

Installation Manual

DCM-PR

heating system with Cable & Membrane



Technical Helpline

US: 1-888-927-6333

CA: 1-888-592-7687

IMPORTANT!

Please read this manual before attempting to install your Warmup product. Complete and submit your warranty form **online at** www.warmup.com or www.warmup.ca



Electric
Heating System

www.warmup.com
www.warmup.ca

Warmup®

The world's **best-selling** floor heating brand™

Over 2 million installations in more than 60 countries

Experience MyHeating™

Download now for iOS and Android



Unique to Warmup:



SmartGeo™

Smarter geo-fencing.
Reduce energy usage
by up to 25%



Easy to use

Simple and secure
set up

Natural Language Programming™

Programming that speaks your language



4iE® SMART WIFI
THERMOSTAT

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WARNING

Your Warmup® Underfloor heating system has been designed so that installation is quick and straight forward, but as with all electrical systems, certain procedures must be strictly followed. Please ensure that you have the correct heater(s) for the area you wish to heat. Warmup plc, the manufacturer of the Warmup® DCM-PRO System, accepts no liability, expressed or implied, for any loss or consequential damage suffered as a result of installations which in any way contravene the instructions that follow.

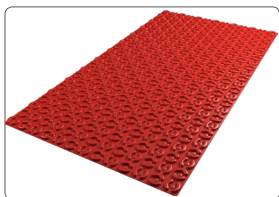
It is important that before, during and after installation that all requirements are met and understood. If the instructions are followed, you should have no problems. If you require help at any stage, please contact our helpline.

You may also find a copy of this manual, wiring instructions and other helpful information on our website:

www.warmup.com
www.warmup.ca

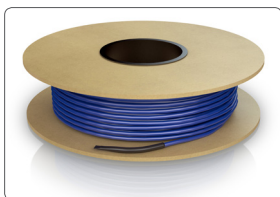


Components available from Warmup



DCM-PRO Mat

NADCM-M-80 NADCM-M-150,
NADCM-PS-80, NADCM-PS-150



NADCM-C Cable

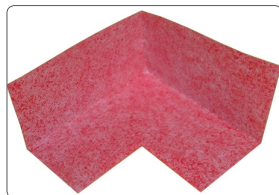
30 sizes available in 120 and 240V.



Warmup Insulation Boards



Warmup Thermostat & Floor Sensor



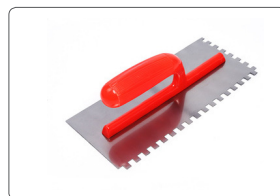
Warmup Waterproofing Kit



Multimeter - Alligator Tester



Warmup Megger



Warmup Trowel

TECHNICAL SPECIFICATIONS - DCM-PRO MAT	
THICKNESS	$\frac{1}{4}$ " (6mm)
COMPOSITION	Polypropylene Membrane and fleece or self-adhesive backing.
SPACING	$3\frac{1}{2}$ " (90mm) & $4\frac{11}{16}$ " (120mm)
SIZE	2'6" x 3'3" (770mm x 985mm) sheet 46'7" x 3'3" (14200mm x 985mm) roll

TECHNICAL SPECIFICATIONS - DCM-PRO CABLE	
OPERATING VOLTAGE	120V or 240V: 60Hz
THICKNESS	$\frac{3}{16}$ " (4.5mm)
OUTPUT RATING	13.4W/ft ² (3 CASTELLATIONS - $3\frac{1}{2}$ ")
INNER INSULATION	ECTFE
OUTER INSULATION	PVC
MIN. TEMPERATURE INSTALLATION	5°F (-15°C)
CONNECTION	10ft (3m) "COLDTAIL" CONNECTION

Certifications

Warmup NADCM-C heating cables are certified or listed to the following standards and usage:

- UL 1673 "Electric Space Heating Cables".
- CAN/CSA-C22.2 No. 130-03 "Requirements for Electrical Resistance Heating Cables and Heating Device Sets".


















- ☒ Ensure that tile adhesive used is compatible with underfloor heating and suitable for application with non porous materials such as the DCM-PRO Mat.
- ☒ 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.
- ☒ Check the resistance of the heater before, during, and after installation to ensure that no damage has occurred. A tolerance of +/- 5% is allowed.
- ☒ Make sure the heater is connected to a GFCI controller or breaker where required by code.
- ☒ 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.
- ☒ Ensure that the heater is separated from other heat sources such as luminaires and chimneys.
- ☒ Ensure that the minimum bending radius of the heater is no less than 1" (25 mm).
- ☒ Ensure the subfloor is fully cured and stable before commencing installation of the heater.
- ☒ Ensure that each tile is solidly bedded in tile adhesive, with no air gaps or voids beneath.
- ☒ Make sure that the heater, including manufactured joints are positioned under the final floor finish and completely embedded in thinset/adhesive.
- ☒ Install the floor probe for the Thermostat. It should be installed centrally between two heating element runs. Ensure that the sensor does not touch or cross over the heater.
- ☒ Ensure that you have electrical provisions to run the heating system at 120VAC /or 240VAC depending on the system being installed.
- ☒ Check the wattage and voltage of the heater to ensure you have the correct system for your application.
- ☒ Make sure that the system is fully grounded following the wiring instructions provided.
- ☒ Use a separate cable for the shower area.
- ☒ Indicate which circuits supply power to the heater on the circuit breaker. Attach the product labels for each heater to the circuit breaker, for future reference.

Register your warranty online: warmup.com/register-warranty

DON'T

-  Cross the cable over another run, over coldtails or the floor sensor. This will cause overheating and will damage the cable.
-  Cut or shorten the heater at any time.
-  Install the heater with staples or other metal fixings that can cause damage.
-  Store tiles, sharp or heavy objects on top of the heater.
-  Install the heater below 5°F (-15°C) ambient temperature.
-  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.
-  Install the heater under permanent fixtures.
-  Commence installation on a slab that has not been fully cured.
-  Cover the cold lead or termination joint with tape. This may cause air pockets resulting in the joints overheating.
-  Install the heater beyond the room or area in which they originate.
-  Allow the Thermostat to exceed the maximum temperature for your final floor finish. Always check the maximum temperatures allowed with the floor covering manufacturer.
-  Switch on the installed heater until tile adhesive has fully cured, check adhesive manufacturer's instructions.
-  Install the cold leads closer than 2" (51 mm) from the heater. Damage to supply conductor insulation may occur.

