



Installation Manual

Thank you for Choosing the HUG Hydronics in-floor heating system!

HUGH, our Tech Duck, is here to explain to you how to install your new HUG Hydronics in-floor heating system.

You are also invited to watch HUGH's How-To Videos [www.https://hughydronics.com/pages/how-to-home-page](https://hughydronics.com/pages/how-to-home-page). Each step has a video. They are short and to the point.

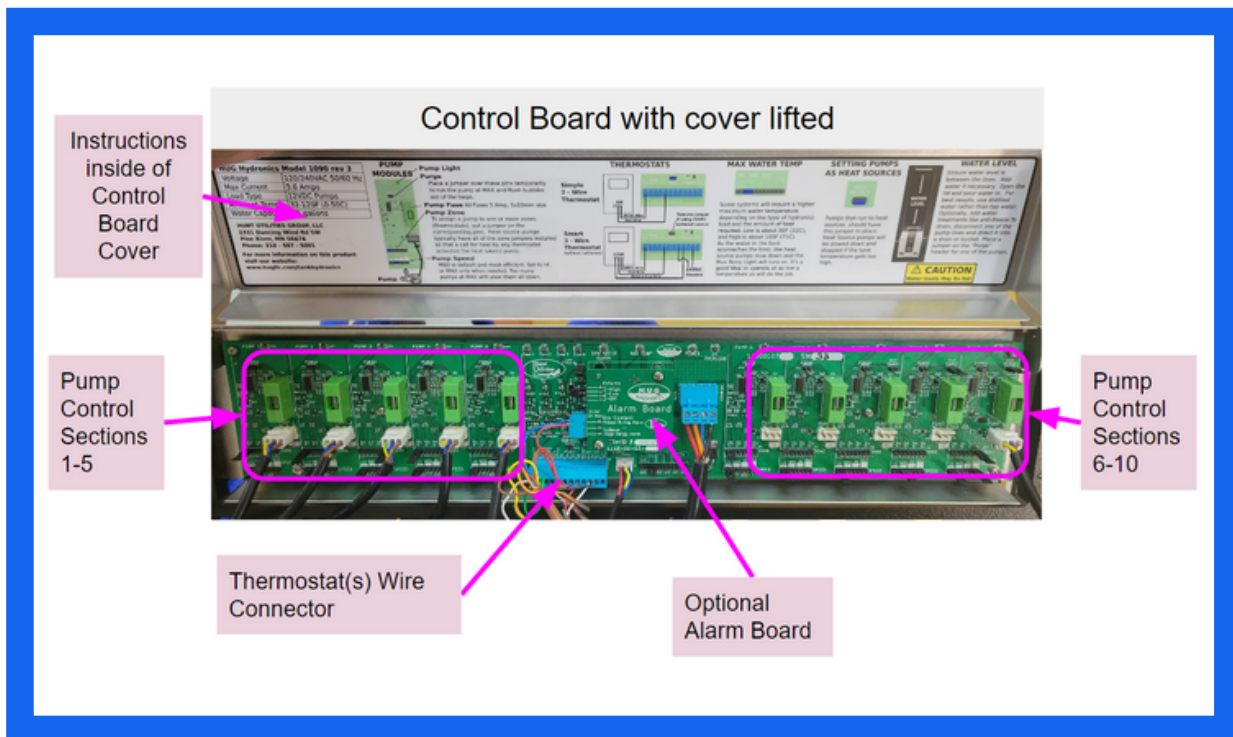


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Getting to Know Your HUG Hydronics System

