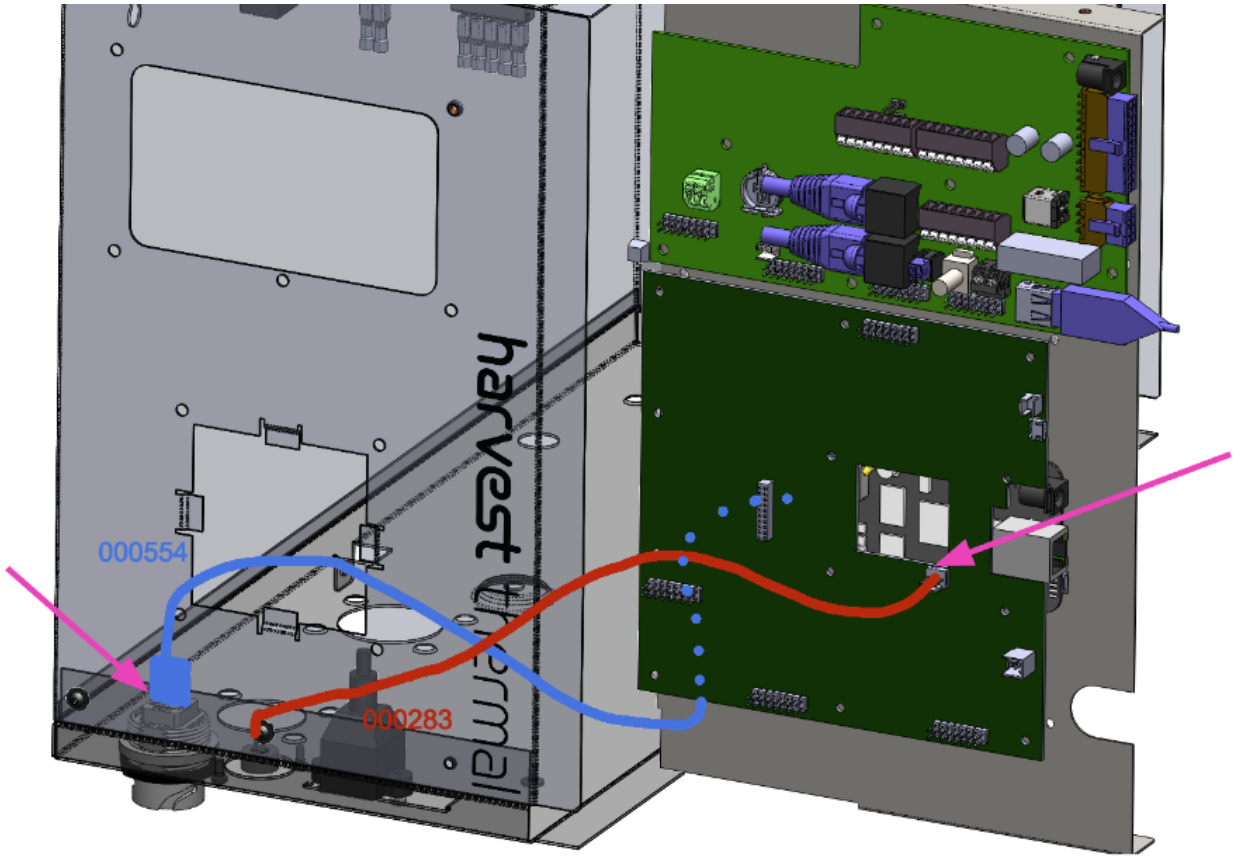


☐ Unscrew partially, do not remove, the two metric screws holding the bottom ethernet port on until the ethernet port can be moved sideways



☐ Unscrew the 4 round-head hex drive screws located on the top and bottom of the pod where they meet the mounting plate.

- ☐ Pull the board out HALFWAY. Disconnect the pink-orange-green cable from its header on the board (shown in image as red), and disconnect the black USB cable (shown in blue) from its port inside the Pod. Disconnection points shown with pink arrows.



- ☐ Check that there is no other cable still attaching the electronics assembly to the plumbing. You may need to cut one more cable tie before removing the board fully.
- ☐ Fully remove the board
- ☐ Keep track of the ethernet extension cable and associated fasteners for future reattachment.

Replacing:
Use FRU PN# 201084

This section is based on a section of Engineering Document 10037 and will need to be updated if changes are made after 7/12/2022

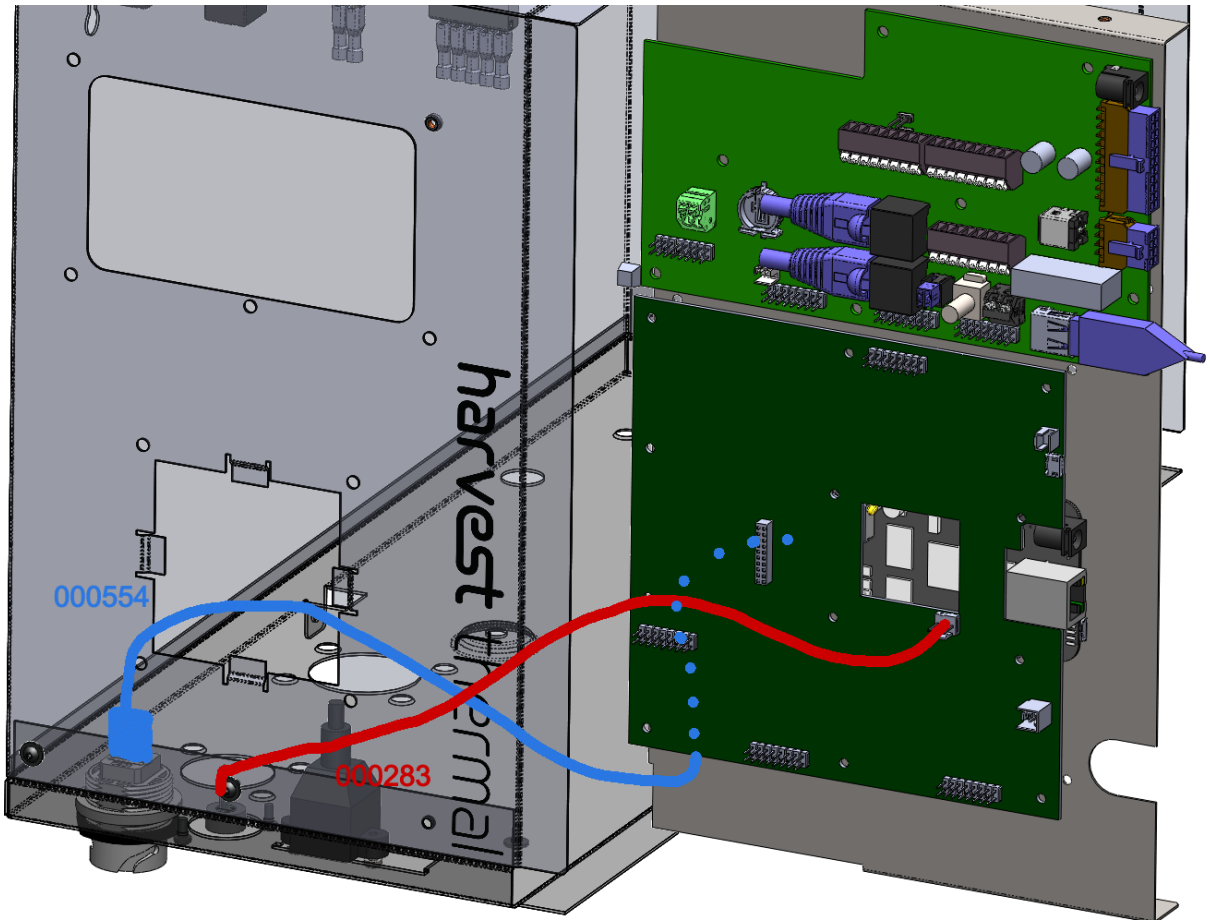
Attaching the Ethernet extension

Ethernet extension cable **000302** is NOT direction agnostic with regards to how it screws into the enclosure wall. Must be oriented so that a cable plugged in will have its tab facing toward the middle of the pod.

- ☐ Insert the Ethernet extension cable **000302** into the space between Interface Board and enclosure wall, and attach the jack to the bottom bulkhead using the M3 screws (**200639**). Do NOT tighten the screws yet, leave them just far enough in for the threads to stay engaged.