WARNING : "RISK OF ELECTRIC SHOCK AND FIRE".



The installation of electrical systems presents risks of fire and electrical shock which can result in personal injury. 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 relevant sections in the CEC.

The heater **MUST** be connected to the electrical system through a Ground Fault Circuit Interrupter ("GFCI"). If you are not using a thermostat with an integral GFCI, ensure that the branch circuit supplying your heaters is GFCI protected and if possible, use a dedicated GFCI protected circuit to supply each heated zone. This requirement is critical to the safe operation of the heater.

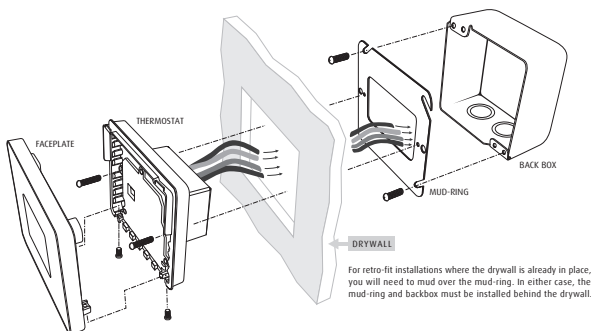
For smaller areas, you may be able to utilize an existing circuit. In most cases, however, you will need a separate dedicated circuit to power the Warmup heating cables.

NOTE: The power leads must be protected where they leave the floor by a suitable approved plate or conduit (where required by electrical code).

NOTE: A junction box is required if more than two heaters are being installed and routed to the same thermostat.

Thermostat Installation diagram

Warmup recommends the use of a deep, double-gang (4x4x2-3/4) box with a single-opening mud-plate. Mount horizontally or vertically based on selected thermostat model. If using a RELAY-25, refer to the wiring diagrams included on pages 12 and 13.



Instructions: testing cables using the Alligator.

To ensure that your floor heating system will function properly, always test the resistance of your wires with the Alligator before, during and after installation.

- Connect the red clip into the outlet labelled "VΩmA" and the black connector into the "COM" outlet. Turn the dial so that the indicator points to the 6 o'clock position, directly above the "200Ω" indicator.
- Clip the alligator head of the black connector to the black wire of your heating system. Then connect the alligator head of the red connector to the yellow wire. This is your "core to core" reading. Compare the ohm number that appears on the display to what the tag, box or installation manual state the reading should be for the model you purchased. Note: +/- 5% of the norm is acceptable.
- Next, clip the Alligator head of the black connector to the black wire of the floor heating system and the alligator head of the red connector to the yellow/green wire (neutral). You want to see the number "1" or the "infinity symbol ∞ ".
- Now, you will leave the red wire connected to the yellow/green wire but this time clip the black connector to the yellow wire of the floor heating system. Again, you want to see the number "1" or the infinity symbol





Instructions: testing cables using a Megger.

WARNING: HIGH VOLTAGE! Follow instructions and avoid direct contact with probes and wires during testing. High Voltage is being emitted and can cause injury or death. If unsure, contact a licensed electrician.

WHAT IT DOES

The megger is used as a quality control measure to test the insulation resistance to detect any fault in the heater cable jacket. Such leaks cannot be spotted with a regular ohmmeter and help spot any damage to the cable and cable jacket.

HOW IT WORKS

The megger sends voltage through the cable to calculate the amount of current flowing through the cable jackets for an accurate indication of insulation integrity. Higher resistance means good insulation.

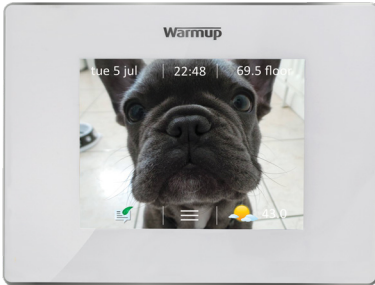
HOW TO USE IT

1. Make sure no power is running to the heating system you are testing.
2. Insert the test probes into the G and E2 input terminals.
3. Turn the dial to the 500V.
4. Clip the black probe to the black wire coming from the heater cold tail lead.
5. Clip the red probe to the ground wire.
6. The display should show “- - -” until the TEST button is pressed.
7. Push and hold the TEST button to begin the test.

Please note: The number in the bottom right of the display screen shows the voltage being applied to the circuit. The resistance will show in the middle of the screen in MΩ or GΩ. The TEST icon will appear in the bottom right corner until the test is complete. If the resistance is higher than the maximum display range, the megger will display the > symbol on the left side of the screen. Higher resistance means good insulation. The minimum and maximum IR (insulation resistance) values can be found in the megger manual.

8. Keep the probes connected and release the TEST button.
9. Remove both probes and repeat the test by clipping the black probe to the red heating wire if testing a 240V system, or solid yellow if testing 120V system. Then repeat steps 5-8.
10. Your reading should be higher than 1 mA. Anything lower, please call Warmup.

Warmup Devices



4iE® Smart WiFi Thermostat



4iE® Smart Thermostat

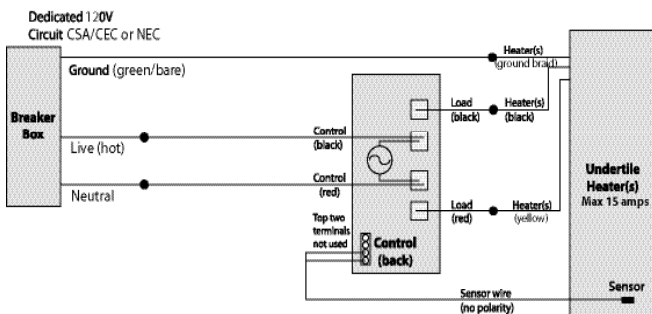


Tempo® Programmable Thermostat - Non GFCI



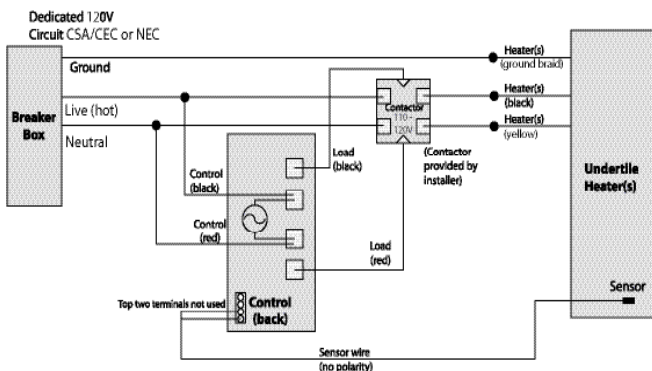
Typical Wiring Diagram 120V

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 ANSI/NFPA 70.

