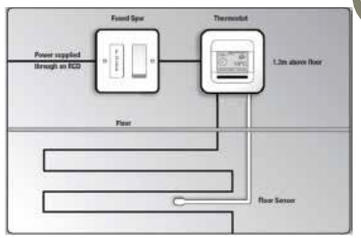

Use single pole disconnection thermostat.
Also use all pole disconnection switch next to the thermostat.

The thermostat used in the test is locked to a max setting of 27°C and the test are performed according to floor type 2. (The results are applicable for floor type 1-5).

The heating mat can also be used if floor type 4 and 5 with a thermostat locked to a max setting of 40°C. This test report also complies with other floor types.

	W/sqm			
Floor Types	120	150	160	200
Concrete/wood structure (timber on top)	27°C	27°C	27°C	27°C
Concrete/wood structure (Ceramic on top)	27°C	27°C	27°C	27°C
Concrete floor (timber on top)	27°C	27°C	27°C	27°C
Concrete floor (ceramic on top)	40°C	40°C	40°C	40°C
Israel version sesame gravel/ sand structure (Ceramic / marble on top)	40°C	27°C	40°C	40°C

Technical Information

Technical Data

1. General Construction = Twin core wire with earth
2. Voltage = 230 VAC – 50Hz
3. Maximum Load = 200w/sqm
4. Approvals = Intertek Semko EN-60335, IEC-60335-1:2001, IEC-60335-2-96:2002, S-Mark CE, EAC
5. Power Range = 120w-2400w
6. Heating mat area = 1.0 sqm to 12 sqm
7. Cable Flexibility = Minimum allowable cable bending radius is 25mm
8. IP Rating = IPx7 as required by the 17th edition IEE wiring regulations
9. UV Resistance = UV resistant as per VDE
10. Ohms/unit tolerance = +10/-5%

Construction

1. Thermal conductor = twin core class 2x multi strand resistance wires. Fluoro polymer insulated with 0.45mm maximum (RTI).
2. Core insulation = Reinforced insulation
3. Screening = Copper shield
4. Outer insulation = PVC (105) UV resistant, tested to 90°C
5. Reinforcement materials = Flouro polymer
6. Mesh size = 0.5 mtr x L (L varies from 2-24 mtr)
7. Other available sizes are = 0.3 mtr & 0.2 mtr also
8. Cold lead = Type-Y attachment
9. Thermostat IP Rating = IP x 21 as per IEC

Testing

Each and every CoreWarm mat is carefully tested before it is shipped from the factory and is packed suitably to avoid damage during transit. However, damage does sometime occur in storage or transit, and sometimes during installation. We strongly recommend you test your mat.

1. After unpacking them but before you install them.
2. After you have installed them but before the floor covering (i.e. while the cable is still exposed).
3. For continuity and resistance value both wires of cold lead (blue and brown) connect to multi meter and get ohms value refer table for verification.
4. For ground testing any one wire blue or brown and ground wire yellow/green, connect to multi meter.
5. After installation and floor covering but before the thermostat is connected, a simple test is visual inspection to make sure there is no visible damage to the heater, and in particular to the cable component in the heater. A simple electrical inspection can be done with an ohm meter to make sure the ohm resistance is as per table. Ohms resistance can vary significantly depending on the ambient temperature and variation of -5% to +10% from the nominal value is acceptable as per IEC 60800. At this point an insulation resistance test should now be carried out.

