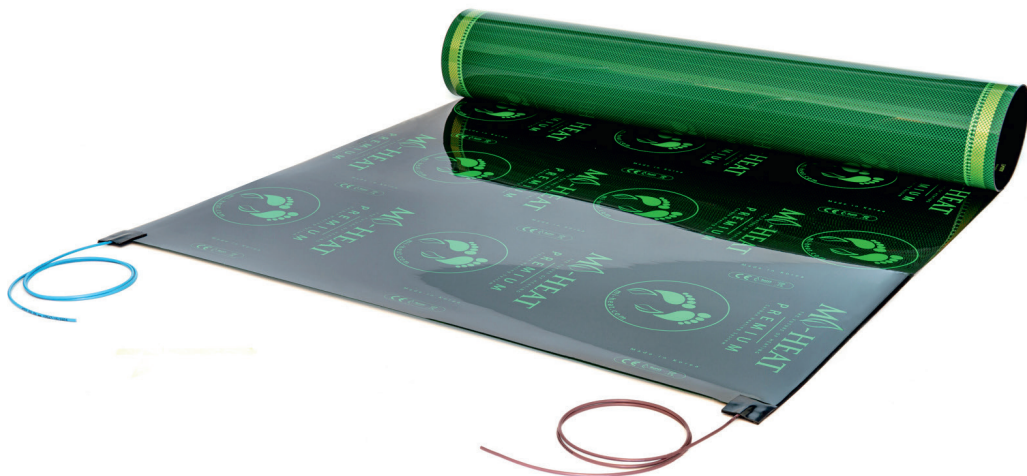


Installation instructions for Mi-Heat heating film

Floating installation for floor temperature control



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GENERAL INSTRUCTIONS FOR INSTALLATION

Thank you for choosing a Mi-Heat heating film.



The installation instructions must be read carefully and completely before installing the Mi-Heat heating film. The instructions contain important information on the use, installation and intended application of the heating film. These instructions and safety rules must be observed to ensure correct operation. The instructions for use are intended for the person responsible for fitting and installing the heating film. Due to the large number of possible applications, as well as the materials used and the structural condition, the installation and assembly instructions contained in the manual do not constitute a guarantee of the properties of the product in the respective installation type within the meaning of the statutory warranty regulations. Keep these instructions, including the installation plan and the control measurements, in a suitable place (e.g. in the electrical distribution box / fuse box).



General information

- Check the contents of the packaging for completeness and damage. Ensure that the heating film is available in the required width, length and rated power.
- We recommend storing the Mi-Heat heating films in a dry place at temperatures of 5-35°C. Any improper damage to the film, such as tears caused by sharp objects or kinks, must be avoided.
- The applicable regulations and standards for the installation and commissioning of the respective components must be observed during use. Operating the Mi-Heat heating film outside of the described and intended use will result in the loss of statutory warranty and liability claims.
- The Mi-Heat heating film is primarily intended for installation on the floor and thus for indoor floor temperature control.
- These instructions describe the installation of the heating film under floating floor coverings such as laminate, parquet, vinyl and carpet.
- Observe all dimensions and distances specified in the instructions during installation.
- The heating film may only be used in conjunction with floor coverings that have been approved for use with electric panel heating systems by the floor covering manufacturer.
- The maximum thermal resistance of the floor covering must not exceed the value $R_{\lambda} = 0.15 \text{ m}^2\text{K/W}$.
- Often only the thermal conductivity value is specified for floor coverings. To calculate the thermal resistance from this, the material thickness of the floor covering must first be converted into metres (m) and then divided by the thermal conductivity value.
- The heating film may only be operated in conjunction with a suitable thermostat, which ensures thermal monitoring by means of an external floor sensor and also enables the floor temperature to be limited to the maximum temperature specified by the floor covering manufacturer (usually 26°C).



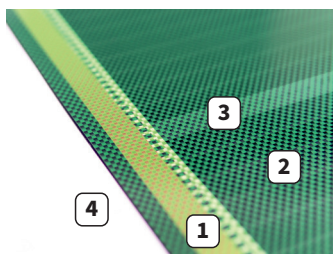
Safety instructions

- The installation, commissioning, maintenance and repair of the Mi-Heat heating film and the associated electrical components may only be carried out by a qualified electrician with a valid licence.
- The Mi-Heat 230V heating films must not be used in damp rooms such as bathrooms.
- The Mi-Heat heating film should have a separate power supply and should not be combined with other electrical devices.
- The circuit to which the Mi-Heat heating film is connected must be protected by a type B overcurrent switch and a residual current device (RCD).
- The Mi-Heat heating film must be firmly connected to the electrical installation. It is not permitted to operate the heating film directly from a socket without a thermostat with an external temperature sensor.
- The Mi-Heat heating film must not be operated without a temperature controller (thermostat), which ensures thermal monitoring by means of an external floor sensor and also enables the floor temperature to be limited to the maximum temperature specified by the floor covering manufacturer (usually 26°C).
- Please note the maximum permissible length of the heating films. The maximum film length depends on the heating output and can be found in the technical data (see page 3).
- The heating film is not suitable for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and/or knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Children should be supervised to ensure that they do not play with the heating film.