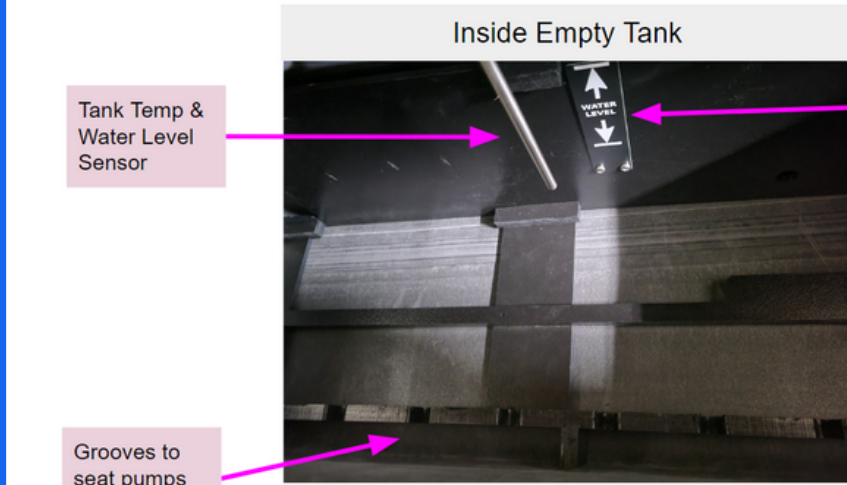


Graphic 1) Front View with Tank Cover Removed

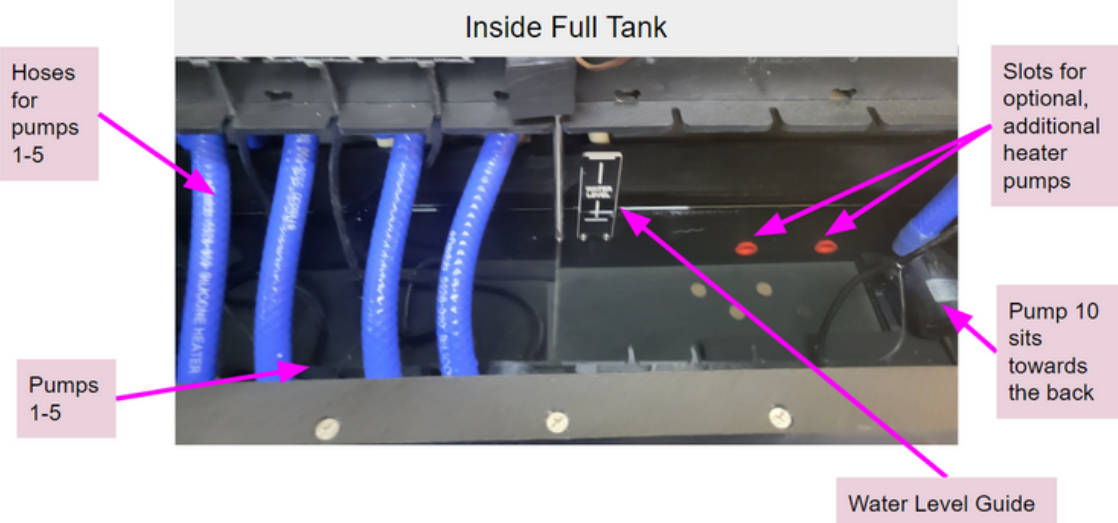


Graphic 2) Control Board with Cover Lifted

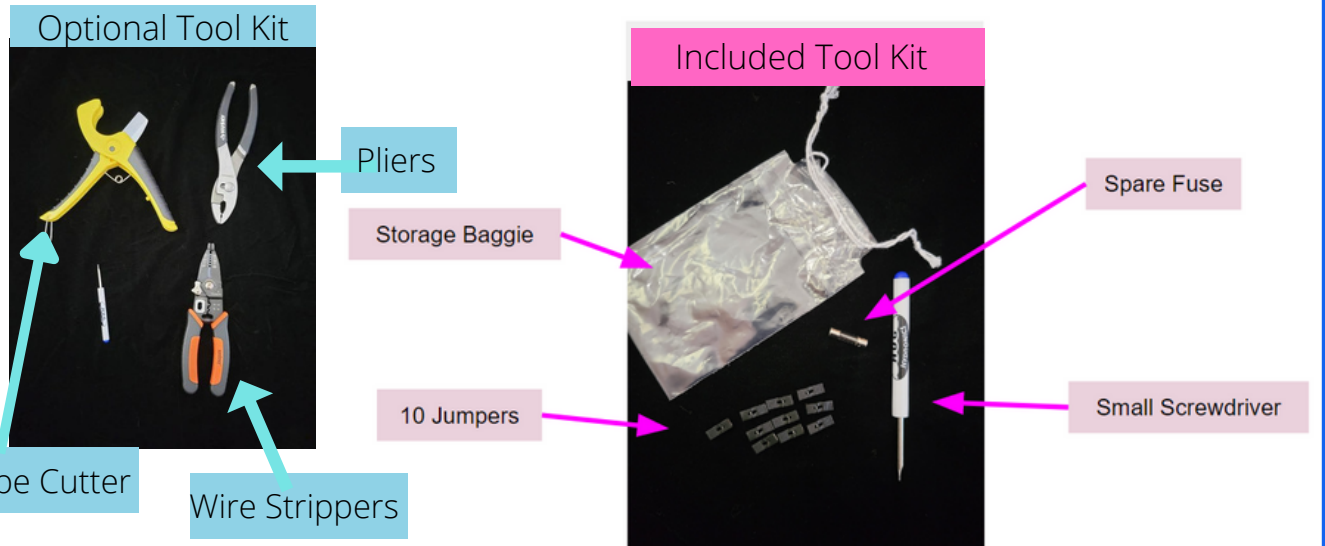
Getting to Know Your HUG Hydronics System (cont)



Graphic 3) Inside Empty Tank



Graphic 4) Inside Full Tank



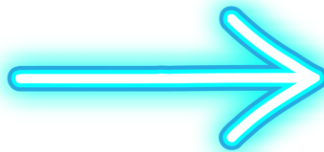
Graphic 5) Tool Kits

Safety Notices

The following instructions are for the safe installation and use of this product:

- This appliance is intended for use by fully functioning adults. For their own safety, please supervise those with a known lack of physical, sensory, or mental capabilities, or experience and knowledge.
- This is not a toy. Please do not let children play with the product.
The product is only to be used with the power supply unit provided. A damaged cord is to be replaced with one supplied by HUG or the manufacturer and not a repaired cord.
- This product is to be installed in accordance with national, state, and local wiring regulations.
- The minimum dimensions of the space necessary for correct installation of the product including the minimum permissible distances to adjacent structures Must be adhered to for safe operation. It is recommended to have 1" on each side and 2 feet in front for service.
- A wiring diagram with a clear indication of the connections and wiring of the product is provided in Step 2 of this manual.
- Details of the type and ratings of replaceable fuses are provided in the service section of the User Manual.
- Information regarding the minimum and maximum water operating temperatures are provided in the specification section of this manual.
- Information regarding the purpose of the product controls is found in the operation section of the User Manual.
- Information regarding the product ambient temperature range is provided in the specification section of the User Manual.

Scan here to link to the full
User Manual
or call 218-587-5001 to
request a paper copy.



Take particular note of the CAUTION symbol when it appears. This information is important for the safe and efficient installation and use of the HUG Hydronics System.



CAUTION signals a situation where potential harm or risk of minor injury could occur if instructions are not followed.



- Hazards include electrical and hot water
- Take precautions when opening the lid as the water may be hot
- Allow the system to cool before replacing submersible pumps or draining the tank.



IMPORTANT Local Electrical and Plumbing Codes must be followed. Please refer and adhere to all appropriate state & local applicable codes for the installation. The product is to be installed in accordance with national wiring regulations.

HUG Hydronics Pre-Installation Check List

Before You Install your HUG Hydronics Unit, verify you are ready by using this checklist:

Please have the following items complete, or available:

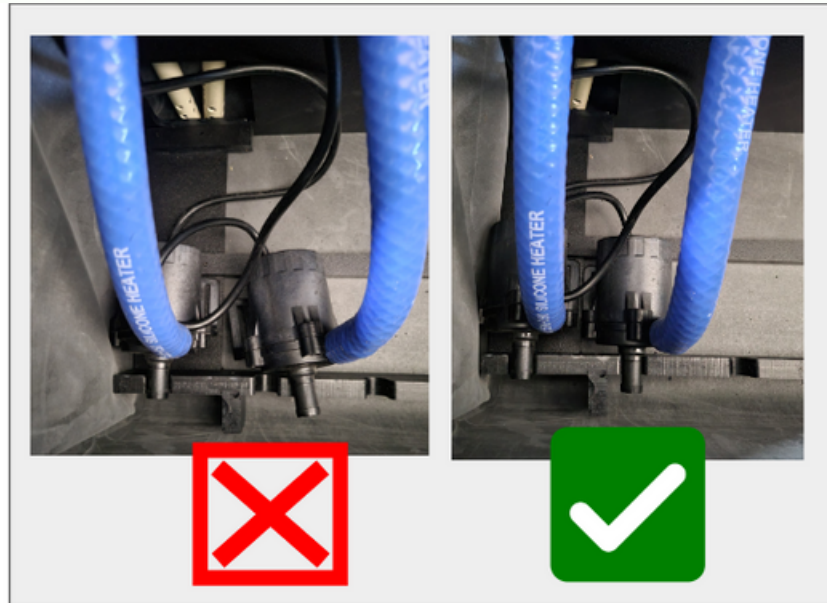
- The pex pipes are installed in the floor and the pipe ends are trimmed at 14-16 inches above the floor, behind the tank. To ease the installation processes, you will want these labeled by their heating zones.
- A 15 amp 120 volt AC GFCI (a regular) electrical outlet is installed within 4 feet (or use a 3 pronged extension cord)
- The thermostats are installed, and the thermostat wires are run to the tank location.
- If using a smart thermostat, it will need a 24 Volt AC power supply to connect to the control board of the tank.
- The correct amount of distilled water and glycol heating system antifreeze is on hand (0.92 gallons per 100 ft of ½" PEX, or about 3 gallons per loop & another 8 for the tank.) So for an 8-loop system, you will want $(8 \times 3) + 8 = 32$ gallons.
- Tools required:
 - small flat-head screwdriver
 - hose cutter or scissor
 - standard pliers
 - wire strippers
- HUG Hydronic Tank (assembled with pumps & hoses).
- The heat source or water heater or boiler is installed and ready for operation.
- The water heater connections have 3/4" pex to 3/4" female swivel adaptors to connect to hoses. See Graphic 6.



