



Nuheat Cable

ELECTRIC FLOOR HEATING SYSTEMS

INSTALLATION GUIDE



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1.1 INSTALLATION GUIDELINES

- The installation of this heating product shall be in accordance with the manufacturer's instructions and in accordance with the Canadian Electrical Code Part 1 or the National Electrical Code (US) whichever is applicable, and as permitted by the Authority Having Jurisdiction (AHJ).
- This equipment shall be installed only by qualified personnel who are familiar with the construction and operation of the apparatus and risks involved.
- Caution should be taken to guard against risk of electric shock, fire and bodily injury during the installation of this equipment.
- Nuheat Cable should be connected to a dedicated electrical circuit.
- It is mandatory to install a Class "A" GFCI or GFCI circuit breaker with each Nuheat installation. Nuheat thermostats are equipped with Class "A" GFCI protection.
- De-energize power circuits before installation or servicing.
- DO NOT USE sharp tools or power tools to clean grout lines.
- Nuheat Cable Guides and Nuheat Membrane are the only accessories approved to secure Nuheat Cable onto the subfloor.
- Indicate on the electrical panel which circuit is used for the Nuheat Cable System.
- Subfloor must be prepared in accordance with ANSI specifications.
- Nuheat Cable cannot be overlapped, crossed, cut, shortened or modified.
- Entire heating portion of Nuheat Cable & mechanical joint must be secured to the floor and covered with self-leveling compound or thinset mortar.
- Do not install Nuheat Cable in direct contact with any combustible surfaces and do not install in / on / under walls or in closets.
- For concrete slab subfloors, we recommend insulating the slab prior to installing Nuheat Cable. Insulation will improve the upward heat transfer from the cable to the flooring surface.
- The Nuheat Cable System should never be installed over an expansion joint.
- The ambient air temperature must be above 10°C or 50°F when the Nuheat Cable System is installed.
- Nuheat Cable must not extend beyond the room or area in which it originates.
-  Cable is intended for indoor embedded floor heating applications (-X) as well as in general use and wet locations (-W) in Canada and US.
- Minimum spacing between cable runs for 12 watts/sq ft is 3".
For 15 watts/sq ft, spacing between cable runs must alternate 3"/2".
- If installing Nuheat Cable with Nuheat Membrane, minimum spacing between heating cable runs is 2.5" (64mm) or two pillars of the Nuheat Membrane.
- The minimum bending radius of the heating cable is 0.5" (12mm).
- Keep ends of heating devices & kit components dry before and during installation.
- The sheath of this device shall not be utilized as a grounding conductor, but must be bonded to the ground.
- Nuheat Cable is not for installation in pool and spa areas, nor outdoor use.
- Do not place objects directly on top of the floor that could impede/trap heat emanating from the floor heating system including but not limited to flush-to-floor furniture, rubber or memory foam mats, and mattresses. These objects could cause unsafe temperatures to be reached underneath these objects which may cause damage to the object and/or the flooring material.

1.2 BEFORE YOU START

1.21 HEATING CABLE COMPONENTS

Nuheat Cable is comprised of:

Heating Cable (red)

The longest portion of Nuheat Cable, this segment of Nuheat Cable is strung onto the subfloor and generates the heat underneath your surface covering.

Cold Lead (black)

The non-heating segment of Nuheat Cable that will run inside the wall cavity to connect to the thermostat. The cold lead is 11' long.

Mechanical Joint (black)

The connection joint between the heating cable and the cold lead. The mechanical joint is thicker than the cold lead.

1.22 TOOLS

- Ohmmeter (or multimeter)
- Hot glue gun (if using hot glue to secure Nuheat Cable Guides)
- Tools to create a groove in the subfloor (chisel or drill)
- Hammer/Screwdriver

1.23 MATERIALS

- Protective plate
- Duct tape
- Industrial-grade hot glue (if using hot glue to secure Nuheat Cable Guides)
- Staples, nails or #6 - 1/2" screws (if using these methods to secure Nuheat Cable Guides)
- Thermostat probe (if installing a floor sensing thermostat)

1.24 FLOOR COVERING OPTIONS

The total combined R-values of all floor covering layers installed over Nuheat Cable must not exceed R 1.5 for 12 watts/sq ft and R1 for 15 watts/sq ft. Check with the floor covering manufacturer for product-specific R-value ratings.