Insertion Procedure

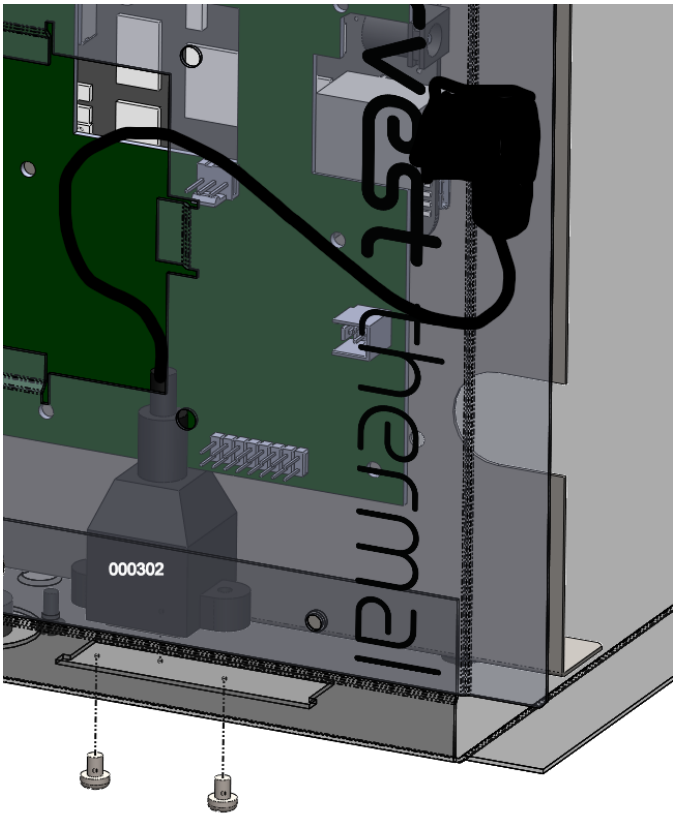
- ☐ Position the Electronics assembly near the left side of the pod. Attach the loose end of the USB-A cable **000554** to the bulkhead coupler in the back of the pod.
- ☐ Take the loose end of **000283** (LED cable), and attach it to J4 on the interface board.



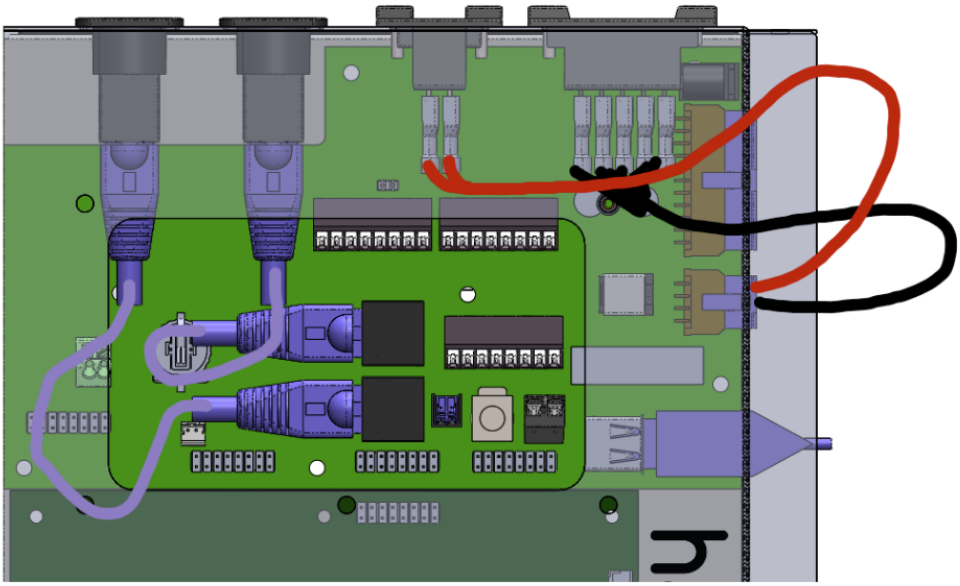
- ☐ Slide the board in, taking care not to let the cables catch on the features on the inside surface of the enclosure. Make sure **000554** (usb-a cable) or any other cables do not get caught between the metal mounting plate and the back of the enclosure. The jack on **000302** needs to be levered out of the way to clear the header on the interface board.
- ☐ Secure with screws (**101334**).

Post-insertion

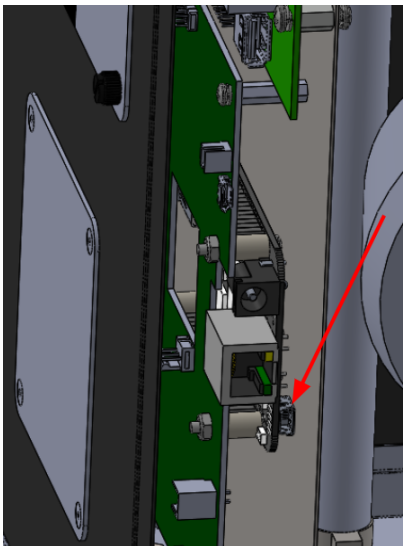
- ☐ Connect the other end of the Ethernet extender **000302** to the exposed Ethernet Jack on the Beaglebone. Tighten the loose screws holding the Ethernet jack to the enclosure wall.



☐ In the space inside the opening on the left side, attach the two ethernet cables (**200620**) shown in purple. The jacks on the Connector board are labeled AHU and HP, these should connect to their respective ports on the top bulkhead.

