

ELEKTRA
***Radiant Floor
Heating***



- single-side powered
MD Heating Mats

ELEKTRA

Heating Mats

For the proper installation and operation of the ELEKTRA radiant floor heating system, it is recommended to first read this Installation Manual.

The heating mats should be installed in accordance with NFPA 70, National Electrical Code (NEC), Article 424 and Canadian Electrical Code, Part I (CEC), C22.2-09, Section 62.

Application

The thin ELEKTRA MD heating mats are primarily intended for use in rooms with a tile or natural stone floor covering.

Additionally, they can be used with floor covering materials as:

- carpet (no more than an 1/2" thick, incl. padding),
- vinyl flooring (no more than an 1/4" thick),
- thin, glued down parquet, engineered wood or wood flooring (no more than an 1/3" thick),
- thin laminate flooring.

Each of the above applications need to be approved to work with underfloor heating by particular the floor covering manufacturer and installed according to directions.

Maximum thermal resistance value (R-Value) rating of floor covering that can be placed on top of heating cables can't be larger than 0.15m²K/W (0.852ft²F/Btu).

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The heating mats can be laid directly on concrete floors, self-leveling concrete slab, as well as existing ceramic tiles, terrazzo or water resistant wooden floors.

If heating mats are to be laid on a wooden subfloor, or on existing ceramic tiles, it is necessary to first apply the additional layer of thinset mortar, or use the approved concrete backer boards.

Caution



The heating cables of the mat can not contact combustible surfaces.

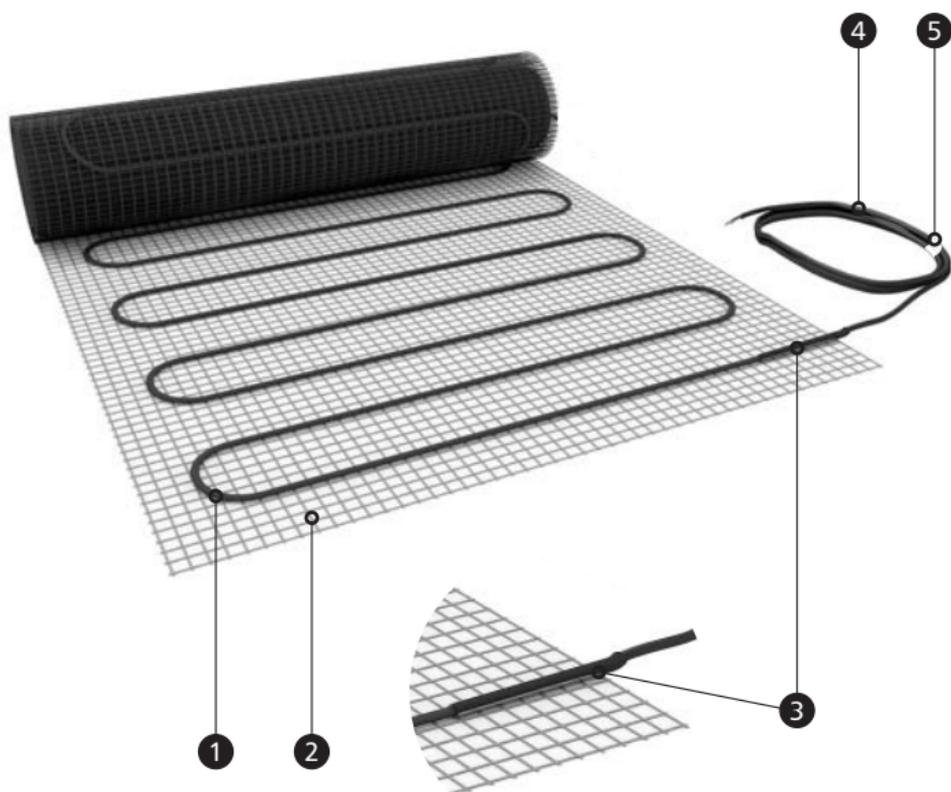
Heating mats can be laid in the thin layer of thinset mortar, flooring adhesive or self-leveling compound.

Heating mats are typically used as a supplementary floor heating system, in order to provide the user with a warm floor. However, they can be used as a primary heating system.

Specification

The ELEKTRA heating mats are supplied as pre-assembled installation units with the width of 1³/₅ ft (50 cm) and length varying from 6¹/₂ to 80 ft (2.0 to 24.0 m). The heating mats are attached to a self-adhesive fibreglass mesh.

The **ELEKTRA MD** heating mats are 0.15" (3.9 mm) thick and are provided with a 13 ft (4.0 m) long cold tail (electrical connection tail) at one end and a joint at the other.



- ① Heating mat
- ② Self-adhesive fibreglass mesh
- ③ Joint between the heating mat with cold tail
- ④ Shielded twin-conductor (PE) cold tail (L – black, N - white)
- ⑤ Mat nameplates sticker

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Heating mat power ratings:

- 9 Watts/sq.ft (100 W/m²)
- 14 Watts/sq.ft (160 W/m²)

Mats with a power rating of 14 W/sq.ft (160 W/m²) **can only be installed under stone or ceramic floor tiles.**

Heating mats with a power rating of 9 W/sq.ft (100 W/m²) **can be installed under any type of floor.** Check with floor manufacturer first.

- Heating mat voltage:
Two options for heating mats are available:
 - 120VAC 50/60Hz-rated, supplied from an electrical panel with 120VAC electrical circuit;
 - 240VAC 50/60Hz-rated, supplied from an electrical panel with 240VAC electrical circuit.

The mat nameplates sticker always show the rated voltage for each heating mat.

CODE: 

DATE: week/year

RADIANT HEATING PANEL UNIT - X

Model: MD 100/5.0 120VAC IPX 7

120VAC 4.1A 28.8ohms
100W/m² 500W
0.5m x 10.0m (20in x 39.3in)
5.0m² (53.8sq.ft)
REFER TO INSTALLATION INSTRUCTIONS
CAUTION: a ground fault protection device must be used with heating device
ATTENTION: ce produit doit être utilisé avec une protection de mise à la terre
Minimum installation temperature 40°F
X – FOR INDOOR FLOOR HEATING APPLICATIONS



- Min. bending radius of the heating mat's cable is 1" (25 mm).
- The minimum installation temperature of the heating mat is 41°F (5°C).
- The heating mats are shielded and power supply connection requires GFCI protection so full anti-shock protection will be provided.

Note



The power output of the heating mats can vary +5, -10% from the provided rated specifications.

Cold tail marking

- 120V – yellow outer jacket or yellow label with 120V printing
- 240V – red outer jacket or red label with 240V printing

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The following symbols are placed on the rating labels of the ELEKTRA heating mats:



ELEKTRA MD
single-side powered
heating mat,



direct in-floor heating,



embedding in thinset,
tile adhesive or self-leveling
compound,



Heating mat with self-adhesive
mesh facing down

Materials and Tools

Required for the heating mats installation

- Properly chosen (based on size and power vs. floor coverage calculation) approved heating mat.
- Approved line voltage thermostat with a floor temperature sensor.
- Approved, single gang, deep, electrical installation box, (or a double gang box with a single gang cover adaptor). One box per thermostat or relay module as per installation directions of the particular device.
- Approved electrical conduits as per local code requirements.
- Approved aluminum self stick tape.
- Approved wire nuts, grounding tails, under baseboard protective finish metal plates etc.
- Approved fast-drying primer for concrete subfloors.
- Thinset mortar or self-leveler.

Typical tools needed:

- Multimeter (resistance tester).
- Mega ohms meter (insulation resistance tester) with min. 1000V testing voltage.
- Cable installation monitor.
- Installation tape.

- Measuring tape, calculator, shop vacuum cleaner, wire snake, electrical tape, scissors, wire cutter, markers, drill, chisel, camera to document the layout, etc.

Caution



The heating mat **shall not** extended beyond the room or area in which it originates.

Never attempt self-repairs of the heating mats. If the heating mats are damaged, please contact an ELEKTRA-authorized installer.

Never expose the mats to excessive stretching, stressing or any impact with sharp tools.

