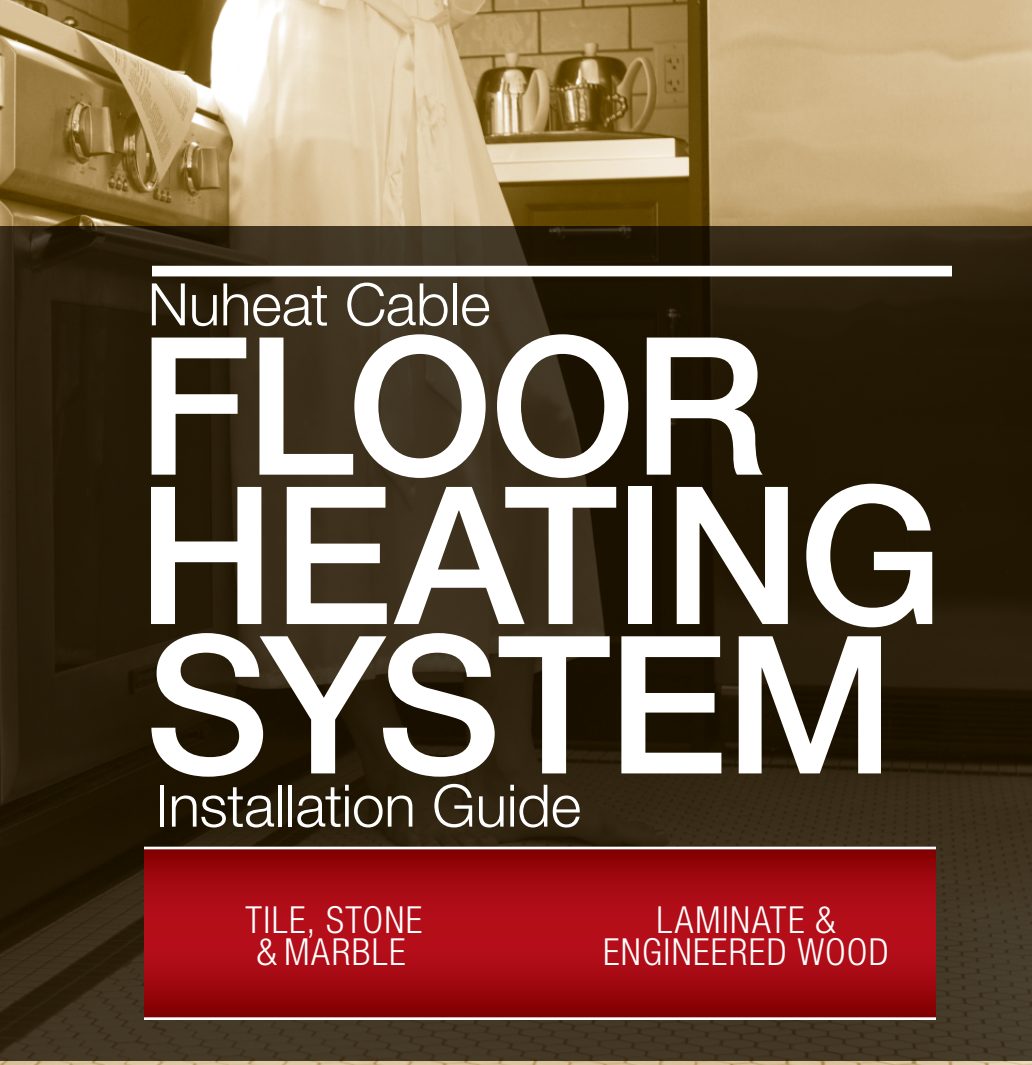

Nuheat Cable

FLOOR HEATING SYSTEM

Installation Guide

TILE, STONE & MARBLE

LAMINATE & ENGINEERED WOOD

Nuheat®

Nuheat Industries Limited
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Nuheat Cable
FLOOR HEATING SYSTEM

SECTION 1

1.1 INSTALLATION GUIDELINES

Nuheat Cable
FLOOR HEATING SYSTEM

SECTION 1

INSTALLATION PREPARATION

- 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 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's Cable Guides are the only devices 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.
- The entire heating portion of Nuheat Cable and the mechanical joint must be secured to the floor and covered with self-leveling compound or thinset mortar.
- Nuheat Cable should be spaced at least 0.5 inches (13mm) from any exposed combustible surface and should never be installed in/on/under walls or in closets.
- For concrete slab subfloors, Nuheat recommends 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 in the U.S., as well as in general use and wet locations (-W) in Canada.**

- Minimum spacing between heating cable run is 3".
- The minimum bending radius of the heating cable is 0.5" (12mm).
- Keep ends of heating devices and 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.

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

- Ohmeter (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 - ½" 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 2.5. 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 240V).
- 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 240V).
- 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.**

INSULATION & RESISTANCE TABLE 1.4

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 and fill out the online warranty card.

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.