Technical Information

Type / Model - FHM - TWIN

Mat Area M²	120W/m² Product Code	120W/m² Watt/Unit	120W/m² Ohms	150W/m² Product Code	150W/m² Watt/Unit	150W/m² Ohms	160W/m² Product Code	160W/m² Watt/Unit	160W/m² Ohms	200W/m² Product Code	200W/m² Watt/Unit	200W/m² Ohms
1.0	91120050001	120	441	91150060501	150	352	91160110001	160	330	91200080001	200	265
1.5	91120050015	180	294	91150060515	225	235	91160110015	240	220	91200080015	300	176
2.0	91120050002	240	220	91150060502	300	176	91160110002	320	165	91200080002	400	132
2.5	91120050025	300	176	91150060525	375	141	91160110025	400	132	91200080025	500	106
3.0	91120050003	360	147	91150060503	450	118	91160110003	480	110	91200080003	600	88
3.5	91120050035	420	126	91150060535	525	101	91160110035	560	94	91200080035	700	76
4.0	91120050004	480	110	91150060504	600	88	91160110004	640	83	91200080004	800	66
4.5	91120050045	540	98	91150060545	675	78	91160110045	720	73	91200080045	900	59
5.0	91120050005	600	88	91150060505	750	70	91160110005	800	66	91200080005	1000	53
6.0	91120050006	720	74	91150060506	900	59	91160110006	960	55	91200080006	1200	44
7.0	91120050007	840	63	91150060507	1050	50	91160110007	1120	47	91200080007	1400	38
8.0	91120050008	960	55	91150060508	1200	44	91160110008	1280	41	91200080008	1600	33
9.0	91120050009	1080	49	91150060509	1350	39	91160110009	1440	37	91200080009	1800	29
10	91120050010	1200	44	91150060510	1500	35	91160110010	1600	33	91200080010	2000	26
11	91120050011	1320	40	91150060511	1650	32	91160110011	1760	30	91200080011	2200	24
12	91120050012	1440	37	91150060512	1800	29	91160110012	1920	27	91200080012	2400	22

Code — 91xxx Watt/m² — xxx spacing — xx area

GEEKORE®

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Stay Warm
With Us...

Heating Mat
Installation Kit **Guide**

CoreWarm™
Heating Solutions
Heating systems for all floor types

Introduction

An under floor heating system creates a cozy and comfortable environment through modern techniques where the floor can be of tile, concrete, timber or carpeted floor. This heating system distributes heat evenly, silently & safely.

Installation Manual

This instruction manual contains important information regarding the safe installation and operation of heating mats. These installation instructions are not intended to replace or supersede the installation instructions provided by the manufacturers of your floor coverings but to supplement them. Our heating mat kits are extremely strong but care must be taken when installing them, Please ensure you read this guide carefully before commencing installation of heating mat and check that you have all the components required. The system be controlled via an RCD protected circuit. For systems not exceeding 13 amps a fused spur or circuit breaker that has contact separation in all poles that provides full disconnection under Cat 3 conditions can be used. For system larger than 13 amps a suitable protective device that complies with regulations must be used. In case of any ambiguity please contact CoreWarm Heating Solutions or your local installation provider.

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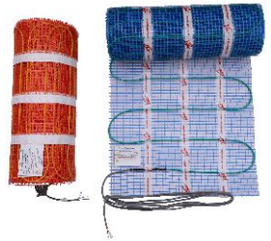
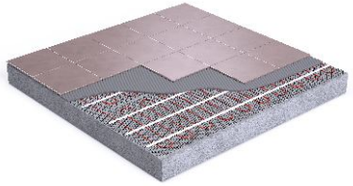
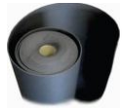




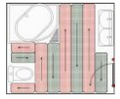
Installation

Installation Notes

1. To avoid any damage to a heating element and its terminations in timber constructions due to relative movement after installation, use flexible sheet of polyethylene foam. It serves two proposes one a thermal insulation, and secondly it absorbs the movement of wood.
2. During installation we provide set of 3 labels which are fixed adjacent to the distribution board and that it has to contain the locations of the heating units
   - Installation statement (refer last page)
   - Drawing layout
   - One-line diagram
3. The installation statement will contain date, installer name, project name, area / location name. It is recommended to use double sided tape to fix the mat onto the floor.