1.3 INSULATION & RESISTANCE TESTS

If insulation or resistance tests do not pass the requirements at any point of the installation, halt installation immediately and contact Nuheat Technical Services at 1.800.778.WARM(9276).

1.31 INSULATION TEST

To ensure cable is fully insulated:

- Acquire a digital ohmmeter (or multimeter) with alligator clips or equivalent testing device. Set the ohmmeter to the appropriate setting.
- Place one probe clip on the metal braid wire (ground). Place the other probe clip on the yellow/white wire (red wire for 240 V).
- Confirm the reading is OL or infinity (open circuit).
- Repeat these steps to check the reading between the metal braid wire (ground) and the black wire.

1.32 RESISTANCE TEST

To ensure continuity in cable:

- Acquire a digital ohmmeter (or multimeter) with alligator clips or equivalent testing device. Set the ohmmeter to the appropriate setting.
- Place one probe clip on the black wire. Place the other probe clip on the yellow/white wire (red wire for 240 V).
- Confirm ohm reading is within +10% / - 5% of the factory reading listed on the cable tag. Record the readings in the table on page 7.
- If installing a Nuheat floor-sensing thermostat, test the sensor probe. Set resistance range to 20KΩ. Probe wires should read between 8K –12K ohms.



Nuheat Cable must be tested before, during and after installation to validate the warranty.

1.4 INSULATION & RESISTANCE TABLE

1.41 RESISTANCE TABLE

Record the resistance readings in the table below. For warranty purposes, the resistance table must remain with the end user.

NUHEAT CABLE RESISTANCE TABLE	
CABLE MODEL NUMBER	
FACTORY MEASURED RESISTANCE	
RESISTANCE TEST OHMS READING (BEFORE INSTALLATION)	
RESISTANCE TEST OHMS READING (DURING INSTALLATION)	
RESISTANCE TEST OHMS READING (AFTER INSTALLATION)	

Failure to record resistance tests in the above table will void the Nuheat Cable System warranty. To submit your warranty, visit www.nuheat.com/warranty and fill out the online warranty card.

2.1 INSTALLATION: PLANNING

2.11 INSTALLATION LAYOUT PLAN

Nuheat Cable may be installed 1" to 6" away from walls and/or fixed furniture, depending on the square footage of the heated area.

It is VERY IMPORTANT to plan the Nuheat Cable installation before securing any part of the floor heating system to the subfloor.

- Using grid paper, draw a sketch of the room, complete with perimeter dimensions. This sketch will become the Installation Layout Plan and be referenced throughout the installation process.
- Indicate the location and dimensions of counters, fixed furniture or other areas under which Nuheat Cable cannot be installed.
- Indicate the location and dimensions of toilet drains, heating vents or other heating appliances. Nuheat Cable should not be installed closer than 6" from the center of toilet drains, or under the footing of the toilet.
- Indicate the thermostat location on the Installation Layout Plan. The thermostat indicates the mechanical joint location and the start of the heating cable.
- Draw the Nuheat Cable Guides on the Installation Layout Plan. Guides should generally be installed along the floor of two opposing walls.*



To accommodate curved or angled walls and obstructions, Nuheat Cable Guides may be cut into smaller pieces before being secured to the subfloor. See Figure 2.15.*



Each Nuheat Cable Guide is 12" long.*

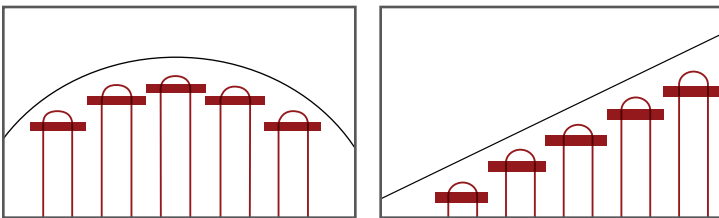


FIGURE 2.15: Curved or angled cable guide installation

*Not applicable if installing Nuheat Cable with Nuheat Membrane.

