

UNDERFLOOR HEATING LOOSE CABLE SYSTEM

INSTALLATION MANUAL





Contents

Important Safeguards and Warnings
1 General Information 3
1.1 Use of the Manual3
1.2 Safety Guidelines3
1.3 Remember to measure resistance 4
1.4 25-year Limited Warranty4
2 ThermRite Loose Cable System4
2.1 ThermRite Loose Cable Specifications 4
2.2 Thermostat Specif <mark>ication</mark> s4
2.3 ThermRite Loose Cable typical installations and applications
3 Floor Heating Design and Product Selection 5
3.1 Design the Installation
3.2 Confirm Your Product Selection 7
4 installation
5 Commissioning
5.1 Insulation Resistance Test
5.2 Heating Cable Resistance Test
5.3 Sensor Resistance Test
6 Troubleshooting
EXTENDED WARRANTY15



Important Safeguards and Warnings

WARNING: Shock and fire hazard

If the Loose Cable System is damaged or not installed properly, fire or shock could occur resulting in serious personal injuries or damage to property. You must carefully follow the warnings and instructions contained in this manual.

· Thermostat must be used.

· It is important that this equipment is installed only by qualified electricians who are familiar with the proper sizing, installation, construction and operation of floor warming system and the hazards involved. The installation must comply with all national and local electrical codes. If you are unfamiliar with these requirements, contact an electrician.

• The heating cable is designed for under floor heating purposes only. Be sure that the floor is not penetrated by nails, screws, or similar devices that can cause damage on first installation or during subsequent floor repairs in the future.

• If the Loose Cable System is damaged, it must be replaced. Do not attempt to splice or repair any part of the system.

1 General Information

1.1 Use of the Manual

This manual describes the ThermRite Loose Cable floor heating system — how to design the room, select the product, and install the system. It is important to thoroughly review this manual and the following document prior to installation:

Thermostat Installation and Operation Manual

1.2 Safety Guidelines

The safety and reliability of any floor heating system depends on proper design, installation, and testing. Incorrect installation or mishandling of the product can cause damage to the heating cable, system components and property, and can create a risk of fire or shock. The guidelines and instructions contained in this guide are important. Follow them carefully to minimize these risks and to ensure that the Loose Cable system performs reliably.

Pay special attention to the following:

Instructions marked Important

·Safety warnings identified as 🖄 WARNING



1.3 Remember to measure resistance

The resistance should be measured between the two conductors, blue and brown. Compare this resistance reading to the resistance specified in the Product Selection "Table 1 or Table 2". The value should be within -5%~+10%.

Also, measure the resistance between the blue, brown and shielding/ground wire. Both should read infinity.

Please refer to "5 Commissioning" for instructions on how to measure the resistance.

Important: measure the resistance four times during the installation process

Remember to always measure, verify and record the actual resistance throughout the installation process (out of the box, after installation, after thin set cement or self-leveler application and after installation of floor tiles).

1.4 25-year Limited Warranty

For a period of twenty-five (25) years from the date of purchase warrants that the ThermRite Loose Cable heating cable is free from defects in material, design, and workmanship. The extended warranty is only valid if the warranty certificate has been properly completed and mailed, and the installation is in accordance with the installation instructions.

2 FHCT System

2.1 FHCT Specifications

Cable Construction:	Twin conductor	
Rated Voltage:	230V	
Output:	12W <mark>/m, 16</mark> W/m	
Heating Element Size:	9.6-1 <mark>50.0m</mark>	
Bending radius:	25mm	
Cable Diameter:	3.6m <mark>m</mark>	
Conductor Insulation:	fluor <mark>opolym</mark> er	
Outer Insulation:	PVC	
Max. Ambient Temp.:	85°F <mark>(30℃)</mark>	
Min. Installation Temp.:	40 °F <mark>(5℃)</mark>	
Cold lead	2.5m length	

2.2 Thermostat Specifications

Functions:	On/Off control, digital display, 7-day programmable
Supply Voltage:	120/240 V ±15%, 50/60 Hz
Maximum switching current:	16 Amp
Temperature control range:	40 to 104°F (5 to 40°C)
Ambient range:	32 to 104°F (0 to 40°C)
Floor temperature sensor:	2-wire, 3m lead wire





2.3 ThermRite Loose Cable typical installations and applications

Alternative method: self-leveling cement is recommended for large surfaces and the following floor materials: engineered wood, laminate, floating floors, vinyl, linoleum, and carpet.