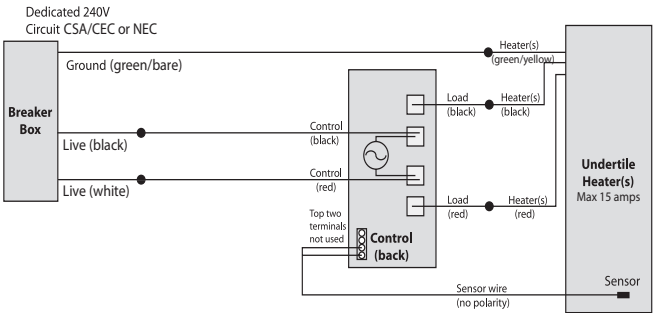
Typical Wiring for a Thermostat Control and Contactor



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.

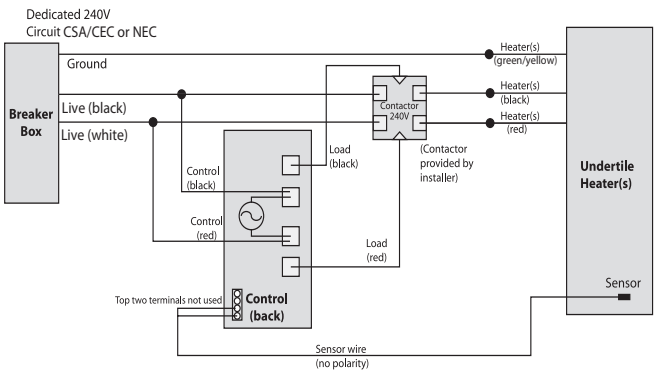
Typical Wiring Diagram 240V

Typical Wiring for a Thermostat GFCI Control to an Existing Breaker



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 of the NEC ANSI/NFPA 70.

Typical Wiring for a Thermostat Control and Contactor to an Existing Breaker



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 of the NEC ANSI/NFPA 70.

NOTE: When installing the heater in kitchens or bathrooms it must be protected by a GFCI. If the heater is switched by a separate contactor its supply must be GFCI protected. To prevent nuisance tripping a thermostat with integral GFCI protection should not be supplied by a GFCI protected circuit.

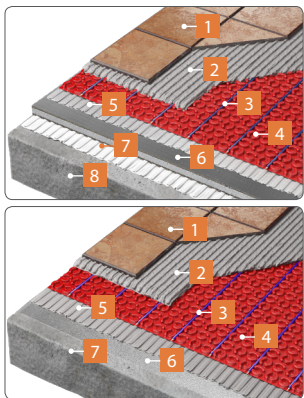
NOTE: The CEC in Canada requires all circuits to floor heating systems in any room to be protected by a GFCI circuit. If the thermostat is connected to a relay contactor, only the contactor requires GFCI protection. The thermostat is then best connected on a traditional breaker (unless powered via the relay).



Subfloor Preparation

Subfloors previously covered in vinyl, cork or carpeting: all old flooring and adhesive must be removed. If there is bitumen as a damp proofing layer, it must be covered with a minimum 2" (50mm) of sand/cement screed or overboarded with 1/4" (6mm) Warmup Insulation Boards, taking care not to puncture the bitumen coating. The screed must be fully cured and dry before proceeding. If using other damp proofing or tanking systems, contact the manufacturer for advice.

Concrete Subfloors



CONCRETE SUBFLOOR

- 1 Floor Finish
- 2 Tile adhesive or levelling compound
- 3 Warmup DCM-PRO Cable
- 4 Warmup DCM-PRO Mat
- 5 Flexible Tile Adhesive*
- 6 Warmup Insulation Board (Optional)
- 7 Flexible Tile Adhesive
- 8 Subfloor

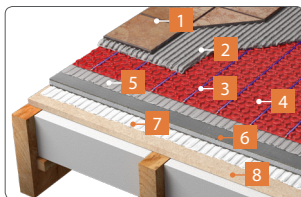
*Unless using the Peel & Stick version

It is recommended that, over concrete slabs, you use Warmup® Insulation Board beneath Warmup DCM-PRO for optimum performance. The insulation will improve the system's response to heating demand, saving energy and reducing running costs.

Where expansion joints are present in the subfloor, these must be preserved up through all covering layers, including insulation where installed and DCM-PRO.

In addition to the general subfloor preparation instructions on the previous page, wood subfloors should be prepared for tiling in accordance with local tiling standards such as ANSI A108.01.

Wood Subfloors



WOOD SUBFLOOR (Recommended)

- 1 Floor Finish
- 2 Tile adhesive or levelling compound
- 3 Warmup DCM-PRO Cable
- 4 Warmup DCM-PRO Mat
- 5 Flexible Tile Adhesive*
- 6 Warmup Insulation Board (optional)
- 7 Flexible Tile Adhesive
- 8 Floor Deck

*Unless using the Peel & Stick version

Did You Know?

The TCNA-tested DCM-PRO anti-fracture Membrane can be installed on wood and cement subfloors using any tile adhesive. The patented DCM-PRO design allows for more adhesive to connect with the cable thereby distributing the heat more evenly. The DCM-PRO Membrane is ready to tile.

Installers can use either modified or unmodified adhesives over the membrane to suit their installation needs. The DCM-PRO Membrane can even be covered with self-levelling mortars (SLU's) to allow installation of small format tiles and other floor types such as glue-down wood and LVT's, to be laid on top of the DCM-PRO System.