Graphic 6)
Water Heater
Connection

Set Up & Start Up

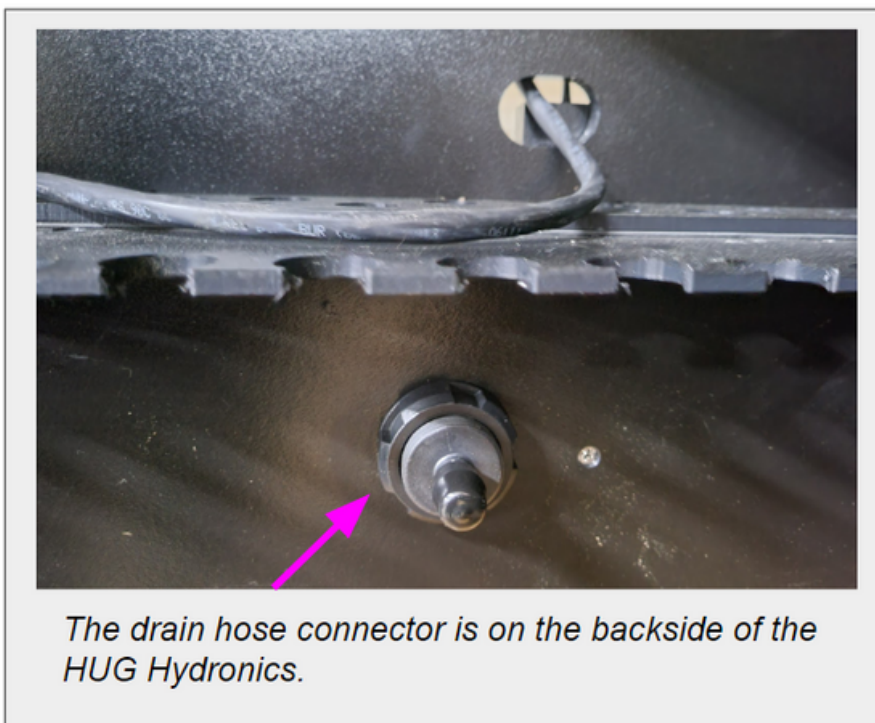
Step 1)



Graphic 7)
Pump
Placement

A) Remove the unit from the box and remove all packaging from the tank.

Ensure that all pumps are properly seated in their respective grooved holder. If one seems to be uncooperative give it more or less slack by pulling on the blue hose.



The drain hose connector is on the backside of the HUG Hydronics.

Graphic 8) Drain Hose Connection

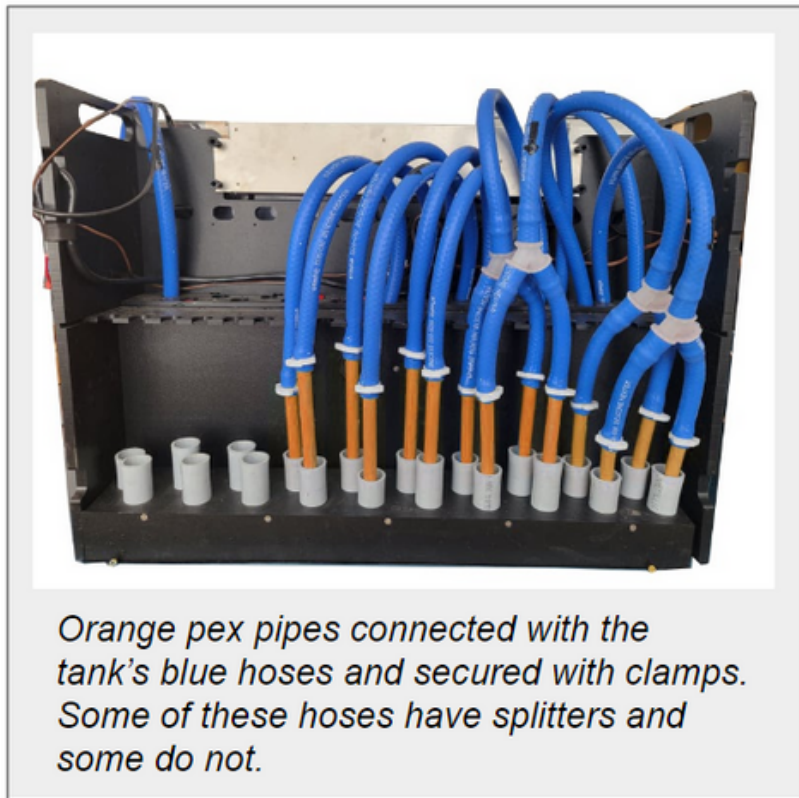
B) Connect the optional overflow to floor drain.

The drain hose is not included. It is optional and is not required to be hooked up.

On the backside of the tank is a drain hose connector.

Connect a 1/2" hose here and route the hose to where you want the potential overflow to drain.

Step 1) cont



Graphic 9) Connect Hoses to Pipes

C) Connect the source and return hoses to the pex pipes.

Hoses come out in 2 rows & marked with arrows, indicating flow in to and out of the tank.

Trim hoses and pex pipes as needed to make connecting neat and easy.

You may want to leave some slack to allow for ease of moving the tank.

Trim hoses with scissors or hose cutters.



Graphic 10) Trim Hoses

HUGH Says:

Pex pipes can be in any color, white, blue, black, orange, or red. The color doesn't matter. We use Orange/red in our graphics so it is easy to tell the difference between the blue hoses from the tank and the orange pex pipes.

1/2" diameter water pipe integrates seamlessly with our system.





Graphic 11) Hose Connection

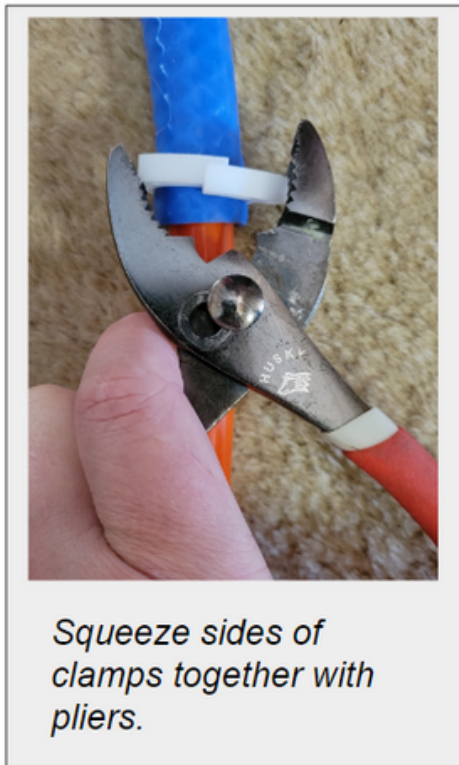
To Connect Hoses:

Slip clamp onto a hose.

