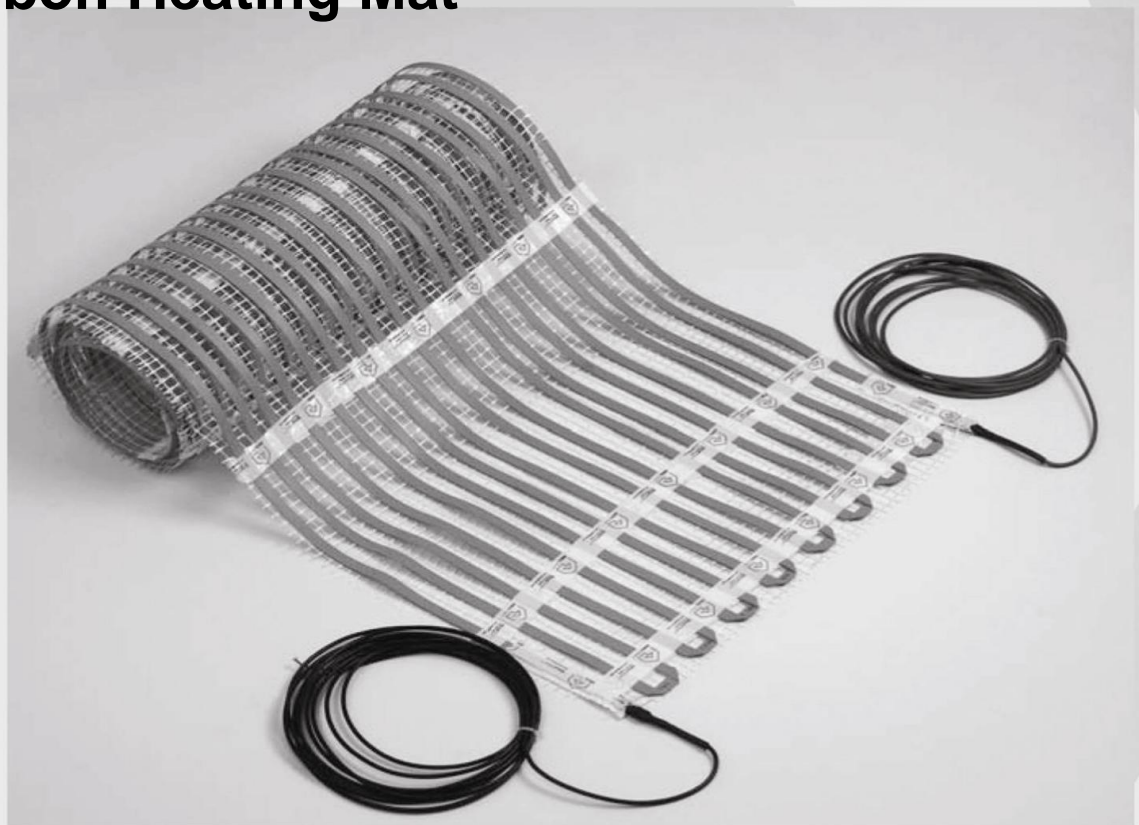


Installation Manual

For IdealMat™

**The Ultimate Crystalline
Ribbon Heating Mat**



**The Most Luxurious and Safe System
For Underfloor Heating**



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Important Instructions!

- Do not install the heating mats before reading carefully this installation manual.
- Use this product only with a dedicated residual current device (RCD).
- Never install this product anywhere except inside buildings (for outdoor heating use Ideal Heat outdoor products).
- All electrical connections must be performed by a fully qualified electrician and in accordance with each country's NEC (National Electrical Code).
- IdealMat™ already includes a built-in grounding wire for backup protection. Always connect the grounding cable from the mat's ribbon to the house grounding system, and follow the electricity safety regulation in your country.
- NEVER install or use this product under walls, heavy cabinets, closets, or fixtures such as toilets, sinks or tubs, and NEVER install or use it in places where any of the above might be installed or placed in the future.
- **Incorrect installation could cause damage to the heating mats or connections and will immediately invalidate the Warranty.**

Safety Instructions:



INSTALLATION

- IdealMat™ heating mats should be installed only by qualified personnel who are familiar with the construction and operation of the apparatus and the risk involved.
- The installation of this heating product shall be in accordance with the manufacturer's instructions and the regulations of the authority having jurisdiction.

