HYDRONIC RADIANT SLAB INSTALLATION GUIDE

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SECTION 1: IS YOUR BASE READY?

Before unrolling any tubing, verify that your site preparation meets the following requirements:

- **Vertical Perimeter Insulation:** Ensure 2 inches of R-10 insulation is installed vertically around the perimeter of the building. In northern climates, we recommend extending this insulation 2 to 3 feet down from the top surface of the concrete slab.
- **Level Base:** Verify that the sub-base is completely level and properly compacted.
- **Vapor Barrier:** Lay down a minimum 6-mil or thicker vapor barrier directly on top of the compacted base.
- **Proper Foam PSI:** Verify your sub-slab foam insulation meets the required load capacity:
    - **15 PSI:** Recommended for basements, standard living areas, and residential car garages.
    - **25 PSI:** Required for commercial shops or garages housing heavy equipment.
    - >**25 PSI:** Used as needed for heavy loads on concrete slabs.

SECTION 2: TOOLS



- SAFECUT – Used to safely open shrink wrap and cut protective paper off tubing rolls without slicing or damaging tubing.



- KALISPEED/REAMER/ BEVELING TOOL – Used to bevel, debur, and restore the round shape of the tubing prior to installing the adapter fittings.



- TUBING CUTTER – Used to cut multilayer PEX-AL-PEX tubing. Performs clean cuts with minimal tubing deformation.

SECTION 3: TUBING LAYOUT BASICS

The Spacing Formula
To determine your exact loop spacing on center, utilize this layout calculation:

On-Center Tubing Spacing (Inches) = (Inside Square Footage) ÷ (Total Linear Feet of Available Tubing) x 12

Note: Your custom layout drawing is a calculated guide. Minor field adjustments can be made as needed.

Step-by-Step Installation

1. **Identify the Manifold Location:** Mark the location of the manifold or install the manifold on a wall (see Section 4).
2. **Install Slab Protectors:** Slip protective plastic sleeves, slab bend supports, or PEX-Pal organizers over the tubing leads where they exit the concrete. Ensure the protective sleeves extend at least 1 inch above the final finished concrete level.

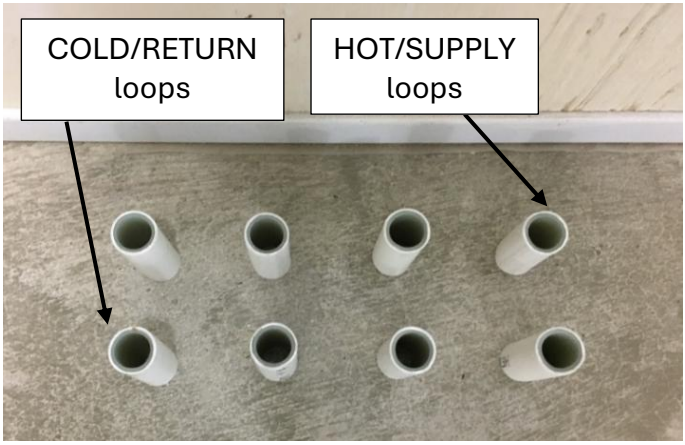


Figure 1 – HOT/SUPPLY loops coming up approximately 2-3 inches from the wall through individual slab supports. Each HOT/SUPPLY loop is 2-3 inches from the next HOT/SUPPLY loop. The COLD/RETURN loops come up 2 inches in front of the HOT loops.

