

Warmup

The world's best-selling electric floor heating brand™
La marque de plancher chauffant la plus vendue au monde™

120V & 240V NADCM-C

Loose Cable Installation Manual

Manuel d'Installation du Câble pour Plancher Chauffant

IMPORTANT

Read this manual before attempting to install your Warmup heater. Incorrect installation could damage the heater and will invalidate the warranty.

IMPORTANT

Lisez ce manuel avant de commencer l'installation de la maille chauffante. Une mauvaise installation pourrait endommager le système chauffant et annuler la garantie.



Technical helpline:
Assistance Technique en ligne:
US: 1-888-927-6333
Canada: 1-888-592-7687

Contents

3	Before you Begin Product Information
4	Area Guide
5 - 6	Do's and Dont's
7	Heating Cable Specification
8	Heating Cable Selection Thermal Insulation Floor Coverings
9	Subfloor Preparation
10	Controlling Your System
11	Wiring Diagram 120V
12	Wiring Diagram 240V
13	Electrical Provisions
14	Testing the System
15	Planning your Installation Installing the Fixing Guides Spacing Guide
16	Heating Cable Installation
17	Installing the Floor Sensor Installing the Thermostat
18	Floor Coverings - Tile and Stone Carpet, Vinyl and Laminate flooring
19	Floor Coverings - Hardwood Flooring
20	Points to Remember Operating Tips
21	Troubleshooting
22	Notes
23	Control Card
24	Floor Plan
25	Warranty and Warranty Registration Form

ITEMS INCLUDED IN THE Warmup® KIT:

- NADCM-C Loose Heating Cable
- Installation Manual
- Fixing Strips not included in package (Sold separately)

ITEMS REQUIRED FOR SYSTEM INSTALLATION:

- A Warmup thermostat with an integrated Ground Fault Circuit Interrupter or separate GFCI breaker installed in the household panel
- Digital ohmmeter (multi-meter)
- Electrical housing boxes/switch plates
- Electrical conduit
- Adhesive or hot melt glue

If these instructions are followed you should not have any problems during installation. However, if you require assistance at any stage, please call our helpline :
US:1-888-927-6333 Canada:1-888-592-7687

Before you Begin

Thank you for purchasing the Warmup® NADCM-C Loose Heating Cable. This manual contains IMPORTANT information regarding the safe use and installation of your heating cable. Please read through the entire manual carefully before you install or use the product.

Double check your measurements and ensure that you have the correct heating cable for the area you wish to heat. The heating element **MUST NOT** be installed under appliances or permanent fixtures such as refrigerators, cabinets, tubs, vanity units etc.

If you are missing any items from the box or believe that you have the incorrect heaters to cover the area required, please call the helpline for further assistance.

Product Information

The Warmup heating Cable consists of:

A twin conductor resistance heating cable with a primary insulation of Fluoropolymer with high dielectric strength and high temperature properties. The conductors are covered by a ground braid providing additional mechanical strength and a ground path. A final outer jacket of PVC is given to make it sturdier and provide corrosion protection.

The heating cable is terminated at one end with a 10' cold lead. The conductor cores and ground braid are factory joined in a water resistant joint assembly to each supply conductor and ground conductor of the unheated lead. The heater is terminated at the other end with a smaller water resistant joint.

The unheated power connection lead (10ft) can be trimmed to your needs or extended using a suitable UL-approved wire. Always complete cable connections in a junction box. Do not leave excess wire in the wall. This must be carried out by a qualified electrician in accordance with local/state laws and guidelines. Inspect the entire heating cable for damage, this includes the factory made joint and end termination. If any parts are damaged contact the technical helpline.

The Warmup Heating Cable is  approved (File No. E303230).

Area Guide

Ensure that you have the correct heater wire for the area you wish to heat using the table below.

		Heated Area, ft ²			
		PRODUCT CODE	Cable Length ft	Loose laid cable w/spacers	
				3"	4"
120 Volt	NADCM-C-120-65	16.7	4	6	
	NADCM-C-120-130	33.1	8	11	
	NADCM-C-120-195	49.9	12	17	
	NADCM-C-120-260	66.3	17	22	
	NADCM-C-120-325	83.0	21	28	
	NADCM-C-120-390	99.4	25	33	
	NADCM-C-120-525	132.8	33	44	
	NADCM-C-120-655	166.0	42	55	
	NADCM-C-120-785	199.1	50	66	
	NADCM-C-120-920	232.2	58	77	
	NADCM-C-120-1050	265.4	66	88	
	NADCM-C-120-1180	298.5	75	100	
	NADCM-C-120-1315	331.6	83	111	
	NADCM-C-120-1445	364.7	91	122	
	NADCM-C-120-1575	397.9	99	133	
240 Volt	NADCM-C-240-325	83.0	21	28	
	NADCM-C-240-390	99.4	25	33	
	NADCM-C-240-525	132.8	33	44	
	NADCM-C-240-655	166.0	42	55	
	NADCM-C-240-785	199.1	50	66	
	NADCM-C-240-920	232.2	58	77	
	NADCM-C-240-1050	265.4	66	88	
	NADCM-C-240-1180	298.5	75	100	
	NADCM-C-240-1310	331.6	83	111	
	NADCM-C-240-1640	414.6	104	138	
	NADCM-C-240-1970	497.6	124	166	
	NADCM-C-240-2300	580.6	145	194	
	NADCM-C-240-2630	663.2	166	221	
	NADCM-C-240-2955	746.2	187	249	
	NADCM-C-240-3240	829.2	207	276	

Do's and...

- DO** carefully read this installation manual before commencing installation.
- DO** When loose laying the cable on the floor, maintain a consistent cable spacing of no less than 3" and no more than 4".
- DO** make sure all electrical work is done by qualified persons in accordance with local building and electrical codes, the National Electrical Code (NEC), especially article 424, Part V of the NEC, ANSI/NFPA 70, for the US and Canadian Electrical Code, Part 1, for Canada.
- DO** check the resistance of the heating cable before, during, and after installation to ensure that the heating cable has not been damaged. The value should match the rating label found on the product. A tolerance of +/- 5% is allowed.
- DO** ensure that the heating cable is connected to a Class A Ground Fault Circuit Interrupter(GFCI) at all times.
- DO** plan the heating system layout and installation so that any drilling after tiling (e.g. for fixtures such as vanity units, tubs) will not damage the wiring. Remember to keep a copy for future reference.
- DO** take some pictures before installing the floor covering for future reference.
- DO** ensure that the heating cable is separated from other heat sources such as luminaires and chimneys.
- DO** ensure that the minimum bending radius is no less than 1" (25mm) for the heating cable.
- DO** allow sufficient drying/curing of the subfloor before commencing installation of the heating cable.
- DO** ensure that each tile is solidly bedded in tile adhesive, with no gaps or voids beneath.
- DO** make sure that ALL heating cable including the joints are positioned under the final floor finish and completely embedded in thinset/adhesive.
- DO** remember to install the floor probe for the Warmup® thermostat. The floor sensor should be located in the centre of two heating element runs. Ensure that the sensor does not touch or cross over any of the heating cables.
- DO** ensure that you have electrical provisions to run the heating system at 120VAC /or 240VAC depending on the system being installed.
- DO** check the wattage and voltage of the heating cable to ensure you have the correct system for your application.
- DO** ensure that the cold tail conduit is kept separate from the sensor conduit.
- DO** remember to attach the rating labels included within this manual to the circuit breaker and thermostatics controls.