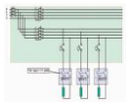


polyethyleme Foam



Drawing Layout

Scan Drawing Layout



One-line Diagram

4. The system requires a mains voltage 230/240v and must be connected by a suitably qualified person.
5. Our heating mat elements are 12W-15W per linear meter, while wattage per meter square is determined by spacing the cable at around 50mm to 110mm, available in 120w/sqm, 150w/sqm, 160w/sqm and 200w/sqm

6. The power cord is multi core grey cable which is the cold lead having multi strand yellow / green earth core which is connected to the mains incoming earth from the supply. The second core (brown) is for live (L) connection and the third core (blue) is neutral (N). Connect the wires depending upon the colours required by standard of each contries.
7. For larger areas, if two or more mats are required, these can usually be connected together at the thermostat or by using a small blank fronted connection box.
8. The system is suitable for installing on any sub-floor which is sound and suitable for tiling on top this will be concrete, plywood or cement faced tile-backer boards. Some water resistant composite boards may also be suitable, but it is not recommended to tile directly onto hardboard, MDF or standard grade chipboard as these substances absorb moisture and subsequent swelling could cause tiles to crack o r dislodge. Please check installer for the sub-floor suitability.
9. Note: if installing on a newly finished concrete screed the required minimum drying out or 'curing' period should be followed before installing (this is typically 1mm per day in good conditions).
10. The electrical and electromagnetic fields generated are negligible and well within all recommended European and international guidelines.
11. The heating mat elements MUST NOT over-lap or cross at any point and should be minimum 50mm apart

Contents of Heating Mat Kit.

1. Twin-core heating element laid on glass fiber flexible mesh.
2. Bottle/s of thermal floor primer.
3. Disposable roller for application of primer.
4. Digital thermostat & separate floor sensor.
5. Warranty certificate
6. Conduit for floor sensor

Note: Point 2 to 6 - to be Provided by local installation provider

Electrical Installation

Professional Electrical Installation

The faulty installation of electrical systems can cause risk of fire and electrical shock which can result in personal injury. Caution should always be taken to guard against each such risk. Only a qualified electrician should connect the heating mats to the thermostat and or to the electrical supply circuit. Carry out all electrical work required to install i.e. Chisel walls and install back boxes for fused spurs and thermostat position. Please make sure all works conform to the implied National wiring regulation. The heating units are to be supplied through a residual current devise (RCD) having a rated residual operating current not excluding 30mA and upto 4.8 KW. For connecting heating units to the supply, connect all cold wire leads from the heating mats in parallel inside an electrical junction box or boxes.

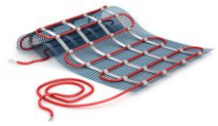
Caution

Due to the new requirements of the part P building regulation, which deals with the electrical safety in dwellings only a qualified person who is familiar with the construction and operation of the apparatus and the hazards involved shall make the final connections to the electricity supply and test the installation.

Important

All such connections must be in accordance with BS7671 17th Edition part P wiring regulation which covers design, installation, inspection testing, verification and certification.

Note: when installing the thermostats in bathrooms they should always be located outside the room and use the floor probe supplied, always check with a qualified electrician that all electrics are in safe and suitable zones.



Installation Instruction

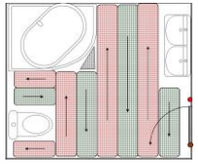
Step 1

Before installing draw an installation plan showing the placement of the mats, floor sensor, and junction box or boxes. The heating mats should cover at least 65% - 80% of the floor area of your room to be used as a primary heat source; the more coverage, the less time needed to heat the area. Our heating mats are available in several convenient sizes. Choose the combination of heating mats that best enables you to cover the recommended 65% - 80% of your room. Plan to use the larger heating mats as much as possible and to use smaller mats only as gap fillers.

Note: The mats are supplied with 16 feet (4 meters) of electrical cold leads, if this is not enough, ask your electrician to extend the cold leads.

Ensure that the sub-floor is solid and suitable for tiling, free from dust and debris. Wooden sub floors should ideally be reinforced to prevent flexing and the possibility of tiles dislodging. This can be reinforced using a suitable WBP or Marine plywood or insulated tile-backer boards. Bitumen bases should be covered with a suitable backer board or a 3-5 mm leveling compound.