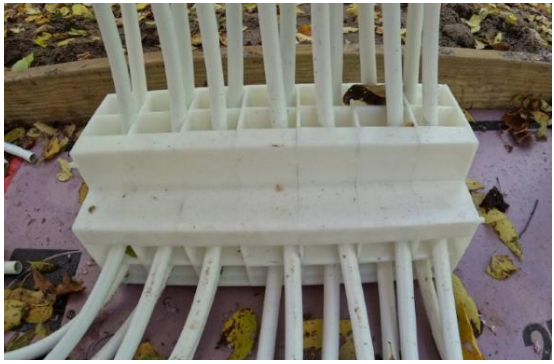


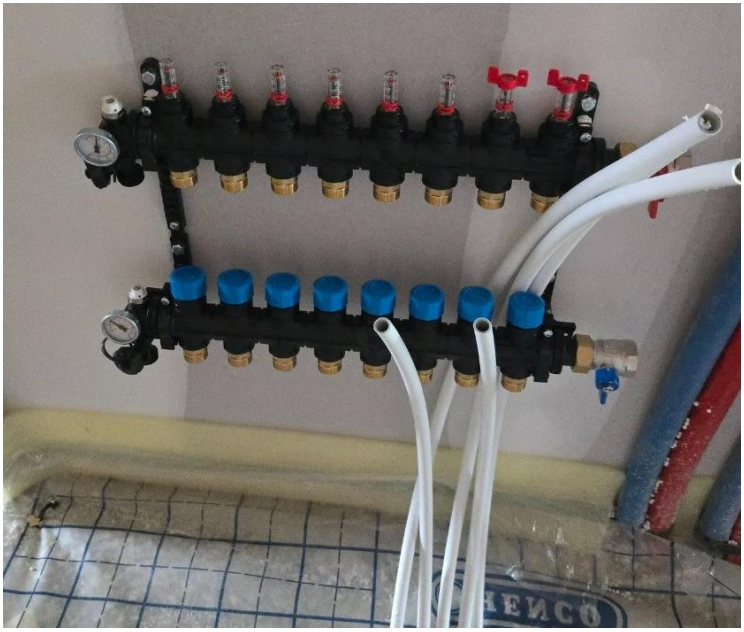
Figure 2- A PEX-Pal organizer being used to organize and protect the tubing.

3. **Orient the Flow:** Refer to your drawing to route the **HOT / SUPPLY** side of the loops along the cold, exterior walls first.

4. **Set Exterior Offsets:** Position your first run of tubing approximately 6 inches inward from the interior face of outside walls.
5. **Inspect as You Go:** Check the tubing for any shipping or handling damage as you unroll it. Note that the tubing features convenient integrated measurement marks every 2 feet.
6. **Roll Like a Tire:** Roll the tubing coil out across the floor like a moving tire. Have a second person follow immediately behind to secure it. Mark your shoe or use a spacer template to maintain consistent on-center spacing.
7. **Fasten Regularly:** Secure the tubing to your insulation or wire mesh with fasteners placed every 2 to 3 feet.
8. **Take Turns Wide:** Work slowly around the first few 180-degree turns. Keep your hands spread wide on the pipe to form a smooth, sweeping radius. This prevents kinks. *If a minor kink occurs in PEX-AL-PEX, it may be carefully rounded back out; heavily creased or collapsed tubing must be cut and repaired with an approved compression coupling wrapped in silicone tape or replace the entire loop*.

9. **Use Every Foot:** Install all the tubing provided for the zone. If you return to the manifold location and have extra pipe remaining on the loop, do not cut it off. Walk back along the loop, slightly tighten the spacing layout, and sweep it back to absorb and use the full length.
10. **Avoid Sub-Slab Crossings:** Do not cross lines over one another out in the open pour area. Tubing crossings should only occur directly beneath the manifold connection point.
11. **Group and Identify:** Group the supply and return lines cleanly as they exit the floor. Use a permanent marker to explicitly label each line with its flow direction and zone name (e.g., *"Kitchen Supply"*, *"East Bedroom Return"*).
12. **Maintain Tail Length:** Leave an ample tail of 3 to 5 feet of tubing sticking out of the floor to easily reach the manifold or attach the lines directly to the manifold as you install them. *Do not cut more than 2 feet of excess tubing off any loop tail*.
13. **Seal Open Ends:** If the manifolds are not yet mounted during the pour, tape all open tubing ends completely shut or use test plugs to keep out concrete slurry. If the manifolds are mounted, drape them with plastic or a towel to protect the brass, valves, and gauges from concrete splatter.

SECTION 4: MANIFOLD ASSEMBLY & LAYOUT



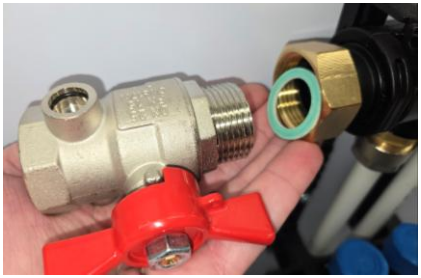
- **Supply Manifold (Top Manifold):** Identified by the transparent flow indicators, balancing valves, and red control knobs.
- **Return Manifold (Bottom Manifold):** Identified by the blue caps.

1. **Assemble the Manifold Bracket:** Insert the manifold mounting clamp into the mounting bracket and rotate it into place.



2. **Determine Supply Side:** Manifolds can receive system water from either the left or the right side:
    - *For composite MDK manifolds:* Unsnap the retention clips to easily swap the end orientation.
    - *For stainless steel MDSS manifolds:* Flip the rail around so the integrated Henco logo faces the wall to accommodate a right-side supply feed.
3. **Place the Manifold in the Clamps:** Position the supply and return manifolds in the clamps and tighten to secure the manifolds to the mounting bracket.
4. **Attach the Manifold to a Wall:** Manifolds are typically installed on a wall, roughly 2 to 3 feet above the finished floor level. A temporary wall or mounting surface may need to be constructed before the concrete pour.