Note: Refers to US and Canada: The installation shall be made in accordance with Article 424, Part J, of the National Electrical Code, ANSI/NFPA 70 and the applicable sections of Canadian Electrical Code, C22.1.



HIGH VOLTAGE

Disconnect the heating mats from the power line before any adjustment. Maintenance should be done only while heating mats are disconnected from the power source, and should only be performed by qualified personnel.



LINE VOLTAGE

Before connecting the product to the power supply, make sure that the voltage of the power source matches the requirements of the product, as marked on the IdealMat™ label located near the product's power connectors.



WIRING

- All electrical connections must be performed by a fully qualified electrician and in accordance with each country's NEC (National Electrical Code). Make sure that all conductor sizes are 18AWG (0.75mm²) minimum.
- The connection of the cold leads must be made inside the electrical connection box. Connect all units in parallel making sure not to exceed the current handling capacity of the supply line.
- The heating system should be connected to its own circuit of the power supply.



IMPORTANT!

Risk of electric shock and fire. Damage to supply conductor insulation may occur if conductors are routed less than 51 mm (2 inches) from this heating product. Refer to installation instructions for recommended means of routing supply conductors

Before Starting:

Before installing the heating mats make sure that you have the following additional parts:

- **Electrical junction box:** Use it as the connecting junction for the cold leads of the Heating mats.
- **Control thermostat:** Allows controlling the room temperature. The control thermostat must also have a two terminal manual on/off switch. Control thermostats have two of the following sensors:
 1. Ambient air temperature safety sensor.
 2. Floor temperature safety sensor.

In bathrooms, use thermostat with only floor temperature sensor. You can use the Same kind of thermostat for other wet areas such as kitchen, but it is not a must. Use thermostat with ambient air and floor temperature sensors for all other Installations.

Note: Ideal Heat recommends the use of fully programmable digital thermostats, which enables you maximum saving and flexibility in planning and programming your heating plans (See page 15 for thermostat recommendations).

- **Ground Fault Circuit Interrupter or Residual Current Device:** Consult your local distributor / supplier or Ideal Heat local representative for additional details regarding the applicable GFCI or RCD.
- **Hard insulation material:** It is used as a heat insulator for efficient heating under the heating mats in ceramics / granite-porcelain / marble, or any stone type floors. The material comes in plates, usually made of foamed Polyurethane / Polystyrene / Polyethylene. Material should have compressive strength of more than 2 Kg/cm^2 (28 PSI). The R value of the material should be in the range of $0.1 - 0.3 \text{ m}^2 \text{ }^\circ\text{C/W}$ or 1 - 3 Tog ($0.57 - 1.7 \text{ ft}^2 \text{ h }^\circ\text{F/Btu}$). (See page 15 for additional comments on hard insulation materials.)

Note: It is common to find insulation materials of 6mm (1/4 inch) thickness, with thermal conductivity of $0.02\text{-}0.06 \text{ W/m }^\circ\text{C}$ ($0.035\text{-}0.1 \text{ Btu/h ft }^\circ\text{F}$). However you can use other thickness and Thermal conductivity as long as the R value of the material is in the range of $0.1 - 0.3 \text{ m}^2 \text{ }^\circ\text{C/W}$ or 1 - 3 Tog ($0.57 - 1.7 \text{ ft}^2 \text{ h }^\circ\text{F/Btu}$).

- **Soft insulation material:** Used as a heating insulator for efficient heating under the heating mats in all non stone type floors (such as wood, parquet / synthetic parquet). The material usually comes in rolls and should have compressive strength of more than 0.02 Kg/cm^2 (0.28 PSI). The R value of the material should be in the range of $0.1 - 0.3 \text{ m}^2 \text{ }^\circ\text{C/W}$ or 1-3 Tog ($0.57 - 1.7 \text{ ft}^2 \text{ h }^\circ\text{F/Btu}$). (See page 15 for additional comments on soft insulation materials.)