🗥 Warning

Consult the manufacturer for information on special installation requirements for wood, laminate and vinyl or linoleum flooring.

Important

• Read the instructions carefully before installing ThermRite Loose Cable system.

Remember to measure the resistance four times.

• Do not install ThermRite Loose Cable under permanent fixtures or furniture such as showers, toilets, vanities, or cabinets. New furniture added in the future on the heated area must have feet or will cause overheat and damage to the heating cable.

• If heated area covered by anything, such as carpet, the floor sensor must be in the hottest area to protect the heating cable or overheat will be caused and therefore damage the heating cable.

• The cable (include splice and end seal) must be on the floor and embedded in mortar, thinset, concrete or similar material, or will cause overheat and damage the heating cable.

The heating cable cannot be cut to length, crossed over itself, or installed too close to another length of cable.

- \cdot It is recommended to use copper wire only.
- Remember to check the supply voltage matches the voltage of the ThermRite Loose Cable.
- \cdot Do not install ThermRite Loose Cable in walls or ceilings.
- \cdot Only for indoor installation.
- \cdot The minimum installation temperature is 40 $^\circ \! \mathrm{F}$ (5 $^\circ \! \mathrm{C}$).



3 Floor Heating Design and Product Selection

3.1 Design the Installation

Step 1: Measure the heated area

For example, in Figure 2, the area of the bathroom is $6m^2$. When you subtract the area of the vanity, shower and toilet, the total heated area is only $4.2m^2$.

Step 2: Determine the power supply voltage

Make sure the supply voltage was 230 V.

Important

Operating the 230V cable at 220V will reduce 8.5% output, at 240V will add 8.9% output.

Step 3: Plan the design

Determine the optimum floor heating Cable layout for your heated area to ensure coverage. Select a spot for the thermostat in the wall above the heated area where it can be reached by the 2.5m cold lead on the ThermRite Loose Cable, and the 3m floor temperature sensor. Please refer to Figure 3.

Important

The predetermined ThermRite Loose Cable spacing must be maintained to ensure proper floor heating. Do not change the ThermRite Loose Cable heating cable spacing when you lay out the cable or the floor



may have cold spots.





Figure 3: Typical cold lead and floor temperature sensor



3.2 Confirm Your Product Selection

Confirm that your ThermRite Loose Cable is no larger than the heated area. Following the example from Figure 2, if the heated area is 4.2m2, and you if prefer 200W/m2, then 4.2*200=840W, select TRC12-750.

Catalog number	Cable length	Power output	Current	Resistance
	m	W	A	Ohms
230V. 12W/m FHCT				
TRC12-150	12.5	150	0.7	352.7
TRC12-225	19.0	225	1.0	235.1
TRC12-300	25.0	300	1.3	176.3
TRC12-375	31.5	375	1.6	141.1
TRC12-450	37.5	450	2.0	117.6
TRC12-525	44.0	525	2.3	100.8
TRC12-600	50.0	600	2.6	88.2
TRC12-675	56.5	675	2.9	78.4
TRC12-750	62.5	750	3.3	70.5
TRC12-900	75.0	900	3.9	58.8
TRC12-1050	87.5	1050	4.6	50.4
TRC12-1200	100.0	1200	5.2	44.1
TRC12-1350	112.5	1350	5.9	39.2
TRC12-1500	125.0	1500	6.5	35.3
TRC12-1800	150.0	1800	7.8	29.4
230V, 16W/m FHCT				
TRC16-200	12.5	200	0.9	264.5
TRC16-300	19.0	300	1.3	176.3
TRC16-400	25.0	400	1.7	132.3
TRC16-500	31.5	500	2.2	105.8
TRC16-600	37.5	600	2.6	88.2
TRC16-700	44.0	700	3.0	75.6
TRC16-800	50.0	800	3.5	66.1
TRC16-900	56.5	900	3.9	58.8
TRC16-1000	62.5	1000	4.3	52.9
TRC16-1200	75.0	1200	5.2	44.1
TRC16-1400	87.5	1400	6.1	37.8
TRC16-1600	100.0	1600	7.0	33.1
TRC16-1800	112.5	1800	7.8	29.4
TRC16-2000	125.0	2000	8.7	26.5
TRC16-2400	150.0	2400	10.4	22.0