5. **Install the Ball Valves:** Thread the red ball valve onto the top Supply inlet and the blue ball valve onto the bottom Return outlet. Place the flat green sealing gasket inside the female union nut first. **Hand-tighten, then snug with a wrench. Do NOT overtighten, and do NOT use Teflon tape or pipe dope on these straight-thread gasket joints.** The opposite side of the ball valves features standard 1" Female NPT threads for your main system piping.



6. **Form and Trim Tubing:** Hand-form each loop tail smoothly behind the specific manifold port it will connect to. Cut the tubing square and level using your tubing cutters. Because the manifolds are stacked, your supply and return tails will be trimmed to two different heights.
7. **Bevel the Edges:** Insert your beveling tool fully into the trimmed pipe end until the blades engage. Rotate the tool several times to create a clean internal chamfer and remove all sharp burrs.

8. **Assemble the Fitting:** Slide the compression nut over the tubing first, followed by the brass split-ring. Moisten the barbed fitting attachment with a drop of water, then push it firmly into the beveled tubing end until it seats completely.



9. **Connect to Manifold:** Push the assembled pipe tail straight up into the manifold port. Thread the compression nut on by hand until tight, then finish with an additional 3/4 to 1 full turn using a wrench. **Do NOT use excessive force.** MDK composite manifolds require a 15/16" wrench to hold the threaded brass fitting to keep it from spinning in the manifold when tightening. Many times, loosening the fitting and then retightening it will realign it and stop a leak. *Note: If a minor weep occurs once the system is filled, tighten the nut slightly while the fluid is warm*.

SECTION 5: SYSTEM PRESSURE TESTING

Perform a compressed air test to ensure system integrity before pouring concrete.

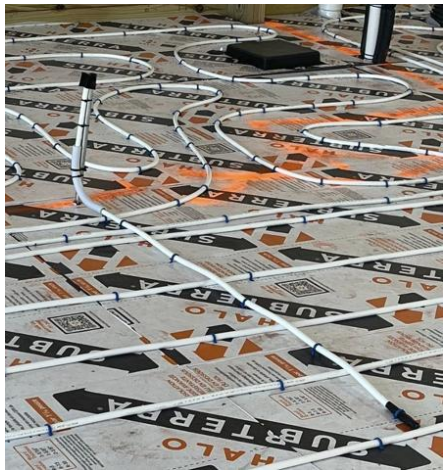
1. **Hook Up the Gauge:** Install your air test gauge assembly directly into the 1" NPT inlet of the supply ball valve (red). It may be easier to install the gauge into the ball valve in a vise or while not installed on the manifold.
2. **Isolate the Manifold:** Fully close the return manifold ball valve (blue) and full open the supply manifold ball valve (red).



3. **Open the Circuits:** Turn all red balancing valve flow indicators (top manifold) and blue caps (bottom manifold) counter-clockwise. These are shipped in the closed position and must be opened to allow air into the tubing loops.
4. **Pressurize:** Introduce compressed air through the test gauge valve until the system reads between **60 PSI and 100 PSI**.

5. **Check for Leaks:** If the gauge drops, mix warm water and liquid dish soap in a spray bottle. Spray down all manifold joints, compression fittings, and air gauge threads. Bubbles will immediately form at the source of any structural or mechanical leak. Changes in ambient air temperature may affect the pressure in the system by a few PSI.
6. **Keep System Under Pressure:** The radiant system should remain under pressure during the entire concrete pour. Monitor the air test gauge closely. If a sudden drop in pressure occurs, stop the pour immediately to locate and repair the damaged tubing before the concrete sets. Damaged tubing can be repaired with an approved compression coupling wrapped in silicone tape.

SECTION 6: THERMOSTAT SLAB SENSOR CHASE



If your system design includes a floor-sensing thermostat, you must install an in-slab conduit chase before the concrete is poured.

- **Create the Conduit:** Use a short piece of scrap radiant tubing to form a protective sleeve. Tape the sub-slab end completely shut to prevent concrete entry.
- **Positioning:** Route the tube from your planned wall thermostat location down into the floor, terminating the closed end exactly centered between two active heating loops.

- **Wire Length Constraints:** Standard slab sensors include 10 feet of lead wire. Ensure the total run length from the expected thermostat mounting height to the end of the floor chase does not exceed 10 feet.
- **Multi-Zone Layouts:** For multi-zone systems, install one dedicated slab sensor conduit chase per zone, positioned in the primary area of that specific zone.

Stuck on a step or have a question? Call us before you pour—we are here to help!



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