...Don't's

- DON'T** allow the heating cables on the mat to cross over or touch each other at any point as this can cause the cable to overheat. Always use the fixing strips to avoid this.
- DON'T** cut or shorten the heating cable at any time.
- DON'T** install the heating cables with any staples or other metal fixings that can damage the heating cable.
- DON'T** store tiles, sharp or heavy objects on any of the wiring while tiling or bang a trowel on the installation area to remove excess mortar from the trowel.
- DON'T** install the heating mat below 5°F (-15°C) ambient temperature.
- DON'T** attempt to bypass the GFCI if it trips and cannot be reset during normal operation. Consult a qualified electrician or call the helpline for further assistance.
- DON'T** install the heating element under permanent fixtures.
- DON'T** commence installation on a mud job/screed that has not been fully cured.
- DON'T** use the heating system until you have allowed sufficient drying period for the finished floor.
- DON'T** cover the cold lead joint or termination joint with tape when securing the subfloor. This may cause air pockets resulting in the joints overheating.
- DON'T** install the heating mat beyond the room or area in which they originate.
- DON'T** attempt to repair the heating cable if it becomes damaged. Call the technical helpline for further instructions.
- DON'T** allow the thermostat to exceed the maximum temperature for your final floor finish. Always check the maximum temperatures allowed with the floor covering manufacturer.
- DON'T** switch on the installed heating system until tile adhesive has fully cured (1 - 3 weeks minimum), check adhesive manufacturer's instructions.
- DON'T** install the cold leads closer than 2" from the heating cable on the mat.

Heating Cable Specification

Note: The heating cables spacing must be no less than 3" at all times. The maximum area loading **MUST NOT** exceed 15w/sq ft.

3.5" Spacing		120 Volt			
Area (ft ²)	Model	Length (ft)	Wattage (W)	Amps (A)	Resistance (Ω)
5	NADCM-C-120-65	16.7	65	0.5	221.5
10	NADCM-C-120-130	33.1	130	1.1	110.8
15	NADCM-C-120-195	49.9	195	1.6	73.8
20	NADCM-C-120-260	66.3	260	2.2	55.4
25	NADCM-C-120-325	83.0	325	2.7	44.3
30	NADCM-C-120-390	99.4	390	3.3	36.9
40	NADCM-C-120-525	132.8	525	4.4	27.4
50	NADCM-C-120-655	166.0	655	5.5	22.0
60	NADCM-C-120-785	199.1	785	6.5	18.3
70	NADCM-C-120-920	232.2	920	7.7	15.6
80	NADCM-C-120-1050	265.4	1050	8.8	13.7
90	NADCM-C-120-1180	298.5	1180	9.8	12.2
100	NADCM-C-120-1315	331.6	1315	11.0	11.0
110	NADCM-C-120-1445	364.7	1445	12.0	10.0
120	NADCM-C-120-1575	397.9	1575	13.1	9.1
3.5" Spacing		240 Volt			
Area (ft ²)	Model	Length (ft)	Wattage (W)	Amps (A)	Resistance (Ω)
25	NADCM-C-240-325	83.0	325	1.4	177.2
30	NADCM-C-240-390	99.4	390	1.6	147.7
40	NADCM-C-240-525	132.8	525	2.2	109.7
50	NADCM-C-240-655	166.0	655	2.7	87.9
60	NADCM-C-240-785	199.1	785	3.3	73.4
70	NADCM-C-240-920	232.2	920	3.8	62.6
80	NADCM-C-240-1050	265.4	1050	4.4	54.9
90	NADCM-C-240-1180	298.5	1180	4.9	48.8
100	NADCM-C-240-1310	331.6	1310	5.5	44
125	NADCM-C-240-1640	414.6	1640	6.8	35.1
150	NADCM-C-240-1970	497.6	1970	8.2	29.2
175	NADCM-C-240-2300	580.6	2300	9.6	25.0
200	NADCM-C-240-2630	663.2	2630	11.0	21.9
225	NADCM-C-240-2955	746.2	2955	12.3	19.5
250	NADCM-C-240-3240	829.2	3240	13.5	17.8

Heating Cable Selection

The table below can be taken as a general guide. Actual requirements will depend on the floor construction, type of floor coverings, insulation levels etc. The heating cable selection will depend on the application.

Application	W/sq ft
New floors in builds with high levels of insulation	13W/sq ft
Wooden floors	11W/sq ft
Wet areas (showers, bathrooms, steam rooms etc)	13W/sq ft

Note: The UL Listing for this product covers use in wet locations for **CANADA** only. Wet location installation in United States shall be in accordance with the National Electric Code, NFPA 70 and any other applicable jurisdictional code and final acceptance is to be made by the Authority having Jurisdiction (AHJ).

Thermal Insulation

The insulation levels of a floor will affect both the performance & running costs of under tile heating. Using the heating cable without thermal insulation can take up to 5 hours to heat a room whereas a system with thermal insulation takes less than an hour.

If the Warmup heating cable is being installed onto a concrete base it is highly recommended that a layer of insulation is used prior to installing the heating cable. The thermal insulation reflects the heat upwards instead of allowing heat to penetrate into the subfloor, greatly improving the warm-up times & running costs.

The Warmup insulation boards are fixed to the base using screws or tile adhesive. The thickness of insulation required will depend on whether it is for floor renovation or a new floor.

Floor coverings

All floor finishes should be installed as per the manufacturer's instructions. With radiant heating, the floor covering is essentially part of the heating system. The most suitable floor coverings are those with a low thermal resistance, normally referred to as the R-value.

The Type and thickness of floor covering materials used with this product must not exceed a thermal insulation "R" value of 1.

Floor covering	R Value
Carpet	1.0
Ceramic, Mosaic Tile	0.15
Laminate Flooring	0.675
Natural Stone	0.38 - 0.114
Wood Flooring	0.80

Subfloor Preparation

Ensure that the subfloor is smooth, dry and free from dust. Visually check that there are no objects on the floor that might damage the heater.

Where necessary an appropriate smoothing compound should be applied and allowed to cure.

If the cable is being fitted to a solid floor it is essential that the concrete slab has been allowed to cure.

If using the Warmup insulation boards use a suitable cement based adhesive and screws to fix boards to the subfloor as per the instructions.

If installing in a wet room ensure a slope in the mortar bed is maintained in order to direct water to the drain pipe.

Controlling Your System

Warmup only recommends listed or UL certified programmable thermostats designed for use with underfloor heating to control the Warmup loose heating cables. When using multiple loose heating cables you can connect them in parallel to the same thermostat. Check with your installer or call Warmup for circuit sizes and maximum loads.

The thermostats come with a 9' sensor cable to detect the temperature under the floor finish. The end of the probe wire contains a capped sensor that should be evenly centered between two heating cables at least 12" into the heated area. At no time should the probe wire cross the heating cable.

If you have more than one heating cable, all the lead wires need to be connected in parallel to the thermostat. For convenience, it may be easier to run multiple lead wires to a junction box and then take a single wire (which has the appropriate rating) from the junction box to the thermostat.

NOTE: 240V wires are Red and Black. 120V wires are Yellow and Black. Connect ground wires to the power source ground.

The total Amp load of the heating cable(s) must not exceed the thermostat's Amp limit or the Amperage rating of the circuit or other control switch without using an appropriately rated contactor/relay.