The unique design of the DCM-PRO Membrane protects the cable from installation damage leading to a reduced risk of cable failures.

The membrane has been successfully tested to ANSI 118.12 standards and performed well on the Robinson test (ASTM C-627). It is the highest-rated membrane for floor heating systems.

STEP 3 - LAY DCM-PRO MAT



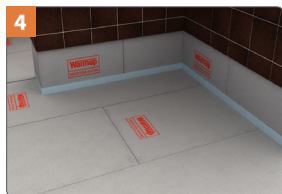
- Ensure the subfloor is dry and smooth. If necessary an appropriate smoothing or levelling compound should be applied. Shop-Vac the floor and where necessary, mop with damp rag.



- If required, prime wood or sand and cement screeded subfloors. For proprietary subfloors refer to the manufacturers instructions.



- **Optional Step** - Install Warmup® Insulation Board over the subfloor referring to their installation instructions.



- Where required, install expansion strips within the DCM-PRO system, along any perimeter or sectional expansion joints within the subfloor to preserve their function.

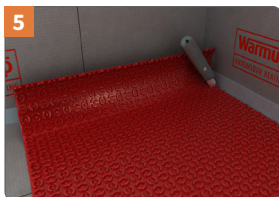
Installing in a wet area?

Warmup's 3-ply waterproof membrane protects floors and walls under thin-set tile installations from substrate cracks and moisture migration. It is comprised of 2 outer polypropylene layers and one inner polyethylene waterproofing membrane and exceeds testing requirements per ASTM 118.10. The kit includes a 35ft roll of 5"-wide membrane, along with 2 outer corners and 6 inside corners to complete waterproofing in most common bathrooms under 100 sqft.



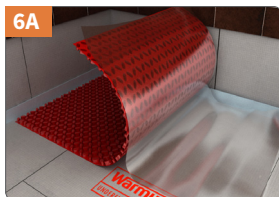
When installing the NADCM-WP systems for waterproofing with the DCM-PRO Membrane, refer to the installation manual available on warmup.com or warmup.ca.





- Measure and cut a length of mat to suit your room using a utility knife and/or scissors.

DCM-PRO Peel-and-Stick



- Peel the transparent layer on the back of the DCM-PRO membrane and stick to the ultra-clean subfloor.

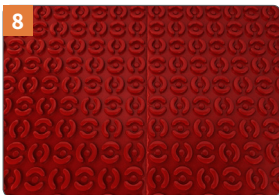
DCM-PRO Fleece-backed



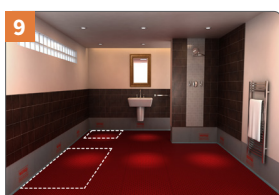
- Apply a layer of polymer-modified thinset to the substrate using a $\frac{1}{4}$ " x $\frac{1}{4}$ " square notch trowel. A 50lbs bag of thin-set should be planned for every 100 sqft of membrane.



- Position the mat, fleece side down into the adhesive bed
- Embed the mat into the adhesive bed using a float/roller removing any air pockets.
- After fitting a sheet or roll section, gently lift the membrane to verify proper coverage of the membrane and subsequent bonding with the subfloor.



- Repeat steps 5 & 6 for subsequent runs of the mat, butting the mats together tightly until the floor area is covered, making sure to align the castellations between mat runs.
- Protect the mat with walking boards in areas of high foot traffic and under heavy loads.



- Mark out the floor with a permanent marker or tape showing where fixtures and other unheated areas are going to be.



A plan of the cable layout is required as part of the control card so that any cutting or drilling after tiling will not result in damage to the heater. Request a layout from Warmup or simply take pictures of your completed installation, to be added to your warranty file.

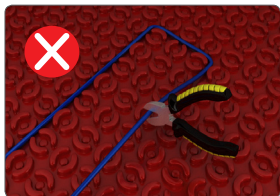
Before you begin



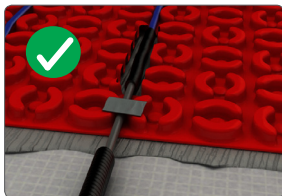
- Ensure that there is a minimum 2" spacing between parallel heating cables and they are away from the influence of other heat sources, such as heating and hot water pipes, lighting fixtures or chimneys.



- When installing the cable **DO NOT** cross the cable over another run, over coldtails or the floor sensor. This will cause overheating and will damage the cable.



- The heating cable must not be cut, shortened, extended or left in a void, it must be fully installed within the layer of tile adhesive or levelling compound.



- Heating cables cannot be installed across expansion joints within the floor. Where a heated floor is divided by expansion joints, individual cables should be used to heat each area. The cold tail may cross the expansion joint within a 12" long conduit if necessary.

NOTE: The heater should not be installed on irregular surfaces such as stairs or up walls.

The standard specific heating load of the DCM-PRO system is 13.4 W/ft². By adjusting the cable spacing, the installation can be customized to suit both the floor coverage and heat load requirements.

We do not recommend going over and up shower curbs, but rather use a separate cable in the shower.

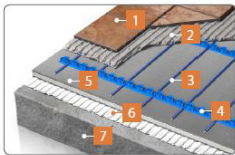
Fixing Strips

Installing the Spacing Strips

When using the 12" (305mm) Spacing 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" (305 mm) long with 1" (25 mm) spacing guides.

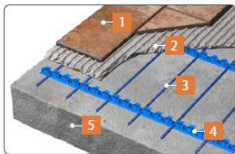
The perimeter Spacing Strips should be installed a minimum of 3 inches (76 mm) away from the wall. The Spacing Strips can be secured to the floor using hot glue, nails, screws or strong double-sided tape. Add runs every 3-4ft to keep the cable evenly spaced.