Never attempt to lay the ELEKTRA mats if the ambient temperature drops below 41°F (5°C).

Never install the mats under places where fixed furniture is planned (e.g. legless floor-level wardrobes, kitchen units, baths).

Never lead the end joint and the connecting joint between the heating cable and the power supply conductor out of the surface. Both joints must be placed within the layer of the concrete or self-leveling slab.

Never bend the joint and end seal.

Never install the heating mats in closets.

Caution



Never install the heating mats in walls.

Never use installation materials other than specified in the installation manual.

Never use nails or screws of any kind for installation of the mats.

The segments of the heating mat **must not** overlap.

The cold lead or the floor temperature sensor's cable **must not** run across the heating element.

The heating mat **must not** be installed in places where any fixed furniture (e.g. floor-based wardrobes, built-in cupboards, etc.) has been planned. Carpets or rugs thicker than 3/4" (20 mm) should be avoided, as they reduce the efficiency of the installation.

Always install the heating mat according to the installation manual.

Electrical connection of the mat **must** be performed by a qualified licensed electrician.

The minimum distance between the heating mat and other heat sources (e.g. hot water pipes) **should always** exceed 2" (51 mm).

A dedicated circuit **must** be provided for the radiant floor heating system.

Choosing the right Heating Mat

When selecting your heating mat, follow the instructions below:

1. choose the mat's proper rated voltage
– 120 or 240VAC;
2. decide on the main purpose of your heating system – is it the warm floor you would like to achieve, or rather is your system going to be the primary heating source;
3. decide on the floor finishing details.

How to do it?

re 1. When selecting the mat of the proper voltage rating – 120 or 240VAC – it is necessary to remember that the mat (or mats, if the room size requires it) in the heated room will be connected to a thermostat. The max. thermostat's load is 15A. The thermostat is voltage flexible (it is rated for both 120 and 240VAC). This means that the following heating mats can be connected to one thermostat (without a relay contactor):

- of overall wattage 1800W – for the 120VAC-rated mats;
- of overall wattage 3600W – for the 240VAC-rated mats.

120VAC-rated heating mats are optimal for smaller systems, up to 1500W. For larger systems, 240VAC-rated mats are recommended.

re 2. To achieve the warm floor, it is normally sufficient to install the heating mats of the following heat output:

- $9\text{W}/\text{ft}^2$ ($100\text{ W}/\text{m}^2$) – for the stone or ceramic floor finishing;
- $14\text{W}/\text{ft}^2$ ($160\text{ W}/\text{m}^2$) – for the ceramic floor finishing laid on the concrete slab subfloor with no heat insulation;
- $9\text{W}/\text{ft}^2$ ($100\text{ W}/\text{m}^2$) – for the thin wood parquet floor finishing, laminates, carpets or vinyl flooring.

re 3. If the heating mat is intended as the primary heating source for the room, for ceramic and stone floors, the mat of the heat output of $14\text{ W}/\text{ft}^2$ ($160\text{ W}/\text{m}^2$) should be selected.

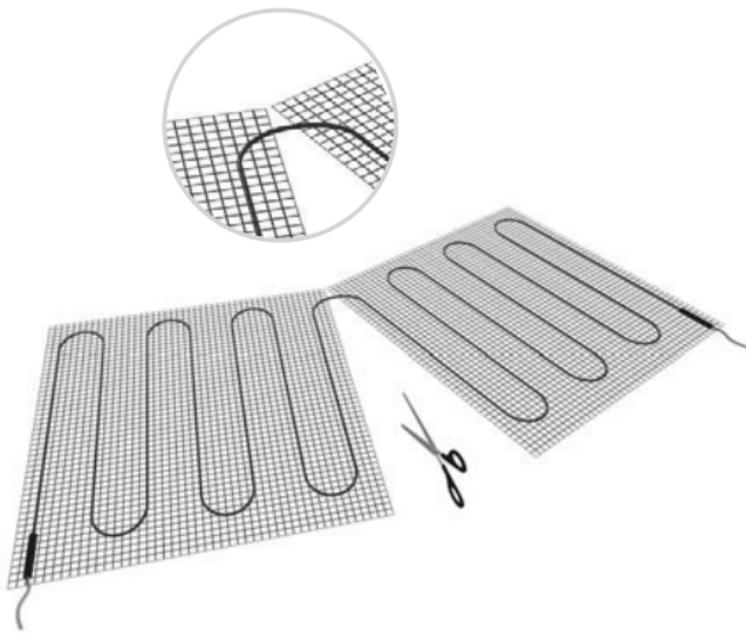
In case of thin parquet flooring, laminate, carpets or PVC, only the mats of the $9\text{ W}/\text{ft}^2$ ($100\text{ W}/\text{m}^2$) are suitable.

Heating mats of the heat output of $9\text{W}/\text{ft}^2$ can constitute the primary heating system only for buildings equipped with highly efficient thermal insulation and located in mild climate zones.

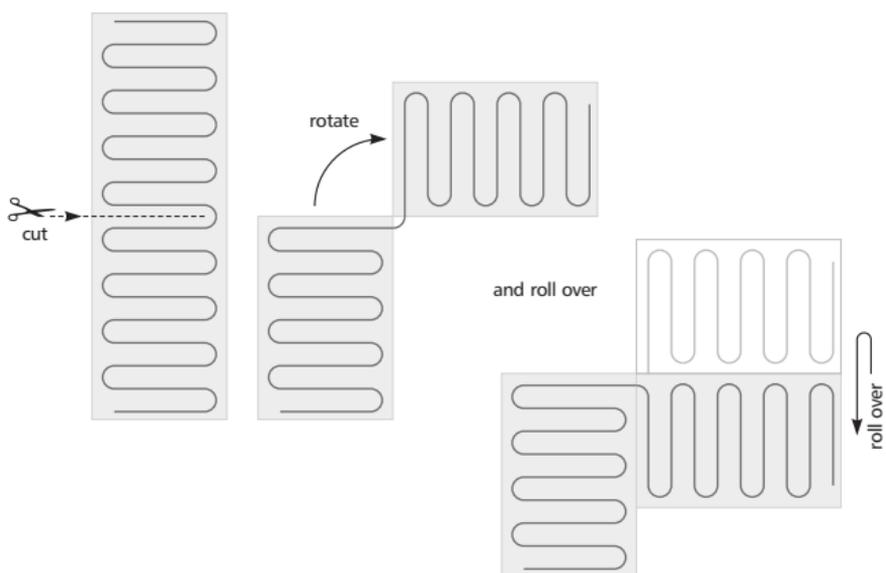
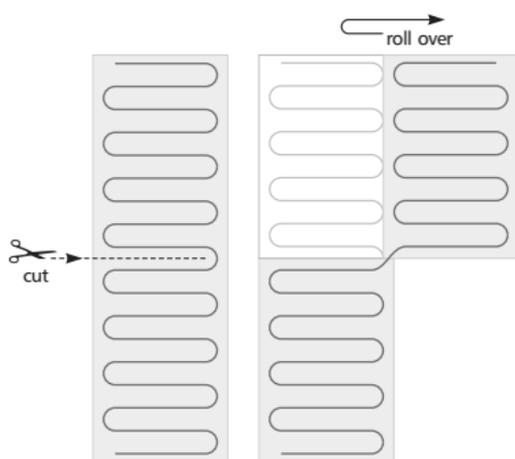
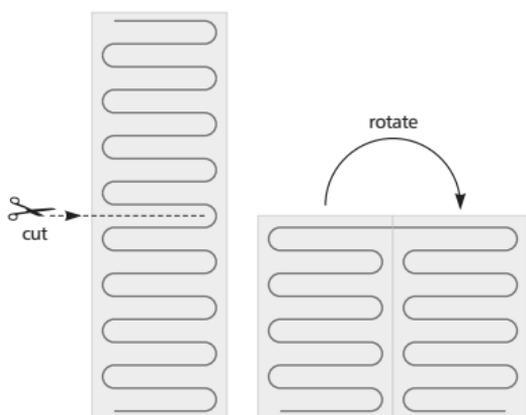
Before choosing the correct size of heating mat(s), plan their arrangement on the entire floor, or the selected floor areas. The heating mats must not be laid in places where fixed pieces of furniture will be positioned later (e.g. cupboards, baths, toilet, etc.).

