

⚡ WARMLYYOURS TECHNICAL REFERENCE

PRO Field Checklist: Electric Floor Heating Diagnostics & Troubleshooting

For: Tile Setters, Flooring Contractors, Electricians & Remodelers

① Pre-Pour 3-Stage Verification Matrix



ELECTRICAL SAFETY NOTICE: Always de-energize and lock out the circuit breaker before disconnecting wiring or taking resistance measurements. Testing and hookup must be performed by a qualified electrician in accordance with local electrical codes (NEC / CEC).

Installation Stage	Measurement	Acceptable Range	Action if Out of Range
Stage 1 Out of Box	Core-to-core (120V: yellow-black; 240V: red-black) Core-to-ground (each core to ground)	Core-to-core: $\pm 15\%$ of label value Core-to-ground: Open loop / infinite resistance (OL / ∞)	 Do NOT install. Escalate to Tech Support; no field repair.
Stage 2 After Laying Cable	Same as Stage 1	Core-to-core: $\pm 15\%$ of label value Core-to-ground: Open loop / infinite resistance (OL / ∞)	 Inspect for staple/trowel nick before applying mortar.  Pro Tip: Connect a Circuit Check™ continuity alarm tool during thinset/tiling for an immediate audible alert if a trowel nicks the wire.
Stage 3 After Tile/Mortar	Same as Stage 1	Core-to-core: $\pm 15\%$ of label value Core-to-ground: Open loop / infinite resistance (OL / ∞)	 Record on warranty log prior to thermostat hookup.  Pro Tip: Connect a Circuit Check™ continuity alarm tool during the tiling process for real-time wire damage detection.

② Quick Diagnostic Flowchart — Symptom → Root Cause → Solution

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GFCI Trips on Thermostat — Step-by-Step Troubleshooting

1

Reset the GFCI

Press the **RESET button** on the thermostat unit. If it holds, monitor for recurrence. If it trips again immediately, continue to Step 2.

2

Check the Breaker

Is the thermostat also wired to a **GFCI breaker** at the panel (double GFCI protection)?

- **Yes** → Swap that breaker for a **standard (non-GFCI) breaker** — the two GFCI devices are likely conflicting and causing nuisance trips.
- **No** → Continue to Step 3.

3

Check the Circuit

Is this circuit shared with anything else — another thermostat, a fan, lights, etc.?

- **Yes** → Move the electric floor heating to its own **dedicated circuit/breaker**.
- **No** → Continue to Step 4.

4

Test Heating Cable/Mat Resistance AND Insulation

Measure **core-to-core ohms** at the thermostat or junction box and compare to the label value ($\pm 15\%$ tolerance).

THEN — critically — test core-to-ground:

Any continuity reading (not OL/ ∞) indicates a ground fault in the mat/cable.

 **Isolation Test:** Disconnect the heating mat load wires from the thermostat base. If the thermostat GFCI now resets and holds, the ground fault is confirmed in the heating mat/wiring — NOT the thermostat.

Results:

- **Core-to-core within tolerance + core-to-ground = OL/ ∞ + GFCI still trips with load disconnected** → Thermostat is likely faulty — **replace the thermostat**.
- **Core-to-core out of tolerance / open / shorted** → Heating element has failed — **replace or repair the mat/cable**.
- **Core-to-ground shows any continuity (ground fault)** → Ground fault in mat/cable — **replace or repair the mat/cable**. Do NOT assume the thermostat is faulty.

③ Floor Sensor Testing & Placement — Critical Pre-Tile Checklist



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The floor sensor probe is the thermostat's eyes. A faulty or misplaced sensor is one of the most common causes of a newly tiled floor that won't heat — displaying errors like E1 / E2 or heating uncontrollably.

Check	How to Test	Acceptable Reading	Action if Out of Range
Sensor Resistance — Before Tile	Set multimeter to 20kΩ range. Measure resistance across the two sensor leads.	~8kΩ–12kΩ depending on ambient room temp. Target: ~10kΩ at 77°F / 25°C (WarmlyYours standard 10k sensor)	⚠️ Replace sensor before tiling if reading is open (OL), shorted (0Ω), or far outside range.
Sensor Resistance — At Final Hookup	Repeat multimeter test at thermostat terminals before powering up.	Same as above. Slight variation acceptable due to temperature change.	⚠️ If reading has changed dramatically, sensor may have been damaged during tiling. Switch to backup sensor.
Sensor Placement	Visual inspection before mortar is applied.	Centered between two parallel heating wire runs. At least 12–18 inches into the heated area. Not overlapping or touching any heating wire.	⚠️ Reposition before tiling. Incorrect placement causes the thermostat to misread floor temp — leading to overheating or underheating.
Backup Sensor Installed	Confirm second sensor probe is embedded in floor alongside primary, with wires routed to electrical box.	Backup sensor reads same range as primary. Wires labeled and tucked dead in box.	✅ If primary sensor fails post-tile, switching to backup takes 2 minutes — not a tile tearout.

④ The 8 Job-Site Commandments for Radiant Tile

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1 Test the Circuit — Before, During, and After

Test the heating roll(s) before, during, and after the installation. A digital meter is strongly recommended because of the precise measurements needed.

2 Never Staple, Pierce, or Nick the Heating Element

Staples should never cross, pierce, or nick the heating element. NEVER staple across or on top of the wires.

3 Never Cut or Shorten the Heating Element

The key to the system is the uninterrupted flow of electricity through the heating element. Never cut the heating element.

4 Respect Spacing — No Overlaps, No Crossing Runs

Minimum 3 in. spacing between adjacent heating cables.

5 Fully Embed and Protect the Heating Element and Factory Splice

Both the factory splices and the heating element must be completely embedded in thinset or self-leveling underlayment.

6 Install a Backup Floor Sensor

Always embed a secondary (backup) sensor probe into the floor alongside the primary sensor, centered between two parallel heating wire runs. Leave the backup sensor wires tucked dead in the electrical box. If the primary sensor fails after tile is set, switching to the backup takes 2 minutes — not a tile tearout.

7 Respect Buffer Clearances & Permanent Fixtures

Never install heating cable under permanent fixtures (vanities, cabinets, tubs, toilets). Maintain 6 inches away from the toilet wax ring flange and 2–4 inches away from walls and the perimeter.

8 Allow Full Mortar Cure Before Powering Up

Do NOT power the system to full heat immediately after tiling. Mortar and grout must fully cure — typically 7 to 28 days per manufacturer specs. Turning on heat prematurely causes mortar to dry out, crumble, and debond the tile.