Insert pex pipe into the blue hose, by about an inch.

Tighten clamp over where they connect.

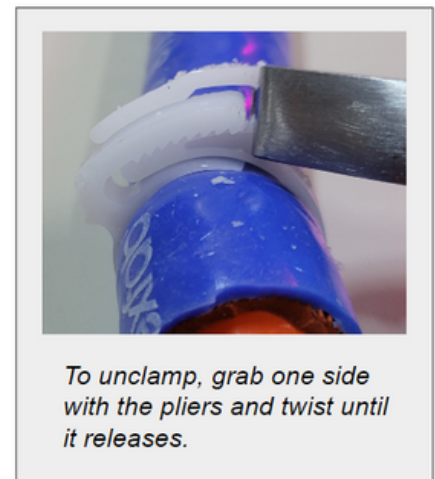
To unclamp the hoses, use pliers to twist one side of the clamp until it unclips.



Graphic 12) Squeeze Clamp



Graphic 13) Completed Hose Connection

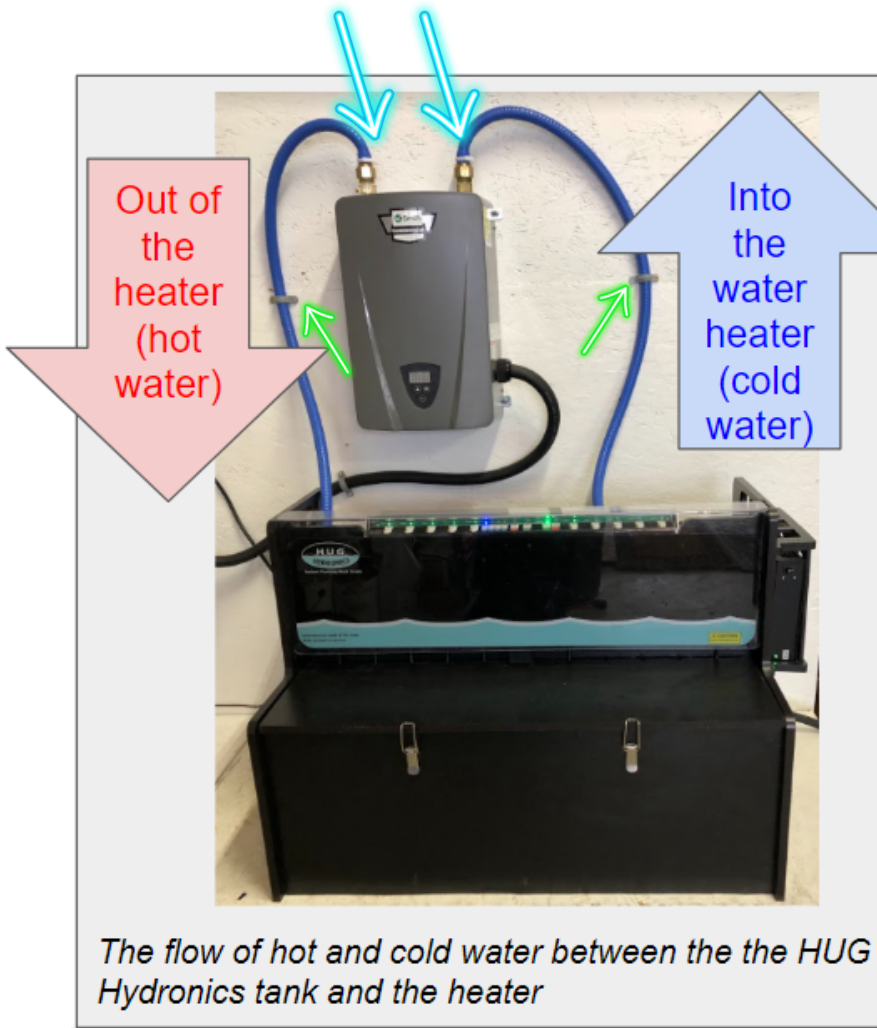


Graphic 14) Unclamping



QR Code: Quick Quack Video
How to Use Clamps:
[www.hughydronics.com/
page/how-to-clamps.](http://www.hughydronics.com/page/how-to-clamps)

Step 1) cont



Graphic 15) Water Flow Diagram

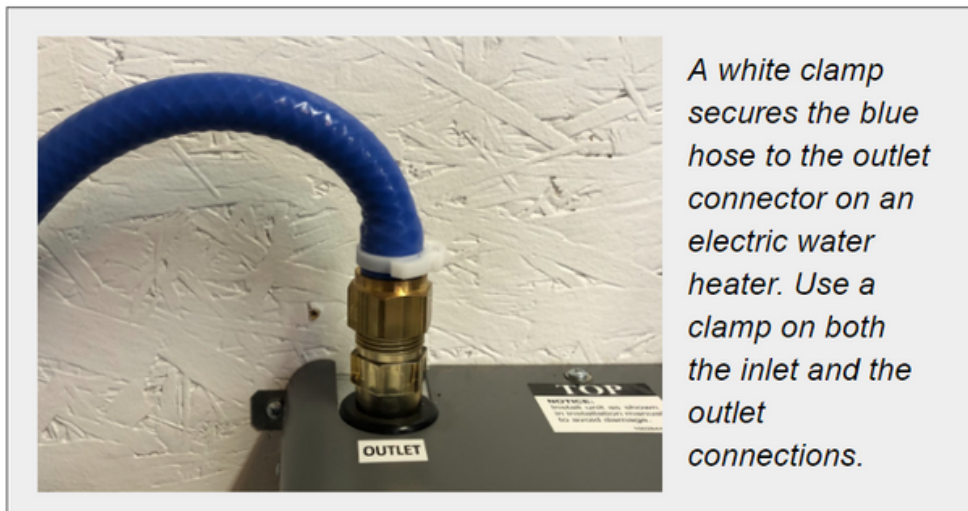
D) Connect the longer blue hoses on each end of the tank to the Water Heater.

The blue hose on the right side connects cold water into the water heater. The one on the left side connects warm water from the heater to the tank.

The blue hoses hook to the top of the electric heaters, and the bottom of the gas heaters.

Attach hoses to the wall with plastic conduit clamps (not provided) to prevent kinking.

E) Use clamps to secure them.



Graphic 16) Water Heater Hose Clamp



Graphic 17) Gas Water Heater Hose Connection

Step 2) Connect Thermostat

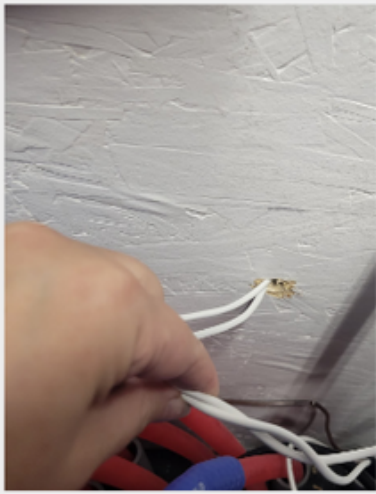


QR Code: Quick Quack Video:
How to Connect Thermostat:
[www.hughydronics.com/
pages/how-to-connect-
thermostat](http://www.hughydronics.com/pages/how-to-connect-thermostat)

A) Route Thermostat wires.