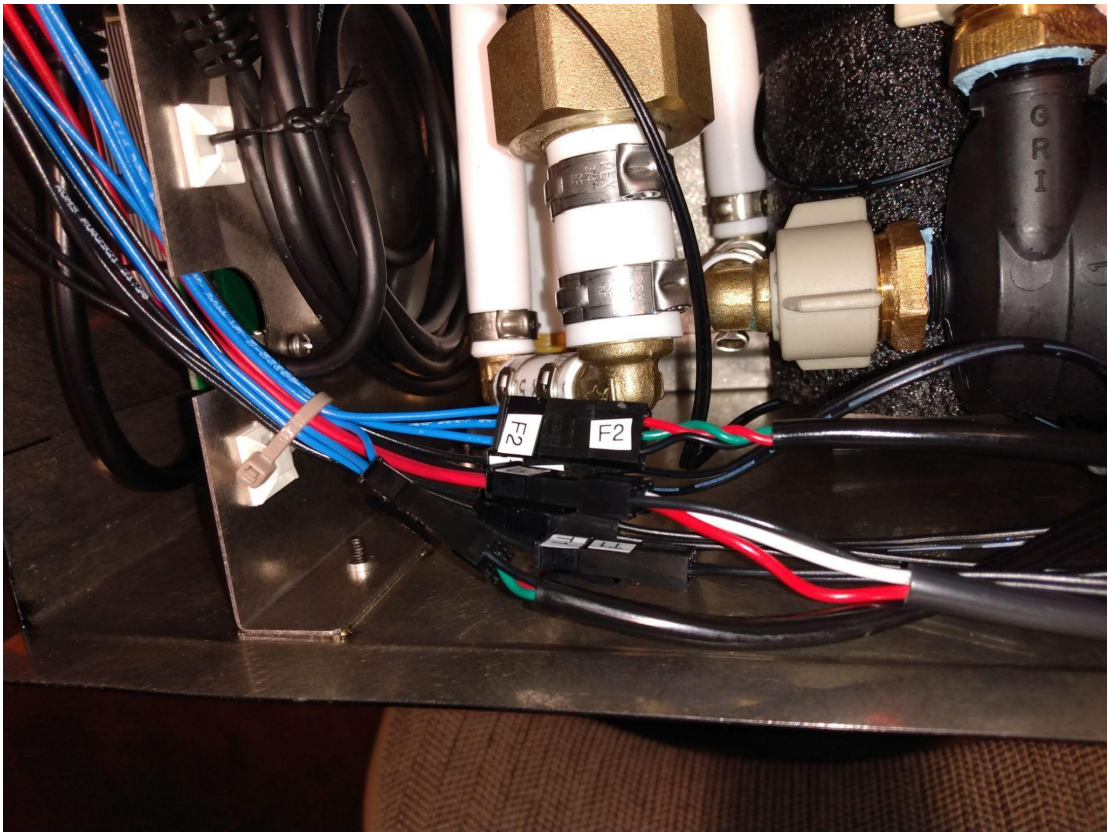


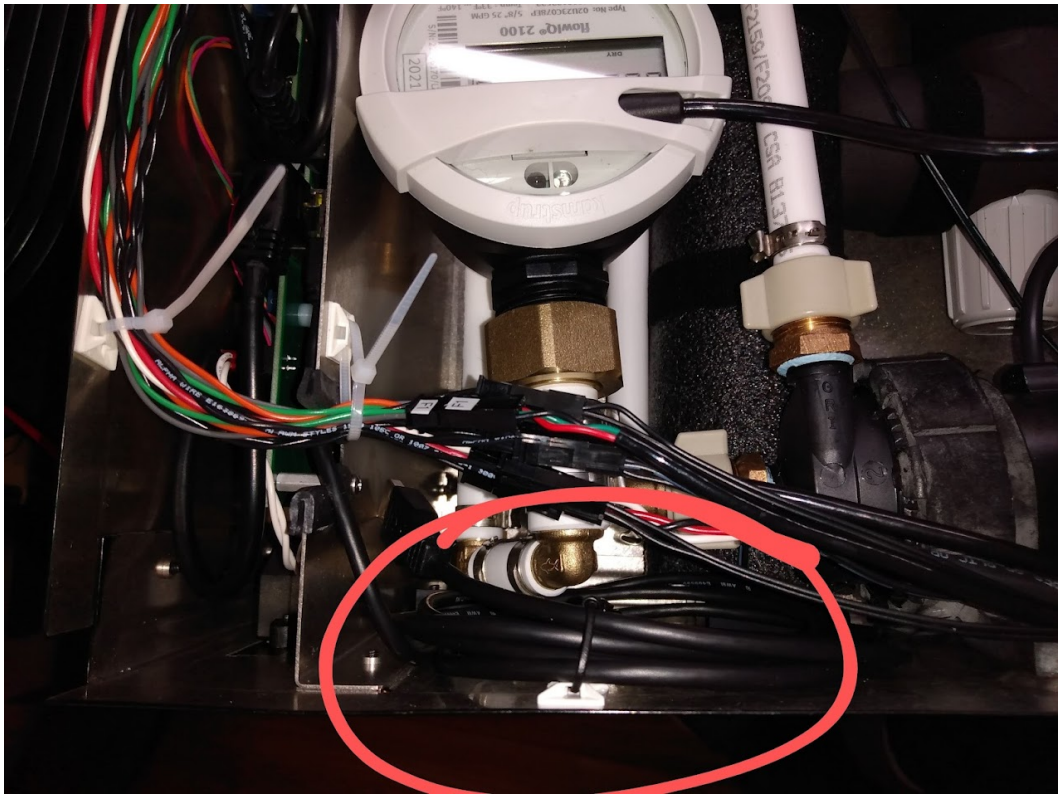
- ☐ Connect the 22-pin header of the Omnibus cable and the 8-pin header of the Bulkhead cable to the Connector Board
- ☐ **200632**: Connect to USB-miniB jack on Beaglebone, and leave the rest hanging into the main plumbing compartment. This will be secured later.



Final Cable management

- ☐ Attach 3 cable tie anchors points in the main plumbing compartment, in locations as shown in the following images.
- ☐ Connect the ends of the Omnibus Cable **100741** to the plugs in the plumbing compartment according to their labeling.
- ☐ Route the Omnibus Cable (**100741**) through the mouse hole lower down on the mounting plate, and coil the slack in the sensor cables using twist ties.
- ☐ Secure **100741** and the sensor coils to the anchor points shown using CABLE ties (not twist tie as in picture).
- ☐ Add an additional cable tie halfway up **100741**, making sure to secure the ends of Tx and Ty.
- ☐ Coil **200632**, and secure to the anchor point as shown using a TWIST tie, NOT a cable tie



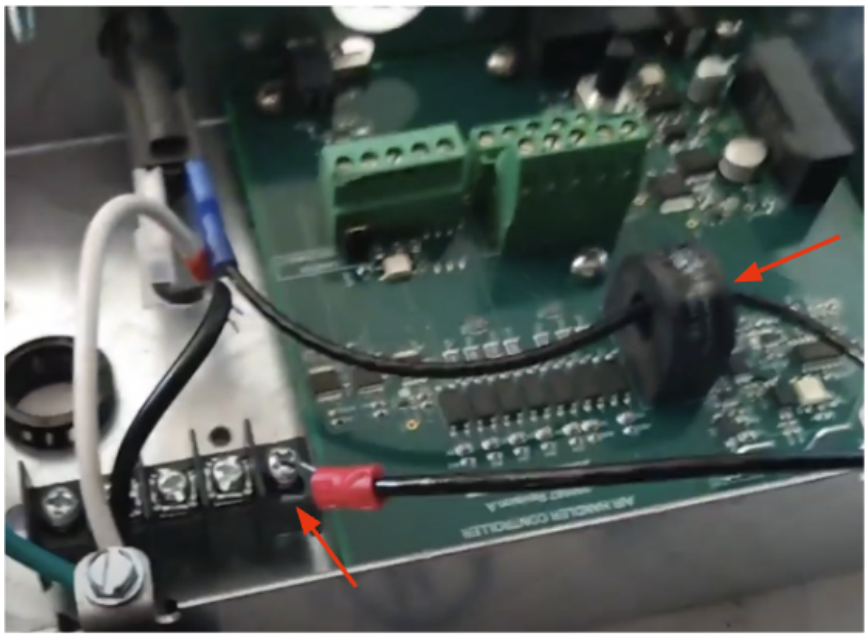


☐ When finished reinstalling the board, reconnect the auxiliary wires and power.

P. Air Handler (AHU) Board

Removing:

- ☐ Disconnect all cables from the outside of the Controller box, and also unplug power from the wall AC outlet.
- ☐ Open front panel
- ☐ Identify the cable routed through the donut-shape component on the board. **Make a note of which terminal block screw it is connected to**. Unscrew the end of this connector attached to the terminal block (red crimp, see picture), and feed back through the black donut-shape component on the board.



- ☐ Disconnect all wires from the Terminal blocks. *Tip*: *label the wires before disconnection for easy reconnection later*
- ☐ Disconnect spade terminals in the corner of the board.

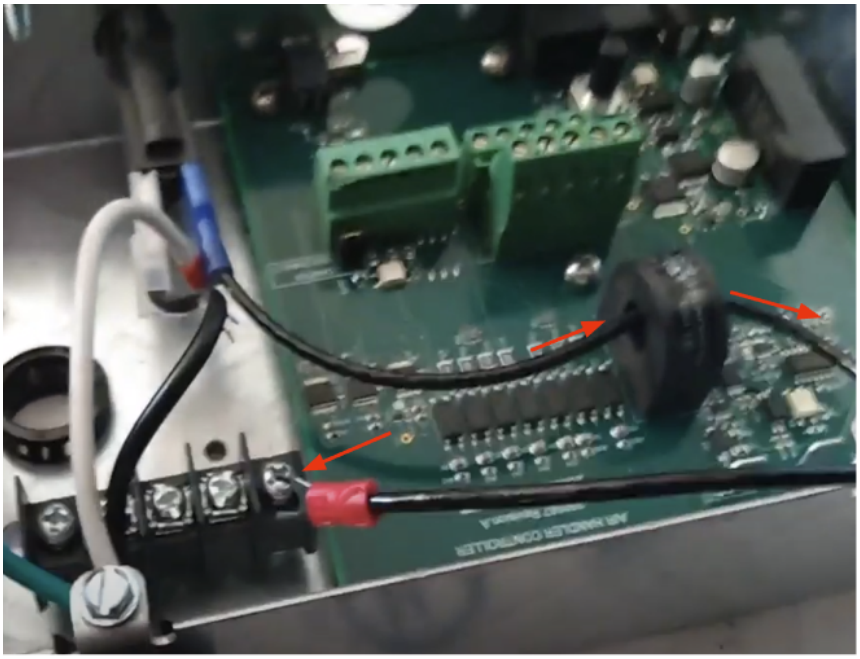
- ☐ Unscrew the screws holding the board in place
- ☐ Remove board, taking care to avoid contact with the electrical components

Replacing:
Use FRU PN# 201065
[see 10043 for further detail if necessary]

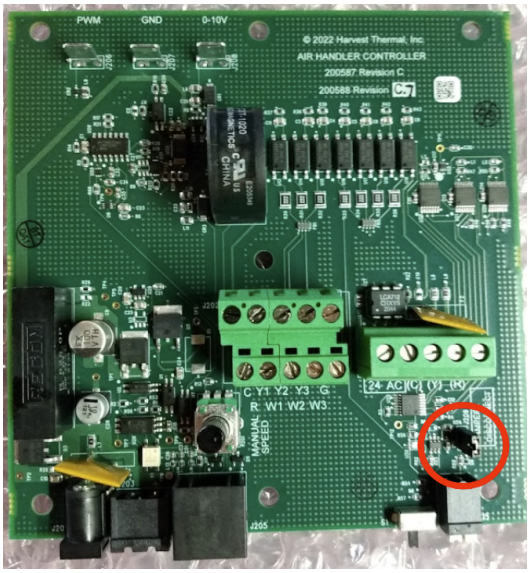
- ☐ Insert board, securing with screws. Terminal block openings should be facing toward the side of the box with the grommet.