4 installation

Main Important: Tools and materials required

You will require the following items to install and test the floor heating system:

- Scissors
- Utility knife
- ·Wire strippers
- ·Tape measure
- Screwdriver
- Multimeter

You will also need the appropriate tools and materials to install your floor. These will likely include products like self-leveling mortar, thin-set mortar, backer board, tile, a notched trowel, and any other tools for your specific floor.

Follow these steps to ensure a successful ThermRite Loose Cable installation.

Step 1: PLAN LAYOUT

Make a sketch layout or a floor plan of the room; include all permanent furnishings such as toilets, bathtubs, appliances, cabinetry, etc. Indicate all dimensions required to determine the available floor area and the position of the JH thermostat.

Market Important

Manufacturer recommends that the installation is documented with photos to note the location of connections and the sensor.

Step 2: TRANSFER LAYOUT TO FLOOR

Draw an outline of the layout on the room floor including a footprint of all furnishings that are not yet installed. Unroll the first few feet of the ThermRite Loose Cable. The starting point of the cable must be placed within 2.5m from the thermostat. Using your floor plan determine your desired spacing of cable and strapping (recommended 0.5-1m apart).



🞽 Important

Minimum distance between the cables must be 50mm or greater. Mark the position of the connection point between the power lead and the green ThermRite Loose Cable heating cable. **This connection must be concealed in thinset or self-leveling cement.** When using a floor temperature sensing thermostat, mark the sensor position in the middle of 2 heating cables, about 25cm away from the wall (within the heated area), as close as possible to the thermostat.



Step 3: INSTALL SENSOR

If using a floor temperature sensing thermostat, install the sensor now, either in conduit tube, or directly to the subfloor. It is recommended that the sensor be installed in conduit tube. This will allow the sensor to be easily replaced in the unlikely event of failure.

The sensor and/or tube needs to be installed between the thermostat wall box and the sensor position. The conduit tube must be partially countersunk into the subfloor. Cut a channel approximately 8cm deep × 8cm wide in the floor and wall up to the thermostat for



the sensor conduit. The conduit must go from the thermostat and minimum of 25cm away from the wall towards the middle of the floor.

/ Important

The sensor conduit must be centered in the cable loop (between two green heating wires). Use duct tape to close the end of the conduit so that thinset can't penetrate the conduit.

Use duct tape to hold the sensor conduit into the groove to prevent it from floating up when the mortar or thinset is poured.

If the sensor is installed directly in the mortar bed, use duct tape to secure to subfloor.

Step 4: PREPARE SUBFLOOR SURFACE

Clean and vacuum the floor thoroughly and remove dust and debris from the floor that may damage the heating cable.

Ensure that the subfloor is secure and stable. Carefully fill in all cracks to prevent any potential damage to the new tiles resulting from shifts in the subfloor.

Step 5: MEASURE THE RESISTANCE (THE FIRST TIME)

Use a digital ohm meter to measure the resistance of the FHCT and compare it to "Table 1". Record the

measured resistance on the warranty card. Documenting the resistance at each stage of installation is required for warranty purposes. Also, measure the resistance between the blue, brown, and shielding/ground wire. Both should read infinity.

Please refer to "5 Commissioning" for instructions on how to measure the resistance.