The thermostat wires are often run through the walls and will emerge from a hole somewhere in the utility room.

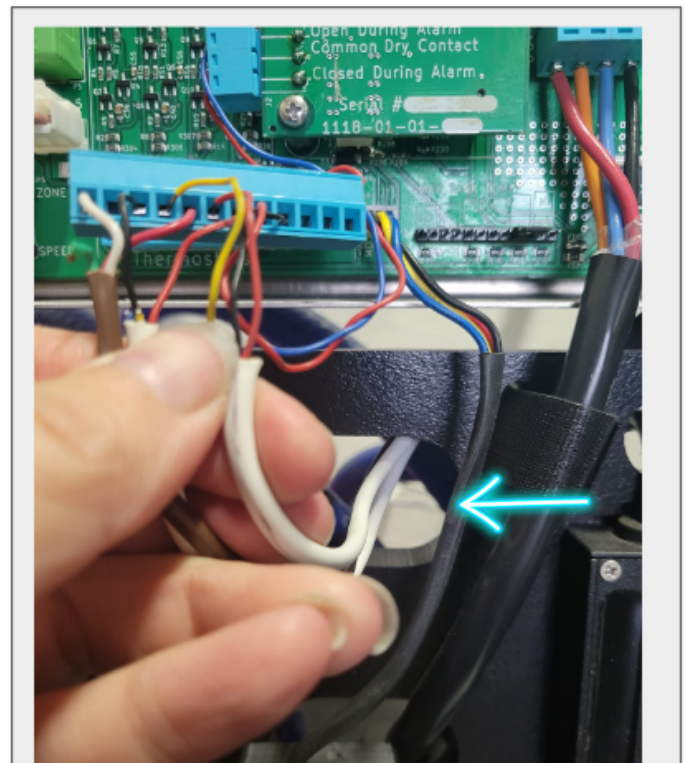
Just below the middle of the control board is a hole to pull the thermostat wires through.



A hole in the wall with thermostat wires coming through

Graphic 18) Thermostat Wire Hole in Wall

Give yourself enough slack in these wires to not only reach the front of HUG Hydronics tank, but also to move the tank by 12-18"



The hole under the control board to pull thermostat wires through

Graphic 19) Thermostat Wire Hole in Tank

HUGH Says:

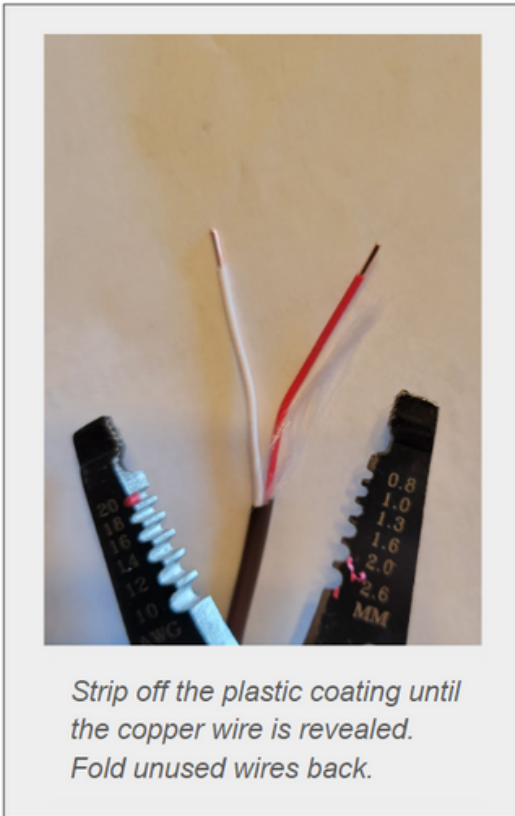
The HUG Hydronics Tank is designed with a series of holes under the Control Board. These holes are there to help you control your wires and cords.

If you pull the excess wires through these holes, you can keep the front of tank visually clean.



Step 2) Connect Thermostat (cont)

B) Gently pull out the 12-pin wire connector from the bottom center of the control board (see Graphic 22).



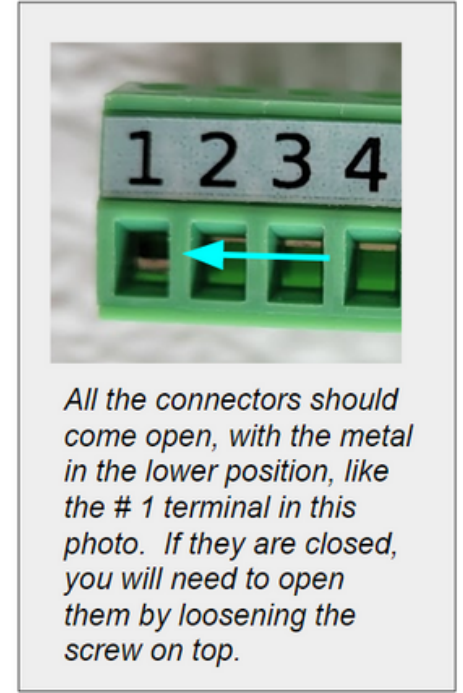
Graphic 20) Thermostat Wires Stripped

C) Strip the end of the thermostat wires.

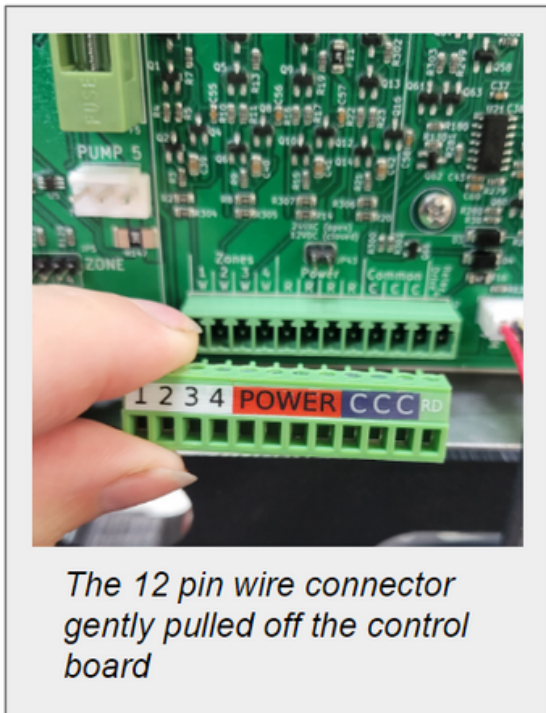
Take a tool and cut about 2 inches of the outer sheath of the thermostat wire.

Inside you will see a white and a red coated wire.

You are going to strip the plastic insulation off each of the thermostat wires.



Graphic 21) Thermostat Wire Connector Open Terminal



Graphic 22) Thermostat Wire Connector

Insert wire into the connector. Mark with your fingers how deep it goes in. Strip the wire to this point, 1/4 to 5/8".