Plug in:

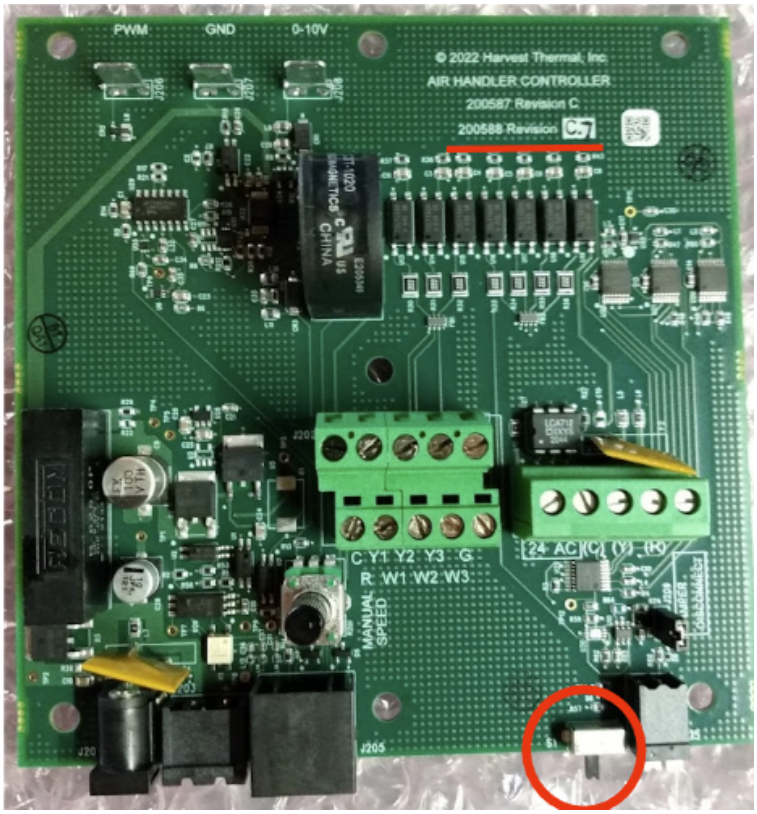
- ☐ White spade connector to PWM
- ☐ Black spade connector to GND
- ☐ Red fork connector is routed through the black donut-shaped component on the board and screwed back into the terminal block. Make sure to use the same screw that it was previously connected to.



- ☐ Reattach thermostat and damper control wires to the terminal blocks, routing through the grommet on the front of the box
- ☐ Check that shorting jumper is installed



- ☐ If board is labeled 200587 Rev C, Check that switch is in the “left” position as shown below

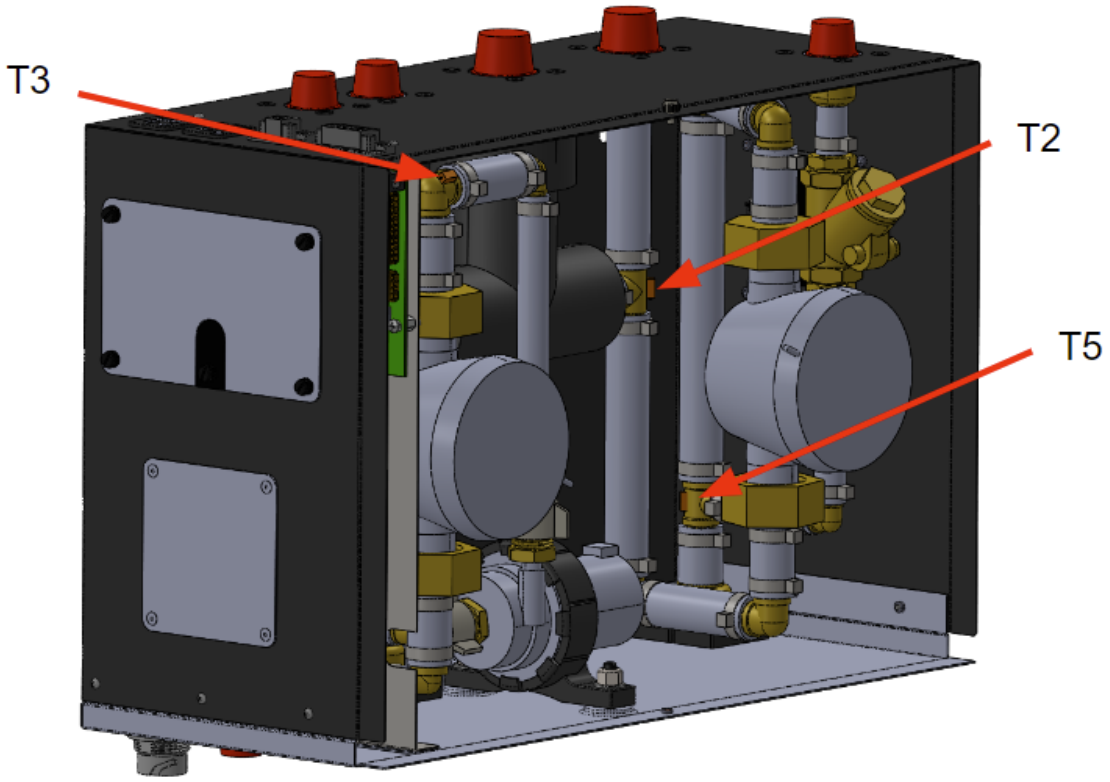


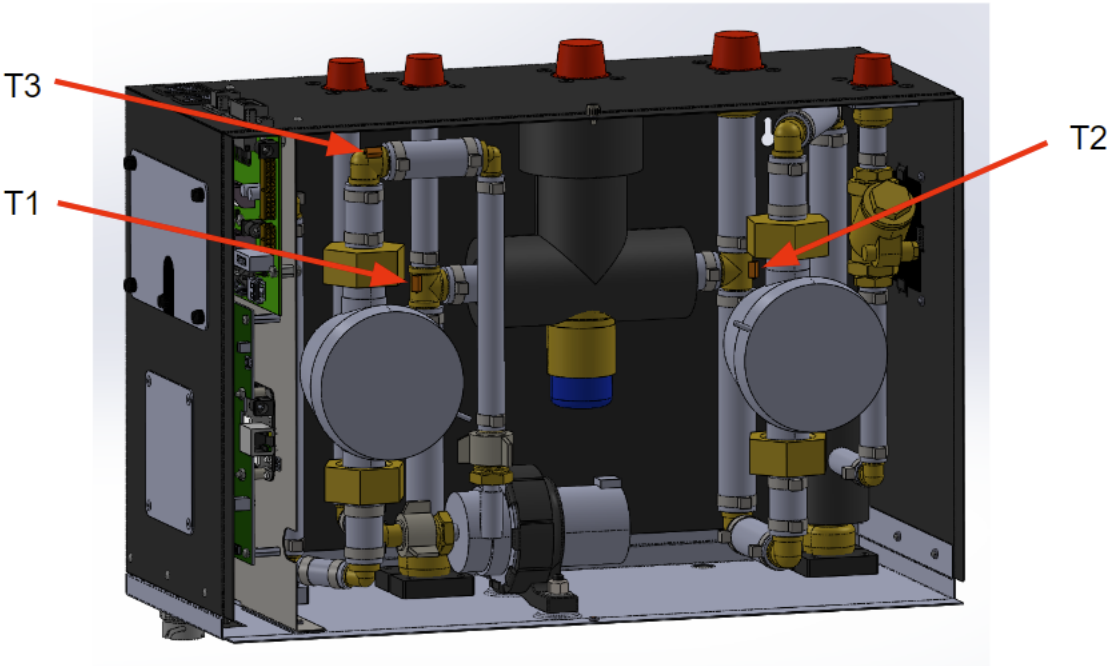
- ☐ Close panel
- ☐ Reconnect external cables to the control box
    - AC wall plug
    - Ethernet cable
    - barrel jack power cable
    - pluggable terminal block

Q. Thermistors

Removing:

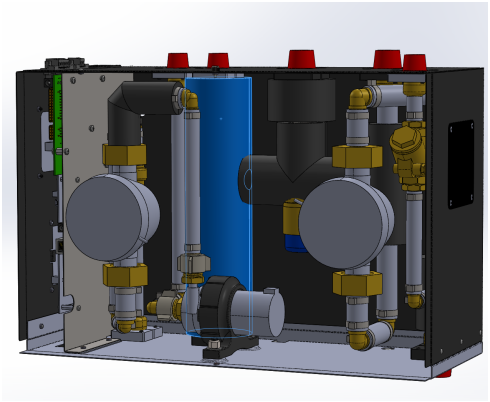
- ☐ Identify which thermistor needs to be replaced.
- ☐ Open front panel. See below photos for exact locations of thermistors.