Concrete Subfloors



CONCRETE SUBFLOOR (Recommended)

- 1 Floor Finish
- 2 $\frac{3}{8}$ " Minimum Thinset or levelling compound
- 3 Warmup DCM-PRO Cable
- 4 Warmup Fixing Strips
- 5 Warmup Insulation Board
- 6 $\frac{1}{4}$ " Minimum Thinset
- 7 Subfloor



CONCRETE SUBFLOOR

- 1 Floor Finish
- 2 $\frac{3}{8}$ " Minimum Thinset or levelling compound
- 3 Warmup DCM-PRO Cable
- 4 Warmup Fixing Strips
- 5 Subfloor

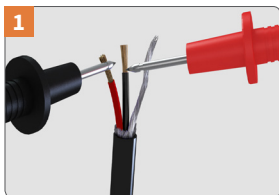


Cable size guide

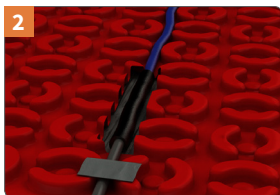
	NADCM-C Cable					REFERENCE RESISTANCE BANDS (Ω)
	PRODUCT CODE	Heated Area (ft ²) (3 pegs)	Power (W)	Load (A)	Resistance (Ω)	
120 VOLT	NADCM-C-120-65	5	65	0.5	221.5	210.4 - 232.6
	NADCM-C-120-130	10	130	1.1	110.8	105.3 - 116.3
	NADCM-C-120-195	15	195	1.6	73.8	70.1 - 74.0
	NADCM-C-120-260	20	260	2.2	55.4	52.6 - 58.2
	NADCM-C-120-325	25	325	2.7	44.3	42.1 - 46.5
	NADCM-C-120-390	30	390	3.3	36.9	35.1 - 38.7
	NADCM-C-120-525	40	525	4.4	27.4	26.0 - 28.8
	NADCM-C-120-655	50	655	5.5	22.0	20.9 - 23.1
	NADCM-C-120-785	60	785	6.5	18.3	17.4 - 19.2
	NADCM-C-120-920	70	920	7.7	15.6	14.8 - 16.4
	NADCM-C-120-1050	80	1050	8.8	13.7	13.0 - 14.4
	NADCM-C-120-1180	90	1180	9.8	12.2	11.6 - 12.8
	NADCM-C-120-1315	100	1315	11.0	11.0	10.5 - 11.6
	NADCM-C-120-1445	110	1445	12.0	10.0	9.5 - 11.5
	NADCM-C-120-1575	120	1575	13.1	9.1	8.6 - 9.6
240 VOLT	NADCM-C-240-325	25	325	1.4	177.2	168.3 - 186.1
	NADCM-C-240-390	30	390	1.6	147.7	140.3 - 147.7
	NADCM-C-240-525	40	525	2.2	109.7	104.2 - 115.2
	NADCM-C-240-655	50	655	2.7	87.9	83.5 - 92.3
	NADCM-C-240-785	60	785	3.3	73.4	69.7 - 77.1
	NADCM-C-240-920	70	920	3.8	62.6	59.5 - 65.7
	NADCM-C-240-1050	80	1050	4.4	54.9	52.2 - 57.6
	NADCM-C-240-1180	90	1180	4.9	48.8	46.4 - 51.2
	NADCM-C-240-1310	100	1310	5.5	44	41.8 - 46.2
	NADCM-C-240-1640	125	1640	6.8	35.1	33.3 - 36.9
	NADCM-C-240-1970	150	1970	8.2	29.2	27.7 - 30.7
	NADCM-C-240-2300	175	2300	9.6	25.0	23.8 - 26.3
	NADCM-C-240-2630	200	2630	11.0	21.9	20.8 - 23.0
	NADCM-C-240-2955	225	2955	12.3	19.5	18.5 - 20.5
	NADCM-C-240-3240	250	3240	13.5	17.8	16.9 - 18.7

HEATED AREA AT DIFFERENT SPACINGS, ft ²						
120 VOLT	PRODUCT CODE	Cable Length (ft)	DCM-PRO		Loose laid cable w/spacers	
			3 Pegs	4 Pegs	3 Pegs	4 Pegs
	NADCM-C-120-65	16.7	5	7	4	6
	NADCM-C-120-130	33.1	10	13	8	11
	NADCM-C-120-195	49.9	15	20	12	17
	NADCM-C-120-260	66.3	20	27	17	22
	NADCM-C-120-325	83.0	25	33	21	28
	NADCM-C-120-390	99.4	30	40	25	33
	NADCM-C-120-525	132.8	40	53	33	44
	NADCM-C-120-655	166.0	50	67	42	55
	NADCM-C-120-785	199.1	60	80	50	66
	NADCM-C-120-920	232.2	70	93	58	77
	NADCM-C-120-1050	265.4	80	107	66	88
	NADCM-C-120-1180	298.5	90	120	75	100
	NADCM-C-120-1315	331.6	100	133	83	111
	NADCM-C-120-1445	364.7	110	147	91	122
	NADCM-C-120-1575	397.9	120	160	99	133
240 VOLT	NADCM-C-240-325	83.0	25	33	21	28
	NADCM-C-240-390	99.4	30	40	25	33
	NADCM-C-240-525	132.8	40	53	33	44
	NADCM-C-240-655	166.0	50	67	42	55
	NADCM-C-240-785	199.1	60	80	50	66
	NADCM-C-240-920	232.2	70	93	58	77
	NADCM-C-240-1050	265.4	80	107	66	88
	NADCM-C-240-1180	298.5	90	120	75	100
	NADCM-C-240-1310	331.6	100	133	83	111
	NADCM-C-240-1640	414.6	125	167	104	138
	NADCM-C-240-1970	497.6	150	200	124	166
	NADCM-C-240-2300	580.6	175	233	145	194
	NADCM-C-240-2630	663.2	200	266	166	221
	NADCM-C-240-2955	746.2	225	300	187	249
	NADCM-C-240-3240	829.2	250	333	207	276

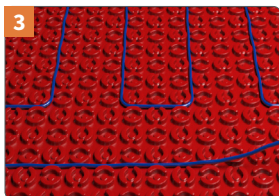
STEP 5 - INSTALL DCM-PRO CABLE



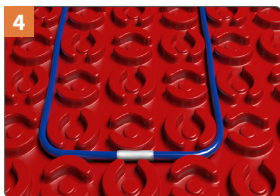
- Measure and record the resistance of the heating cable in the “Resistance Before” column of the control card, supplied as part of this installation guide on Page 31.
- Stop installation immediately and contact Warmup if its resistance falls outside the range set out in the Reference Resistance Band table on Page 35.