Using a wire stripping tool makes this easier

HUGH Says:

Cutting the wire off instead of stripping it is a common mistake. If this happens, just repeat the last step again until you achieve the right amount of bare wire.

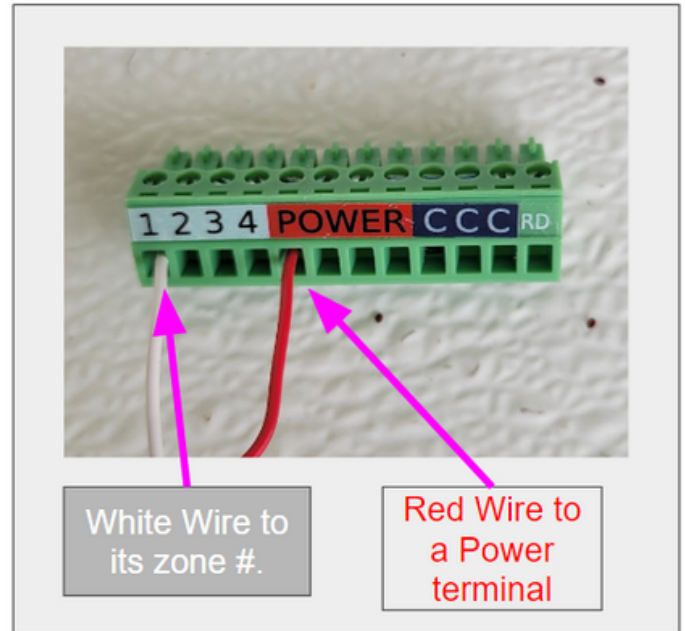
A wire stripping tool makes it easier. If you end up with too much bare wire, you may cut it to the right length to just fit into the connector.



Step 2) Connect Thermostat (cont)

D) For each thermostat, Connect the wires by:

1. Stick the white wire in the connector for the appropriate thermostat zone number.
2. Tighten the little screw, by turning it to the right (clockwise) as tight as it will easily go. This should hold the wire securely and make the electrical connection possible.
3. The red wire will go in one of the power terminals. Tighten as with the white wire.
4. *Do not plug the connector back into the control board yet.*



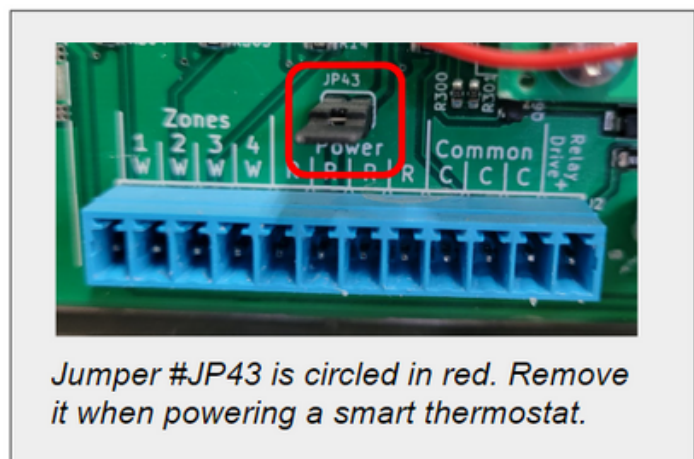
Graphic 23) Thermostat Wire Placement

Additional Steps for Smart Thermostats



Your smart thermostat will probably require a 24V AC power supply to be added to our system. A simple mechanical thermostat works fine without a power supply and without removing the jumper.

Graphic 24) Smart Thermostat



Jumper #JP43 is circled in red. Remove it when powering a smart thermostat.

Graphic 25) Jumper #JP43

A) Remove Jumper #JP43 (the one above the “power” section on the control board). This allows the thermostat connector to run on 24 Volts.

Step 2) Connect Thermostat -Additional Steps for a Smart Thermostat

Ask Hugh: What's a Jumper?

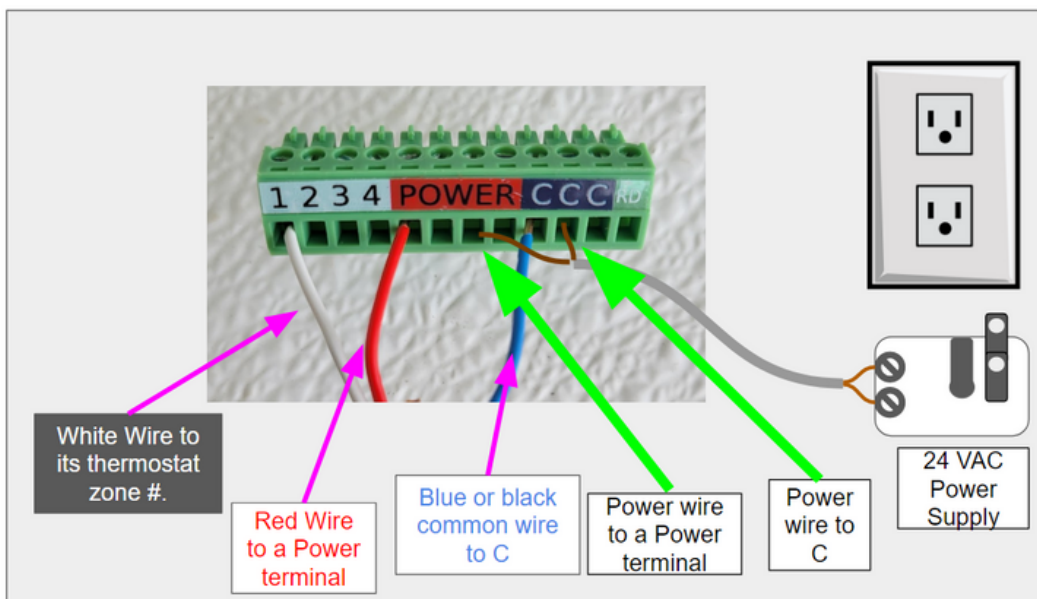


A: A jumper is a little black piece that connects two pins; connecting the circuit like an “on” switch.

Jumpers are used on the control board to allow you to easily choose options by putting the jumpers on appropriate pins.



The control board comes with jumpers already in their most standard configurations, and there are extras in the accessory bag.



Graphic 26) Wiring a Smart Thermostat

B) Wiring a Smart Thermostat

1. Strip 3 wires from the thermostat wires, the white, red, and a blue or black (common) wire.
2. Connect the white wire to the thermostat zone its for.
3. The red wire goes into a power terminal.
4. The blue or black goes into a Common terminal (C), if you need to you can insert 2 wires of the same size into any one of the terminals.
5. Do not plug the 24 VAC power supply into the outlet until it is time to power up. It has 2 wires. They will have to be stripped and inserted into the connector.
6. One is inserted into an Power Terminal, the other into a C Terminal. *Do not plug the connector back into the control board yet.*

Step 3) Fill the Tank

Step 3) Fill the Tank

Pour water or water/glycol mixture into the tank until its water level is between the full and low marks.