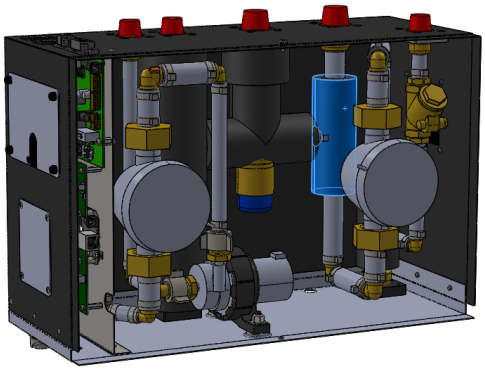
Accessing T1:

- ☐ The insulation shown below in blue will need to be removed. to do this, first undo and remove the velcro straps holding it closed. Then remove the insulation.

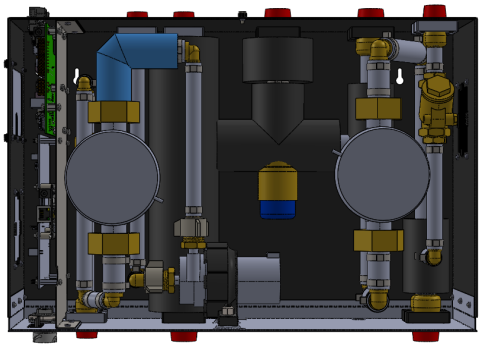


Accessing T2:

- ☐ The insulation shown below in blue will need to be removed. to do this, first undo and remove the velcro straps holding it closed. Then remove the insulation.

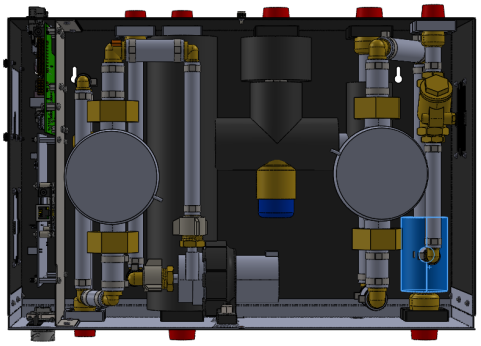


Accessing T3:



Accessing T5:

- ☐ The insulation shown below in blue will need to be removed. to do this, first undo and remove the velcro straps holding it closed. Then remove the insulation.

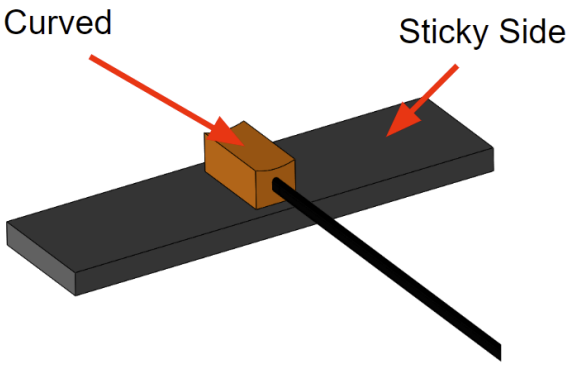


Removal process:

- ☐ First gain access to the desired thermistor as described above. Remove the tape covering the thermistor. **Make a note** of where on the fitting it was located, and which direction the wire comes out. Pull the thermistor off, and clean any residue off the brass fitting using isopropyl alcohol.
- ☐ Disconnect the thermistor's 2-pin cable, and remove from any ties holding it in place.

Replacing:
Use FRU PN# 201078

- ☐ Label the thermistor wire according to which thermistor you are replacing: T1, T2, T3, T5.
  It is advisable to use gloves for this process.
- ☐ Kit includes two sizes of tape. If you are replacing T1 or T2, use the wider 3/4" tape. If you are replacing T3 or T5, use the narrower 1/2" tape. Remove the protective backing. Place the copper head of the thermistor on the tacky side of the tape, in the center, leaving the curved face of the thermistor facing up



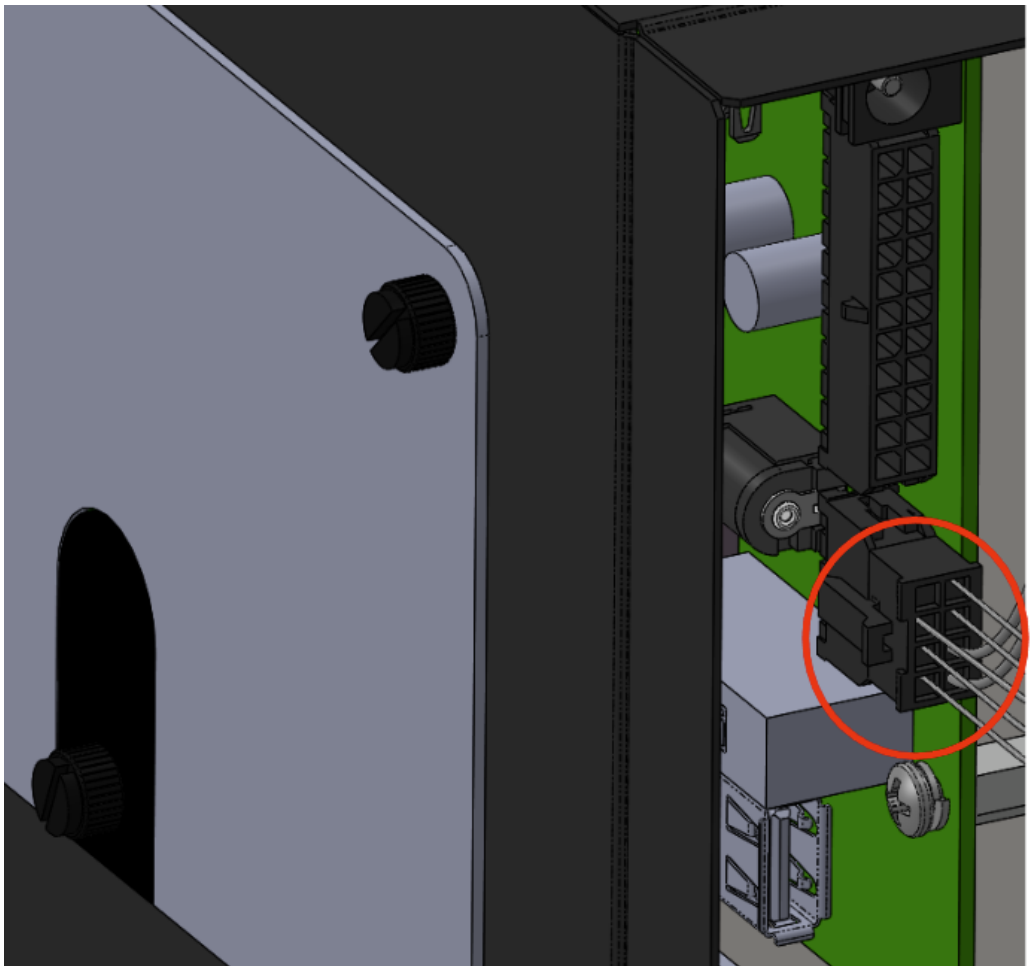
- ☐ Apply a bead of the silicone from the kit to the curved face of the thermistor. Use a generous amount, like the thermistor is a toothbrush and you're in a toothpaste commercial.

- ☐ Apply the thermistor to the fitting: press the thermistor into the fitting, silicone-coated side first, to establish good contact. Then wrap the ends of the tape around the sides, keeping a bit of tension in the tape as you do in order to keep the contact between the thermistor and the fitting.
- ☐ Put the insulation back on, taking care to make sure the wire is not pulling on the thermistor and is exiting the insulation cleanly.
- ☐ Add back the velcro clasps. It is important in this step that they are tight enough to close the air gap so that heat does not escape.
- ☐ Close the main panel.