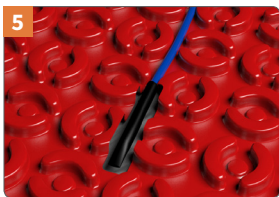
- Place the coldtail on the floor. Cut a section in the mat for the manufactured joint so that it sits at the same height as the heater.
- Secure the cold tail using tabs of electrical tape as necessary. **DO NOT** tape over the manufactured joint or heating cable. These must be fully embedded within the tile adhesive or levelling compound being laid over.



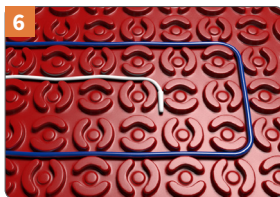
- Begin laying the heating cable, pressing it between the castellations.
- Follow the installation layout created in Step 4 to complete the cable placement.
- **DO NOT** install the heater in ambient temperatures less than 5°F (-15°C).



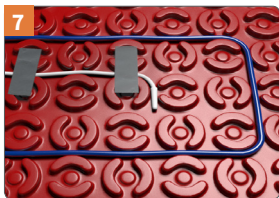
- The DCM-PRO cable has a marker at its midpoint. When you reach it, review your progress up to that point and check that you are correctly spacing the cable, ensuring that you will have covered the whole of the heated area when you reach the end of the cable.



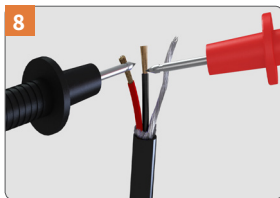
- At the end of the heating cable, you will find a termination joint. As with the manufactured joint at the beginning of the heating cable, this joint will have to be cut into the mat so that it sits at the same height as the heater.
- **DO NOT** tape over the termination joint, it must be in direct contact and fully embedded within the tile adhesive or levelling compound being laid over the heating cable.



- Install the floor sensor at least 12" into the heated area it will be controlling. It should be located centrally between parallel runs of heating cable and not in an area influenced by other heat sources.
- If the heating cable is installed at multiple spacings, then the sensor should be installed centrally between the narrowest parallel run.



- Measure the resistance of the floor sensor and record it on the control card on Page 31. If its resistance is outside the prescribed range, contact Warmup.
- **DO NOT** tape over the floor sensor tip, as it must be in full contact with the heated tile adhesive or levelling compound.



- Measure the resistance of the heating cable and verify it is still in line with the "Resistance Before" reading previously taken.
- Stop installation immediately and contact Warmup if its resistance has changed significantly or if it falls outside the range set out in the Reference Resistance Band table on Page 35.



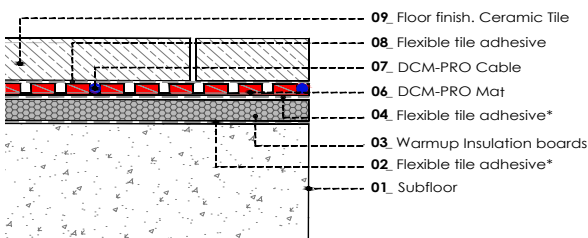
For floor finishes other than tiles a $\frac{3}{8}$ " layer of self levelling compound is required over the heater which is suitable for use with underfloor heating. You must ensure the entire heater, including manufactured joints are encased in the levelling compound.

The self levelling layer will:

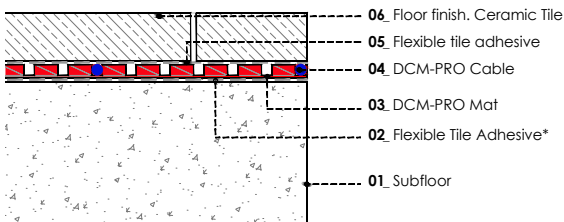
- Allow a variety of floor finishes to be laid on top such as tile, vinyl, wood and carpet.
- Provide protection for the heater until the final floor is laid.
- Give a smooth surface onto which to lay your chosen floor covering.
- Provide a more uniform temperature distribution.

NOTE: Before installing the floor finish, its suitability for use with underfloor heating and its maximum operating temperature should be checked against required operating conditions.

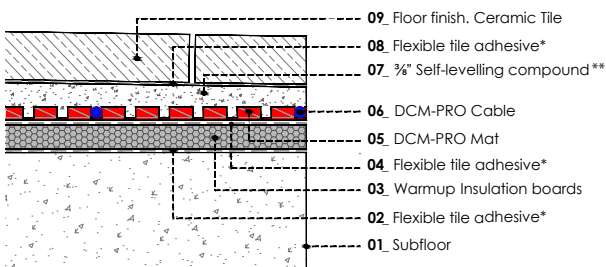
Tiled Floor Finish - With Warmup Insulation Boards



Tiled Floor Finish - Without Warmup Insulation Boards



All Floor Finishes - With $\frac{3}{8}$ " Self Levelling Compound and Warmup Insulation Boards



* Where required, prime the exposed surface in accordance with the tile adhesive instructions

**Unless using the Peel & Stick DCM-PRO application

Underfloor heating performs the most efficiently with conductive, low resistance floor finishes such as stone and tiles. The maximum thermal resistance of the floor should not exceed a thermal insulation “R” value of 1ft²·°F·h/Btu.

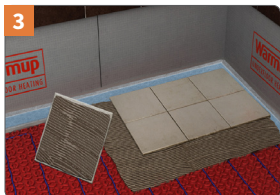
Tiled Floors



- Cover the installation with a full bed of modified thinset using a flat trowel. Take care not to damage or dislodge the heating cable. If using tiles smaller than 3 1/2" in length or width, cover the installation with a levelling compound first.



- Carefully lay the tiles and press into the adhesive bed.
- Depending on tile format and application, ensure there are no air gaps between the tile and the DCM-PRO Membrane.



- After laying the first tile remove and ensure the tile is getting a full coverage of adhesive from your application.



- Grout the floor as soon as possible as per the ceramic tile adhesive manufacturer's instructions. **DO NOT** switch on the heater until the tile adhesive and grout have fully cured. **DO NOT** use the heater to accelerate the curing process of the adhesive or levelling compound.