The Warmup thermostat has a maximum resistive load of 15 Amps. Please refer to the table on page 7 to calculate the amperage load for your particular system.

For smaller areas, you may be able to utilize an existing circuit. In most cases, however, you will need a separate dedicated circuit to power the Warmup heating cables.

The thermostat should be connected to the main electrical supply via a fuse or circuit in accordance with the National Electrical Code. If the thermostat used does not include a built-in Ground Fault Circuit Interrupter (GFCI), then one must be added to the circuit between the main power supply and the thermostat. If the thermostat does include a GFCI, it is NOT recommended to include another in the circuit, as this may cause accidental tripping of the control unit.

Further details on the installation of the thermostat can be found in the instruction manual included with the thermostat.

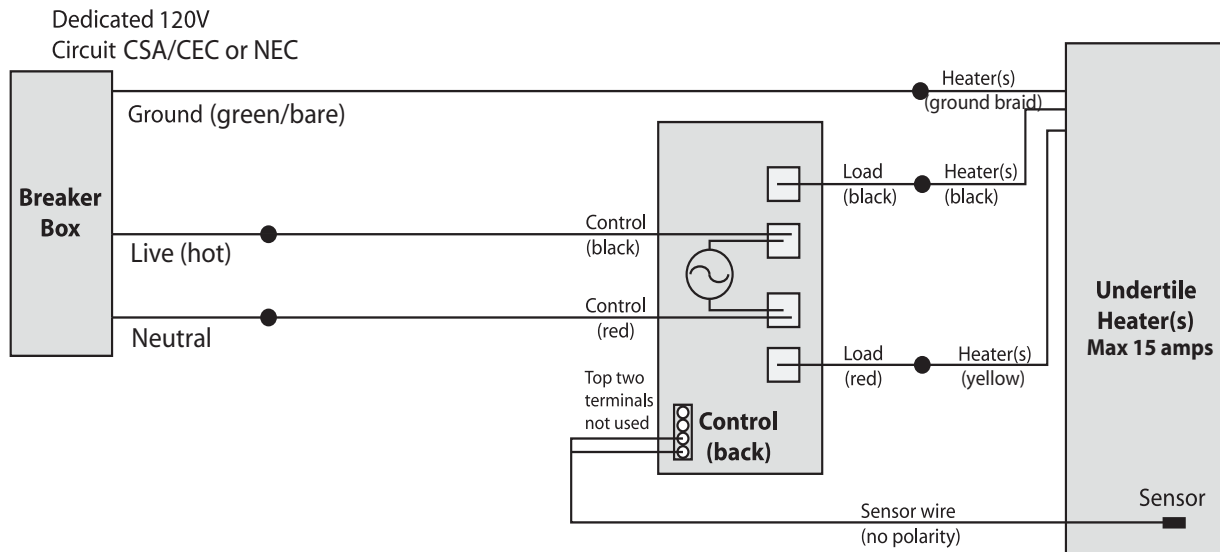
Ensuring Safety

Install the Warmup thermostat within the same room as the heating cables. In order to ensure the efficient running of the system within bathrooms, we recommend that the controls are located at least 60 inches away from shower openings or basin back splash areas so you minimize the possibility of exposure to water.

The control card on page 23 of this manual must be attached to the circuit breaker box for referral by the homeowner or electrical inspector.

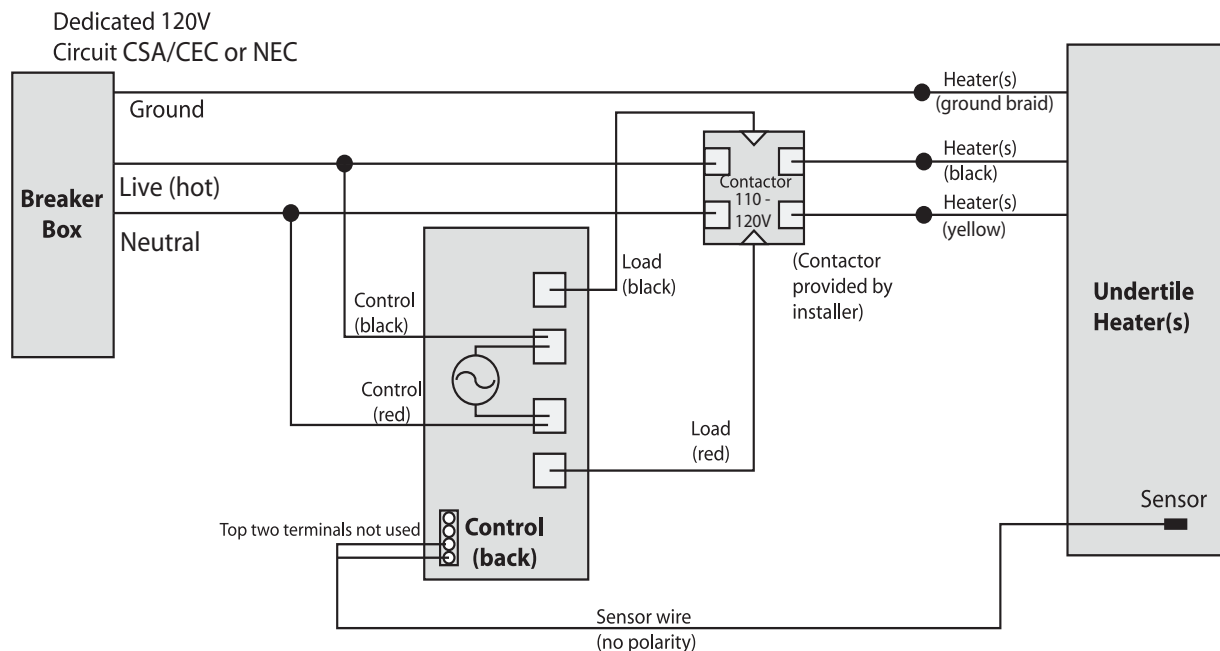
Wiring Diagram 120V

Typical Wiring for a Thermostat GFCI Control



NOTE: All electrical work must be performed by a qualified electrician in accordance with local building & electrical codes and the Canadian Electrical Code, part 1 in Canada or the National Electrical Code in the USA, especially Article 424, Part V of the NEC ANSII/NFPA 70.

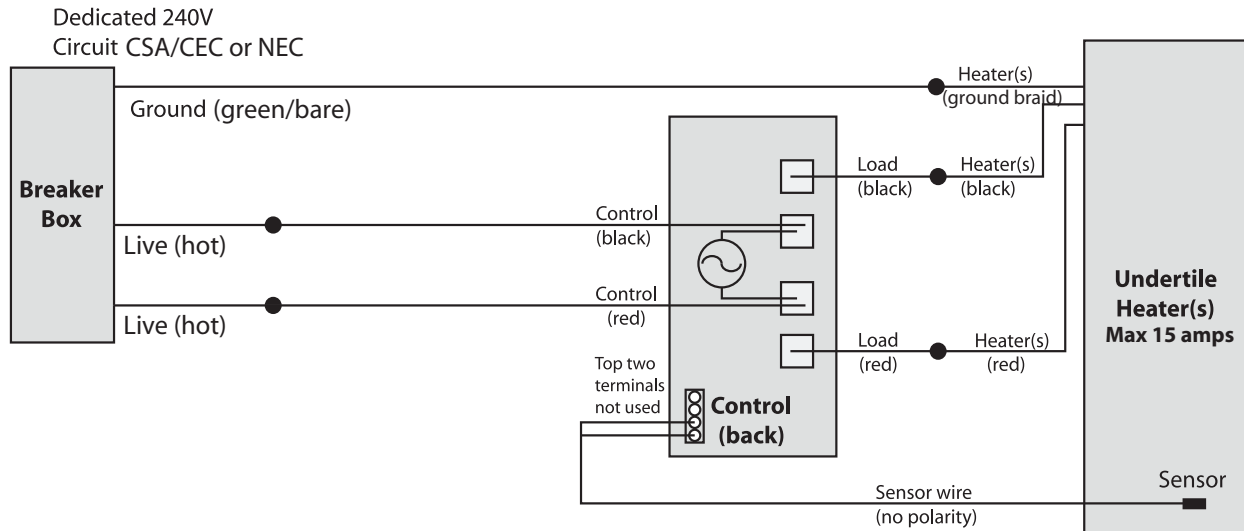
Typical Wiring for a Thermostat Control and Contactor