2.1 INSTALLATION : PLANNING

2.11 INSTALLATION LAYOUT PLAN CONT...

6. Draw the cable runs on the Installation Layout Plan. See Figure 2.16.

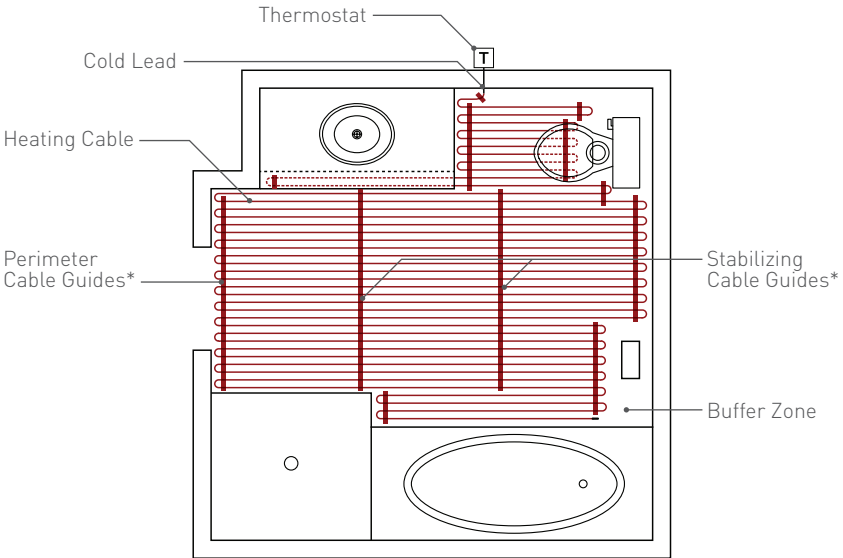


FIGURE 2.16: Installation Layout Plan Example

7. During installation, additional "Stabilizing Cable Guides" must be inserted at 3' (ft) to 4' (ft) intervals. Determine the location of these additional guides and draw them on the Installation Layout Plan. See Figure 2.16.*
8. Predicting where the cable will end is difficult. As such, it's important to include a "Buffer Zone" in the Installation Layout Plan; an area where heating is not essential (e.g. behind the toilet, behind a door, or any other low traffic area). This "Buffer Zone" can be used to accommodate any excess cable or remain unheated if cable is needed elsewhere. See Figure 2.16.

Identify a "Buffer Zone" on the Installation Layout Plan.



Conduct insulation and resistance tests and record the resistance readings on page 7.

*Not applicable if installing Nuheat Cable with Nuheat Membrane.

2.2 INSTALLATION: CABLE & GUIDES

2.21 INSTALLING THE CABLE

If installing Nuheat Cable in Nuheat Membrane, please refer to installation steps in section 2.8.

1. Create a hole/notch in the wall sill plate below the thermostat electrical connection box to allow the cold lead to be routed to the electrical box.
2. If necessary, create a small groove on the subfloor to accommodate the mechanical joint and/or cold lead (approximately ¼" deep). The groove should be as close to the sill plate hole as possible.
3. Secure the mechanical joint to subfloor with duct tape or hot glue.



FIGURE 2.23: Secure the cold lead to the subfloor

4. Secure excess cold lead to the subfloor using industrial-grade hot glue.



Ensure the glue-gun tip does not touch any portion of the cold lead or heating cable.

5. Nuheat Cable Guides are designed to snap together. See Figure 2.25. Use hot glue, staples, nails or #6 - ½" screws to secure the Nuheat Cable Guides to the subfloor per the Installation Layout Plan. If using screws/nails/staples, use 3 to 4 screws/nails/staples per Nuheat Cable Guide.

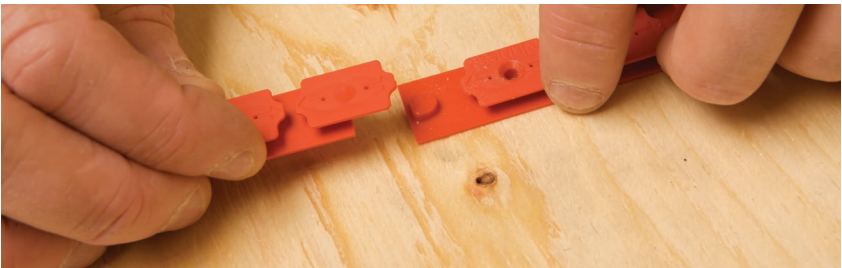


FIGURE 2.25: Snap together Nuheat Cable Guides

2.2 INSTALLATION: CABLE & GUIDES

2.21 INSTALLING THE CABLE CONT...

6. Install Nuheat Cable according to the Installation Layout Plan.



Individual runs of Nuheat Cable should be spaced 3" apart for 12 watts/sq ft. For 15 watts/sq ft, alternate spacing 3"/2". Nuheat Cable Guide anvils are 1" wide.