Always remember to take the following during the installation process:

- **Ensure that:** the electric circuit that supplies electricity to the heating mats is equipped with a 30 mA ground fault current interrupter (GFCI) or residual current device (RCD).
- **Ensure that:** the total current needed for all the heating mats connected in parallel is not more than 80% of the listed amperage capacity of the relevant electrical junction box, and of its power supply line and breaker.
If you need advice consult your installer / supplier.
- **Ensure that:** you have provided each room equipped with the heating mats with its own electrical junction box and its own control thermostat. Each thermostat has a maximum capacity of 16 Amps. If the amount of Amps in the room is greater than 16 Amps, divide the amperage over several thermostats, or add a dedicated contactor between the mats and the thermostats as shown in the Wiring diagram.
(To calculate the amount of Amps in the room see table on page 16).
- **Ensure that:** all cold wires leads of the heating mats should be connected in parallel into an electrical junction box or boxes.
- **Always:** connect the grounding cable from the mat to the house grounding system.
Follow the electricity safety regulation in your country. The mat has **double isolation** and the ground connection is made only for backup protection and for EMF (Electromagnetic) purposes.
- **Ensure that:** the thin set/ cement/ glue/ grout is completely dry before operating the system. Drying period is generally 2-14 days depending on the cement / glue / grout manufacturer's instructions.
- **It is recommended** to use an insulation layer 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.
Note: When there is no insulation, or if the R- value of the insulation layer is lower than $0.1 \text{ m}^2 \text{ }^\circ\text{C/W}$ or 1 Tog ($0.57 \text{ ft}^2 \text{ h } ^\circ\text{F/Btu}$), please follow the insulation comments on page 15 and act accordingly.
If you don't have an appropriate underlay material, contact your distributor /supplier.



NEVER:

- **NEVER** fold or wrinkle the heating mats.
- **NEVER** overlap heating mats one on the other.
- **NEVER** place heavy or sharp tools, or other potentially damaging objects on top of the heating mats.
- **NEVER install or use this product under walls or partitions.**
- **NEVER** install electrical cables or pipes under the floor together with the heating mats.
- **NEVER** use insulation layer which contains cellulose.
- **NEVER** connect any other electrical appliance on the same electric fused spur or RCD unit of the heating system.
- **NEVER** install mats when room temperature is below -5°C (23°F).
- **NEVER** install mats within 5cm (2 inches) of any other heat conductor in the apartment or in the building.
- **NEVER** install mats within 5 cm (2 inches) of one another, 10cm (4 inches) of Any wall, or 15cm (6 inches) of a fireplace, chimney or hot water pipes.
- **NEVER** install heating mats under wooden floor if the wooden floor is Thicker than 15mm
- **NEVER** use any type of insulation material on top of the heating mats.
- **NEVER** step unnecessarily on the heating mats even when they are not connected to the electricity.

Planning the Installation:

In order to install the heating mats properly, and before installing, draw an installation plan. Remember to include in your plan: the placement of the mats, the floor sensor, the placement of the thermostat and junction box or boxes (See example on page 19). The heating mats should cover at least 75%-80% of the floor area of your room to be used as a primary heat source; IdealMat™ heating mats are available in several convenient sizes. Choose the combination of heating mats that best enables you to cover the recommended area of your room. Plan to use the larger heating mats as much as possible and to use smaller mats only as gap fillers. The more coverage the less time needed to heat the area (but never under walls, heavy cabinets, closets, or fixtures such as toilets, sinks or tubs).

Laying Out the Heating Mats

1. Floor Base: Make sure that the floor base is completely clean of all debris or any other materials.

2. Insulation Layer: If installing the heating mats under:

- **Stone based floors** – use a flexible tile adhesive to secure a hard insulation Material on top of the floor base. (See page 15 for recommendations on hard Insulation materials.)
- **Other flooring** – use a soft insulating material which can simply be placed on the floor or secured with tape. (See page 16 for recommendations on hard insulation materials.)
Clean all the remaining materials from the surface of the insulation layer.

3. Laying the Mats: Open the heating mats. Roll them on top of the insulating material.

When using IdealMats that are pre-attached to netting, the heating ribbon should face down and the net should face up. If there is no pre-attached netting the folds should face down.

It is recommended to leave a gap of approximately 10cm (4 inches) from the wall to the heating mats, and a gap of about 5cm (2 inches) between each mat.

Ensure that each heating mat is completely flat.