1. Avoid air gap between the heating element and screed. After pouring the screed, sweep the floor thoroughly, the screed will enter the gaps in the textile mesh and there will be no air voids.
2. Keep current orientation during laying and don't install over irregular surface.
3. Thermal resistance or the materials ability to resist the transfer of heat from the source to the ambient is measured as a tog value. Depending upon the floor covering and their thermal performance, the system will support for a tog value of 2.0
4. Do NOT install the heating mat directly onto a bitumen base.



Step 2

Prime the floor using acrylic based primer contained in the kit (not suitable for anhydrite screeds). Once primed leave to dry (typically 1-2 hours). Once primed avoid any excess foot traffic over this area. The purpose of priming is to promote greater adhesion and reduce the amount of moisture absorbed into the sub-floor.

ALWAYS CHECK with tile adhesive / leveling compound manufacturer that the primer is suitable for use with their product/s, please contact the installation service provider if you are in any doubt.

Step 3

If using CoreWarm tile backer boards or XPS premium insulation boards, do so in accordance with manufacturer's instructions, we do advise staggering the boards in a brick bond style and making sure the boards are fixed using suitable flexible adhesives to solid floors and or mechanically fixed to wooden sub-floors @300mm using suitable screws and washers.
(DO NOT use XPS premium boards on wooden sub-floors)
(DO NOT use XPS standard boards with this heating system)

Step 4

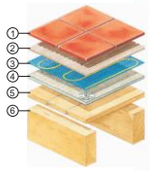
At this point we recommend referring to the testing procedure on page 5/6. Please take time to carry out this as it is extremely important.

Step 5

The heating element/cable MUST NOT overlaps or cross at any point (the heater cables should not be spaced closer than 50mm at any point to each other). Adjust the spacing if necessary to ensure all the mat is used up and the floor has an even covering.

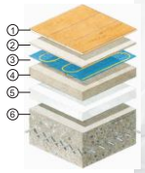
Timber screed sub floors

1. Finished floor covering, could be ceramic, stone, timber, carpet or vinyl
2. Flexible cement based tile adhesive, when tiling over thermonet, or self leveling compound when laying a soft floor finish (Vinyl, carpet or timber).
3. Thermonet (Mat)
4. 12mm econoboard coated screwed down at 300mm centres
5. Floor boards or chipboard flooring
6. Floor joints

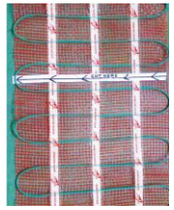


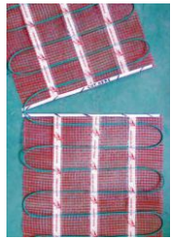
Concrete screed subfloors

1. Finished floor covering, could be ceramic, stone, timber, carpet or vinyl.
2. Flexible, cement based tile adhesive, when tiling over thermonet, or self leveling compound when laying a soft floor finish (vinyl, carpet or timber).
3. Thermonet (Mat)
4. Sand and cement screed.
5. Polystyrene insulation
6. Concrete ground slab use of a thermal insulation board such as econoboard will greatly reduce heat up times and increase the efficiency of the system this would be installed between points 3 & 4 stable sub floor.



Split and U turn as per picture during mat installation.


1

2

3

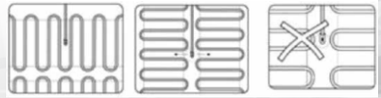
4

Step 6

Position the sensor in the black conduit supplied between two runs of mat and tape into position. The sensor wire can be shortened or lengthened. If you need to cut the sensor wire you must only cut the end containing the wires. DO NOT cut the end which contains the plastic sensor. The connections to the thermostat can now be made. The earth from cable can then be connected to the earth from the incoming supply by using the earth terminal in the back box. If using a plastic box with no terminal then a suitable terminal block can be used. At this point an insulation resistance test must be carried out by a qualified electrician. The rest of the thermostat connections can be made as per thermostat manufacturer guidelines.