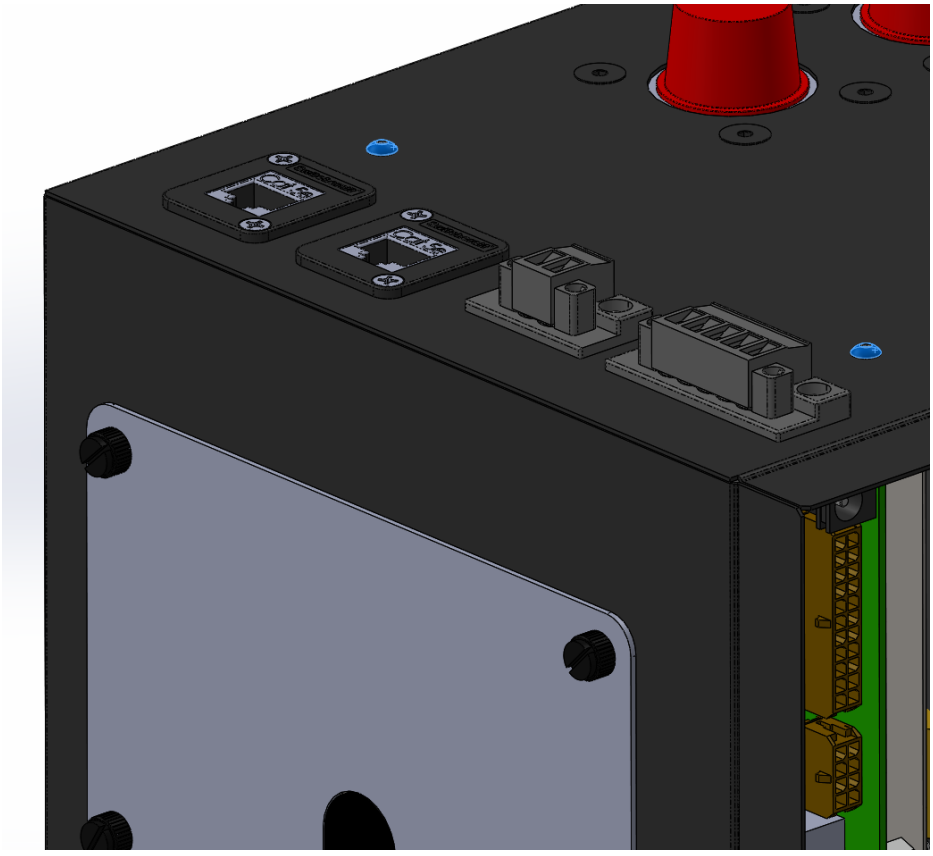
R. Bulkhead Cable

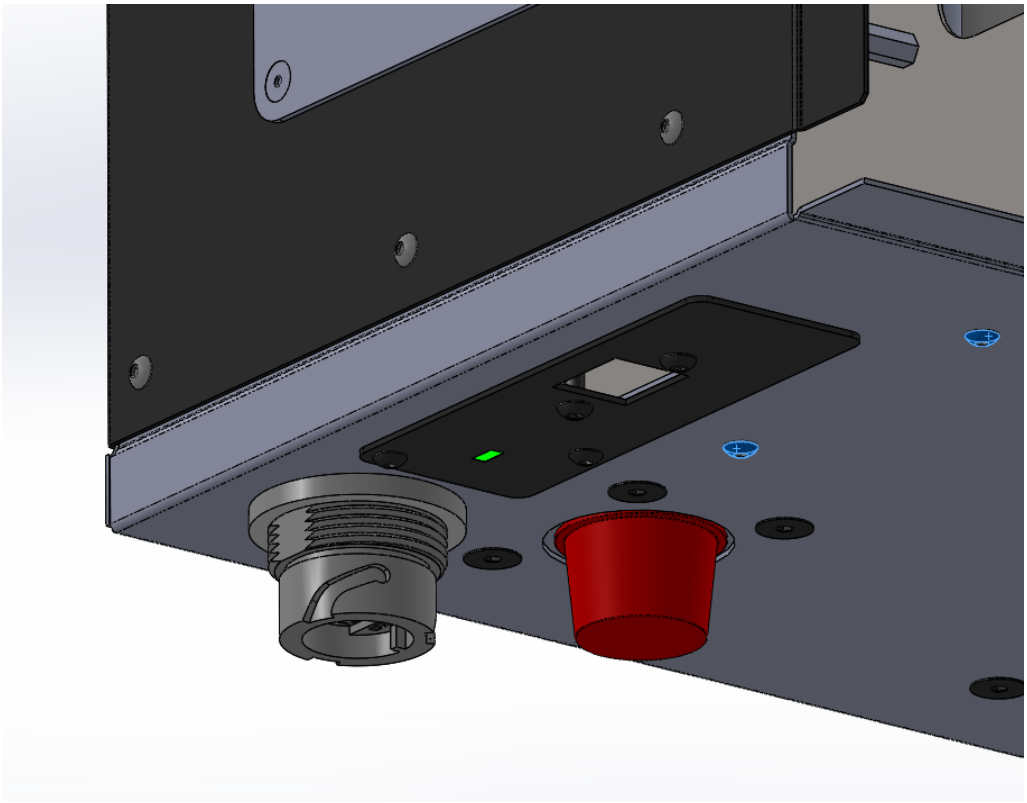
Removing:

- ☐ Disconnect power to Pod
- ☐ Open front panel
- ☐ Disconnect the 8-pin connector on the edge of the board. You will need to press down on the latch and pull.

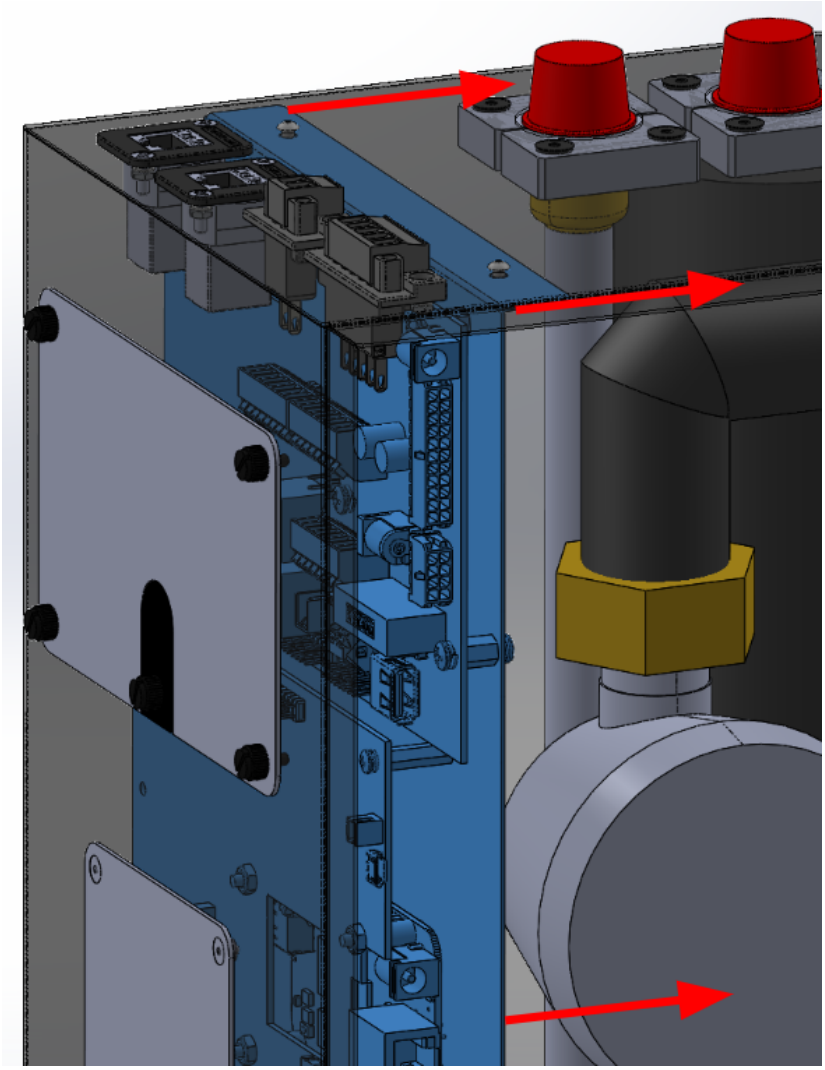


- ☐ Remove 4 screws holding the electronics board assembly in place (highlighted in blue below)





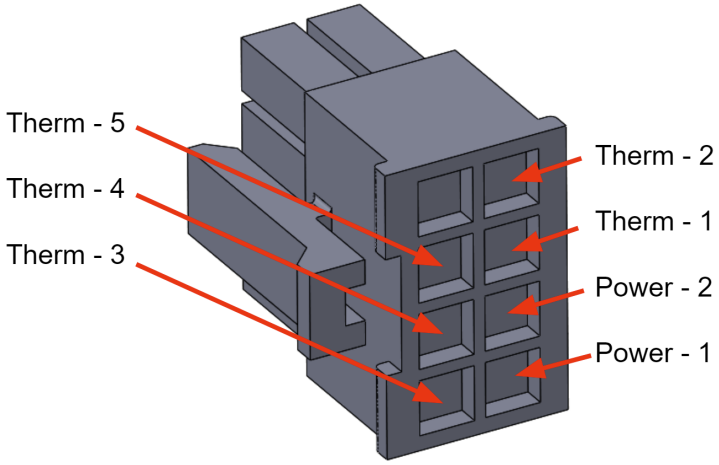
- ☐ Gently push the electronics board to the right as far as it will go.