Ensure that the cold leads of the mats are on the closer side of the mat to the electrical junction box location (See also – Making the Electrical Connection).

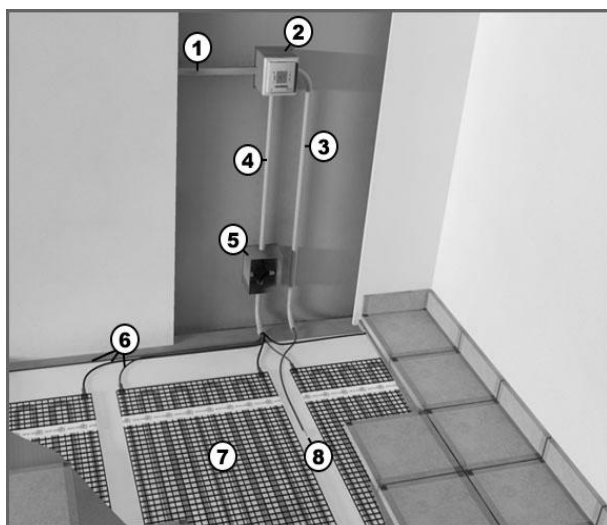
Your mats have double-sided adhesive tape on the mat edges. Stretch the mats and secure the mats to the floor with the tape.

Note: Where required, additional adhesive tape can be used to secure the mats to the insulation material.

4. Cold Leads: Place the cold leads of the mats between the mats toward the junction box. Place the cold leads so that they do not cross each other.

Since the cold lead connector is slightly thicker than the rest of the mat, create a slight groove in the insulation board under the connector to ensure that the heating mat lays flat. If any cold leads cross, create a groove for the cold leads at the point at which they cross.

Mark each pair of cold leads coming from the same mat with a number. Place a small sticker with the number of each pair of leads close to the free end of the lead.



IMPORTANT! Ensure that the cold leads do not cross over the mat.

1. Power supply
2. Thermostat
3. Electric conduit for
The floor sensor wire
4. Electric conduit for
The electric wire
5. Junction box
6. Electric cold
7. Heating mat
8. floor sensor installed
Between the mats

Electrical Connections

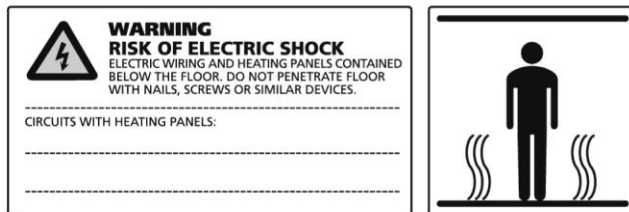
Note: All electrical connections must be performed by a fully qualified electrician and in accordance with each country's NEC (National Electrical Code).

Note: Make sure that all conductor sizes are 18AWG (0.75mm²) minimum.

Note: Make sure that a readily accessible circuit breaker or emergency switch who's ON (I) and OFF (O) positions are clearly marked, and that is suitably rated and approved, is installed in the building installation. The switch must disconnect both poles simultaneously.

IMPORTANT! Tightly screw all connections to ensure good electrical contacts.

1. Install the electrical junction box or boxes, above floor level according to the local safety And building regulations and codes. Place the following label or similar on the electrical junction box or boxes and in the electrical cabinet indicating that an underfloor heating System is installed in the room.



2. Install the control thermostat as far as possible from any heat sources or heat sinks such as fireplaces, chimneys, direct sunlight, windows, doors, or anything that could possibly affect proper temperature readings. The suggested height for placement is 1.5m (5 feet) above floor level.

Note: In bathrooms only, use a thermostat with only a floor temperature safety sensor. You can use the same kind of thermostat for other wet areas such as kitchen, but it is Not a must.

For all other installations, use a thermostat with both an ambient air temperature sensor and floor Temperature safety sensor. See page 15 for recommendations on thermostats.

3. Install an electric conduit to the junction box and thermostat as shown on the diagram.

1. Thermostat 2. Junction box

4. Connect the floor temperature safety sensor to the thermostat through the conduit, and install the sensor between two heating mats, at least 50 cm (20 inches) from the wall.

IMPORTANT! Make sure that the sensor does Not touch any of the heating ribbons.