1. 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. See Figure 2.17.
2. Indicate the location and dimensions of counters, fixed furniture or other areas under which Nuheat Cable cannot be installed.
3. Indicate the location and dimensions of toilet drains, heating vents or other heating appliances. Nuheat Cable should be installed a minimum of:
   a. 6" from the center of toilet drains
   b. 8" from heating vents or other heating appliances
4. Indicate the thermostat location on the *Installation Layout Plan*. The thermostat indicates the mechanical joint location and the start of the heating cable.
5. 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.**

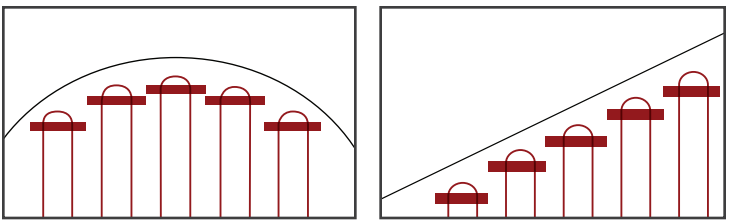

FIGURE 2.15: Curved or angled cable guide installation

2.11 INSTALLATION LAYOUT PLAN CONT...

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

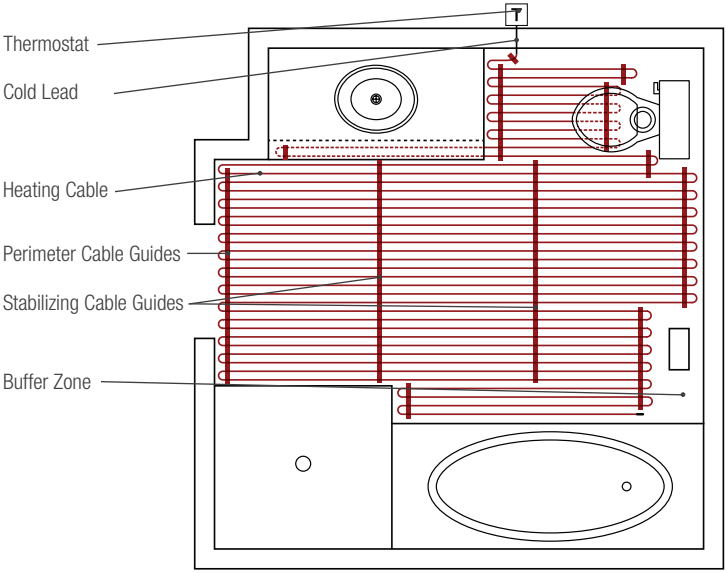

FIGURE 2.16: Installation Layout Plan Example

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.**

2.21 INSTALLING THE 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 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 the 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

2.21 INSTALLING THE CABLE CONT...

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

Individual runs of Nuheat Cable should be spaced 3" apart. Nuheat Cable Guide anvils are 1" wide. Ensure there are three (3) anvils between each cable run. See Figure 2.26.

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

2.21 INSTALLING THE CABLE CONT...

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

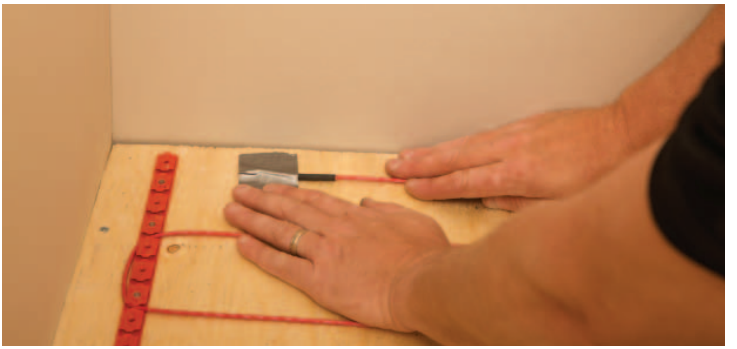

FIGURE 2.28: Secure the end seal

9. 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.**

2.31 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.

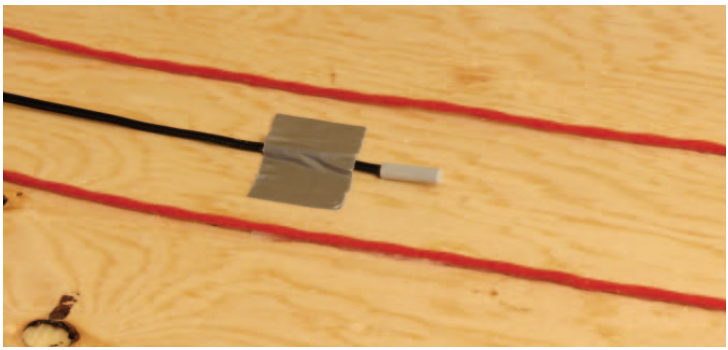

FIGURE 2.31: Secure the floor-sensing probe

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. Install vapor barrier, water proof membrane or underlay, if applicable, as per manufacturer's instructions and local building code requirements.