*Note: Pure (De-ionized, Distilled, or Reverse Osmosis) water is recommended to minimize scaling and biological growth. Pure water is the cheapest option and has the best heat transfer ability.

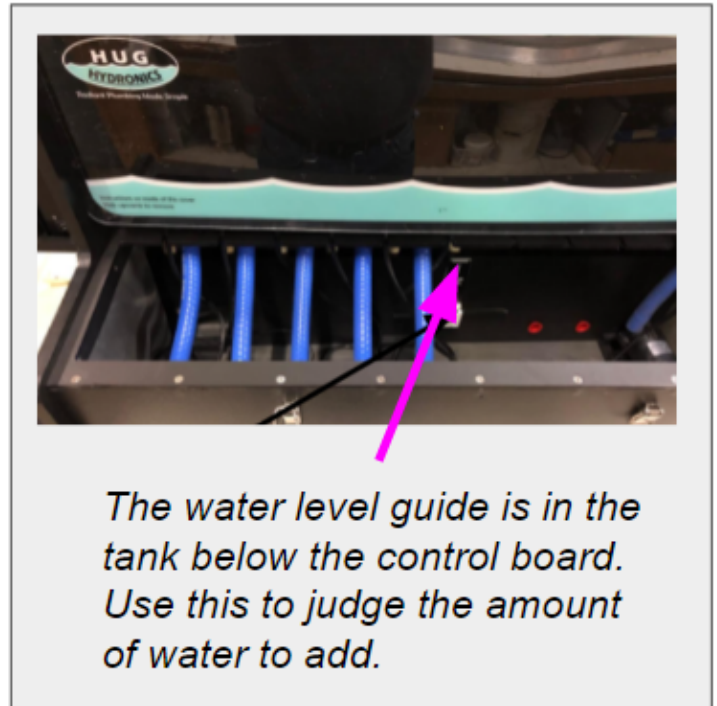
Each 300-foot pex loop holds about 3 gallons of fluid.

Not all of your fluid will fit in the tank at first, you will be adding more fluid as you purge the loops.

The tank holds about 8 gallons in addition to the fluid in the loops.

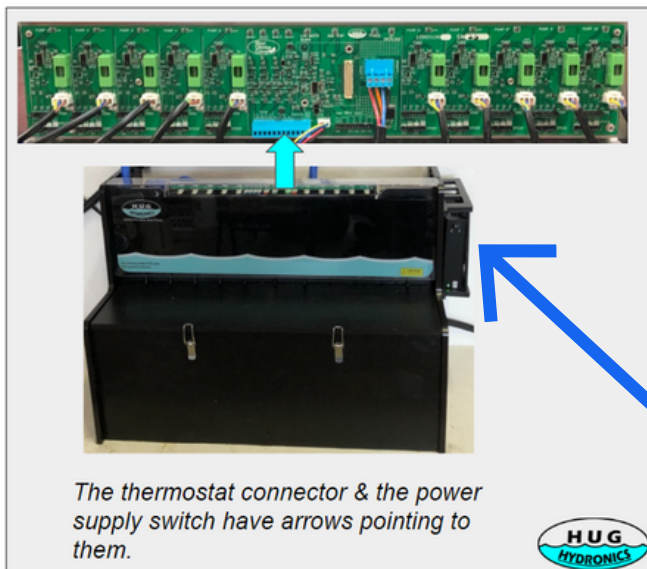


QR Code: How To Anti-Freeze, discussion on whys and hows of using anti-freeze.



Graphic 27) Water Level Guide

Step 4) Purging



A) Open the Control Board cover and verify the thermostat connector is unplugged from the control board.

B) Plug in the tank power supply into a nearby, 120 volt (a normal) outlet.

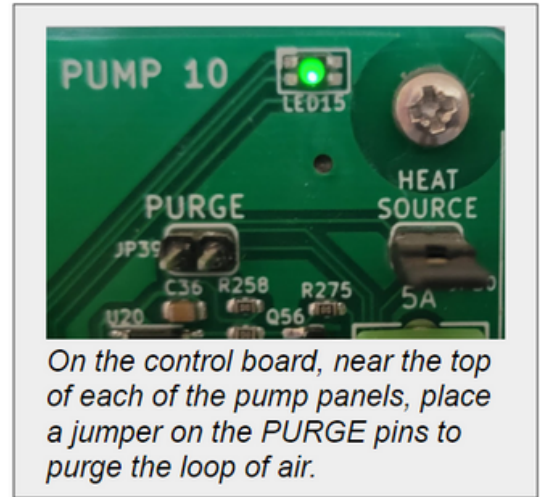
C) Turn on the power supply switch.

Graphic 28) Thermostat Connector and Power Switch

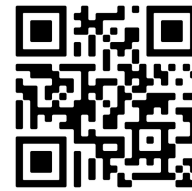
Step 4) Power Up and Pump Settings

D) Purge air out of the heater and pipes.

- Place a spare jumper on the “Purge” pins for pump 10 on the control board to purge the heat source hoses first.
- The pump light will become bright orange.
- Let the pump run until gurgling sounds in the water tank stop.
- Use the same jumper to purge each pump that is in use.
- The water level in the tank will drop during this process. Add more water/glycol to the tank as needed.



Graphic 29) Purge Pins



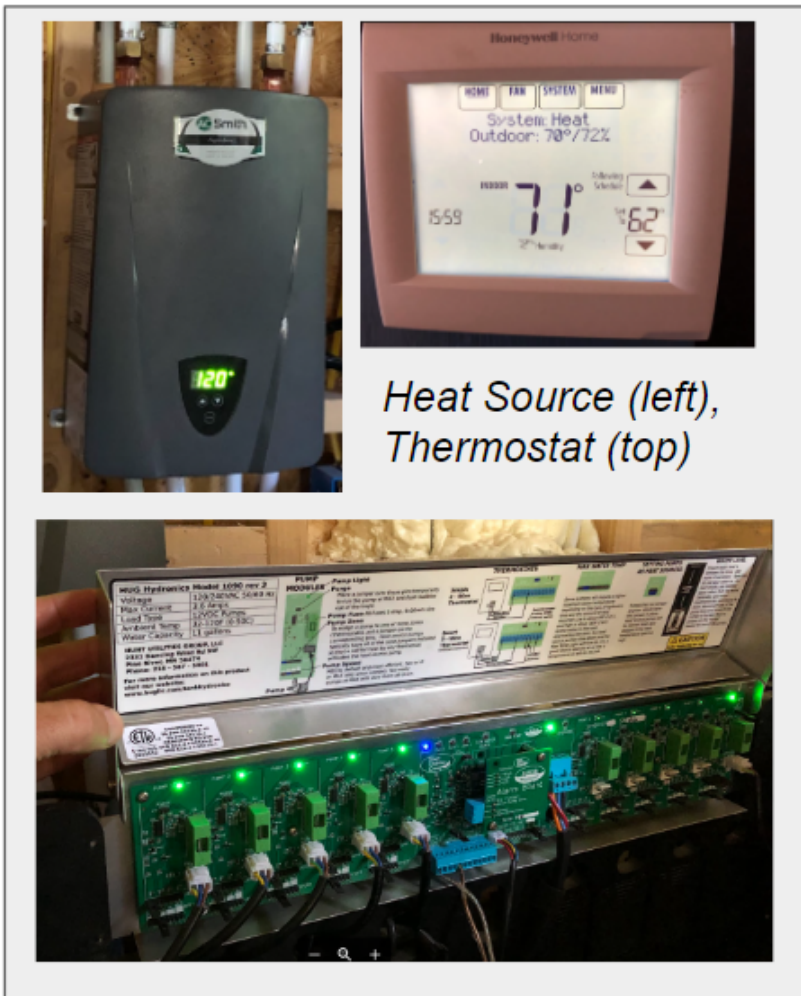
QR Code: How To Purging:
www.hughydronics.com/pages/how-to-purging

Step 5) Settings

A) Power up the heat source & set its temperature (120°F to 140°F is a typical setting).