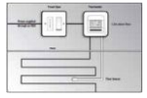
Step 7

Check the heating mat resistance and insulation resistance values after laying. Check if these values are consistent with pre-install values. Record values on the warranty certificate.



Step 8

Run the power leads from the start of the heating mat cable up to the thermostat position. If the cable contains a earth braid around the cold tail this can be unbraided by using a screwdriver and earth wire yellow / green connected to the main earth supply – if using multiple cables route all power leads through a conduit from the floor to a junction box and supply the junction box from the thermostat. The earth from the cable can then be connected to the earth terminal in the back box, (shown here) if using a plastic box with no terminal then a terminal block can be used.

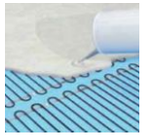


Step 9

Test the heating mat resistance again using a multi-meter, an insulation resistance test should also be carried out to ensure the cable is free from damage.

Step 10

If possible cover the heating mat cable with a thin layer of suitable latex based leveling compound (5-6mm). This will help protect the cables when tiling. You may tile directly over the cables, however extra care must be taken not to dislodge the cables or to damage the cable in anyway. If you are using a suitable vinyl carpet or engineered / laminate floor as the final covering then we recommend a minimum of 8mm suitable latex leveling compound to cover the heating mat/ cables to ensure even heat distribution.



You can now lay your flooring according to your floor manufacturer's instructions. Please refer to adhesive manufacturer's guidelines for drying times before turning ON your heating system, this is usually around 7 days, the floor temperature should be increased gradually by 1-2 degrees per day over a 2 week period to reduce the risk of forced drying.

Use double sided tape to fix the mat on to the floor.

Step 11

Tile the floor using a flexible tile adhesive and grout as per industry standards and manufacturers conditions. Finally wait at least 1 week before turning ON to allow time to dry. NOTE the heating may be slow to react at first, especially if installed on a new screed floor or in a new building. Start by setting the floor temperature at approx 18°C and build up by 1°C per day until your desired temperature is reached. Please see separate instructions for connection and operation of digital thermostat.

Do's

1. Do read through these instructions carefully before beginning work (including joints) is fitted beneath the floor covering
2. Do use a multi-meter to test the cable, before, during and after covering
3. Do use a heat mat thermostat to control your system
4. Do test the heating mat cable before tiling. Do be careful not to damage or dislodge the higher tog heating element during tiling. Do wail at least 7 days before turning on the system.
5. Do ensure the joint between the cold tails and heating mat element is beneath the tiles. De ensure that the electric circuit that supplies electricity to the underfloor heating system is equipped with 30mA ground fault current interrupter (GFCI) or Residual Current Device (RCD). For wet areas ensure that the electric circuit that supplies electricity to the heating system is equipped with a 5mA ground fault current interrupter (GFCI) or Residual Current Device (RCD). See page 5 for a list of recommended thermostats.
6. Do connect all cold wire leads from the heating mats in parallel inside an electrical junction box or boxes.
7. Do log on to www.geekoreindia.com to ensure that you are using the most recent instructions.
8. Do ensure that the total current needed for all mats connected in parallel is not more than 80% of the listed amperage capacity of the electrical junction box and its power supply line and breaker. (for advice consult your recommended installer / supplier).
9. Do provide individual heating systems in each room with this own electrical junction box and control thermostat. Each thermostat has a maximum capacity of 16 amps. If the amount of amps in the room is greater than 16 amps, use master and slave units or add a contactor between the mats and the thermostats.
10. Do use insulation under the mats to reduce running costs and warm-up time. Check with your installer to determine the R value of the sub floor insulation layer. If there is no insulation, or if the R-value of the insulation layer is lower than 0.57 ft2*h*F/Btu (0.1 m2* C/W or 1 Tog).
11. Do take full precaution to avoid any damage during installation such as droping sharp / heavy objects or negligence in concrete pouring or undue stepping.
12. Do keep the heating units at a sufficient gap away from the heat sources/fire places.