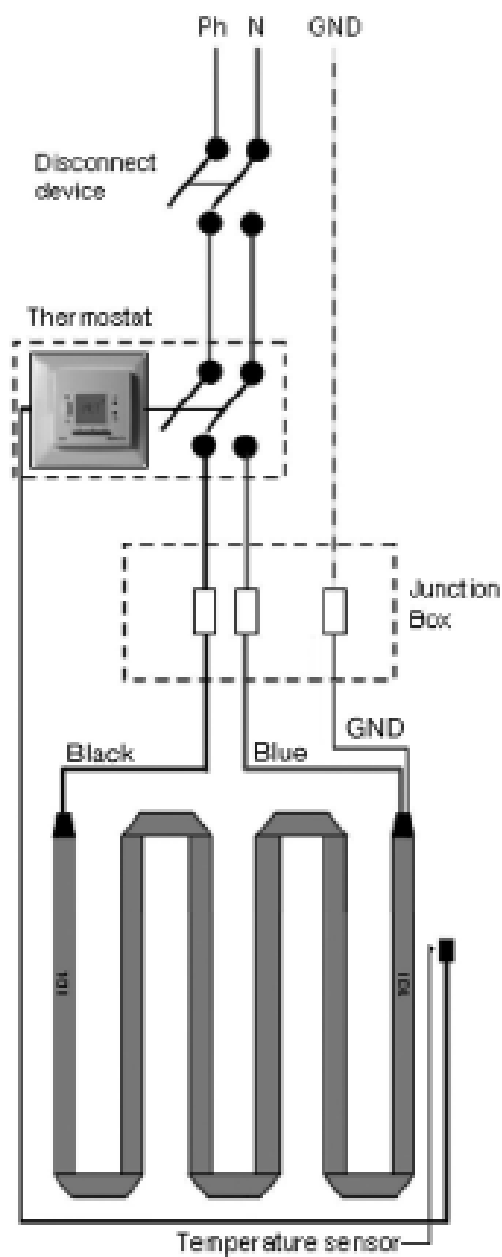
5. Measure the resistance of the heating mat/system and record the value (see page 19). Make sure the measured values are adequate with the resistance values that are printed on the specific mat nameplate.
6. Measure the insulation values with a Megger tester and record the value (see page 19). Make sure there is no insulation problem.
7. Feed the cold leads of each mat in parallel to the electrical junction box. Mark with stickers and numbers each pair of cold leads according to the specific mat which the leads are extended from. Make sure that you can see the stickers with the numbers of the leads before connection. If necessary, shorten the leads, but make sure the stickers with the lead's numbers are affixed to the shortened lead:
 - Expose the conductor in each lead.
 - Connect all leads of the same color.
 - Insert each set of colored leads to one connector in the junction box.
 - Connect each cold lead from the thermostat to the connector in the electricity junction box containing the set of cold leads of the same color from the mats (pay attention to the relevant colors of leads in accordance with the applicable National Code).
 - Connect the grounding electrical wires to the ground lead (green/yellow) in the electrical junction box (comes from the power supply of the house).
8. Make a diagram plan that includes all the installed heating mats, their specific location in the room and the numbers of the related cold leads (see example on page 19).
9. Connect the wires to the control thermostat according to the wiring diagram on page 12.
10. Switch ON the heating system (see the directions in your thermostat manual) for half an hour to ensure that the system is working properly. It is important to check each entire system to ensure each mat is heating.
11. Switch OFF the heating system (see the directions in your thermostat manual).
12. When the mats are cool, lay down your floor covering. If you are installing a glued type of floor covering (wood, vinyl or linoleum), first cover the mats with at least 6mm (1/4 inch) self leveling flooring cement. (You can also use similar materials, like Latex based self leveling material, as long as they have the same or better thermal conductivity as the self leveling flooring cement). Consult your local construction material dealer regarding the right material for your type of floor.

IMPORTANT!