If you have a smart thermostat, plug in that power supply now.

B) Plug in the thermostat connector and turn up thermostats to call for heat.



Graphic 30) Power Up

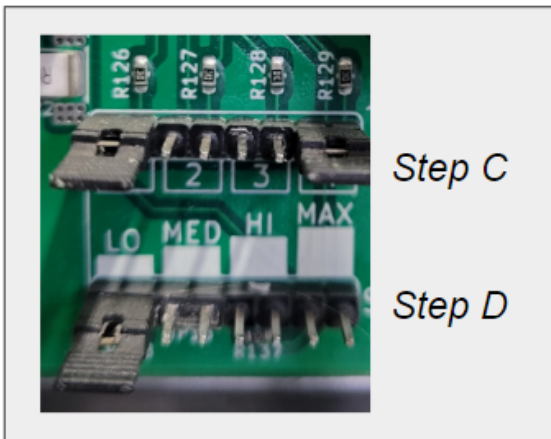
- Each active thermostat should show a blue “Zone” light at the top of the board above the thermostat connector.
- All pumps should be active, each indicated by its green light getting brighter.

Step 5) Settings

(You can skip this step if you only have 1 thermostat)
All pumps are initially assigned to zone 1, except pump 10. It is pre-assigned to all 4 zones.

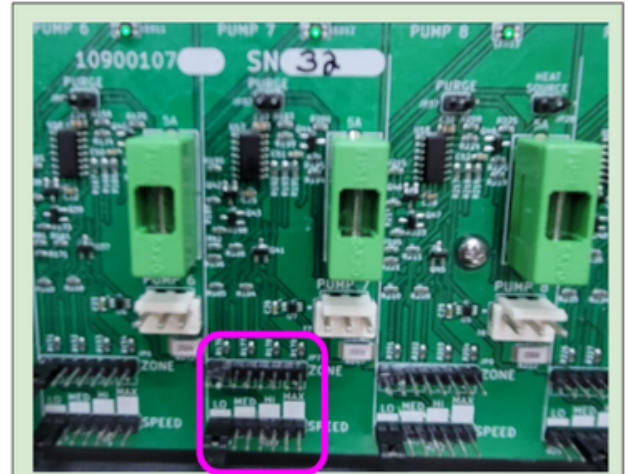
C) Assign the thermostat zones for each pump by moving the jumper to the correct zone #.

Each pump has its own section of the control board, labeled 1-10. Pump 10 is always to the heat source. The other pumps may be assigned to specific zones by moving the jumper to the pins labeled with that zone #.



Graphic 32) Close up on Zone & Pump Speed Selector Pins

- LOW IS ADEQUATE for most single loops
- MED for splitters w/2 loops
- MAX for Heat Sources (pump 10)



A close up of the control board (a section for 3 pumps). The jumpers are located near the bottom. The higher row selects the thermostat zone the pump is connected to. The lower row selects the speed for the pump.

Graphic 31) Control Board Close Up

D) Assign Pump Speeds:

Just below the Zone selection is the speed selection for the pump. Assign speeds by moving a jumper to the matching pins.

Set pumps as low as possible to keep your house warm. Usually, those settings end up as follows:

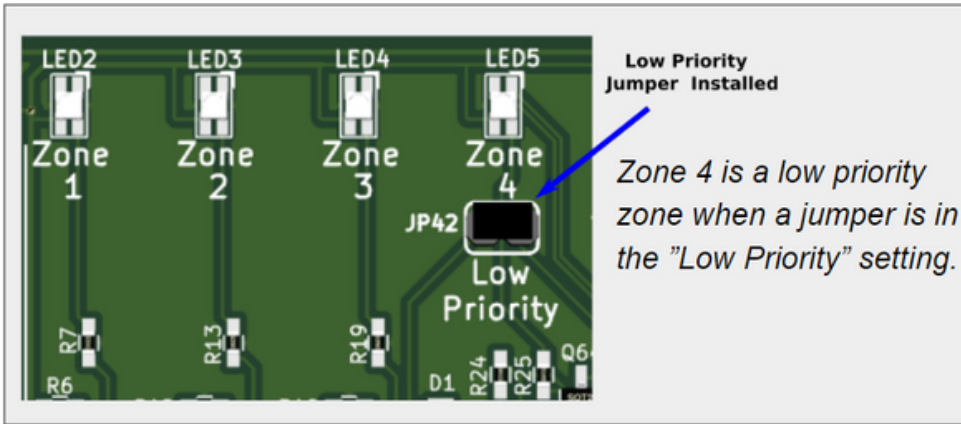
E) Re-adjust heat source temperature & thermostats to your desired temps.



Graphics 33) Heat Source & Thermostat Adjustments

Step 6) Final Checks

A Low Priority Zone



Graphics 34) Low Priority Zone Jumper

You may choose thermostat zone 4 to be low priority so it will only heat after others are warm.

Connect that thermostat wire to be zone 4 and put a jumper on the "Low Priority" pins.

If Zone 4 is in low priority mode and is calling for heat while any other zone is calling, then the "Zone 4" LED will glow dim yellow to indicate that it wants to heat now, but it is waiting for other zones to stop calling.

Step 6) Final Checks

A) Check the water level, add additional water/hvac glycol mix until you reach the upper mark on the water level indicator.

*Note: Add a calendar reminder to check the water level every 6 months.

B) Reinstall and latch the tank cover.

C) Complete a final check with the thermostat(s) calling for heat:

- Check that the pump indicator lights are green or yellow, indicating the appropriate pumps are working.
- Check that the hot water hose(s) from the water heaters to the tank are warming. They should be warm to the touch.
- Close the cover shield over the control board.

CAUTION

**Water
may be
HOT**

Congratulations!

You're Just
Ducky!

Please send a Pic of you and your HUG Hydronics System, and date of install to: raya@hugllc.com, we will post your success on our Facebook page and enter your warranty data.

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Quick Video QR Codes



QR Code: All the QUICK Quack How To Videos



QR Code: Full User Manual



QR Code: Warranty Registration