The heating mats can be cut to a desired shape (do not cut the heating cable), rotated and than laid out in various directions.

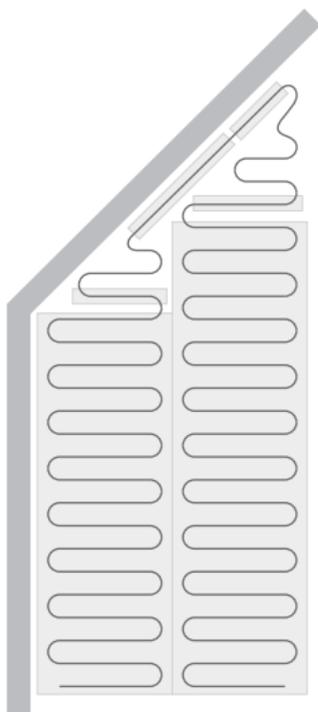
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While planning the heating mat's layout, consider the cuts needed to achieve the desired layout.

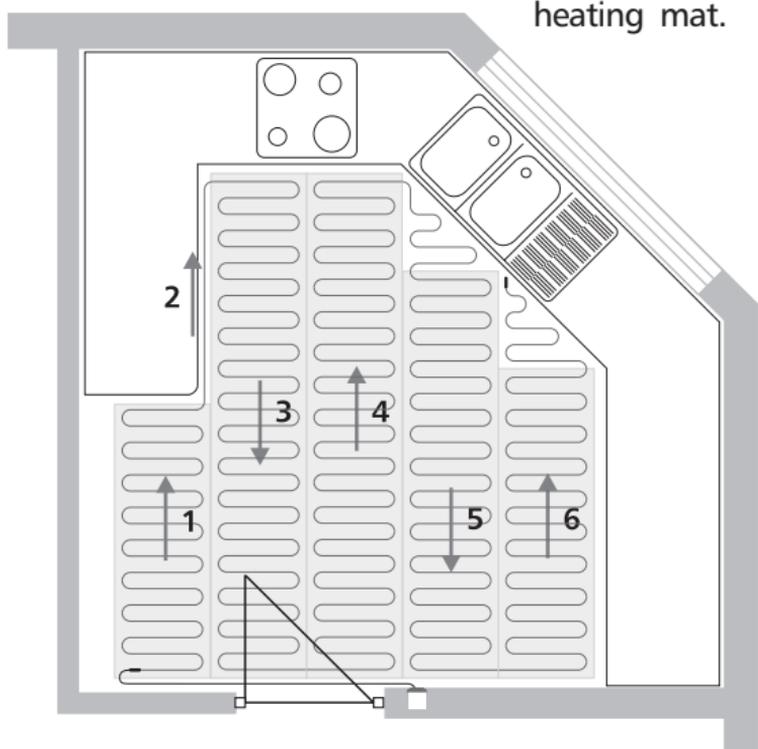


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In places where the heating mat cannot be laid properly, it is possible to remove the heating mat's cable from the mesh or cut the mesh into narrow strips, so as to enable the desired mat's arrangement.

- It is recommended to retain the cable spacing as in the original heating mat.
- Extreme caution is required so as not to damage the heating mat.



The example of arrangement of the ELEKTRA MD heating mat

Choosing the Thermostat for ELEKTRA Heating Mat

An approved line voltage thermostat is a core component of any radiant floor heating.

The thermostat connects the heating mat with the electrical system and ensures that the required temperature of the floor or ambient air in the room is maintained.

- If the heating mats serve as a supplementary heating source in the room and the user wishes merely to enjoy a warm floor feeling, then a thermostat equipped with a floor temperature sensor is sufficient to keep the required temperature of the floor.
- If the heating mats are the primary heating source in the room, then what the user usually wants is the optimum ambient temperature. In such a case, a thermostat that can measure air temperature should be installed. Such a thermostat should be equipped with both an air temperature sensor and an additional floor temperature sensor (while measuring the ambient temperature, the floor temperature sensor protects the floor and the heating mat from overheating).

For temperature control, either a manual thermostat may be used which keeps constant temperature or a programmable thermostat which can be programmed in a daily and/or a weekly cycle.

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Thermostats are flexibly voltage-rated, both for 120VAC as well as 240VAC, and their max. load is 15A. Therefore, they can operate with the 120VAC or 240VAC-rated heating mats.

For the thermostats with the 120VAC-rated heating mat, max. mat's heat output will be 1800W. For higher outputs, it is possible to connect a relay contactor which will increase the thermostat's capacity with the additional 1800W.

For the thermostats with the 240VAC-rated heating mat, max. mat heat output will be 3600W. For higher outputs, it is possible to connect a relay contactor which will increase the thermostat's capacity with the additional 3600W.

Heating type	Thermostat type	
	Manual	Programmable
Primary	—	UDG
Supplementary for the warm floor	UTN	UDG

UDG, UTN thermostats and USG relay module are UL/cUL listed.

UDG: programmable 4-event thermostat.



Consists of the control unit with an built-in air temperature sensor, and the floor temperature sensor.

The possibility of the setup in 3 variants of the temperature measurement, via:

the air, floor and both air and floor (limit) sensor.

Load max. 15A
- 1800W @ 120V or
3600W @ 240V.

Built-in GFCI.

UTN: manual thermostat.

Consists of the control unit, and the floor temperature sensor.

Load max. 15A
- 1800W @ 120V or
3600W @ 240V.

Built-in GFCI.





USG: relay contactor for large applications.

When the maximum thermostat load has been exceeded, the device enables the connection of the subsequent heating cables in the same room.

Load max. 15A
- 1800W @ 120V or
3600W @ 240V.

Built-in GFCI

Heating Mat installation

ELEKTRA heating mat can be installed in the floor by a tile setter, a flooring contractor or a suitably qualified person, on condition that they have read and understood the Installation Manual.

Only a qualified licensed electrician should connect the floor heating mat to the control device and to the electrical circuit, in accordance with the National Electrical Regulations. The electrical connection presents risks of fire and electrical shock, which can result in personal injury. Caution should be taken to guard against each risk.

Step 1 – Preparation of Electric Works

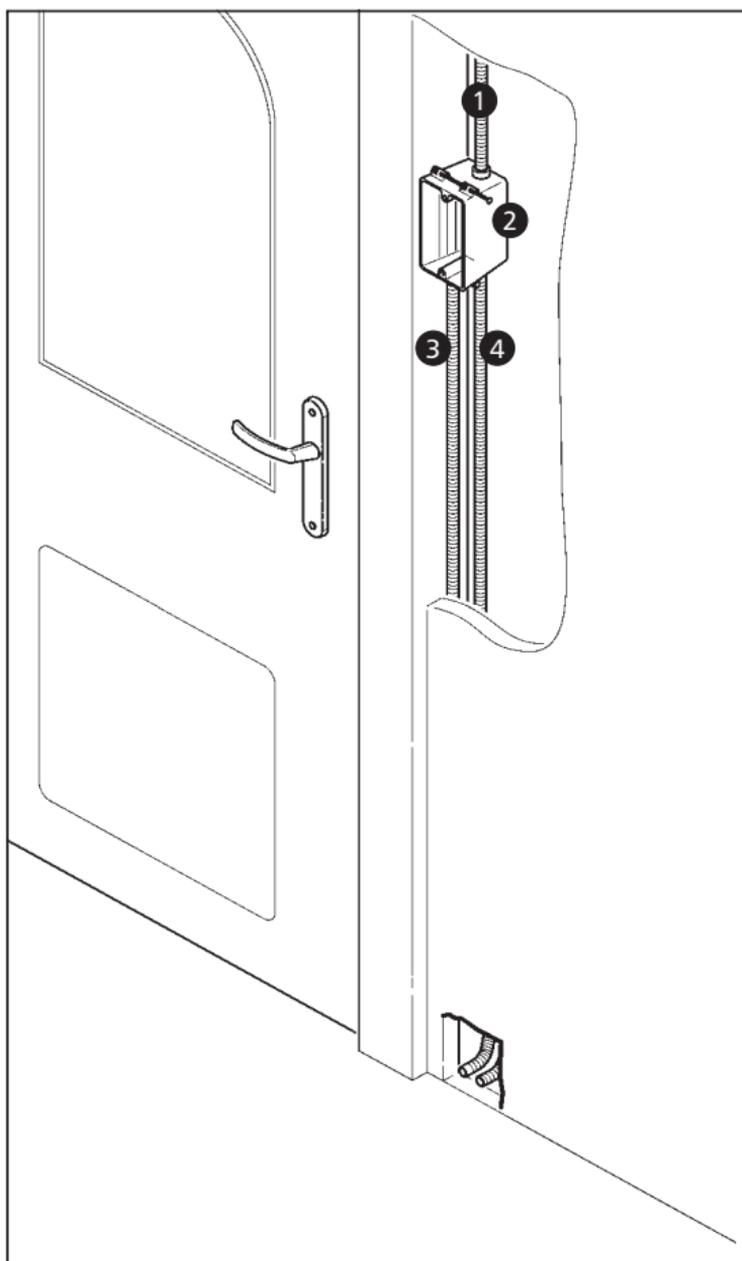
As preparation for the installation take the following steps:

1. select the location of your thermostat, preferably in the same room where the heating mats will be assembled, at the height of approx. 4 – 5 ft (1.2 – 1.5 m), in a easily accessible place. Thermostats should be located in a current standard-approved distance from wet zones,
2. install an approved deep single-gang electrical box for the thermostat. In case more than two cold tails of the heating mat will be connected, use a respectively larger box with a masking ring. For the installation of relay contactor, use an approved deep double-gang electrical box,
3. from the electrical panel to the electrical box, lead min. 14 AWG supply conductor placed inside a protective conduit, suitable for the amperage of 15A. In case the planned wattage of your floor heating system will be exceeding 1800W (at the voltage of 120 VAC) or, respectively, 3600W (at the voltage of 240 VAC), an additional 14 AWG supply conductor should be applied, leading to the additional electrical box, where the power module will be installed.

The conductor should supply from the electrical panel the voltage suitable for the mat rating. 120VAC-rated heating mats require 120VAC electrical panel voltage supply, and respectively

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- 240VAC-rated heating mats require supply with the conductor leading from the electrical panel to the 240VAC 2-pole interrupter,
- 4. two protective conduits should be run from the electrical box down to the floor. One will contain the cold tails of the heating mats the other one will be used for the floor temperature sensor,
- 5. using appropriate tools, make a wall cavity of 2 x 2" (51 x 51 mm) at the floor level, below the controller box, as well as the groove in the wall sill plate, which will facilitate running the heating mat's cold leads inside the wall,
- 6. in case any other controlling device with the built-in GFCI is planned to be used rather than the one recommended by ELEKTRA, it must be mounted in the terminal junction box.



- ① Power supply cable
- ② Deep installation box for the thermostat
- ③ Flexible conduit for the floor temperature sensor
- ④ Flexible conduit for the mat's cold tails

Step 2 – Subfloor preparation

Wood subfloors

Installation of heating mats directly on plywood or wood subfloors is not allowed.

First, min. 1/2" thick approved backer boards must be laid, in accordance with manufacturers' instructions.

Building regulations require that the subfloor's overall thickness amounted to min. 3/4", depending on the target application.

Ground-based concrete slab subfloors must be insulated before any floor heating system is laid.

In case the subfloor's finish is existing ceramic tiles, they should be removed or covered with thinset mortar (if floor level rise is acceptable).

Remove all debris, staples and nails. Sand the edges of any boards to eliminate potential differences in elevations. Clean the floor first, then apply the primer for concrete subfloors. The primer will bind dust on the subfloor surface and consequently:

- increase the adhesiveness of thinset or self-leveling compound,
- increase the adhesive properties of the heating mat's mesh (the mesh is self-adhesive).

After priming, it is recommended to indicate on the subfloor the areas of the predicted location of fixtures (closets, cupboards, baths, shower bases or toilets).

Step 3 – Installation of the Floor Temperature Sensor

- Run the temperature sensor's cable inside a protective conduit mounted at the stage of the electric works. The sensor should extend min. 10" (25 cm) into the heated area.
- The temperature sensor should be placed inside the groove earlier made in the subfloor.
- Installation of the second (backup) sensor is possible.
- The temperature sensor's cable must not cross the heating element.
- In case of floating laminate floors, or the engineered wood floors, install the sensor between the underlay and the floor finishing material.

Step 4 – Testing the Heating Mats

Before installing the heating mat, it is necessary to take the following resistance measurements:

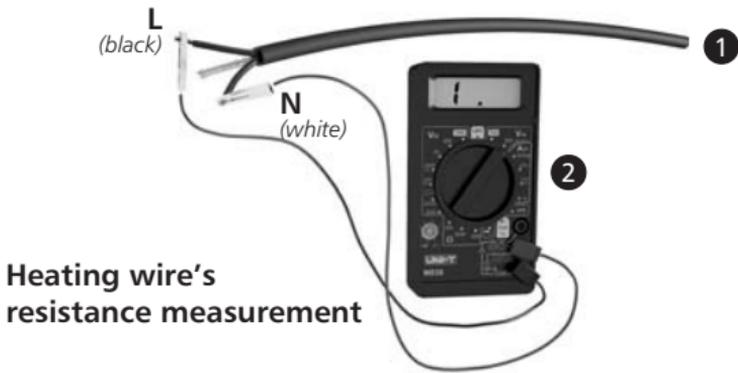
- the resistance measurement of the heating wire,
- the resistance measurement of the insulation of the heating core.

The resistance value taken for the heating wire should not vary with more than -5% and $+10\%$ from the one listed on the product label.

The insulation's resistance for the heating mat, as measured with a tool of the rated voltage 1000 V (e.g. megaohmmeter), should not be below 50 M Ω . Enter the results into the Warranty Card.

After the heating mat has been attached to the floor, and the slab laid, the measurements should be repeated to certify that at no installation stage the heating mat was damaged.

MD heating mat – measurements



- 1 MD heating mat's cold lead
- 2 Ohmmeter
- 3 Megaohmmeter (Insulation Tester)

Cable Installation Monitor

The device enables detection of mechanical damage of heating cables or power supply conductors. The monitor should be connected to the power supply conductor of the heating set from the time the installation is commenced until the floor finish is ready. The device will signal mechanical damage and will sound an alarm.



Note



As soon as the device signals the damage, it is necessary to contact the heating system's installer to determine the location of the damage and repair as required.

Application of the monitor does not eliminate the need to perform the resistance measurements of the heating core and insulation.

Step 5 – Installation of the Heating Mat

The mat should be rolled flat on the subfloor according to its planned earlier layout. The mat will attach itself to the floor, due to the mesh's self-adhesive properties.

The mat's fragments which have not become attached to the subfloor need to be secured with a installation tape.

Caution



While the mat is being fixed, position it in the way to ensure that the temperature sensor is located in an equal distance between two heating cables.

Step 6 – After Fixing the Heating Mat to the Floor

- make a groove in the subfloor to accommodate the mechanical joint, located at the end of the heating mat, connecting the heating mat with supply conductor,
- enter the heating mat cold tail into the installation box through the protective conduit mounted at the step 1: preparation,
- perform measurements:
 - heating wire resistance,
 - insulation resistance.Enter the results into the Warranty Card,
- mount the protective plate on the groove previously cut in the sill plate under the thermostat's box.

Caution



The cold leads of the heating mat should be run along the mat and not closer than 2" (51mm) from the heating mat and should be fixed to the ground by means of a tape or adhesive.