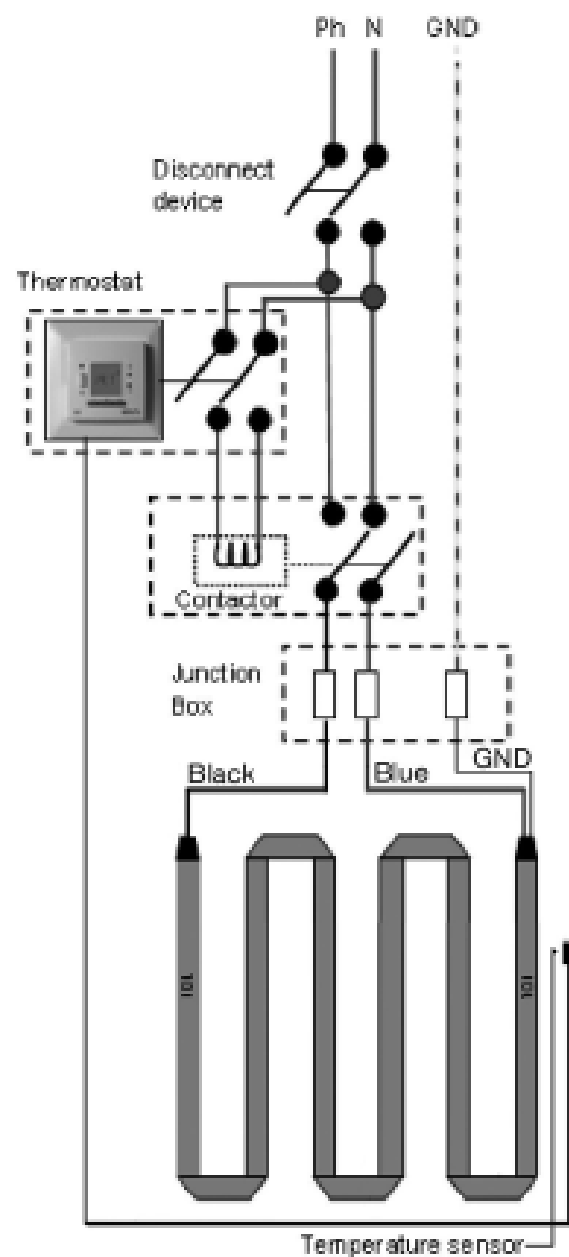
If you are installing a glued type of floor covering, or using thin-set or grout or tile adhesive, do not switch on the heating system again until the glue, thin-set, or grout or tile adhesive is completely dry. Consult the material's manufacturer for the exact required drying time.

Wiring Diagram

Less than 16 Amp.



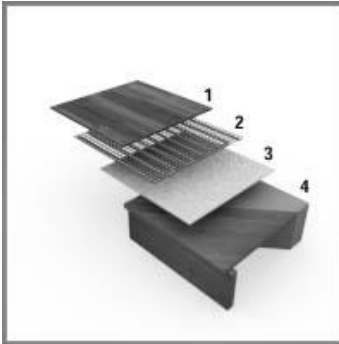
More Than 16 Amp.



Installation Examples

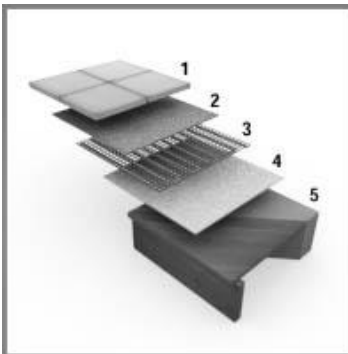
IMPORTANT!

Check your local building codes and regulations and act accordingly, if they contradict any of the following examples or instructions.



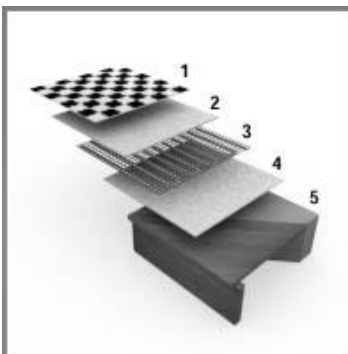
Under wood, laminate, parquet flooring

1. Wood flooring material
2. Heating mat
3. Insulation material
4. Floor slab (concrete / wood)



Under tiles in dry/ wet surroundings

1. Tiles
2. Thin-set/Grout/Tile adhesive
3. Heating mat
4. Insulation material
5. Floor slab (concrete / wood)



Under glued vinyl, linoleum or wood (with adhesive)

1. Vinyl, linoleum with adhesive
2. Self leveling flooring; cement or latex material of at least 6mm (1/4 inch) thickness
3. Heating mat
4. Insulation material.
5. Floor slab (concrete / wood)



Recommendations on Controls & Accessories

Recommendations on Thermostats

The thermostats that are supplied by Ideal Heat are programmable.