NOTE: All electrical work must be performed by a qualified electrician in accordance with local building & electrical codes and the Canadian Electrical Code, part 1 in Canada or the National Electrical Code in the USA, especially Article 424, Part V of the NEC ANSII/NFPA 70.

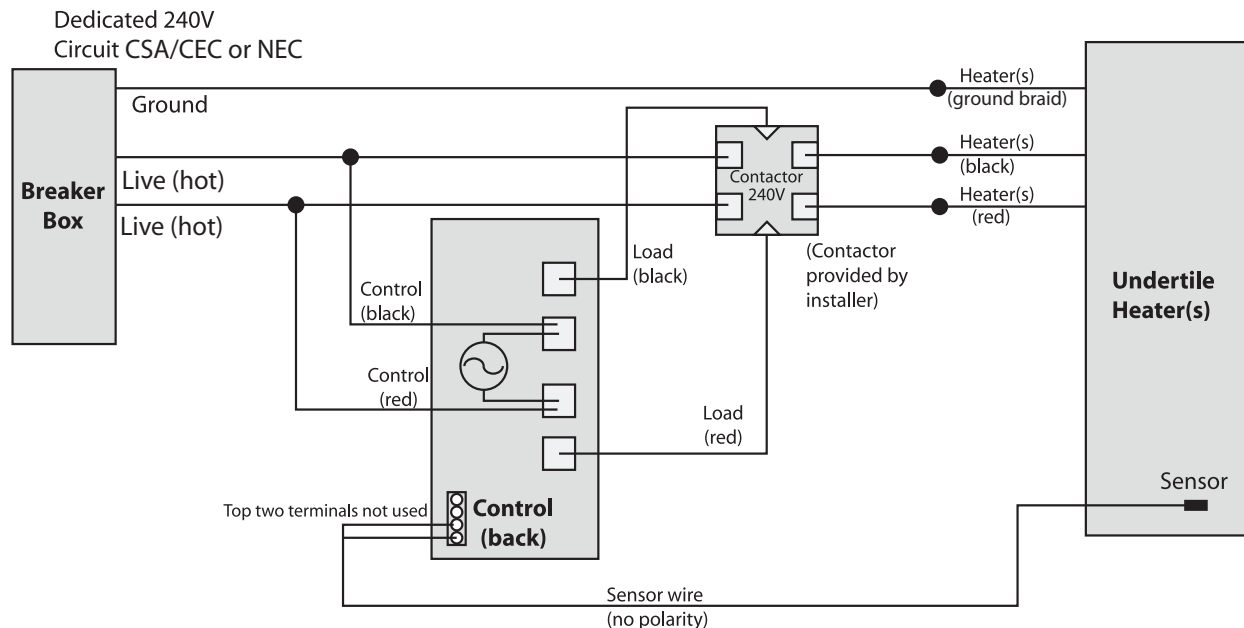
Wiring Diagram 240V

Typical Wiring for a Thermostat GFCI Control



NOTE: All electrical work must be performed by a qualified electrician in accordance with local building & electrical codes and the Canadian Electrical Code, part 1 in Canada or the National Electrical Code in the USA, especially Article 424, Part V of the NEC ANSI/NFPA 70.

Typical Wiring for a Thermostat Control and Contactor



NOTE: All electrical work must be performed by a qualified electrician in accordance with local building & electrical codes and the Canadian Electrical Code, part 1 in Canada or the National Electrical Code in the USA, especially Article 424, Part V of the NEC ANSI/NFPA 70.

Electrical Provisions

For each Warmup loose heating cable you install, you will have 1 unheated lead running from the floor to the thermostat's electric connection. The joint connecting the unheated lead to the heating cable must be at least 2 inches from the wall and placed in a position to be covered by a thinset/adhesive under the final floor covering. **THIS JOINT SECTION MUST NEVER BE PLACED IN THE DRYWALL.**

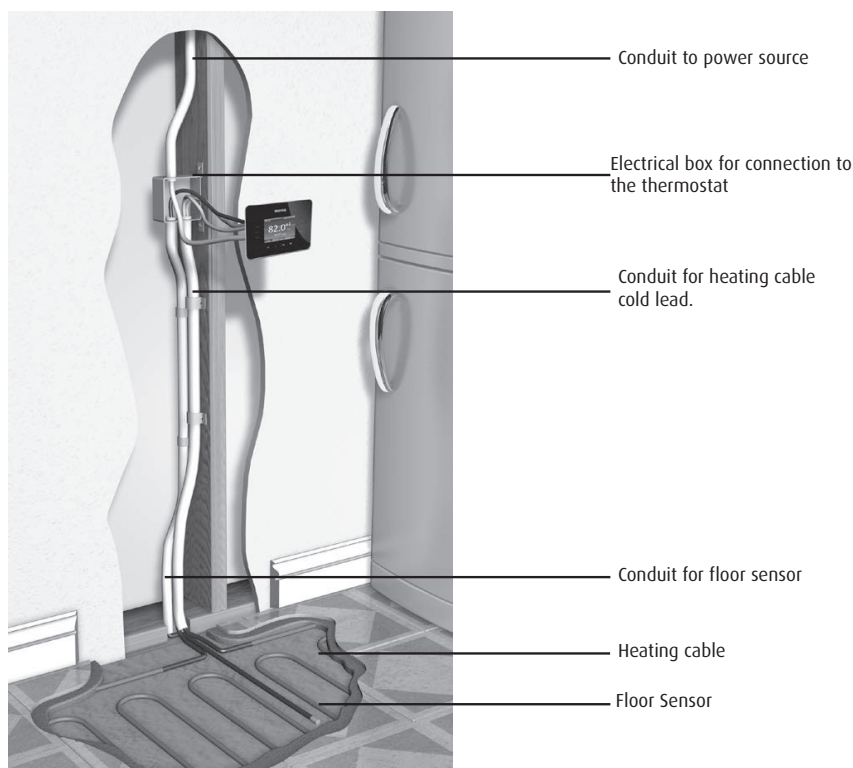
It may be necessary to chisel out short channels in the subfloor to minimize the increased height presented by the floor probe and the unheated lead.

Neither the unheated lead nor sensor wire must cross, or come into contact with the heating element. Bear in mind that you will need to make provisions for drawing the unheated lead and sensor wire up through the conduit to the control box.