Step 6: BEGIN LAYING THE THERMRITE LOOSE CABLE

Place the cable so that the connection point and the temperature sensor are in their intended positions and bring the power lead cable to the thermostat or connection box.

Begin laying the ThermRite Loose Cable according to the layout developed in Step 1.

DO NOT CUT OR SHORTEN THE GREEN **HEATING CABLE!**





Do not expose it to any mechanical stress. Avoid walking on the heating cable. If this is not possible, **use shoes with soft soles.** Use ThermRite Loose Cable strapping to secure the cable to the subfloor. Attach the ThermRite Loose Cable strapping with adhesive, nails, staples, or double-sided tape. Please refer to Step 8 for instructions on how to use the ThermRite Loose Cable strapping.

ENSURE THAT THE SENSOR CONDUIT HAS BEEN PROPERLY INSTALLED BEFORE PROCEEDING (refer to Step 3).

It is highly recommend take photographs of the installed ThermRite Loose Cable before installing the flooring.

Step 7: MEASURE THE RESISTANCE (THE SECOND TIME)

Please refer to Step 5.

Step 8: THERMRITE LOOSE CABLE STRAPPING INSTRUCTIONS

Space the strapping at 0.5 to 1m (maximum recommended spacing is 1m). Secure the strapping to the subfloor with adhesive, staples, nails, or double-sided tape.





Step 9: Embed the floor heating cable in mortar

For tiling applications, proceed with the installation of the tiles by covering the heating cables with a layer of thinset cement as directed by the tile manufacturer. Ensure that the thinset mortar covers the entire heating cable as the tiles are installed.

For engineered wood or laminate floor coverings, it is recommended to consult the flooring manufacturer for maximum temperature allowance (use a thermostat with a floor temperature limiter). For wooden floors, selfleveling cement over the heating cable is recommended. Ensure that all moisture in the selfleveling cement has been fully eliminated in



accordance with the drying times recommended by the cement manufacturer (consult the manufacturer for exact drying time).

🞽 Important

The system must not be turned on until the thinset cement has fully dried. A minimum of two weeks is recommended.

Step 10: MEASURE THE RESISTANCE (THE THIRD TIME)

Please refer to Step 5.

Step 11: Install the tile

To install the tile, apply a layer of acrylic or latex modified thin-set using the ridged side of your trowel. Tile and grout the floor using best industry practices and in accordance with instructions provided by the manufacturer of the tile.

Step 12: CONNECT POWER SUPPLY AND THERMOSTAT

The connection of the power supply and the thermostat must be done by a qualified electrician in accordance with the National Electrical Code (NEC) and the Canadian Electrical Code (CEC). The electrician should connect the floor sensor to the thermostat, take the final resistance reading and record it on the warranty card, see Step 13.

Note: You need to mark the appropriate circuit breaker reference label indicating which branch circuit supplies the circuits to those electric space heating cables.

Step 13: MEASURE THE RESISTANCE (THE FOURTH TIME)

Please refer to Step 5.

Step 14: RECORD INFORMATION AND AFFIX LABELS

It is important for the homeowner to mail in the certificate immediately after installing the system (cable and thermostat). Failure to do so could void the manufacturer's warranty. The warranty is subject to the guaranteed conditions listed on the warranty certificate.

Keep a copy of the warranty card for your reference.

Step 15: ENJOY THE COMFORT OF FHCT

The ThermRite Loose Cable heating system is now ready to use. Increase the floor temperature gradually and adjust it until it reaches a comfortable level depending on the type of room and your personal preferences.



5 Commissioning

Important

For the extended 25-year limited warranty to apply, you must perform these tests, record the results on the warranty card, and retain a copy of the record.

You must perform the Insulation Resistance Test, the Heating Cable Resistance Test, and the Sensor Resistance Test four times (Please refer to 4 installation) during the installation process.

5.1 Insulation Resistance Test

This test ensures that the insulating jackets of the cable are not damaged. A low value indicates the cable has been damaged and must be replaced.