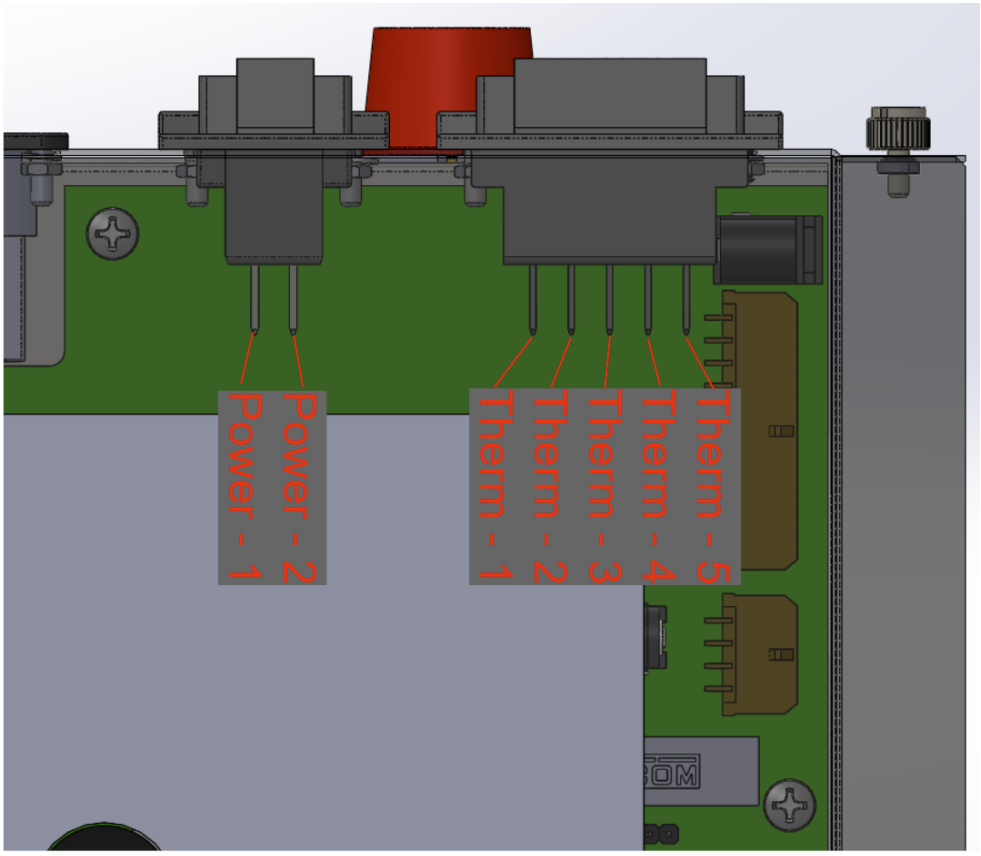


- ☐ Disconnect the red receptacle connectors on the other side of the cable from the spade connectors on the pod.

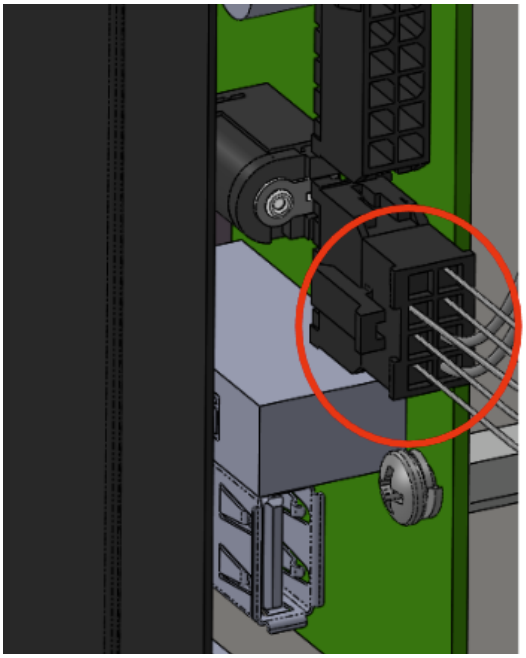
Replacing:

- ☐ Use: FRU PN#201087
- ☐ Attach the quick connects as follows. You will need needlenose pliers to do this:





☐ Plug in the connector to the side of the board, as shown below

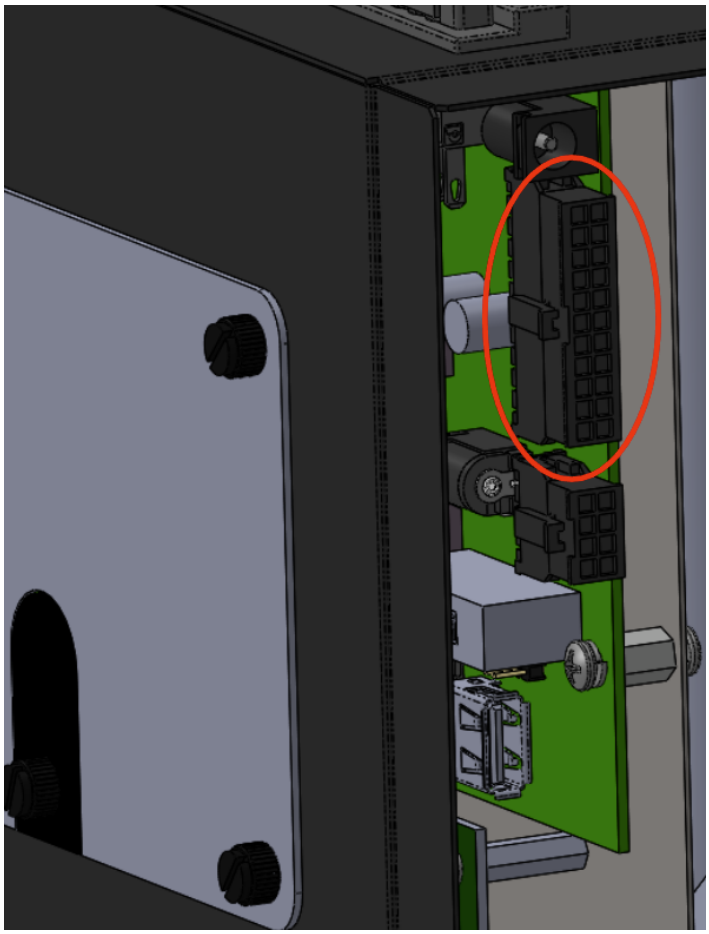


- ☐ Move the electronics assembly back into place, and secure with the four screws on the top and bottom of the Pod.
- ☐ Close the front panel.
- ☐ Reconnect power to the Pod.

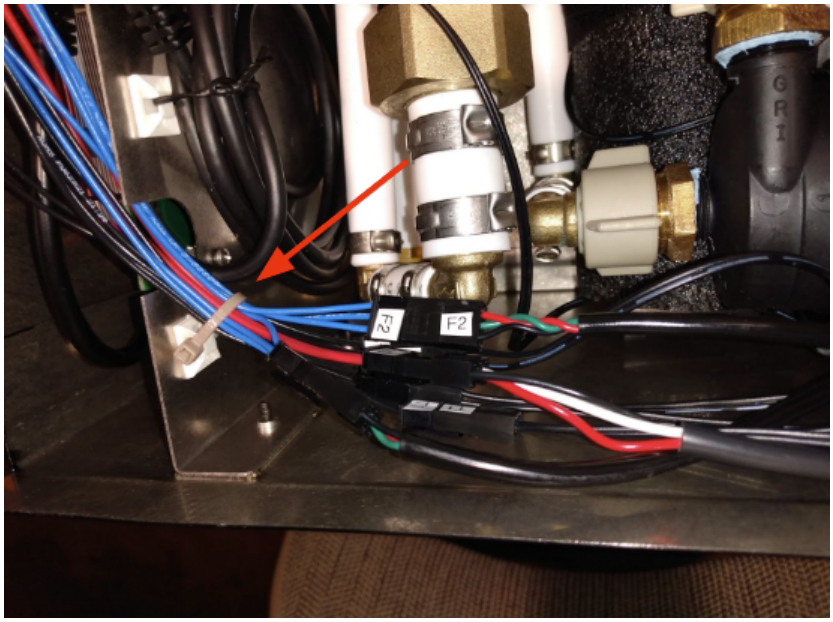
S. Omnibus Cable

Removing:

- ☐ Disconnect power to the Pod
- ☐ Open the front panel
- ☐ Disconnect the large black 22-pin connector from the electronics assembly. You will need to press down on the latch and pull.