NOTE: If using tiles smaller than 3 1/2" in length or width, you **MUST** cover the installation with levelling compound first.

NOTE: Ensure that the tile adhesive used is compatible with underfloor heating and suitable for application onto non porous materials such as the DCM-PRO Mat.

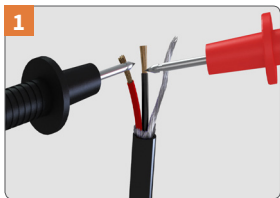


Other Floor Coverings



If you are planning to install wood, carpet or vinyl over the heater lay a minimum $\frac{3}{8}$ " levelling compound over the heater. You must ensure that all heating cables are completely covered.

Final Steps

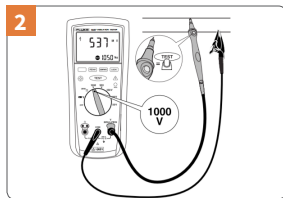


When the tiles or levelling compound has been installed, conduct another resistance test as described on Page 29 to ensure the sensor and heater have not been damaged and record in the control card on Page 31.

NOTE: Warmup thermostats use a 10k Ω floor sensor. The expected resistance is:

10k Ω at 77°F (25°C),
12.1k Ω at 68°F (20°C),
14.7k Ω at 59°F (15°C).

NOTE: Before installing the floor finish its suitability for use with underfloor heating and its maximum operating temperature should be checked against required operating conditions.



Megger Testing (optional). Warmup highly recommends performing a final test with a Mega-Ohmmeter which will ensure no damage was done to the cable.

Did You Know?

Purchase Testing Devices such as the Warmup Mutlimeter tester and the Megger, as well as Cable Repair kits from Warmup on warmupedia.warmup.com/shop.

Install the thermostat in accordance with its installation instructions

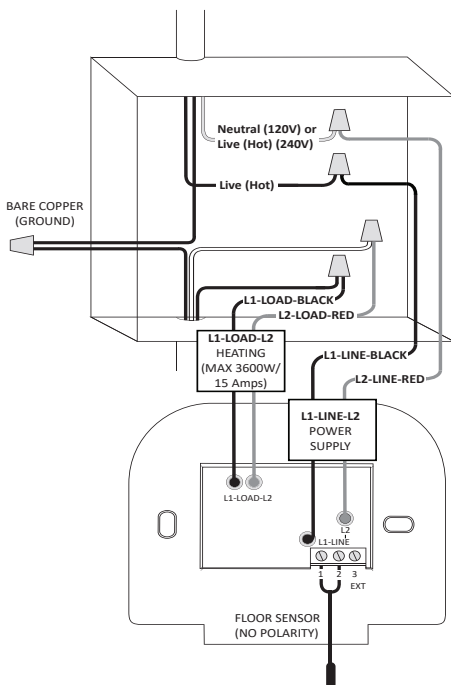
Instructions for fitting Warmup® Thermostats can be found inside the thermostat box. The thermostat should be connected to the main electrical supply via a fuse or circuit breaker in accordance with the National Electrical Code. If the thermostat used does not include a built-in Ground Fault Circuit Interrupter (GFCI), then one may be required 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 is likely to cause nuisance tripping of the GFCI's.

The total amp load of the heating cable(s) must not exceed the thermostat's limit or the amperage rating of the circuit or other control switch without using an appropriately rated contactor/relay. Warmup thermostats have a maximum resistive load rating of 15 Amps.

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" away from shower openings or basin back splash areas so you minimize the possibility of exposure to water.

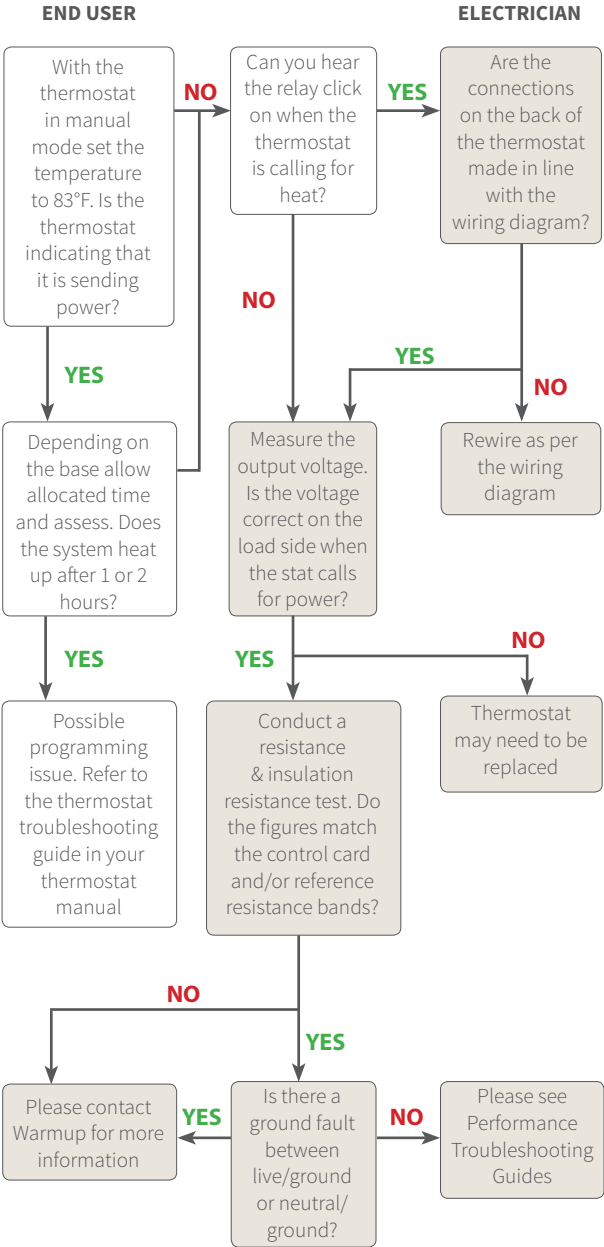
Typical Warmup Thermostat Wiring Diagram