- 1. Connect the ground wire to the black lead and both power wires to the red lead of the multimeter.
- 2. Make sure the meter reads "Open" or "OL." If you get a different reading,
- 3. Record these readings on the warranty card.

5.2 Heating Cable Resistance Test

This test measures the resistance of the ThermRite Loose Cable and is used to determine circuit integrity.

- 1. Set your multimeter to the 200- or 2000-ohm range.
- 2. Connect the multimeter leads to the brown and blue cold lead wires.
- 3. Compare this resistance reading to the resistance specified in the Product Selection "Table 1". The value should be within -5% \sim +10%. If you get a different reading,
- 4. Record these readings on the warranty card.

5.3 Sensor Resistance Test

This test measures the resistance of the floor sensor and is used to verify the sensor integrity.

- 1. Set your multimeter to the 200K ohm range.
- 2. Connect the multimeter leads to the red and green lead wires.
- 3. Make sure the meter reads between 9-25K ohms. If you get a different reading,
- 4. Record these readings on the warranty card.







6 Troubleshooting

Symptom	Probable Causes	Corrective Action			
Floor doesn't heat	No voltage.	Check circuit breaker.			
	Circuit breaker tripped.	J. Ensure that there are not too many cables orothe			
		appliances connected on the same circuit. The			
		ThermRite Loose Cable may require a dedicated			
		circuit. See the Product Selection "Table 1" of this			
		manual.			
	Ground fault tripped in	Pofer to Thermostat Installation and Operation			
	the thermostat				
		Manual.			
	Thermostat not turned	Refer to Section 4 of this manual, and the			
	on.	Thermostat Installation and Operation Manual.			
	Cable not connected	Refer to Thermostat Installation and Operation			
	to thermostat.	Manual.			
	Floor temperature	Refer to Thermostat Installation and Operation			
	sensor not connected.	Ma <mark>nual.</mark>			
	Faulty sensor.				
Floor warm all the	Clock not set correctly.	Refer to Thermostat Installation and Operation			
time		Manual.			
Floor not warm	Thermostat setting not	Refer to Thermostat Installation and Operation			
enough	set correctly.	Manual.			
Installation		Download the latest version of ThermRite			
instructions not		Loose Cable system Installation Instructions			
available		from			



⚠ EXTENDED WARRANTY

For a period of twenty-five (25) years from the date of purchase warrants that the ThermRite Loose Cable is free from defects in material, design, and workmanship. The extended warranty is only valid if the commissioning record has been properly completed and kept, and the installation is in accordance with the installation instructions.

The defective ThermRite Loose Cable must be inspected by or submitted to or an authorized ThermRite Loose Cable dealer. Failure to comply with all the foregoing will void this extended warranty. will, when the customer has documented that a defect in the HC was present at the date of delivery, repair or supply a new FHCT at option. All claims shall be made within the extended warranty period. shall not be liable for any claims made later than twenty-five years from date of purchase.

shall not be liable for any consequential and secondary costs or damages linked to the defect or replacement of the ThermRite Loose Cable. will be liable for any costs related to the dismantling of defective product and the installation of a new product; however, such liability is limited to the amount of five (5) times the initial product costs for each damage/case.

Commissioning Reco Retain this record.	ord			
Date of commissionin	Ig			
Company		Address		
		Phone		
Installer		Phone		

		Cabl <mark>e/mat</mark> 1	Cable/mat 2
Heating	Catalog Number		
cable/mat	Batch Date (from box or cord label)		
Insulation	Out of the box		
Resistance	Before embedding in mortar		
	After embedding in mortar		
	After floor covering		
Heating Cable Resistance	Out of the box		
	Before embedding in mortar		
	After embedding in mortar		
	After floor covering		
Sensor Resistance	Out of the box		
	Before embedding in mortar		
	After embedding in mortar		
	After floor covering		

Installer: please leave this record with homeowner.

Homeowner: you must keep a copy of the completed Commissioning Record in order for the 25-year limited warranty extension to apply.