FIGURE 2.26: Install the heating cable

7. Ensure individual cable runs maintains moderate tension. This will prevent the cable from floating during the floor covering preparation.



FIGURE 2.27: Install the heating cable

2.2 INSTALLATION: CABLE & GUIDES

2.21 INSTALLING THE CABLE CONT...

- Use duct tape, hot glue or a Nuheat Cable Guide to secure the end seal of the heating cable to the subfloor.



FIGURE 2.28: Secure the end seal

- Install "Stabilizing Cable Guides" per the Installation Layout Plan. These additional "Stabilizing Cable Guides" will ensure the heating cables does not float during the self-levelling process.



To make installation of the "Stabilizing Cable Guides" easier, flip the cable guide upside down to smoothly pass underneath the cable runs. Then flip the guides over to secure them to the subfloor and snap the cables into place.



FIGURE 2.29: Install stabilizing guides



Conduct insulation and resistance tests and record the resistance readings on page 7.

2.3 INSTALLATION: THERMOSTAT PROBE

2.31 INSTALLING THE FLOOR-SENSING PROBE

Thermostat installation instructions are included with each Nuheat floor-sensing thermostat. To ensure full functionality of the floor-sensing thermostat, it is vital to install the floor-sensing probe at this point in the installation.

1. Secure the tip of the floor-sensing probe to the subfloor using duct tape.

When choosing where to install the probe, ensure:

- The probe is away from excess temperature swings (i.e. direct sunlight, drafts, areas covered by rugs or fixed furniture).
- The probe is installed a minimum of 12" into the heated area.
- The probe is centered between two runs of heating cable without touching any portion of the heating cable.

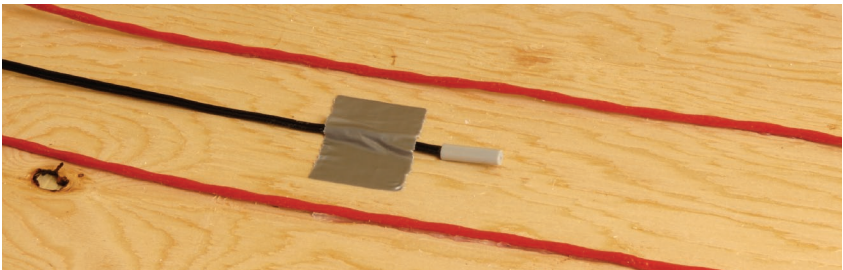


FIGURE 2.31: Secure the floor-sensing probe

2. Route the thermostat probe through the sill plate hole and up to the thermostat electrical box. As per electrical code, the sensor probe can run up the wall with the cold lead but must enter through the front of the electrical box connect to the thermostat.



Perform a visual inspection of the cable. If the cable appears to be damaged or defective, halt installation immediately and contact the Nuheat Technical Services Team at 1.800.778.WARM[9276].

2.4 INSTALLATION: SELF-LEVELER

2.41 FLOOR PREPARATION: SELF-LEVELING METHOD

[Recommended Method]

1. Prepare the subfloor and self-levelling compound as per manufacturer's instructions.
2. Pour the self-leveling compound over the heating cable and guides. Use a scraper or flat trowel to spread the self-leveling compound. The heating cable should be completely covered with only the top of the guides showing.



FIGURE 2.42: Self-leveling compound method

3. Allow the self-leveling compound to set as per manufacturer's instructions.
 - ⚠ Conduct insulation and resistance tests and record the resistance reading on page 7.
4. Proceed with laying the floor covering as per the manufacturer's instructions.
 - ⚠ Before activating Nuheat, allow setting material (self-leveling/thinset mortar compound and grout) to cure according to manufacturer's instructions (usually 72 hours to one week).

2.5 INSTALLATION: THINSET MORTAR

2.51 FLOOR PREPARATION: THINSET MORTAR METHOD

1. Prepare the thinset mortar as per manufacturer's instructions.
2. Use a flat trowel at a 45° angle (following the same direction as the cable) to spread a thin layer of thinset mortar over the cable and guides. The heating cable should be completely covered with only the top of the guides showing.