5. 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).**

2.51 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. Install vapor barrier, water proof membrane or underlay, if applicable, as per manufacturer's instructions and local building code requirements.

5. 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).**

2.61 FLOOR PREPARATION: DIRECT METHOD

⚠ **Tile/Stone installations only.**

1. Prepare the thinset mortar as per manufacturer's instructions.
2. Use a minimum ⅜" x ⅜" 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).**

2.71 FLOOR PREPARATION: WET ENVIRONMENT

Nuheat Cable may be installed in wet environments such as a 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.

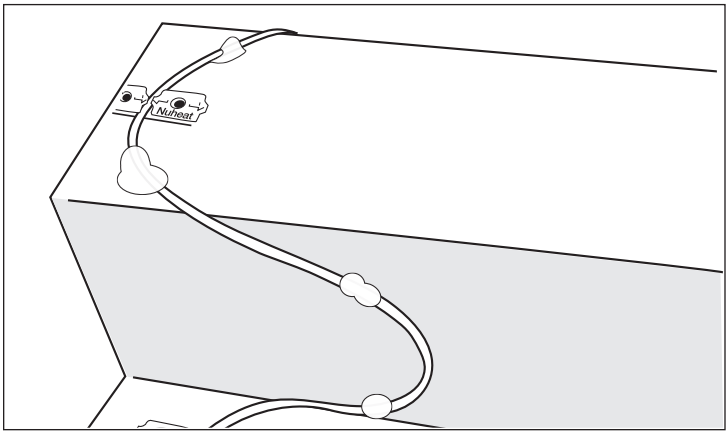

FIGURE 2.72: Running the cable over a curb/corner

3. To continue the heating cable up to the shower bench (if applicable), use hot glue to secure the heating cable onto the wall of the shower bench.

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

⚠ **To bring the cable over a curb/corner, use an "S" formation which will ease the tension on the heating cable. See Figure 2.72.**

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

2.71 FLOOR PREPARATION: WET ENVIRONMNET CONT...

4. Due to the slope of the mortar bed, the cable will become suspended above certain areas of the shower floor. Use hot glue to re-secure 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.

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 must be connected to the electrical service through a Class "A" Ground Fault Circuit Interrupter (GFCI) or a GFCI circuit breaker. All Nuheat thermostats come equipped with a built-in Class "A" GFCI. 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 thermostat(s) 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 WARRANTY INFORMATION

4.41 HOW TO CLAIM THIS WARRANTY

Contact Nuheat (referred to hereafter as the Company) to provide details relating to the nature of the defect, the installation and operation of the product and the date of purchase. After examination of the information provided, the Company may advise the owner to proceed as follows:

- Deliver or ship the product covered under the warranty to the dealer from whom it was originally purchased, the Company's local representative or, direct to Nuheat.
- A retail sales receipt or proof of purchase should accompany the product.
- Freight costs, if any, will be prepaid by the owner.

4.42 DISCLAIMER & EXCLUSIONS

The following items are not covered by this warranty:

- Any incidental or consequential damage.
- Any failure that results from an accident, abuse, neglect, or failure to operate or install the product in accordance with the instructions provided in the installation manual and by a qualified electrician.
- Costs of removal, freight, delivery and reinstallation of the Nuheat Cable System.
- The Nuheat Cable system is not warranted if used for purposes other than those they were designed to perform.

This warranty may not be transferred and is exclusively to the sole benefit of the original purchaser.

This warranty gives you specific legal rights and you may also have some legal rights which may vary from state to state or province to province. Nuheat Industries Limited hereby disclaims, and it is a condition of sale, that there are no implied warranties. Some states and provinces do not allow limitations on an implied warranty so the above limitations may not apply to you. British Columbia law applies to this warranty.

4.43 WARRANTY COVERAGE

Nuheat's warranty obligations are limited to the terms set forth below:

Nuheat Industries Limited warrants each Nuheat Cable System that it sells to be free from defects in material and workmanship effective on the date of the purchase of the Nuheat Cable System by the original purchaser. The warranty shall remain effective for a period of twenty-five (25) years from the date of original purchase of the Nuheat Cable System. The maximum liability of the company is limited to the cost of the original Nuheat Cable System multiplied by the percentage of the warranty period remaining.

Nuheat's obligations under this warranty are limited to, at its sole discretion, repairing or reimbursing the Nuheat Cable System originally supplied in the product that Nuheat has determined to be defective in materials and workmanship.

Nuheat shall repair or reimburse, at its sole and entire discretion, the defective Nuheat Cable System free of charge. Repair or replacement will only be made for defective parts; and no allowance or reimbursement shall be made for wages, labor and freight costs. Should Nuheat choose to reimburse the cost of the Nuheat Cable System, it will do so at the lesser of the value of the purchase price or the suggested retail price for the same item. Because of our ongoing commitment to product quality and innovation, Nuheat reserves the right, at any time and without incurring any obligations, to revise, change, modify, or discontinue any specifications, features, designs or components.

Nuheat®

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