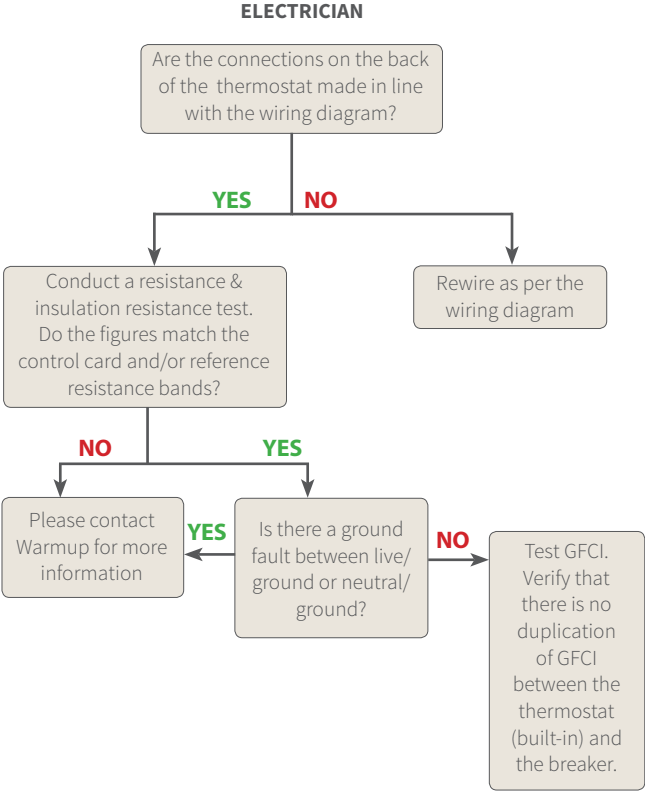
HEATING ISSUE 1 - The floor does not heat up

Instructions which are shaded grey must completed by a qualified electrician



HEATING ISSUE 2 - The heater trips the GFCI

Instructions which are shaded grey must completed by a qualified electrician





My floor is getting too hot

- 1. The floor temperature settings on the thermostat may be incorrect.**

Check the thermostat settings ensuring that it is controlling the floor surface temperature and that the set target and limiting temperatures are correct.

- 2. The floor sensor may be poorly positioned, if so the thermostat will be displaying a floor temperature that is not indicative of the floor surface temperature.**

Recalibrate the floor sensor in the thermostat settings.

- 3. The thermostat may be set in regulator mode with the duty cycle set too high.**

If the thermostat cannot be set to reference a floor sensor, reduce the regulation value to its minimum selectable value. With the heating active, incrementally increase the setting at an hourly interval until the required floor surface temperature is achieved.

My floor does not get up to temperature

- 1. Underfloor Heating is normally designed to heat floors to up to 16°F (9°C) above the design room air temperature, which is typically 84°F (29°C). Delicate floor finishes, such as vinyl and some woods, may be limited to 81°F (27°C). Our hand and foot temperature is normally similar to this, at around 84° - 90°F (29 - 32°C), so the heated floor will feel slightly cooler than touching your own hands together.**

If you wish to raise the floor temperature, such that it feels warm, it is permissible to set it up to 27°F (15°C) higher than the design room air temperature. The higher heat output of the floor may overheat the room, making it uncomfortable. The manufacturer of the floor finish should be consulted to ensure compatibility with the chosen temperature before making any changes to the thermostat settings.

- 2. Refer to points 1, 2 & 3 in the “My floor is getting too hot” above, as each issue can also be the cause of under heating a floor.**

- 3. If the thermostat is controlling the heating using the air temperature, with a floor temperature limit then the floor may be turned off before it reaches its limit.**

This is normal as the thermostat is preventing the room air temperature from becoming overheated.

My floor does not get up to temperature

4. The heating system may be uninsulated. If the heater has not been installed over a layer of Warmup Insulation Boards, it will be actively heating the subfloor as well as the floor finish. The warm up period of the floor will therefore be slower as the system is heating a much greater mass. It could take several hours if it is installed directly on a thick layer of uninsulated concrete.

If your thermostat has an optimised start feature, ensure it is enabled so that the thermostat can compensate for the mass of the floor. If your thermostat does not have an optimised start feature, measure the time taken for the floor to warm up and adjust the heating start time to compensate.

5. The heat output of the installed system may not be sufficient. The system will require a power output of approximately 0.93W/ft^2 (10W/m^2) for every degree warmer you require the floor to be than the air. This is in addition to any heat loss downwards through the subfloor.

If the room air temperature is also lower than desired, supplementary heating may be required to overcome the room heat losses.

If access is available to the underside of the subfloor, installing insulation within the floor will reduce the amount of heat lost through the floor.

6. Floor coverings such as carpets, underlays and wood are thermally resistive and will reduce the achievable floor surface temperature. They may also require the floor sensor to be recalibrated.

Floor finish combinations with a thermal resistance of more than 1.5 tog are not recommended and we recommend that you look to fit a less resistive floor finish. Floor finish combinations with a thermal resistance of more than 2.5 tog are not permitted.

I am getting patchy heat across my floor

1. If the subfloor varies across the floor, the amount of heat absorbed by it and lost through it will affect the floor surface temperatures differently above each case.

2. If the floor covering over the underfloor heating changes, each floor finishes characteristics will affect the warm up period and the achievable surface temperature.

3. Hot water pipes under the floor could cause parts of the floor to seem warmer than others.

4. Irregularly spaced cables will cause the floor to be warmer above the closer cables and cooler where the cables are spaced further apart.



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. From the date of original purchase, only if the heater is registered with Warmup within thirty (30) days after the date of purchase; and
2. Proof of purchase is presented to Warmup i.e. invoice and receipt. Such invoice and receipt must state the exact model that was purchased; and
3. The control card accompanying this warranty is complete and presented to Warmup for inspection; and
4. The floor covering under which the heater(s) was originally installed, remains undisturbed and in situ; and
5. The heater has been grounded and protected by a ground fault circuit interrupter (GFCI) at all times during the heaters operation

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 NADCM-C 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 (CEC), 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.

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, Canada or Mexico.
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 MERCHANTABLE 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.

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Electric
Heating System

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