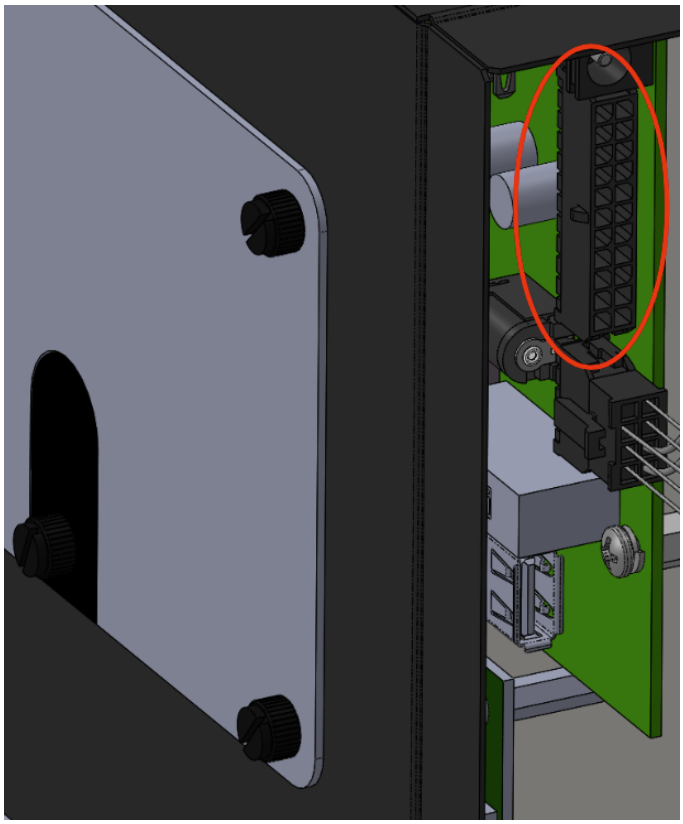
- ☐ Remove the cable tie holding down the Omnibus cable to the divider wall



- ☐ Unplug all other connections to the Omnibus Cable.
- ☐ Remove cable from Pod.

Replacing:
Use FRU PN# 100741

- ☐ Plug in cable to rectangular header on the edge of the board



- ☐ Locate the Plugs in the main plumbing compartment, and connect them to the correspondingly 7 labeled receptacles on the Omnibus cable. Labels are F1, F2, C, T1, T2, T3, and T5. Leave Tx and Ty unconnected.
- ☐ Secure the cable by routing through the notch in the divider wall, and attaching to the plumbing-side of the divider with a cable tie as shown (bottom red circle).
- ☐ Add a cable tie halfway up the cable to capture the ends of Tx and Ty (top red circle)

- ☐ Close the front panel
- ☐ Reconnect power to the pod

T. Ethernet Extender Cable

Removing:

- ☐ Follow instructions for removing the Pod board, except without reattaching the extender cable at the end.

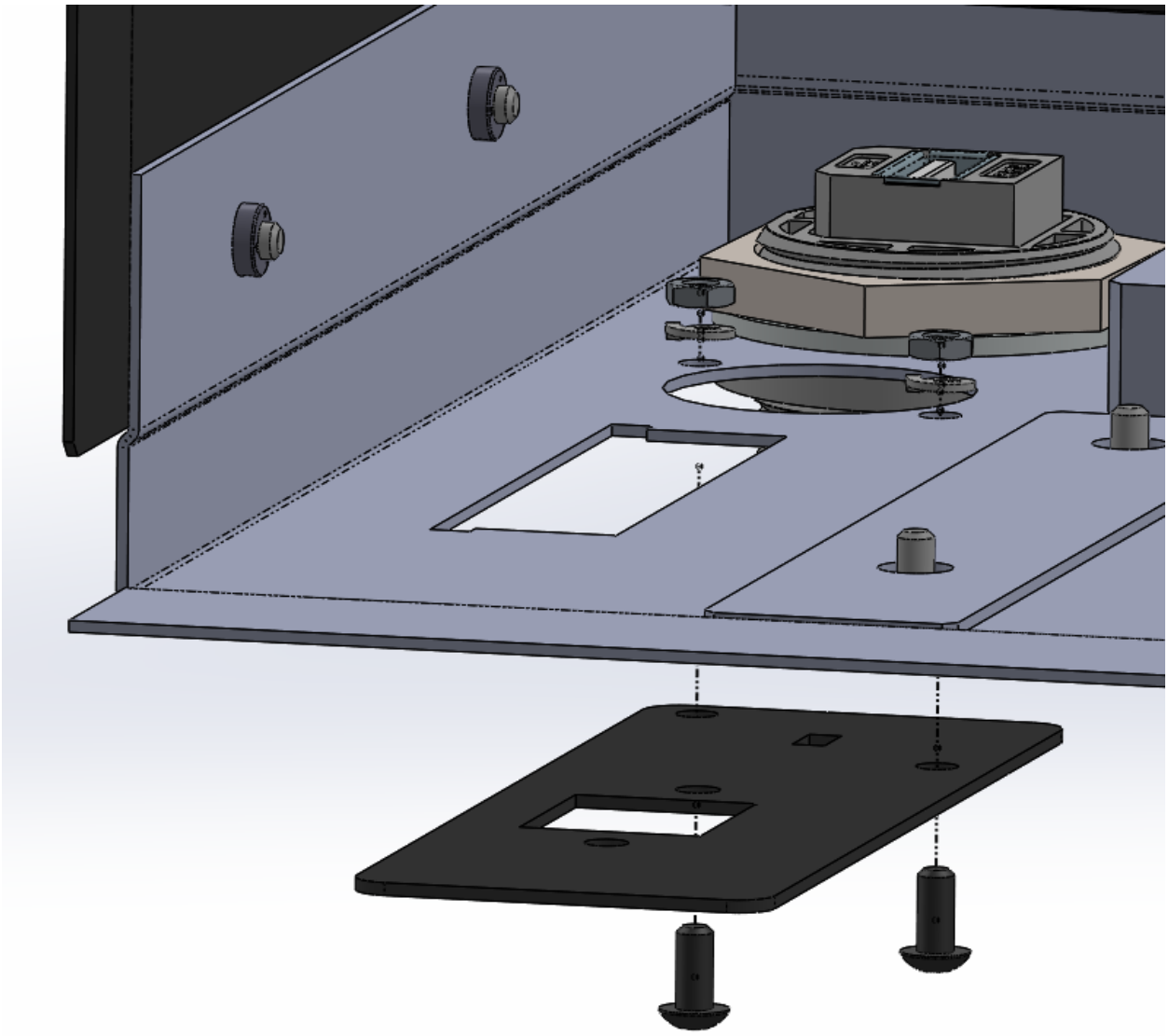
Replacing:

- ☐ Use FRU PN# 000302
- ☐ Follow instructions for installing the Pod board, beginning with the section titled “Attaching the Ethernet extension”.
- ☐ Close the front panel

U. LED Plate

Removing:

- ☐ Follow instructions for removing the Pod board, but do not reattach the ethernet extender cable. Hold on to the screws and ethernet extender cable for later reassembly.
- ☐ Unscrew the two screws holding on the LED plate, and hold on to the hardware for later reassembly. Not shown below, but the LED Cable will still be attached. Leave it attached to the plate.



Replacing:
Use FRU PN# 201082

- ☐ Feed the LED cable through the circular hole in the bottom of the enclosure.

- ☐ Screw in the plate to the outside of the enclosure, according to the assembly diagram in the previous section.
- ☐ Ethernet extension cable is NOT direction agnostic with regards to how it screws into the LED plate. Must be oriented so that a cable plugged in will have its tab facing toward the middle of the pod.

- ☐ With the M3 screws, attach the Ethernet extension cable **000302** into the LED plate. Leave the port loose, with the screws just far enough in for the threads to stay engaged.
- ☐ Reattach the pod board, using the instructions in Pod Board - Replacing.
- ☐ Close the front panel.

V. Full FRU (Field Replaceable Units) List

FRU, Mixing Valve, adapters removed	201088
FRU, Pod Board, REA	201084
FRU, Flow Meter, FlowIQ 2100 with connector	201083
FRU, kit, Air Handler controller	201065
FRU, kit, Bulkhead Cable	201087
FRU, Omnibus Cable	201091
FRU, LED Plate	201082
FRU, Thermistor, standalone kit	201078
FRU, Circulator pump with bushings	201074
FRU, Gaskets for Series AM-1 Mixing Valve	201059
FRU, Ethernet Extender Cable	201090
FRU, PEX Section A	201097
FRU, PEX Section B	201096
FRU, PEX Section C	201095
FRU, PEX Section E	201094
FRU, PEX Section H	201093
FRU, PEX Section X	201092

The following components are not available to order for field replacements. A full Pod replacement will be necessary:

- PEX Section D-G
- Electrical Bulkheads
- Spring Check Valve by itself (PEX Section H must be replaced whole)
- Swing Check Valve by itself (PEX Section A must be replaced whole)
- Enclosure

W. Revision History

Rev	Description	Date
A	Initial Release	9/26/22
A.01	Improvements to readability	9/27/22