NOTE: The leads must be protected where they leave the floor, by rigid metal conduit, intermediate metal conduit, rigid non metallic conduit, electrical metallic tubing or by other approved means.

The installation of electrical systems presents risks of fire and electrical shock which can result in personal injury. Caution should always be taken to guard against each such risk. All electrical connections should be carried out by a qualified electrician in accordance with the National Electrical Code and all local Codes. For installations in Canada, refer to sections 12 and 62 of the CEC.

The Warmup loose heating cables **MUST** be connected to the electrical system through a Ground Fault Circuit Interrupter ("GFCI"). If you are not using a thermostat with a built in GFCI, ensure that the branch circuits that supply your panels are GFCI-protected, or, if possible, a dedicated GFCI is incorporated in each circuit supplying your panels. This requirement is critical to the safe operation of your Warmup loose heating cables.



ALWAYS use listed conduit, fittings and other components.

Testing the System

Each and every Warmup loose heating cable is subjected to careful testing before it is shipped from the factory. However, damage does sometimes occur in storage or transit, and sometimes during installation. We strongly recommend you test your heaters:



After unpacking them but before you install them, and

After you have installed them but before you install the floor covering (i.e. while the cables are still exposed), and

After installation of the final floor covering.

Complete a simple visual inspection of the heating cable to make sure there is no visible damage.

A simple electrical inspection can be done with a digital ohmmeter to ensure the ohms resistance is what it should be. The ohm resistance should be measured between the two conductors without touching the yellow-green wire, which is the ground connection.

Checking for resistance between the two conductor wires ensures there is no break in the cold lead conductor and the heat resistance wire. It does not assure you that there is no electrical short in the circuit.

Place one probe on the black wire. Place the other probe on the yellow (red wire for 240V).

Resistance can vary significantly depending on the ambient temperature and an allowance of +/- 5% from the norm is acceptable.

Ensure cable is fully insulated :

Test across the yellow-green wire (ground). Place the other probe on the yellow (red wire for 240V).

Confirm the reading is infinity (open circuit).

Repeat these steps to check the reading between the yellow-green wire (ground) and the black wire.

There should be no continuity between these wires and the ohms reading should be infinity (not zero). If your meter shows a number of ohms between these wires, your heating cable has an electrical short. Take note of the resistance and contact Warmup.

In order to conduct a more thorough test for insulation verification, Warmup recommends the use of a megohmmeter. Connect the instrument's black cable to the system's ground and the red to the either one of the heating cable leads.

Note that depending on your meter model, you may read "kilo-Ohms" probably due to your fingers touching the probes (it's your body's conductivity). If the readings are not satisfactory, do not commence installation contact Warmup for further advice.

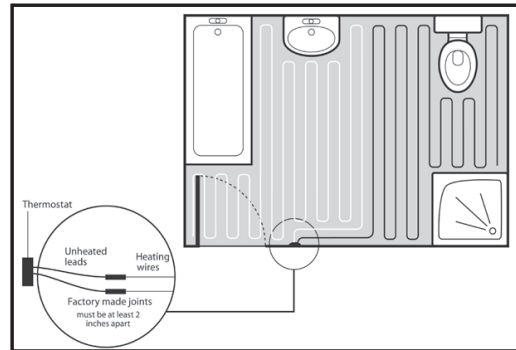
Planning Your Installation

Before installing, draw an installation plan showing the placement of the fixings guides, heating cables, floor sensor, and junction box or boxes.

It is important to mark the location of the cold lead on the plans. The cold lead is the non-heating portion of the cable that will run in the wall to connect the system to the thermostat. The heating cable shall not extend beyond the room or area in which it originates.

Marking the heating cable layout on floor plan makes it easier to trace back the heating cable for trouble shooting purpose. Keep such a layout filed after installation.

Before installing the heating cables, refer to the spacing guide below to ensure you have the correct number and size of heaters for the area you wish to heat.



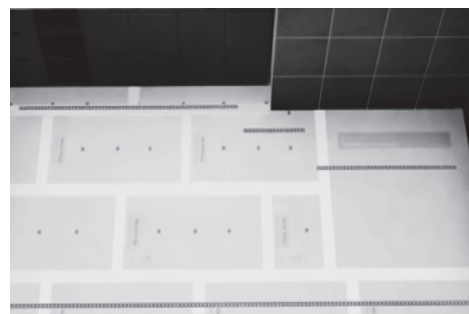
Installing the Fixing Guides

When using 12" Warmup Fixing Strips to secure the cable to the subfloor, use the following provisions to ensure proper spacing of the cable. The fixing guides included in the kit are 12" (300mm) long with 1" spacing guides.

The perimeter fixing guides should be installed a minimum of 3 inches away from the wall in the opposite direction to the cable runs (Additional stabilizing guides could be laid 40 inches apart across the floor). The Warmup Fixing Strips can be secured to the floor using hot glue, nails, screws or strong double-sided tape

It may be necessary to cut the guides into smaller sections to accommodate irregular shaped rooms. The strips can be secured to the floor using hot glue, nails or screws.

Once you have fitted the cable strips, the heating cable may be laid out.



Spacing Guide

For precise calculation of spacing between loops (OCS), we recommend you use the following calculation using the cable lengths given on page 4. For additional clarification please call our technical support line: US: 1-888-927-6333 or Canada: 1-888-592-7687

$$\text{OCS (On Center Spacing)} = \frac{\text{Area (sq ft)} \times 12}{\text{Length (ft)}}$$

Heating Cable Installation

Before you start laying the underfloor heating cable ensure that the heating cable(s) are tested.

Gently pull the unheated lead from the box. Do not remove the spool from the box as this will cause the heating cable to twist.

After 10 feet of cable has been removed, you will reach the point at which the unheated lead joins the heating cable.

The joint should be taped to the floor at the start point. Ensure that the factory joint lays flat on the floor.

The joint must be installed under the floor covering and covered with mortar or self-levelling underlayment. A channel will need to be made into the subfloor to accommodate the extra height of the joint.

Care should be taken to ensure that the joint is not bent at the point of entry into the conduit as this may damage both the factory joint and/or the heating element within.

Secure the joint to the subfloor using duct tape. Do **NOT** completely cover the joint in tape as this may create air pockets resulting in failure of the joint.

Repeat this process for each heater installed.

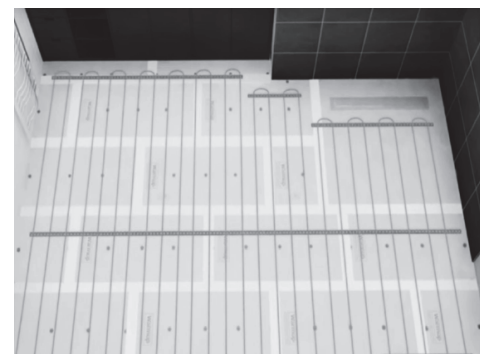
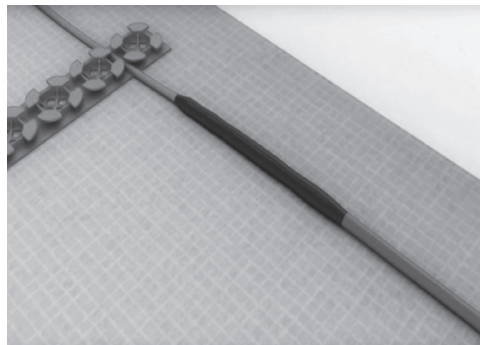
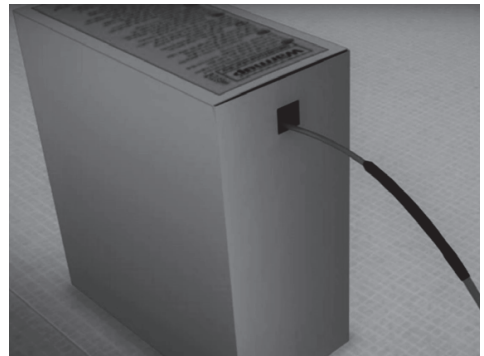
Install the heating cable as per the installation plan.