Caution



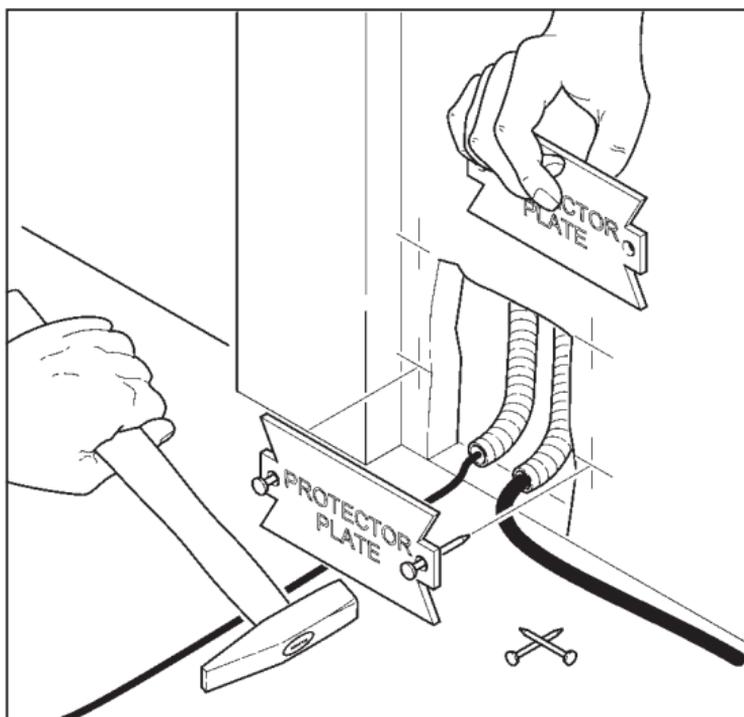
In the Warranty Card, make the sketch of the heating mat and temperature sensor's layout, as well as take photographs of the layout.

Caution



If the heating system's design requires more than one heating mat to be used in a single room, the cold lead of the mat **should** be labeled appropriately with numbers.

The electrician **should** place the heating mats product label in the Warranty Card.



Step 7 – Slab

The heating mat should be embedded in:

- “modified” thinset (acrylic, latex or polymer), or tile adhesive,
- self-leveling compound of the minimal thickness of 1/4”. The heating mats and “cold tails” must be completely covered with the slab.
- never lead the end joint and the connecting joint between the heating cable and the power supply conductor out of the surface. Both joints must be placed within the layer of the concrete or self-leveling slab.

If your floor covering will be carpeted or laminated, you will need a two stage slab application to produce the smooth and flat surface, necessary for these types of flooring.

Caution



Use plastic trowel (not metal), to apply thinset mortar or help the flow of self-leveler;

Never use ready-mix mastic to cover the wires.

After the mortar bed is ready, re-measure:

- the heating core's resistance;
- the insulation's resistance;

and enter the results in the Warranty Card.

Step 8 – Installing the Thermostat

When connecting the thermostat to the domestic electrical circuit, switch off the main power supply on the electrical panel to prevent the danger of electric shock.

Connection of the heating mat with the household wiring should be made by a qualified licensed electrician.

Connections of the following cables with the thermostat:

1. power supply cables of the electric system,
2. heating mat's cold tails,
3. temperature sensor's cable
in the installation box

should be carried out according to the instructions included in the thermostat's installation manual.

Caution



It is not allowed to apply different voltage than indicated on the rated nameplates to the heating mat.

If several heating mats were installed in the room, connect them in parallel, i.e. mats with the same markings should lead to the same terminals on the thermostat.

The electrician should mark the cold leads of each heating circuit and should place a warning label in the panelboard.

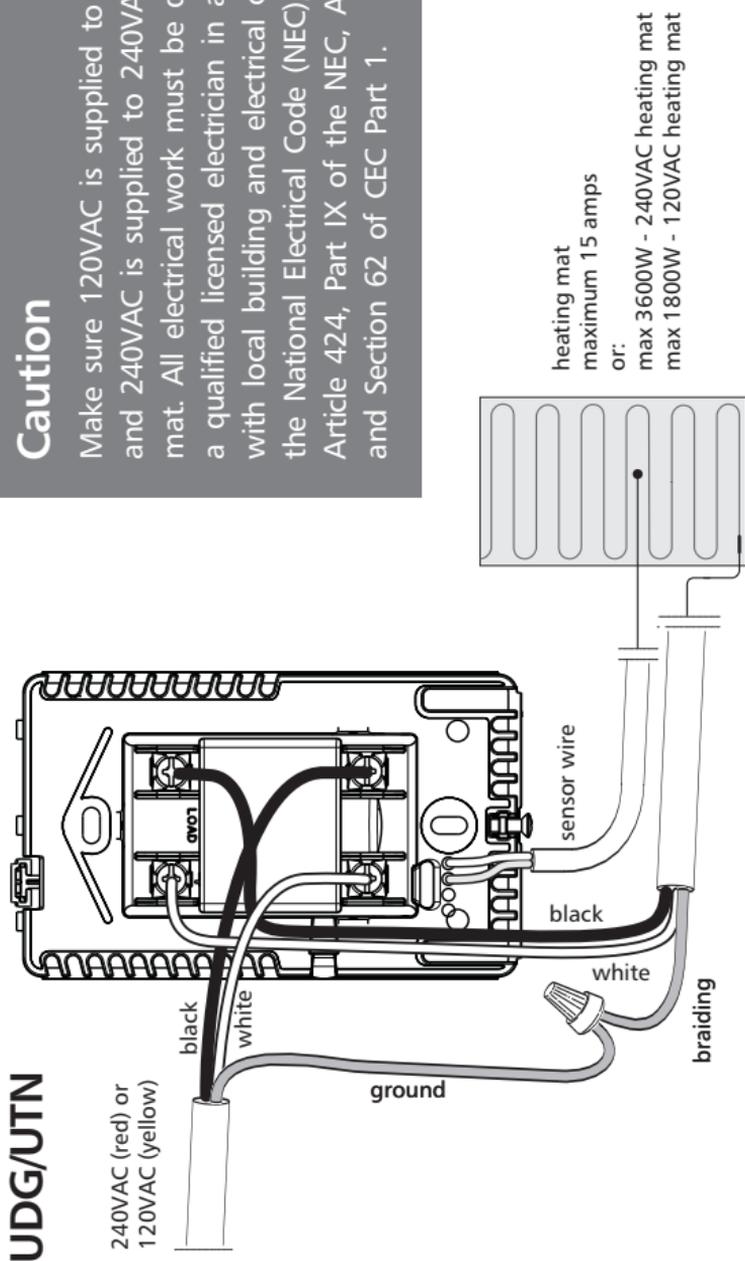
The label is included with the heating mat.

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Caution

Make sure 120VAC is supplied to 120VAC and 240VAC is supplied to 240VAC heating mat. All electrical work must be done by a qualified licensed electrician in accordance with local building and electrical codes, and the National Electrical Code (NEC), especially Article 424, Part IX of the NEC, ANSI/NFPA70 and Section 62 of CEC Part 1.