There are generally 2 types of thermostats to cover the various types of installation:

1) Thermostats with Floor only Temperature Safety Sensor for use in bathrooms (can also be used in other wet areas): We recommend the thermostat supplied by Ideal Heat.

This programmable thermostat includes LCD screen and only Floor Temperature Safety Sensor.

2) Thermostats with Ambient Air Temperature Safety Sensor and Floor Temperature Safety Sensor for use in dry areas (can also be used in wet areas other than Bathrooms): We recommend the thermostat supplied by Ideal Heat.

This programmable thermostat includes LCD screen, Ambient Air Temperature Safety Sensor and Floor Temperature Safety sensor.

Recommendations on Hard Insulation Material

Where hard insulation material is needed, you can use a fiber glass polystyrene panel that stands minimum 75°C. The compressive strength and the thermal conductivity of this material is in line with the recommendations for hard insulation material. You can also use at least 6 mm thick (1/4 inch) Marmox® or similar construction boards. In case that you are not sure of the material, please contact your local distributor before installation.

For other insulation materials please consult with your local construction material dealer.

Recommendations on Soft Insulation Material

Where soft insulation material is needed, you can use the cross linked extruded polyethylene foam layer supplied by Ideal Heat. The compressive strength and thermal conductivity of this material are in line with the recommendations for soft insulation material. In case you are not sure of the material, please contact your local distributor before installation.

For other insulation material please consult with your local construction material dealer.

IMPORTANT!

For installations of soft floor covering, such as vinyl, linoleum you should cover the mats with at least 6mm (1/4 inch) self-leveling flooring cement, thin set or any appropriate latex material. If you are not familiar with these materials or compounds, consult your local distributor or your local construction material dealer before installation.

Sizes of heating mats & values

Average Power Calculation - 230 Volt, 150 Watts per m² (*)

Width/m	Length/m	SQM	Watts/m ²	Total power (w)	Amp.(A)
0.5	1.2	0.6	150	90	0.39
0.5	1.5	0.75	150	112.5	0.49
0.5	2	1	150	150	0.66
0.5	2.5	1.25	150	187.5	0.82
0.5	3	1.5	150	225	0.98
0.5	3.5	1.75	150	262.5	1.15
0.5	4	2	150	300	1.31
0.5	4.5	2.25	150	337.5	1.47
0.5	5	2.5	150	375	1.63
0.5	5.5	2.75	150	412.5	1.8
0.5	6	3	150	450	1.96
0.5	6.5	3.25	150	487.5	2.11
0.5	7.5	3.75	150	562.5	2.44
0.5	8	4	150	600	2.60
1.0	1	1	150	150	0.66
1.0	1.5	1.5	150	225	0.98
1.0	2	2	150	300	1.31
1.0	2.5	2.5	150	375	1.63
1.0	3	3	150	450	1.96
1.0	3.5	3.5	150	525	2.28
1.0	4	4	150	600	2.60
1.0	4.5	4.5	150	675	2.93
1.0	5	5	150	750	3.26
1.0	5.5	5.5	150	825	3.58
1.0	6	6	150	900	3.92

(*) For additional sizes, power or current please contact your local distributor.



Product Warranty Certificate

Thank you for purchasing IdealMat™ – a heating mat manufactured by I.D.L. Heaters Thermal Products Ltd. ("Ideal Heat" or "the Company").

IdealMat™ requires a thermostat and electrical cables that connect the heating mat to the electricity according to the National Electric Code.

Ideal Heat will do its utmost to provide the purchaser professional and friendly service, and is committed to serve the needs of each such customer when a need might arise.