FIGURE 2.52: Thinset mortar method

3. Allow the thinset mortar to set as per manufacturer's instructions.
 - ⚠ Conduct insulation and resistance tests and record the resistance reading on page 7.
4. Proceed with laying the floor covering as per manufacturer's instructions.
 - ⚠ Before activating Nuheat, allow setting material (self-leveling/thinset mortar compound and grout) to cure according to manufacturer's instructions (usually 72 hours to one week).

2.6 INSTALLATION: DIRECT METHOD


2.61 FLOOR PREPARATION: DIRECT METHOD

 Tile/Stone installations only.


1. Prepare the thinset mortar as per manufacturer's instructions.
2. Use a minimum 3/8" x 3/8" square-notched trowel to spread a thin layer of thinset mortar over the Cable (following the same direction as the cable).



FIGURE 2.62: Direct method

 Conduct insulation and resistance tests and record the resistance reading on page 7.

3. To ensure each tile has adequate adherence to the subfloor, apply a layer of thinset mortar to the backside of the tile (back-buttering). Lay the tile directly on the thinset mortar and firmly press down on the tile. This technique has a high level of difficulty and is not recommended for inexperienced tile installers.

 Before activating Nuheat, allow setting material (self-leveling/thinset mortar compound and grout) to cure according to manufacturer's instructions (usually 72 hours to one week).

2.7 INSTALLATION: WET ENVIRONMENT

2.71 FLOOR PREPARATION: WET ENVIRONMENT

Nuheat Cable may be installed in wet environments such as shower beds or saunas*. Nuheat Cable must be installed on top of the mortar bed/dry pack before the installation of the tile/stone.

1. After the mortar bed has fully set, use hot glue to secure Nuheat Cable Guides onto the mortar bed.
2. Install the Nuheat Cable. Ensure the heating cable maintains a moderate tension throughout.
3. Conduct insulation and resistance tests and record the resistance reading on page 7.

* Installations must be in accordance with the Canadian Electrical Code Part 1 or the National Electrical Code (US) whichever is applicable.

2.7 INSTALLATION: WET ENVIRONMENT

2.71 FLOOR PREPARATION: WET ENVIRONMENT CONT...

4. Due to the slope of the mortar bed, the cable will become suspended above certain areas of the shower floor. Use Nuheat Cable Guides to hold the cable onto the mortar bed, ensuring it follows the contours of the slope.



Do not allow the tip of the hot glue gun to touch the cable as it may cause damage.

5. Use the Thinset Mortar Method (refer to page 15) to prepare the floor.

6. Install flooring as per manufacturer's instructions.

2.8 INSTALLATION: NUHEAT MEMBRANE

2.81 INSTALLING THE MEMBRANE

Refer to the Nuheat Membrane Installation Manual for methods to secure the membrane to the subfloor.

2.82 INSTALLING THE HEATING CABLE

1. Create a hole/notch in the wall sill plate below the thermostat electrical connection box to allow the cold lead to be routed to the electrical box.
2. If necessary, create a small groove in the membrane to accommodate the mechanical joint and/or cold lead (approximately ¼" deep). The groove should be as close to the sill plate hole as possible.
3. Snap/Secure the mechanical joint/splice connection of the heating cable into the channels in the membrane using duct tape or hot glue.
4. Snap/Secure the heating cable around the pillars of the membrane. Ensure there is a minimum of two pillars of the membrane between two runs of heating cable (2.5" or 64mm).
5. Ensure individual cable runs maintains moderate tension. This will prevent the cable from floating during the floor covering preparation. If necessary, use tape, hot glue, or rubber fasteners to secure the heating cable to the membrane.
6. Use tape or hot glue to secure the end seal of the heating cable to the membrane.

2.8 INSTALLATION: NUHEAT MEMBRANE

2.83 INSTALLING THE FLOOR SENSOR PROBE

Thermostat installation instructions are included with each floor-sensing thermostat. To ensure full functionality of the floor-sensing thermostat, it is vital to install the floor-sensing probe at this point in the installation.

