



INSTALLATION GUIDE

nVent Nuheat Mat

Pre-built electric floor heating mat



NUHEAT

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1.1 PRODUCT OVERVIEW

Pre-built like an electric blanket, nVent NUHEAT Mat is an electric floor heating system that brings soothing heat to the following surfaces:

- Ceramic or porcelain tile
- Granite
- Marble
- Natural Stone
- Laminate/Engineered wood floors

NUHEAT Mat is a pre-built floor heating system meaning it does not require any on-site manipulation during installation. Thinset is applied to the subfloor, the pre-built NUHEAT Mat is pressed onto the thinset, and flooring can be installed immediately. NUHEAT Mat is compatible with all standard subfloor material and is only 1/8" thick and making it ideal for installations where minimal floor buildup is desired. The pre-built aspect of NUHEAT Mat guarantees even heat distribution as the heating wires are evenly spaced during production.

NUHEAT Mat is available in over 70 standard mat sizes (squares and rectangles of various dimensions) and are available off-the-shelf. A single standard mat can provide adequate floor heat coverage for most standard bathroom and living areas. Installers can also combine multiple standard mats to heat the desired area.

When full coverage cannot be achieved with NUHEAT standard mats (example: areas with curves, angles, or obstructions), NUHEAT custom mats are available to provide optimal coverage. Once area dimensions are submitted/confirmed, NUHEAT custom mats are manufactured in only three days and will fit the exact shape of the area indicated in the submitted drawings. Just like NUHEAT standard mats,

NUHEAT custom mats are pre-built thereby guaranteeing even heat distribution without cold spots. NUHEAT standard and custom mats are available in 120 V and 240 V and produces 12 watts per sq ft (up to 15 watts per sq ft when required/specified).

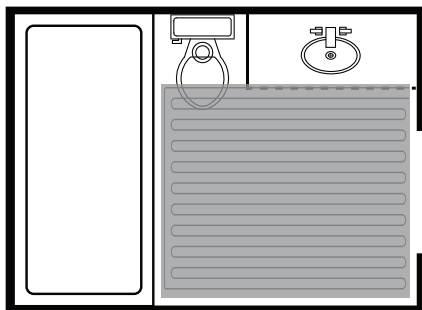
1.2 HOW TO ORDER

1.21 NUHEAT STANDARD MATS

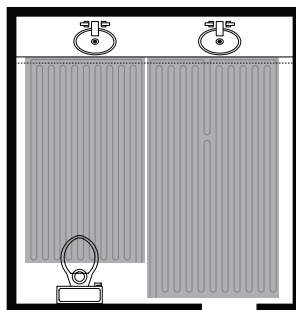
Step 1 – Determine perimeter dimensions

Step 2 – Refer to NUHEAT Standard Mat table to view available sizes. Determine if one or multiple standard mats can be used to cover the desired area.

Step 3 - Locate a NUHEAT distributor using 'Where To Buy' tool on www.nVent.com/NUHEAT.



Single Standard Mat

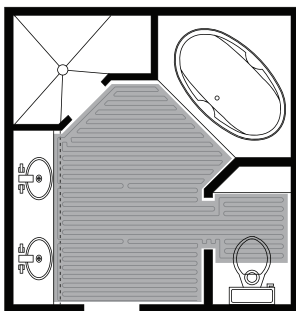


Multiple Standard Mats

1.22 NUHEAT CUSTOM MATS

If desired coverage cannot be obtained using one or a combination of standard mats, NUHEAT Custom Mats can provide the desired coverage for any area regardless of shape or size.

1. Provide an accurate drawing of the area including the full on-site perimeter dimensions, voltage, and desired thermostat location with all obstructions identified (vanities, toilets, vents, etc.). Please ensure that the installer or contractor contact information is provided in the event that we need to verify or confirm the dimensions.
2. Submit the drawing to NUHEAT Customer Care Team at res.customercare@nvent.com. NUHEAT Customer Care will provide a quote and AutoCAD drawing to confirm the submitted dimensions within 24 hours.
3. Once dimensions are accepted by the customer and payment is confirmed, the NUHEAT Custom Mat will be manufactured within three days and shipped to desired location.



Custom Mat

1.3 INSTALLATION GUIDELINES

First time installers should contact the Customer Care Team at 1.800.778.WARM(9276).

- 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.
- 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 Mat should be connected to a dedicated electrical circuit.
- It is mandatory to install a class "A" GFCI or GFCI circuit breaker with each NUHEAT Mat installation.

All NUHEAT thermostats come equipped with a built-in class "A" GFCI.