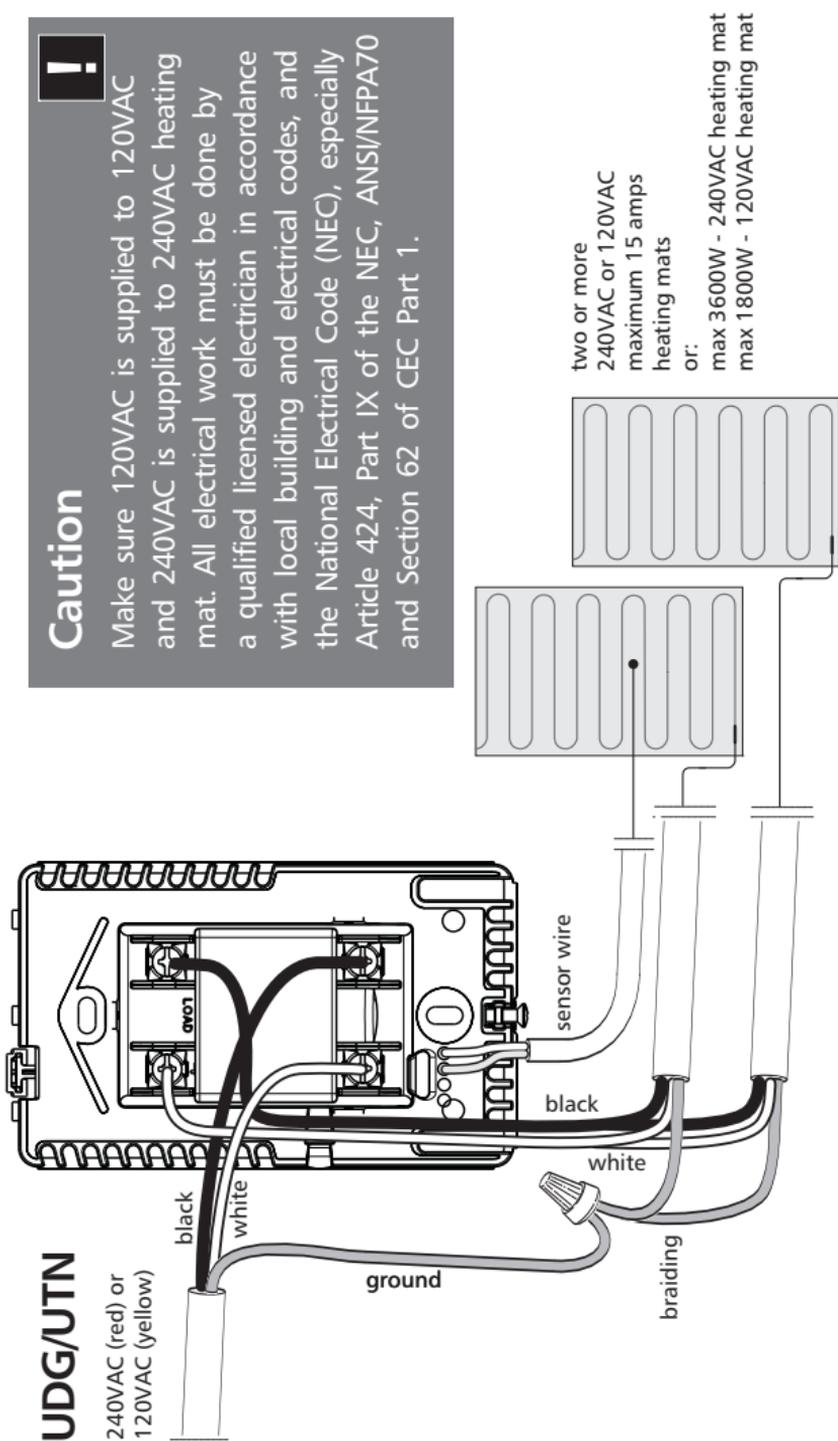


Wiring diagram for the heating mat's connection to the thermostat

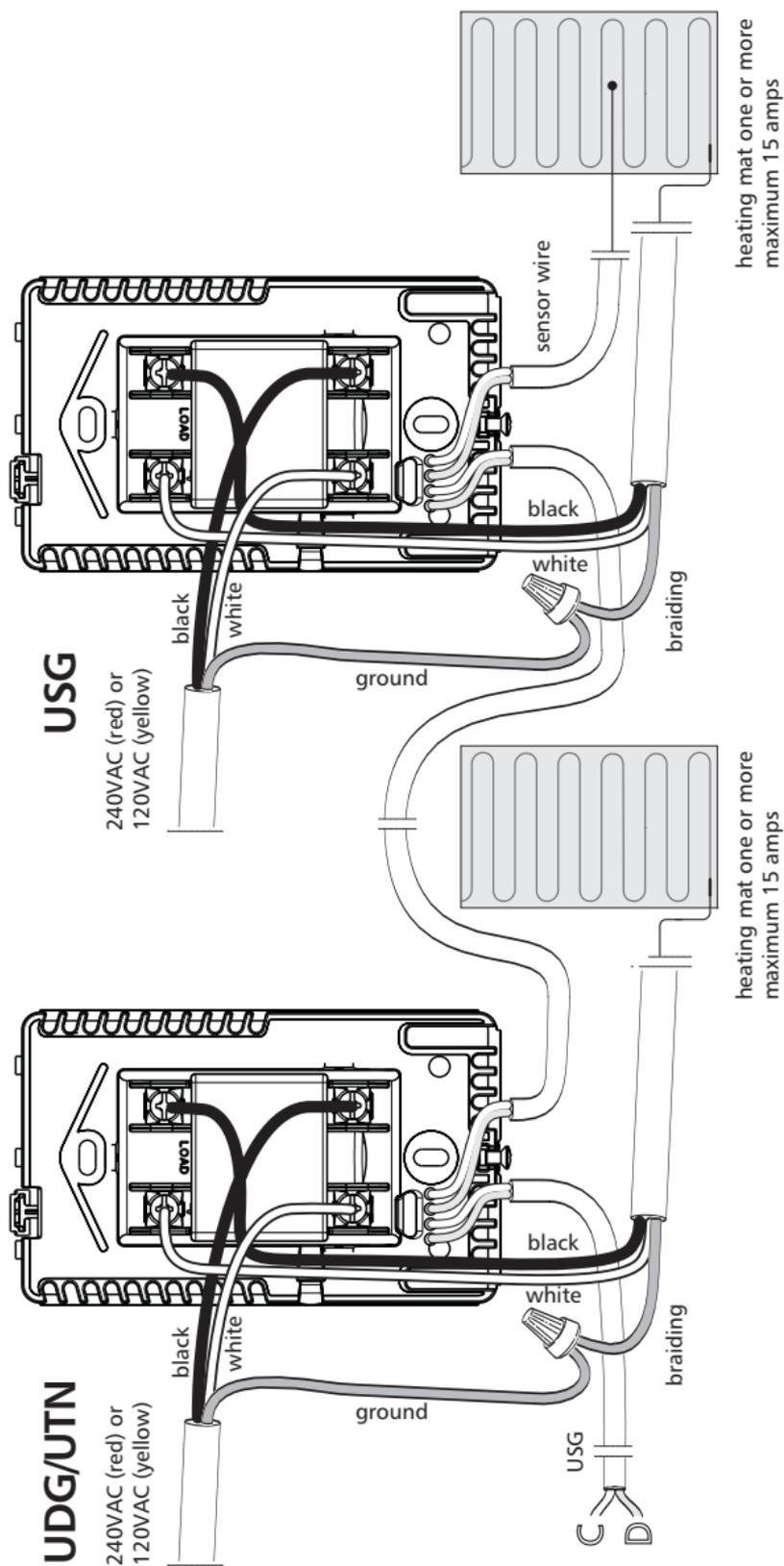
Caution



Make sure 120VAC is supplied to 120VAC and 240VAC is supplied to 240VAC heating mat. All electrical work must be done by a qualified licensed electrician in accordance with local building and electrical codes, and the National Electrical Code (NEC), especially Article 424, Part IX of the NEC, ANSI/NFPA70 and Section 62 of CEC Part 1.



Wiring diagram for the heating mat's connection to the thermostat, for more than one mat



Wiring diagram for the heating mat's connection to the thermostat, with a relay contactor

Caution



Make sure 120VAC is supplied to 120VAC and 240VAC is supplied to 240VAC heating mat.

All electrical work **must** be done by a qualified licensed electrician in accordance with local building and electrical codes, and the National Electrical Code (NEC), especially Article 424, Part IX of the NEC, ANSI/NFPA70 and Section 62 of CEC Part 1.

Step 9 – Floor finishing

Special care must be taken when using power tools (such as drills or grinders) on the floor surface when installing the floor finish, so as not to damage the heating mat.

Cleaning grout lines with sharp tools or power tools is not allowed as it may permanently damage the heating mat.

Anti-shock Protection

The heating mat must be connected to the domestic electrical system via a Ground Fault Circuit Interrupter (GFCI). The ELEKTRA thermostats feature built-in GFCIs.

Note for the System Owner

Make sure the person doing the electrical work has:

- properly completed the Warranty Card,
- labeled the electrical circuit that supplies the ELEKTRA radiant floor heating system.

Operation

The floor temperature of the heating system is limited by setting the desired temperature in the thermostat.