Ideal Heat hereby grants the following warranty for the IdealMat™ heating mat:

1. Ideal Heat guarantees that the IdealMat™ is free of defects due to faulty material or workmanship.
2. If the mat is correctly installed, is in regular use and maintained according to Ideal Heat recommendations and instructions, the warranty provided hereunder will be valid for a period of ten (10) years from the date of delivery (the "**Warranty Period**").
3. Should, during the Warranty Period, any part of the IdealMat™ be found faulty due to defective material or workmanship and the customer immediately informs Ideal Heat of the discovery of such fault, Ideal Heat shall repair or replace the heating mat at no additional cost to the customer. The option to repair or to replace shall belong solely to Ideal Heat and thus be depending on the company's decision.
The above shall be in force only if the customer has installed and serviced the mat according to the instructions provided in writing by Ideal Heat.
4. For goods or essential components manufactured by a third party and supplied or installed by Ideal Heat, or by the customer, Ideal Heat warranty shall not extend beyond the warranty provided by said third party to Ideal Heat.
5. Ideal Heat's responsibilities and liabilities under this warranty are legally binding only when all the instructions described in the installation manual and all the measurements in the table have been completely and properly filled and signed by an authorized and professional electrician, and only when the IdealMat™, in which a defect has been discovered, has been inspected by an authorized representative of Ideal Heat and found by him to be out of order due to a problem with a component or defective material.
6. Any claim under this warranty must be made in writing and posted to IDEAL HEAT directly or through an authorized representative within thirty (30) days from the date of the discovery of the defect in the heating mat, and it must reach IDEAL HEAT not later than thirty (30) days from the end of the Warranty Period. The defective heating mat must be retained until receiving further instructions from Ideal HEAT.

7. This warranty does not cover and IDEAL HEAT shall not be held liable for any of the following damages:
 - a)** damages resulting from normal wear, damages caused, wholly or partially, due to abuse, misuse, negligence, inadequate storage, wrong installation, application and/or maintenance as recommended by IDEAL HEAT from time to time and/or unauthorized repairs or alterations of the IdealMat™ and other reasons beyond IDEAL HEAT 's control;
 - b)** Damages caused by unfortunate accidents, natural disasters (such as fire, floods, lightning, etc.), force major, acts of war, sabotage or any unforeseen circumstances;
 - c)** Damages caused during shipment In any case it is on the customer part to submit any claim or demand to the freight carrier at the earliest time of shipment or immediately after, and claims for such damages must be filed with the insurer).
 - d)** indirect, incidental, consequential or any other damages of any nature arising out of use of the IdealMat™ or inability to use it, including, inter alia, damages due to late delivery or non-delivery, damages to property, loss of profits, costs of installation or removal, injury to goodwill, inconvenience, etc., and whether such damages are claimed to arise from breach of contract, in tort, the theory of product liability or otherwise; reservation is solely being made for IDEAL HEAT's statutory liability due to material breach of an essential contractual obligation, express representations, wrongful intent or product liability acts.
8. In cases where IDEAL HEAT personnel or any authorized IDEAL HEAT agent repairs an IdealMat™ due to a claim by a customer, and at the end the fault is found to be such that it will not be covered by this warranty, all costs caused by the possible repairs shall be covered by the customer .
9. This certificate and the warranty provided hereunder are issued only for the benefit of the customer and shall not apply for the benefit of any other person or entity, including, without limitation, any client of the customer. This warranty is not transferable without a prior and written consent of IDEAL HEAT.
10. The warranty provided hereunder constitutes the exclusive warranty made by IDEAL HEAT for the IdealMat™ and is in lieu of any other warranties, commitments and/or agreements made, or allegedly made, by IDEAL HEAT or any of its employees, agents, representatives or dealers.
11. In no case shall liabilities of IDEAL HEAT exceed the amount which the customer has paid IDEAL HEAT in consideration for the IdealMat™ due to which the claim/responsibility has been raised.
12. The remedies hereby provided shall be the exclusive and sole remedies of the Purchaser.
13. All matters relating to this warranty shall be governed by the laws of the State of Israel, regardless of any rules relating to the conflict of laws which may apply; and the competent courts in Tel Aviv, Israel shall have sole and exclusive jurisdiction with regard to any dispute related to this warranty.



Please fill, draw and keep record of the installation details:

Date of purchasing:	Date of installation:
Model number:	Size and serial number:
Measured resistance value:	Measured insulation value:
Thermostat model:	Type and insulation:
Comments:	
Floor scheme: please draw the heating mats location , Thermostat and temperature sensor placement:	



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