- Do not use sharp tools or power tools to clean grout lines. Cleaning grout lines with sharp tools or power tools may damage the NUHEAT Mat System and will void the NUHEAT warranty.
- Indicate on the electrical panel which circuit is used for the electric floor heating system.
- Subfloor must be prepared in accordance to ANSI specifications.
- NUHEAT Mat cannot be overlapped, crossed, cut, shortened or modified.
- The ambient air temperature must be above 10°C or 50°F when the NUHEAT Mat Floor Heating System is installed.
- For concrete slab subfloors, we recommend insulating the slab prior to installing NUHEAT Mat. Insulation will improve the upward heat transfer from the mat to the flooring surface and improve heat up time.

1.4 BEFORE YOU START

1.41 ASSEMBLE REQUIRED TOOLS

- Multimeter/Ohmmeter
- ¼" x ¼" square notched trowel
- Grouting float/lightweight roller
- Sponge
- Latex-modified thinset
- Thinset mixer
- Large bucket
- Duct tape
- Thermostat sensor probe (included with thermostat)



FIGURE 1.21: Assemble required tools

1.42 PRE-INSTALLATION GUIDELINES

Avoid the following activities that may damage the NUHEAT Mat:

- Connecting the mat to power when folded
- Stapling
- Nailing
- Folding, bending overlapping mats
- Using grout scrapers or utility knives to clean grout lines may damage the mat and void NUHEAT warranty.
- Clean grout lines with a sponge as you go.

1.43 DRY FIT AND ROUTE COLD LEAD PATH

Position NUHEAT Mat to fit contours of room. Route a path for the cold lead to the electrical box. The cold lead CANNOT cross over on top of the NUHEAT Mat. NUHEAT Standard Mats can be flipped in any direction to place cold leads closer to thermostat location.

1.5 INSULATION & RESISTANCE TESTS

If insulation or resistance tests do not pass the requirements at any point of the installation, halt installation immediately and contact Customer Care at 1.800.778.WARM(9276) or email res.customercare@nvent.com.

1.51 INSULATION TEST

To ensure the heating wire is fully insulated:

1. With digital multimeter, set it to measure resistance/ohms. If using an ohmmeter, set it to the 200 ohm setting.
2. Place one multimeter clip on the metal braid wire (ground). Place the other multimeter clip on the white wire (red wire for 240 V NUHEAT Mats).
3. Confirm the reading on the multimeter/ohmmeter is OL or infinity (open circuit).
4. Repeat steps 2-3 to check the reading between the metal braid wire (ground) and the other wire (black).

1.52 RESISTANCE TEST

To ensure the heating wire is fully insulated:

1. With digital multimeter, set it to measure resistance/ohms. If using an ohmmeter, set it to the 200 ohm setting.
2. Place one multimeter clip on the white wire (red wire for 240 V NUHEAT Mats). Place the other multimeter clip on the black wire.
3. Confirm the reading on the multimeter/ohmmeter is within +10% / -5% of the factory resistance listed on the white tag that is attached to the cold lead. The white tag contains information including factory resistance readings, model number, manufacture date and amperage ratings.
4. Record the resistance test readings in the table on page 7.



NUHEAT Mat must be tested before, during and after installation to validate the warranty.

1.6 MAT RESISTANCE LOG

1.61 MAT RESISTANCE LOG

For warranty and troubleshooting purposes, the mat resistance log must be completed and remain with the end user.

MAT RESISTANCE LOG

Mat 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 warranty.
To submit your warranty, visit www.nvent.com/nuheat and fill out the online warranty card.

1.62 FLOOR SENSOR PROBE TEST

To ensure the floor sensor probe is not damaged:

1. With a digital multimeter (or ohmmeter), set the device to the 20K Ω (Kilohms) setting.
2. Place a multimeter clip on each of the wires. It does not matter which clip is attached to which wire. Some multimeters do not have the 20K Ω (Kilohms) setting. Find a suitable multimeter that has this setting.
3. Confirm the reading on the device is between 8-12K Ω (Kilohms) at room temperature.
4. If test readings do not pass requirements at any point of the installation, halt installation immediately and contact Customer Care at 1.800.778.WARM(9276) or email res.customercare@nvent.com.

2.1 SECURING MAT TO THE SUBFLOOR

2.11 SECURING MAT TO THE SUBFLOOR

1. Prepare thinset mixture.
2. Spread thinset onto subfloor.



Use $\frac{1}{4}$ " x $\frac{1}{4}$ " square notched trowel to spread $\frac{1}{4}$ " layer of acrylic/latex modified thinset onto subfloor. Work on one manageable section at a time.