Don'ts

1. Don't attempt to cut the heating element at any point. Don't allow the stress or loose heating mat.
2. Don't allow excessive foot traffic over the wire before tiling
3. Don't cut tiles over the heating mat element
4. Don't place any product over the floor covering that has tog value more than 2.5
5. Don't turn on the heating mat/cable while it is rolled up
6. Don't bend the joint between the element and cold tail
7. Don't supply power to the heater until the cable has been fully encased and the wet screed has been allowed to fully dry out.
8. Do not overlap heating mats
9. Do not fold or wrinkle the heat mats
10. Do not walk unnecessarily on the heating mats
11. Do not install electrical cables or pipes under the floor together with the heating mats.
12. Do not use cellulose insulation
13. Do not install mats when the room temperature is below 23 degree celcius (-5°C)
14. Do not install underfloor heating mats anywhere except inside buildings.
15. Do not install mats within 1 inch (3cm) of any heat conductive building part, such as cold water pipes
16. Do not install mats within 2 inches (5 cm) of ane another, 4 inches (10 cm) of any wall, or 6 inches (15 cm) of a fireplace or hot water pipe.
17. Do not connect any other electrical appliance on the same electric circuit or GFCI unit of the heating system.
18. Do not use grout scrapers or utility knives to clean grout joints or lines as sharp tools may damage the heating mat. Clean grout lines with a wet soft sponge or soft tool instead.
19. Do not order the heating mat more than the floor area and caution not to lay it under any furniture / picture. All dimensions and distance to be clearly marked in layout.

Important

Please ensure that the cold tail joint (the joint between the heating cable and flexible supply lead) is fully encapsulated in adhesive or leveling compound underneath the floor covering. Please ensure that the end joint (the joint at the end of the cable which is black) is also fully encapsulated in tile adhesive or leveling compound. Both the cold tail joint and end joint MUST NOT be placed into a cut out of insulation or subfloor and just covered with tape, this can cause the cable to overheat and eventually fail!
DO NOT BEND THE COLD TAIL JOINT AT ANY POINT

Installation Statement

The installation statement will contain Date, Installer Name, Area/Location Name. Each heating mat label is to be affixed on the installation statement.

Date:			
Project Reference:			
Opening Mat Resistance:			Stick First Label Here
After Installation Resistance:			
Resistance Before Thermostat Installation			
Opening Mat Resistance:			Stick Second Label Here
After Installation Resistance:			
Resistance Before Thermostat Installation			
Opening Mat Resistance:			Stick Third Label Here
After Installation Resistance:			
Resistance Before Thermostat Installation			
Opening Mat Resistance:			Stick Fourth Label Here
After Installation Resistance:			
Resistance Before Thermostat Installation			

Marking Plate Copy

This artwork is only a draft approved by Intertek Semko AB. For different varieties the specifications as shown in the marking plate will change accordingly.

Type:	FHM Twin	Art No:	91 160 110 15
Watts/Sqm:	160	Watts/Unit	240
Ohms/Unit	220 Ω, +10/-5% @ 20 deg.C		230 V ~ 50Hz (IPX7)
Matt Size:	0.5 x 3.0 = 1.5m2		

Max operating temperature 80 degrees C
Do not restrict the thermal emission of the heated floor.
Do not fix using any other materials than those recommended.
Do not drill through or puncture the finished surface or use sharp tools during installation.
Check for Resistance and Continuity before installation.

Fill out and sign the boxes below to declare that all the information recorded on this form correlates to the installation.

Installer		Customer	
Name:		Name:	
Email:		Email:	
Address:		Address:	
Postcode:		Postcode:	
Part P Number:		Postcode:	
Telephone:		Telephone:	
Signature:		Signature:	

Customer Handover Checklist	
Complete all mat tests and record results:	
Take photographs at each stage of the installation:	
Give customer original proof of purchase:	
Complete and sign customer handover form:	
Give customer a completed copy of this form:	
Important Safety Precautions:	
Three mat tests are required for the Corewarm mat.	
Failure to complete this form will void the warranty.	
Actual tested resistance may differ from those listed. Allow a tolerance of -5% to +10% of the resistance specified.	