The heating cable should be laid in parallel lines back and forth across the main body of the area to be heated.

Use the spacing guide on page 4 to space the cable. The heating cable must not be spaced out any closer than 3" (80mm) at any time.

Ensure that the cable is held in place by the fixing guides and that you maintain moderate tension on the cable to prevent it from lifting during the installation of the final floor covering.

Using duct tape secure the end joint to the floor. Do not cover the whole joint in tape as air pockets may cause the end joint to overheat.

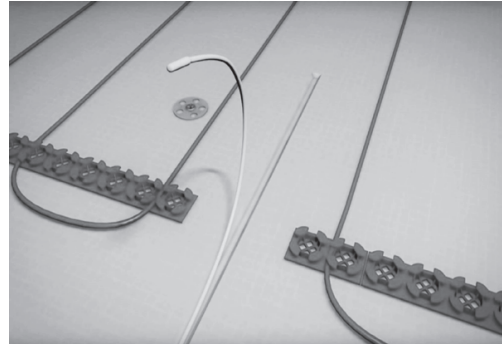


Installing the Floor Sensor

The floor sensor is used for temperature regulation of the floor surface. The end of the probe wire contains a capped sensor that should be centered between two heating cables at least 12" (305mm) into the heated area.

The sensor wire **MUST NOT** touch or cross over the heating cables.

Depending on the requirements of the tiler, it may be necessary to chisel out short channels in the subfloor to minimize the increased height presented by the floor probe. Before chiseling the area, ensure that the heating cable, unheated lead and floor probe are protected to avoid damage during chiseling. Place the floor probe into the channels and secure with fixing tape.



NOTE: Do **NOT** run the cold lead wires and the floor sensor in the same conduit.

IMPORTANT! Test the cable

Before installing the final floor finish ensure that the cable is working properly using the method described on page 14.

Test the probe wire:

Temperature sensor wire must be verified before and after installation. For probe resistances, refer to the thermostat instructions.



Installing the Warmup Thermostat

Instructions for the fitting of the Warmup® Thermostat can be found inside the thermostat box. Each cable has one unheated lead. Please review the information on pages 10 through 13 before proceeding.

The protective ground wire leading from the unheated lead should be connected to the ground leading from the power supply.

Floor Coverings - Tiles & Stone

When installing the heating cable under tile or stone flooring choose one of the following methods:

1. Single Layer Method:

Warmup does not recommend this method as it is impractical to lay tiles and can cause damage to the heating cables. However, when laying the tiles under the one-step method, start by applying thinset over the cable with the flat side of the trowel. Then add thinset on top of that with the notched side to prepare for the tile.

2. Double Layer Method:

Embed the heating cable in a skim coat of self-leveling compound or modified thinset, completely covering compound completely covering the heating element and the sensor wire. Using a rubber float spread the thin-set over the mat in the same direction as the cable. Ensure that the space between the cable is filled. Allow this layer to dry completely.

Apply a second layer of thinset or adhesive and lay the tiles as usual. The required minimum total for both layers is 3/8" of thinset or adhesive.

When deciding between the single layer or the double layer method you should consider the following:

We do NOT recommend the single layer method if you will install mosaics or a combination of tiles of different sizes.

If this is the first time installing underfloor heating the double layer method is highly recommended.

Waiting Period: Ceramic tiles and stone installations require 1 to 3 weeks for the thinset to cure. Do not switch on the underfloor heating system until you have allowed the thinset material to fully cure. Failure to do so will result in damage to the system and cause the thinset to become brittle.

Carpet, Vinyl or Laminate Flooring

Embed the heating cable in a layer of self-leveling compound and let it dry. Ensure that the heating cable are covered with a minimum of 3/8" of self-leveling compound.

Note : The under floor heating cables are NOT approved for direct contact with combustible material. The heating cable MUST always be embedded in thinset / cement mortar / cement based adhesive glue / tile adhesive before installing floating wood or laminate floors.

Final Floor finish - Hardwood Flooring

STEP 1: Wooden Sleepers/ Strips Installation:

Fix the wood sleepers (recommended 1" wide x 3/8" thick or similar) perpendicular to the planned direction of hardwood board.

On the plywood subfloor leave a sufficient space at the end of each wooden sleeper to allow the cable to go from one section to the other.

The sleepers are fixed in such a manner that they create a gap between 12-16" between two sleepers in which the heating cable can be installed. Cut a 1/2" groove into the sleeper to carry the cable from one gap to the next.

STEP 2: NADCM-C System Installation:

Install the Fixing Strips at both ends of the sleeper runs. For runs longer than 4ft, install one or more fixing strips in between to secure the cable at least every 45-50. Run the cables parallel to the fixing strips. Maintain a 3/4" gap from the wood sleepers.

Now Install the cable into the gap which was created by the sleepers.

Carefully return the cold tail lead to the junction box or the thermostat alongside the heating cable and wooden sleepers, if required.

STEP 3: Install the floor sensor

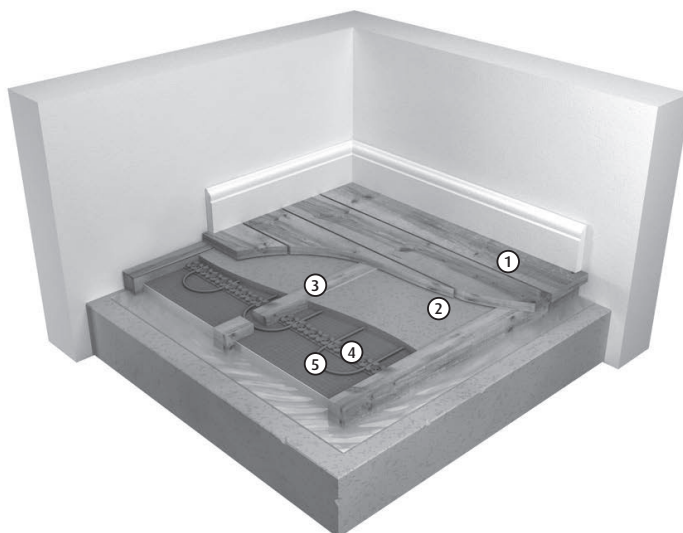
Place the probe wire containing the capped sensor evenly between two heating cables loops at least 12" (30.48cm) from the wall into the heated area. At no time should the probe wire cross the heating cable.

STEP 4: Covering of the NADCM-C cable system

Once the cable(s) have been laid, the system should be covered by self-leveling or dry-pack compound up to the sleeper's height. Do **Not** cover the sleepers.

STEP 4: Hardwood Flooring Installation:

Once the leveling compound or dry-pack has cured, the hardwood flooring may be installed by nailing it into wood sleepers. Be careful not to place nails or staples near to the heating cable or power lead.