Note that the entire floor or a large part of it serves as a heater. Hence, heat dissipation from the floor should always remain unhindered by furniture or by the way the room is used.

For that reason, do not place large footprint objects on the heated sections of the floor, such as mattresses or furniture pieces without feet which have large contact surface with the floor.

Holes can be drilled in the floor only after the exact arrangement of the heating mats has been determined (based on the as-built documentation or measurements taken with a special detector).

Troubleshooting

Problem	Possible cause	Solution
<p>Mat resistance measurement is different than the nameplate label.</p>	<p>An analog type meter (with a needle to indicate reading) was used for measurement.</p>	<p>Re-measure with a digital Ohmmeter.</p>
	<p>If the measurement is significantly different from the value on the nameplate label, this indicates an open or short-circuit, and the mat has been damaged.</p>	<p>Contact the Manufacturer's Representative.</p>
	<p>If the measurement is slightly different from the value on the nameplate label, room temperature might have affected the resistance.</p>	<p>While taking the measurement, ensure that the room temperature stays around 68°F (20°C).</p>

	<p>The heating mats have been wired in series.</p>	<p>In case more than one heating mat is to be used, the mat must be connected in parallel (i.e. cables of the same color must be connected to the same thermostat's terminal).</p>
<p>The thermostat is not working.</p>	<p>The thermostat is off.</p>	<p>Check if the thermostat's switch is on.</p>
	<p>No power is supplied.</p>	<p>Measure power supply conductor's voltage at the thermostat.</p>
	<p>The thermostat is defective</p>	<p>Return the thermostat to the local Dealer for replacement.</p>

<p>The floor continuously heats.</p>	<p>The temperature sensor's wires have become loose at the thermostat's terminals, or have been broken.</p>	<p>In case your heating system is equipped with a thermostat with a floor temperature sensor, re-connect the wires at the thermostat's terminals. If this proves ineffective, measure resistance of the sensor's wire and compare with the reference values given in the Sensor Resistance Table to be found in the thermostat's Manual.</p>
<p>The floor is not getting warm.</p>	<p>The heating mat has been damaged.</p>	<p>Measure heating mat's resistance (as detailed in this Manual) and compare to the value given on the nameplate label. If the measured values differ significantly, contact the local Representative.</p>

	<p>GFCI is tripped.</p> <ol style="list-style-type: none"> 1. Your heating system is controlled with an ELEKTRA thermostat factory-equipped with a GFCI device. 	<p>The GFCI will restart automatically (the red control will go on), reset the GFCI by pressing the Standby button.</p>
	<ol style="list-style-type: none"> 2. Your heating system is controlled with a thermostat with no integrated GFCI device, but protected with a GFCI interrupter positioned on the electrical panel. 	<p>Reset the GFCI. If the GFCI trips again, check if the heating mat has not been damaged (as described above). If not, replace the thermostat or the GFCI.</p>
	<p>Incorrect voltage has been supplied to the heating system.</p>	<p>Measure the voltage. 120V heating mats have yellow cold tails or yellow labels marked with "120V". 240V heating mats have red cold tails or red labels marked with "240V".</p>

	<p>Heating system laid on concrete slab floor.</p>	<p>Concrete slab floors take longer to warm up. Only if after 5–8 hours of heating, the change of temperature is not noticeable, check for mat damage (see “The heating mat has been damaged”).</p>
<p>The thermostat is not working correctly.</p>	<p>Incorrect programming.</p>	<p>Carefully read the thermostat’s Manual.</p>
	<p>Incorrect voltage supplied.</p>	<p>Measure the voltage of the heating system’s power supply conductor at the thermostat and make sure it matches the thermostat’s rating.</p>
	<p>The temperature sensor’s wire has become loose at the thermostat’s terminals, or has broken.</p>	<p>See “The floor continuously heats”.</p>

Product's Limited Warranty

ELEKTRA MD electric heating mats ("The Product") are warranted to be free from defects in materials and workmanship for twenty years (from the date of purchase).

Warranty Terms and Conditions

1. The warranty claim will be held valid if:
 - a. the heating system has been installed in accordance with the Installation Guide hereby, the National Electrical Code (NEC) or the Canadian Electrical Code (CEC) for Canadian customers, and all applicable local building and electrical codes;
 - b. the room where the Product has been installed, has been used in accordance with the instructions included in the part "Operation" of the Installation Guide hereby;
 - c. the properly completed Warranty Card will be presented.

2. Within the validity conditions of the Warranty hereby, the Manufacturer will **ONLY** bear the costs of repair of the defective Product returned to the Manufacturer's local Representative, its replacement for the fault-free one, or refund the cost of purchase of the Product which proved to be defective. The Manufacturer will not assume responsibility for the cost of flooring materials, or the cost of their removal and replacement.
3. This Warranty is transferable to subsequent owners.
4. The Manufacturer will not be held responsible for the consequences of the inappropriately selected heating output of the Product per ft² (m²) of the heated room.
5. Due to differences in building- and flooring insulation, as well as climate conditions, the Manufacturer does not guarantee, that the floor temperature will achieve the level at which users may subjectively be satisfied with.

Note



The complaint claims **must** be associated with the properly completed Warranty Card and the proof of purchase, and reported at the place where the Product was purchased, or at the Manufacturer's local Representative's office.

ELEKTRA
Heating Mats

Before returning the Product recognized to be defective in materials and workmanship, and not damaged as a result of misuse, misapplication or improper installation, to the Manufacturer's local Representative's office for repairs, you **MUST** contact the Representative in order to obtain the dedicated Returned Authorization number (Returned Authorization RA), otherwise the shipment will not be accepted and subsequently returned to the sender.

Warranty Card

Customer shall keep this Warranty Card throughout the entire warranty period of 20 years. The warranty period starts from the date of product purchase.

ELEKTRA Heating Mats

INSTALLATION SITE

Address	
Zip Code	City

Warranty claims with included Warranty Card and the retail sale receipt must be filled with the dealer.

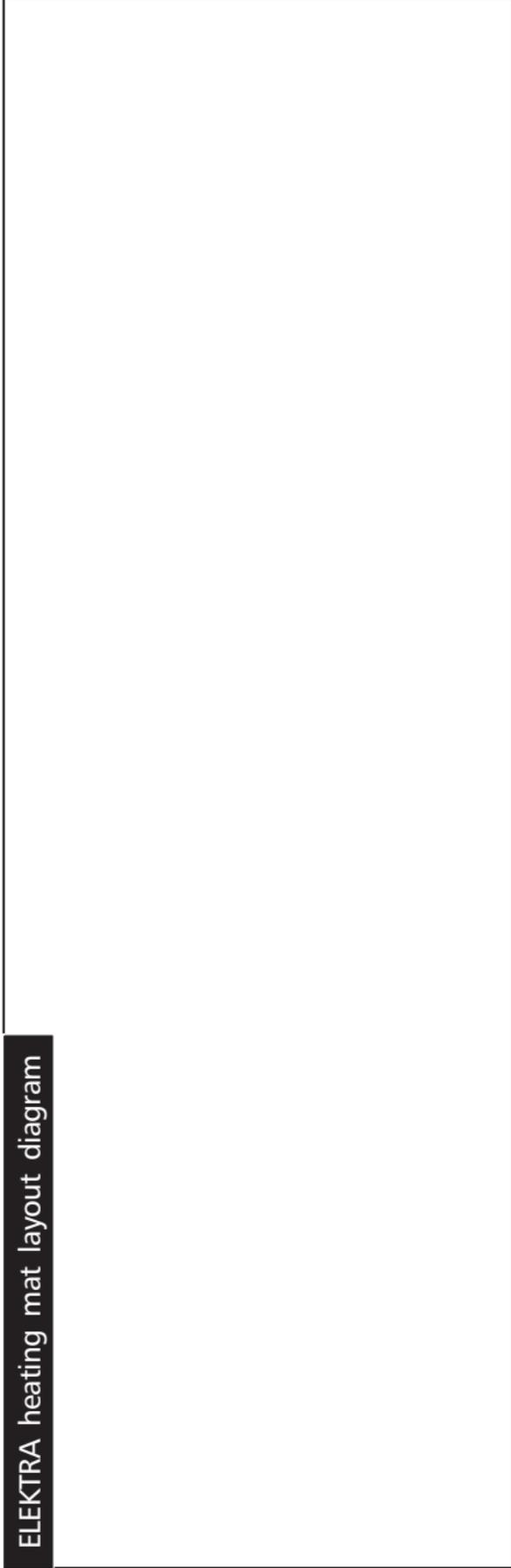
TO BE FILLED BY INSTALLER

Name	Electrician's Co. name and licence #:
Address	e-mail
Zip Code	City
	phone #
	fax #

Note Installer **has to** provide as-built documentation to the user.