FIGURE 2.12: Spread thinset onto subfloor

3. Place NUHEAT Mat onto fresh thinset.



FIGURE 2.13: Place mat onto fresh thinset

4. Press NUHEAT Mat into thinset.



Press NUHEAT Mat firmly into thinset with grout float or lightweight roller. Create 100% contact between NUHEAT Mat, thinset and subfloor. Press out air bubbles underneath mat. Route cold lead(s) to electrical box.

2.1 SECURING MAT TO THE SUBFLOOR

2.11 SECURING MAT TO THE SUBFLOOR (CONTINUED)

5. Perform insulation and resistance test on page 6.

6. Secure floor sensor probe.



Duct tape the floor sensor probe on top of the NUHEAT Mat. The probe's tip should be between the heating wires. Ensure the probe's tip is located in an area that can represent the overall floor temperature and away from other heating/cooling sources (ie. heat ducts vents, direct sunlight, drafts caused by large windows/doors, areas covered by rugs or fixed furniture). The probe wire can cross on top of the heating wire(s).



FIGURE 2.16: Secure floor sensor probe

2.2 INSTALL FLOORING - TILE & STONE

2.2.1 INSTALL FLOORING - TILE & STONE

1. Apply thin layer of thinset.



Use ¼" x ¼" square notched trowel to spread minimum ¼" layer of acrylic/latex modified thinset on top of NUHEAT Mat as per manufacturer's instructions.



FIGURE 2.21: Install tile/stone flooring

2. Install tile/stone as per manufacturer's instructions.

3. Clean grout lines.



Do not use sharp tools or power tools to clean grout lines; doing so may damage NUHEAT Mat.



FIGURE 2.23: Clean grout lines

4. Perform insulation and resistance test on page 6.

5. Make electrical connections.



Before activating NUHEAT Mat, ensure setting compound has fully cured. Refer to setting compound manufacturer's specifications for cure times. Installation of NUHEAT Mat is now complete.

2.3 INSTALL FLOORING - LAMINATE/ ENGINEERED WOOD

2.31 INSTALL FLOORING - LAMINATE/ENGINEERED WOOD

1. Apply smooth layer of thinset.



Use smooth trowel to spread minimum ¼" layer of acrylic/latex modified thinset on top of NUHEAT Mat. Ensure thinset layer is level and smooth. Self-leveling compounds may also be used. Allow thinset or self-leveller to cure as per manufacturer's instructions.

2. Perform insulation and resistance test on page 6.

3. Install laminate/engineered wood flooring.



Install vapor barrier, if applicable, and underlay as per manufacturer's instructions. Install laminate/engineered wood floor as per manufacturer's instructions.

4. Make electrical connections.



Before activating NUHEAT Mat, ensure setting compound has fully cured. Refer to setting compound manufacturer's specifications for cure times. Installation of NUHEAT Mat is now complete.

3.1 ELECTRICAL CONNECTIONS

3.11 ELECTRICAL CONNECTIONS

1. Connect the tin plated copper ground braid/wire of the NUHEAT Mat to the ground screw or ground conductor inside the electrical box using approved wire connectors.
2. Attach corresponding lead wires to electrical box using CSA Certified/UL Listed cable fittings. Make electrical connection only after flooring is complete.
3. NUHEAT Mat must be connected to minimum 14AWG supply conductors.
Supply conductors shall be suitable for residential wiring according to local and national electrical code.

When controlling multiple mats with one thermostat, all mats may be connected directly to the thermostat provided the total amperage does not exceed the 15-amp maximum load of the NUHEAT thermostat. Alternatively, the mat cold leads can be run to a separate electrical box and connected to the NUHEAT thermostat using suitable electrical house wiring. Consult with your electrician to determine the best method for your installation.

In all cases, ensure the electrical box can easily fit all of the connections.



Risk of electric shock and fire. Damage to supply conductor insulation may occur if conductors are routed less than 2" (51mm) from heating wire. Refer to installation instructions for recommended means of routing supply conductors.

4. Affix supplied orange label to panel board beside appropriate circuit indicating branch circuit supplying power to NUHEAT Mat.
5. Affix the supplied "Concealed Area Warning" label to adjacent points of access to concealed areas in which installed heating products are accessible.
6. Affix the supplied "Radiant Floor Heating" sticker to the room control for the NUHEAT Floor Heating System.