1. Hardwood Flooring
2. Self-Leveling Compound
3. Sleepers
4. Fixing Strip
5. NADCM-C Cable

Points to Remember

Ensure that there are no air gaps during application of the cement/mortar cement based adhesive/tile adhesive/thinset or self-leveling compound.

Ensure the entire heating cable, factory splices and thermostat floor sensor are embedded in the cement mortar. The choice and application of building materials should be in accordance with building materials manufacturer's instructions.

Ensure that the correct maturity and curing times for drying of construction materials is followed before you powering ON the heating cables.

Test the heaters before, during and after installation of the final floor finish. Record values in the control card on page 23 of this manual.

Operating Tips

When first energized, the under tile heating cables may take up to 3 hours to fully warm your floor.

Energy consumption will vary depending on user preferences. For lower energy consumption set the thermostats to optimum temperature setting.

Energy consumption can be minimized by turning the system OFF when floor heat is not required, but you will have to allow time for the floor to warm up once the system is turned 'ON' again.

We recommend and supply Thermostats with "set-back" option. This option will reduce the heat-up time to less than 1 hour by reducing the floor temperature and not actually turning off the system during the setback period(s).

Avoid placing thick mats / rugs / floor level furniture / mattresses on your heated floor, specially in the area where the sensor of a floor-sensing thermostat is located. These restrict the transfer of heat away from the cables and result in the floor area beneath them being warmer than other areas.

Avoid mats with rubber or vinyl type backing, as these may decompose with heat and could stain flooring.

Troubleshooting

CAUTION: TURN OFF THE POWER SUPPLY BEFORE TROUBLESHOOTING

If the system fails to heat, check that the GFCI (Ground Fault Circuit Interrupter) has not been tripped. If the GFCI has tripped on the thermostat, this will be indicated with red “test” light on the thermostat. If the thermostat does not have a GFCI, check that the GFI on the breaker panel has not tripped. Check for continuity and resistance level with an ohmmeter and compare the reading with the resistance recorded on the UL label. Make sure the breaker or fuse is delivering power to the system. If the system fails to heat after these checks, call your installer or Warmup®. You will need to locate the model information for the heater, either on the product labels you kept, or based on an invoice. While incorrect grounding is the main cause for breaker tripping, please contact your installer to review your installation more in detail.

CHECKING FOR BREAKS

Checking for resistance between the two conductor wires ensures there is no break in the cold lead conductor and the heating cable wire.

CHECKING FOR ELECTRICAL SHORT

In some rare instances, a sharp object can puncture the insulation around the heating cable, thereby allowing the electricity to flow to ground. If this situation occurred it would immediately trip the GFCI (Ground Fault Circuit Interrupter).

Follow the steps on page 14 if the readings are not satisfactory, contact Warmup® for further advice.

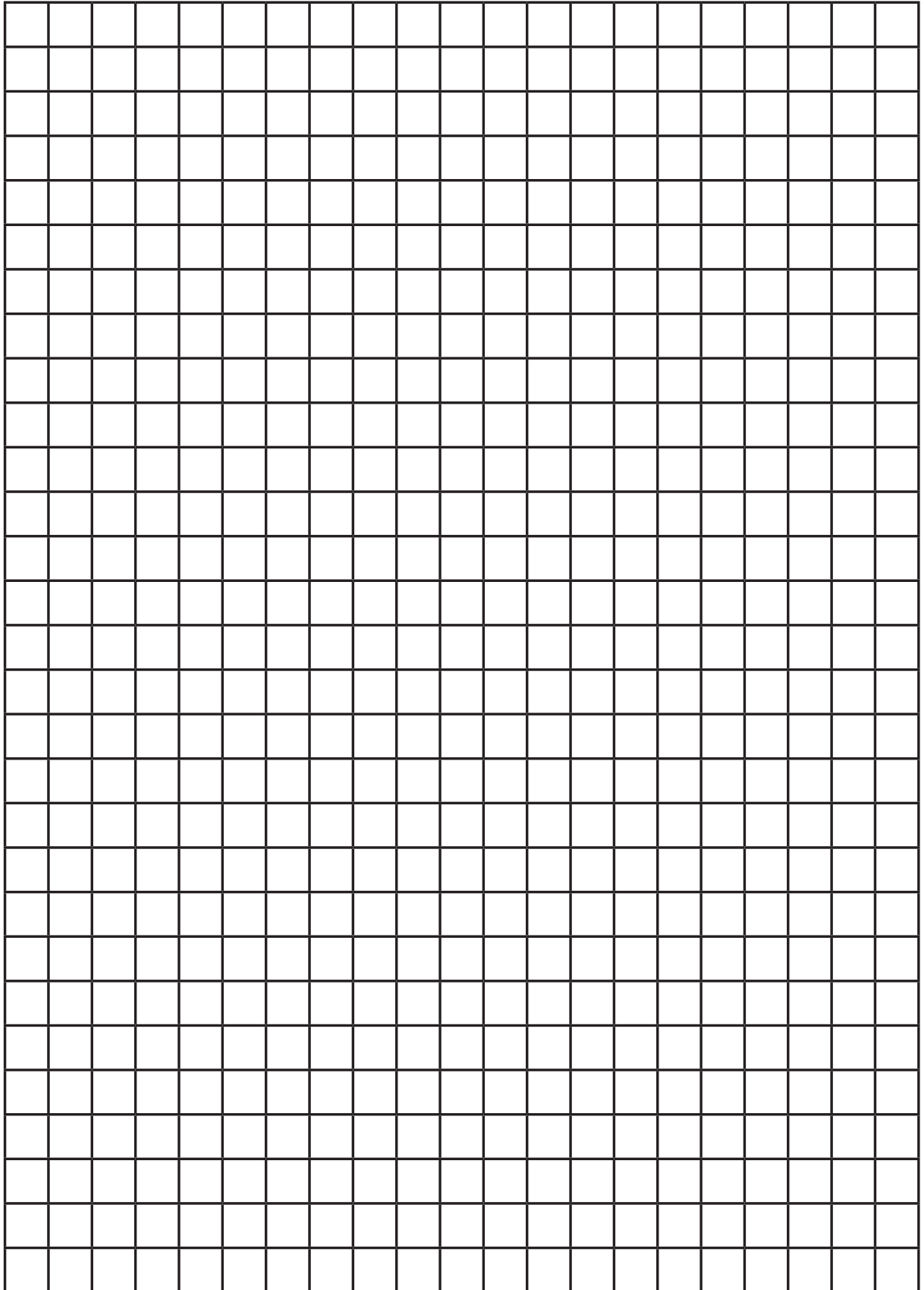
Control Card

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

Heater model number	Resistance (ohms)			Insulation Resistance (M ohms)		
	Before	During	After	Before	During	After
Installation Address :						
Date of Installation:						
Electricians Details						
Name:						
Signature:						

Note: Ensure that this card is completed and signed by the authorized electrician and safely stored along with any floor plans.

Floor Plan



Warranty

WARMUP 30-YEAR WARRANTY

Models:

NADCM-C heaters sold by Warmup, Inc.

THE WARMUP 30-YEAR WARRANTY DOES NOT EXTEND TO THERMOSTATS, WHICH ARE COVERED BY A THREE-YEAR GUARANTEE FROM THE DATE OF ORIGINAL PURCHASE.

GOVERNING LAW: unless otherwise governed by applicable state law, this warranty shall be interpreted and enforced in accordance with the laws of the State of Connecticut.