1. Using an ohmmeter (or multimeter), test floor-sensing probe.
Set resistance range to 20K Ω . Probe wires should read between 8K - 12K ohms.
2. Secure the tip of the floor-sensing probe to the membrane using duct tape. When choosing where to install the probe, ensure:
 - a. The probe is away from excess temperature swings (i.e. direct sunlight, drafts, areas covered by rugs or fixed furniture).
 - b. The probe is installed a minimum of 12" into the heated area.
 - c. The probe is centered between two runs of heating cable without touching any portion of the heating cable.
3. Route the thermostat probe through the sill plate hole and up to the thermostat electrical box. As per electrical code, the sensor probe can run up the wall with the cold lead but must enter through the front of the electrical box connect to the thermostat.

Perform a visual inspection of the cable. If the cable appears to be damaged or defective, halt installation immediately and contact the Nuheat Technical Services Team at 1.800.778.WARM(9276).

2.84 COVERING THE HEATING CABLE AND INSTALLING TILE

1. Refer to membrane installation instructions for appropriate thinset mortar to prepare.
2. Use a flat trowel at a 45° angle to spread a thin layer of thinset mortar over the cable and membrane. The heating cable should be completely covered with only the top of the membrane's pillars showing.
3. Conduct insulation and resistance tests and record the resistance reading and record the resistance reading on page 7.
4. Refer to membrane installation instructions for tile installation steps.

3.1 ELECTRICAL CONNECTIONS

3.11 ELECTRICAL CONNECTIONS

Electrical connections must be made by a certified electrician to validate the warranty.

All wiring must follow specifications set out in the Canadian Electrical Code Part 1 or the National Electrical Code (US) whichever is applicable and local electrical inspection regulations and authorities. Nuheat Cable should be connected to a dedicated electrical circuit. Nuheat Cable must be connected to the electrical service through a Class "A" Ground Fault Circuit Interrupter (GFCI) or a GFCI circuit breaker. The supply leads of the Nuheat Cable must be routed inside suitable conduit unless local electrical codes state otherwise. Check with the local authority having jurisdiction to determine requirements.

Refer to the thermostat installation instructions (included with thermostat) for complete wiring instructions. Thermostats should be installed at an appropriate height and in an accessible location in the same room that the thermostat is controlling.

All thermostats must be UL Listed and/or CSA C/US Approved devices.



A floor-sensing probe is included with each Nuheat thermostat.



Nuheat thermostats are equipped with Class "A" GFCI protection.

1. Pull the lead wires into the electrical connection box via a suitable conduit.



The electrical ratings label must be fixed to the cold lead and visible at the terminal junction box. Removing the label will automatically void the warranty.

2. Secure Nuheat Cable to the box connector hub and install a protective nail plate to cover the sill plate hole.

3. Connect the metal braid wire (ground) to the electrical box ground screw or ground copper conductor wire.

4. Attach the corresponding lead wires to the junction box using CSA Certified / UL Listed cable fittings. The 'line' wire is identified by yellow/white or red color. The Nuheat Cable System must be connected using minimum 14AWG supply conductors. Supply conductors shall be suitable for residential wiring according to local and national electrical codes.

4.1 THERMOSTATS



SIGNATURE THERMOSTAT

Wi-fi – Enabled Floor Heating Thermostat

- WiFi-enabled
- 3.5" Color touchscreen
- Energy usage monitor
- 7-day programmability
- Dual-voltage (120 V & 240 V)



HOME THERMOSTAT

Universal Floor Heating Thermostat

- 3.5" Color touchscreen
- Energy usage monitor
- 7-day programmability
- Dual-voltage (120 V & 240 V)



ELEMENT THERMOSTAT

Non-programmable Thermostat

- Manual temperature control
- Dual-voltage (120 V & 240 V)

4.2 WARRANTY INFORMATION



WARRANTY INFORMATION

Nuheat offers a 25-year Limited Product Warranty and/or 25-year Limited Total Care* Warranty when installed by a Certified PRO Installer.

The **online warranty registration form** must be completed at www.nuheat.com within thirty (30) days from the date of installation and kept by the homeowner, together with a copy of the commissioning report, relevant invoice, and photographs, showing the product(s) in their entirety after installation but before the installation of the flooring material.

*Total Care warranty is an upgrade of our standard product warranty and additionally covers repair or replacement of the Product and restoring the floor in its original state or, if not possible, to an equivalent standard, at no cost to the Buyer. In order to remedy the defect, Pentair must have access to 1m² (10 ft²) of the floor covering material.

For more information, please call: +1.800.778.WARM(9276)
or email: res.customer care@pentair.com.



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THERMAL BUILDING SOLUTIONS

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