3.1 ELECTRICAL CONNECTIONS

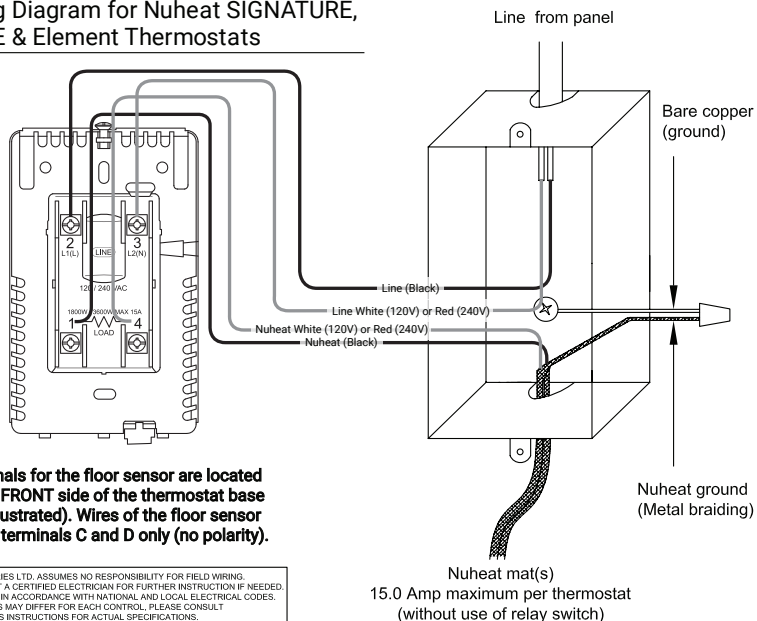
3.11 ELECTRICAL CONNECTIONS (CONTINUED)

All wiring must follow specifications set out in Part 1 of Canadian Electrical Code, or Article 424 of the National Electrical Code ANSI/ NFPA 70, or whichever is applicable to local electrical inspection regulations and authorities. All nVent NUHEAT thermostats are equipped with built-in Class "A" GFCI protection. If NUHEAT Mat is connected directly to a NUHEAT thermostat, a non-GFCI equipped breaker should be used. If the NUHEAT Mat is controlling an external relay for a separate circuit, it is mandatory to install a Class "A" GFCI or GFCI circuit breaker for the external/separate circuit.

The cold leads of NUHEAT Mat may need to be routed inside suitable conduit according to local electrical codes. Check with the local authority having jurisdiction to determine requirements.

 NEC/CEC rules state that the cold lead tag must remain on the cold lead. The tag contains critical information necessary for testing, warranty and troubleshooting purposes. Do not remove the tag for any reason.

Wiring Diagram for Nuheat SIGNATURE, HOME & Element Thermostats



3.2 ELECTRICAL GUIDELINES

3.21 ELECTRICAL 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 (USA), whichever is applicable.
- 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 electric shock, fire and bodily injury during the installation of this equipment.
- De-energize power circuits before installation or servicing.
- NUHEAT Mat should not be connected to power until the NUHEAT Mat is fully installed and covered by flooring material.
- Subfloor must be prepared in accordance with ANSI specifications.
- The heating portion of the NUHEAT Mat shall not touch, cross over, or overlap itself.
- Do not install NUHEAT Mat in direct contact with or within 0.25" (6.5mm) of any combustible surfaces or materials (excluding wood-based substrates).
- The minimum bending radius of the cold lead is 2" (51mm) and heating wire is 0.625" (16mm).
- The ambient temperature must be above 10°C or 50°F when NUHEAT Mat is installed.
- As per National Electrical Code (US) and Canadian Electrical Code (CAN), NUHEAT Mat must be installed on a dedicated circuit for heating appliances/devices (additional NUHEAT Mats, baseboard heaters, electric fireplaces, etc.).
- NUHEAT Mat is designed for indoor floor heating applications in general use (-X) in US and Canada and in wet (-W) areas in Canada.
- Minimum distance of 1.5" (38.1mm) between adjacent heating devices.
- Total combined R-values of all floor coverings must not exceed R-2.5.
- NUHEAT Mat should not be altered.
- NUHEAT Mat 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.

3.22 TROUBLESHOOTING

Should you have any questions or difficulties installing or controlling your NUHEAT Mat, please consult our comprehensive troubleshooting FAQ section at www.nuheat.com or contact Customer Care directly at 1.800.778.WARM(9276) or email res.customer care@nvent.com.

4.1 WARRANTY INFORMATION



4.11 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 **nVent.com/NUHEAT** 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, nVent 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@nvent.com.

5.1 THERMOSTATS & CONTROLS



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)



MAT SENSE PRO ELECTRIC FAULT INDICATOR

The Mat Sense Pro is an electrical fault indicator that simultaneously monitors the hot neutral and ground wires during your NUHEAT Mat or NUHEAT Cable Installation. Use an electric fault indicator to ensure a correct NUHEAT Mat or Cable installation every time.

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Our powerful portfolio of brands:

CADDY ERICO HOFFMAN RAYCHEM SCHROFF TRACER



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