ELEKTRA heating mat layout diagram



Note The layout diagram **must** include distances between the heating mat and walls and fixed furniture with a clearly marked position of the temperature sensor and of heating mats.

Note Please keep the photos of the heating mats' layout for future reference.



Square footage of the heated area	
Heating mat model	
Heating wire and insulation's resistance	
Before you start the installation	Ω
	$M\Omega$
After securing the heating mat to the subfloor	Ω
	$M\Omega$
When the floor is completed, before system connected and powered up	Ω
	$M\Omega$

Date	
Installer's legible signature	

Caution



The measurement results of the heating core's resistance should not vary from the one given on the nameplate with more than -5% and +10%. Resistance of the heating wire insulation **should** be at least 50 $M\Omega$ when measured with a megohmmeter (Insulation Resistance Tester) with a rated voltage of 1000V.

NOTE!

Place the self-adhesive product nameplates attached to the product here (must be carried out prior to installing the heating system)

The Heating Mats

– Complete Product Listing

120V 9W/ft² (100W/m²)

ELEKTRA 110-120V model	Dimensions		Coverage		Amps	Power*
	ft. x ft.	m x m	ft ²	m ²	A	W
MD 100/1.0 120V	1.6' x 6.5'	0.5 x 2.0	11.0	1.00	0.8	100
MD 100/1.5 120V	1.6' x 10'	0.5 x 3.0	16.0	1.50	1.2	150
MD 100/2.0 120V	1.6' x 13'	0.5 x 4.0	21.5	2.00	1.7	200
MD 100/2.5 120V	1.6' x 16.5'	0.5 x 5.0	27.0	2.50	2.1	250
MD 100/3.0 120V	1.6' x 20'	0.5 x 6.0	32.0	3.00	2.5	300
MD 100/3.5 120V	1.6' x 23'	0.5 x 7.0	37.5	3.50	2.9	350
MD 100/4.0 120V	1.6' x 26'	0.5 x 8.0	43.0	4.00	3.3	400
MD 100/4.5 120V	1.6' x 29.5'	0.5 x 9.0	48.5	4.50	3.7	450
MD 100/5.0 120V	1.6' x 33'	0.5 x 10.0	54.0	5.00	4.2	500
MD 100/6.0 120V	1.6' x 39.5'	0.5 x 12.0	64.5	6.00	5.0	600
MD 100/8.0 120V	1.6' x 52.5'	0.5 x 16.0	86.0	8.00	6.7	800
MD 100/9.0 120V	1.6' x 59'	0.5 x 18.0	97.0	9.00	7.5	900
MD 100/10.0 120V	1.6' x 65.5'	0.5 x 20.0	107.5	10.00	8.3	1000

120V 14W/ft² (160W/m²)

ELEKTRA 110-120V model	Dimensions		Coverage		Amps	Power*
	ft. x ft.	m x m	ft ²	m ²	A	W
MD 160/1.0 120V	1.6' x 6.5'	0.5 x 2.0	11.0	1.00	1.3	160
MD 160/1.5 120V	1.6' x 10'	0.5 x 3.0	16.0	1.50	2.0	240
MD 160/2.0 120V	1.6' x 13'	0.5 x 4.0	21.5	2.00	2.7	320
MD 160/2.5 120V	1.6' x 16.5'	0.5 x 5.0	27.0	2.50	3.3	400
MD 160/3.0 120V	1.6' x 20'	0.5 x 6.0	32.5	3.00	4.0	480
MD 160/3.5 120V	1.6' x 23'	0.5 x 7.0	37.5	3.50	4.7	560
MD 160/4.0 120V	1.6' x 26'	0.5 x 8.0	43.0	4.00	5.3	640
MD 160/4.5 120V	1.6' x 29.5'	0.5 x 9.0	48.5	4.50	6.0	720
MD 160/5.0 120V	1.6' x 33'	0.5 x 10.0	54.0	5.0	6.7	800
MD 160/6.0 120V	1.6' x 40'	0.5 x 12.0	64.5	6.0	8.0	960
MD 160/7.0 120V	1.6' x 46'	0.5 x 14.0	75.5	7.0	9.3	1120
MD 160/8.0 120V	1.6' x 52.5'	0.5 x 16.0	86.0	8.0	10.7	1280

* Power -10%, +5%

240V 9W/ft² (100W/m²)

ELEKTRA 208-240V model	Dimensions		Coverage		Amps	Power*
	ft. x ft.	m x m	ft ²	m ²	A	W
MD 100/1.5 240V	1.6' x 10'	0.5 x 3.0	16.0	1.50	0.6	150
MD 100/2.0 240V	1.6' x 13'	0.5 x 4.0	21.5	2.00	0.8	200
MD 100/2.5 240V	1.6' x 16.5'	0.5 x 5.0	27.0	2.50	1.0	250
MD 100/3.0 240V	1.6' x 20'	0.5 x 6.0	32.0	3.00	1.2	300
MD 100/3.5 240V	1.6' x 23'	0.5 x 7.0	37.5	3.50	1.5	350
MD 100/4.0 240V	1.6' x 26'	0.5 x 8.0	43.0	4.00	1.7	400
MD 100/5.0 240V	1.6' x 33'	0.5 x 10.0	54.0	5.00	2.1	500
MD 100/6.0 240V	1.6' x 40'	0.5 x 12.0	64.5	6.00	2.5	600
MD 100/8.0 240V	1.6' x 52'	0.5 x 16.0	86.0	8.00	3.3	800
MD 100/10.0 240V	1.6' x 66'	0.5 x 20.0	107.5	10.0	4.2	1000
MD 100/12.0 240V	1.6' x 80'	0.5 x 24.0	129.0	12.0	5.0	1200

240V 14W/ft² (160W/m²)

ELEKTRA 208-240V model	Dimensions		Coverage		Amps	Power*
	ft. x ft.	m x m	ft ²	m ²	A	W
MD 160/1.0 240V	1.6' x 6.5'	0.5 x 2.0	11.0	1.00	0.7	160
MD 160/1.5 240V	1.6' x 10'	0.5 x 3.0	16.0	1.50	1.0	240
MD 160/2.0 240V	1.6' x 13'	0.5 x 4.0	21.5	2.00	1.3	320
MD 160/2.5 240V	1.6' x 16.5'	0.5 x 5.0	27.0	2.50	1.7	400
MD 160/3.0 240V	1.6' x 20'	0.5 x 6.0	32.5	3.00	2.0	480
MD 160/3.5 240V	1.6' x 23'	0.5 x 7.0	37.5	3.50	2.3	560
MD 160/4.0 240V	1.6' x 26'	0.5 x 8.0	43.0	4.00	2.7	640
MD 160/4.5 240V	1.6 x 29.5'	0.5 x 9.0	48.5	4.50	3.0	720
MD 160/5.0 240V	1.6' x 33'	0.5 x 10.0	54.0	5.00	3.3	800
MD 160/6.0 240V	1.6' x 39.5'	0.5 x 12.0	65.0	6.00	4.0	960
MD 160/7.0 240V	1.6' x 46'	0.5 x 14.0	75.0	7.00	4.7	1120
MD 160/8.0 240V	1.6' x 52'	0.5 x 16.0	86.0	8.00	5.3	1280
MD 160/10.0 240V	1.6' x 66'	0.5 x 20.0	107.5	10.00	6.7	1600

* Power -10%, +5%