This 30-Year Warranty applies:

1. Only to the original homeowner(s) from the date of purchase
2. Only if the unit is registered with Warmup within thirty (30) days after purchase. Filling out the card accompanying this warranty in its entirety will complete registration. In the event of a claim, proof of purchase is required, i.e. invoice and receipt. Such invoice and receipt should state the exact model that was purchased; and
3. Only for the duration of the Lifetime of the floor covering under which it was originally installed if the purchaser of the heater remains the owner of the residence in which it was installed. If the original purchaser sells such residence, the warranty will transfer and continue for the duration of the 30 years from date of purchase.
4. Only if the heater has been grounded and protected by a GROUND FAULT CIRCUIT INTERRUPTER (GFCI) at all times.

COVERAGE

1. The warranty period begins on the date of purchase. Registration is effective only when a letter of confirmation is sent by Warmup, Inc.
2. Warmup's Undertile Heater is guaranteed by WARMUP, INC. ("Warmup") to be free from defects in materials and workmanship under normal use and maintenance for thirty (30) years, provided the Product is installed in accordance with the accompanying Warmup installation manual, any special written design or installation guidelines by Warmup, Inc. for a particular project, the National Electrical Code (NEC), the Canadian Electrical Code (CED), and all applicable local building and electrical codes; and
3. During the period of Warranty, Warmup will arrange for the heater to be repaired or (at its discretion) have parts replaced free of charge. The costs of repair or replacements are your only remedy under this Warranty. Such cost does not extend to any cost other than direct cost of repair or replacement by Warmup and does not extend to costs of relaying, replacing or repairing any floor covering or floor.
4. If Warmup, Inc. determines the repair of the product is not feasible; we will replace the product with equal or similar features and functionality at Warmup's sole discretion. WARMUP'S MAXIMUM LIABILITY IS LIMITED TO THE ORIGINAL PURCHASE PRICE OF THE HEATER MULTIPLIED BY THE PERCENTAGE OF THE WARRANTY PERIOD REMAINING.

EXCLUSIONS

Warmup, Inc. shall in no event be liable for incidental or consequential damages, including but not limited to extra utility expenses or damages to property.

This Warranty is null and void if

1. The floor covering over the heater(s) is damaged, lifted, replaced, repaired or covered with subsequent layers of flooring.
2. The heater fails due to damage caused during installation of the final floor finish, unless damage is caused directly by an employee of Warmup. It is therefore essential to check that the heater is working (as specified in the installation manual) prior to tiling.
3. Damage as a result of floods, fires, winds, lightning, accidents, corrosive atmosphere or other conditions beyond the control of Warmup, Inc.
4. Use of components or accessories not compatible with Warmup heaters
5. Warmup products installed outside the United States or Canada.
6. Parts not supplied or designated by Warmup, Inc.
7. Damage or repair required as a result of any improper use, maintenance, operation or servicing.
8. Failure to start due to interruption and/or inadequate electrical service
9. Any damage caused by frozen or broken water pipes in the event of equipment failure.
10. Changes in the appearance of the product that does not affect its performance.
11. The owner, or his/her designated representative, attempts to repair the product without receiving prior authorization from Warmup. Upon notification of a repair problem, Warmup, Inc. will issue an Authorization to Proceed under the terms of this Warranty.

If Warmup is required to inspect or repair any defects caused by any exclusions referenced above, all work will be fully chargeable at Warmup's inspection and repair rates then in effect.

WARMUP, INC. DISCLAIMS ANY WARRANTY NOT PROVIDED HEREIN, INCLUDING ANY IMPLIED WARRANTY OF THE MERCHANTABILITY OR IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. WARMUP, INC. FURTHER DISCLAIMS ANY RESPONSIBILITY FOR SPECIAL, INDIRECT, SECONDARY, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING FROM OWNERSHIP OR USE OF THIS PRODUCT, INCLUDING INCONVENIENCE OR LOSS OF USE. THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE FACE OF THIS DOCUMENT. NO AGENT OR REPRESENTATIVE OF WARMUP, INC. HAS ANY AUTHORITY TO EXTEND OR MODIFY THIS WARRANTY UNLESS SUCH EXTENSION OR MODIFICATION IS MADE IN WRITING BY A CORPORATE OFFICER. DUE TO DIFFERENCES IN BUILDING AND FLOOR INSULATION, CLIMATE AND FLOOR COVERINGS, WARMUP, INC. MAKES NO REPRESENTATION THAT THE FLOOR TEMPERATURE WILL ACHIEVE ANY PARTICULAR TEMPERATURE OR TEMPERATURE RISE. UL STANDARD LISTING REQUIREMENTS LIMIT THE HEAT OUTPUT OF WARMUP UNDERTILE HEATING, AS SUCH, USERS MAY OR MAY NOT BE SATISFIED WITH THE FLOOR WARMTH THAT IS PRODUCED. WARMUP DOES WARRANT THAT ALL HEATERS WILL PRODUCE THE RATED WATT OUTPUT LISTED ON THE HEATER NAMEPLATE, WHEN OPERATED AT THE RATED VOLTAGE.

TERMS AND CONDITIONS

Shipping Discrepancies:

Incoming materials should be inventoried for completeness and for possible shipping damage. Any visible damages or shortages must be noted prior to accepting the material. Any discrepancy concerning type or quantity of material shipped, must be brought to the attention of your Warmup® reseller within 15 days of the shipping date entered on the packing slip for the order.

Miscellaneous:

The terms of this Limited Warranty are exclusive and supercede any other warranty or terms and conditions relating to the subject matter whether included in a purchase order for this product or in any other document or statement.

Warranty Registration Form

Thank you for purchasing a Warmup Heating System.

You can register your system online on www.warmup.com or www.warmup.ca. Alternatively you can complete, detach and mail in this Warranty form to: US: Warmup Inc., 52 Federal Road, Unit 1F, Danbury CT, 06810 or fax it to 888-927-4721 CA: Warmup Inc., 4 Robert Speck Parkway, Suite 1500, Mississauga ON, L4Z 1S1 or fax it to 905-366-7324.

Full name	
Address	
City	Province/State
Postal code/Zip Code	Telephone #
Email	
Purchased from	Date
City	Province/State
Installer name	
Installer's address	

Please enter the resistance readings in ohms:

Room type	Area size (sq ft)	Reading before installation	Reading during installation	Probe reading	Reading after installation
Kitchen	_____	_____	_____	_____	_____
Bathroom	_____	_____	_____	_____	_____
Sunroom	_____	_____	_____	_____	_____
Hall	_____	_____	_____	_____	_____
Other _____	_____	_____	_____	_____	_____

Type of Project (please tick one): New Construction Remodeling

How did you hear about Warmup? (please tick one)

Showroom Website Electrical Contractor
 Tile Contractor Friend Magazine (please specify) _____
 Architect Home/Tradeshaw Other (please specify) _____

I hereby confirm that I have read and understand the contents of the Installation Manual and that the heater(s) has been installed as specified therein. I acknowledge that no claim can be brought against the manufacturer or its agents for any consequential loss or damage whatsoever.

Signed _____ Date _____

US:

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F: (888) 927-4721

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E: ca@warmup.com
T: (888) 592-7687
F: (888) 927-4721

Complete and submit the warranty form online at
www.warmup.com (US) or www.warmup.ca (CA)