RESERVATION

We reserve the right to change technical data at any time and without prior notice. Changes, errors and printing errors do not justify any claim for compensation. To ensure your safety, the relevant guidelines and regulations as well as the operating and installation instructions must be observed.

Technical data for the Mi-Heat heating film

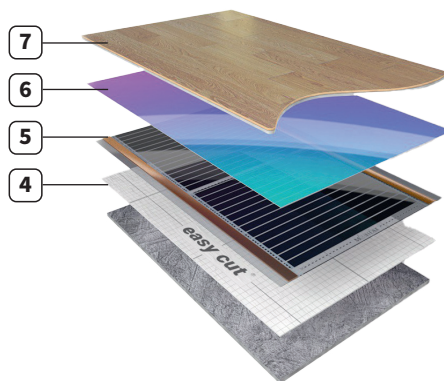
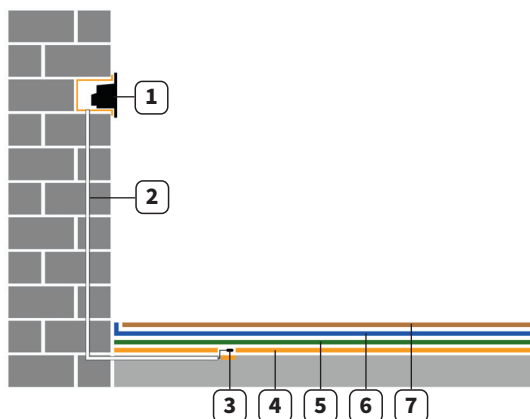


1. The outer copper strips serve as power supply conductors for the heating element.
2. Thin electrical conductors conduct the current to a carrier material. Depending on the heating film, this consists of carbon or graphite or a mixture. The respective heating power of the film is determined by different mixing ratios.
3. The Mi-Heat heating film can be individually cut to the desired length at the designated cutting points. The cut edge must be insulated at the electrically conductive areas of the heating film as described on page 9/10, under point 3/9.
4. Technical information on the heating film, such as the model designation, heating power and voltage, is printed on the edge area. Ready-made heating films also have a product label with all the technical information on the side of the connection cable.

Type	Width	Power per m ² (+/-10%)	Output per running meter	Power supply	Shortenable all	Thickness of the heating film	Max. length per lane *	Max. power per lane *
Premium 80 W/m ²	50 cm	80 W/m ²	40 W/lfm	230 V/AC	25 cm	0,388 mm	46 m	1840 W
Premium 80 W/m ²	80 cm	80 W/m ²	64 W/lfm	230 V/AC	25 cm	0,388 mm	28 m	1792 W
Premium 100 W/m ²	50 cm	100 W/m ²	50 W/lfm	230 V/AC	25 cm	0,49 mm	36 m	1800 W
Premium 100 W/m ²	80 cm	100 W/m ²	80 W/lfm	230 V/AC	25 cm	0,49 mm	23 m	1840 W
Premium 130 W/m ²	30 cm	130 W/m ²	39 W/lfm	230 V/AC	25 cm	0,49 mm	47 m	1833 W
Premium 130 W/m ²	50 cm	130 W/m ²	65 W/lfm	230 V/AC	25 cm	0,49 mm	28 m	1820 W
Premium 130 W/m ²	80 cm	130 W/m ²	104 W/lfm	230 V/AC	25 cm	0,49 mm	17m	1768 W
Comfort 60 W/m ²	50cm	60 W/m ²	30 W/lfm	230 V/AC	25 cm	0,366 mm	61m	1830 W
Comfort 60 W/m ²	100cm	60 W/m ²	60 W/lfm	230 V/AC	25 cm	0,366 mm	30 m	1800 W
Comfort 80 W/m ²	50cm	80 W/m ²	40 W/lfm	230 V/AC	25 cm	0,366 mm	46 m	1840 W
Comfort 80 W/m ²	100cm	80 W/m ²	80 W/lfm	230 V/AC	25 cm	0,366 mm	23 m	1840 W
Comfort 100 W/m ²	50cm	100 W/m ²	50 W/lfm	230 V/AC	25 cm	0,366 mm	36 m	1800 W
Comfort 100 W/m ²	100cm	100 W/m ²	100 W/lfm	230 V/AC	25 cm	0,366 mm	18 m	1800 W
Comfort 130 W/m ²	50cm	130 W/m ²	65 W/lfm	230 V/AC	25 cm	0,366 mm	28 m	1820 W
Comfort 130 W/m ²	100cm	130 W/m ²	130 W/lfm	230 V/AC	25 cm	0,366 mm	14 m	1820 W

* Calculated limitations / specifications - A current consumption of 8 amps per lane should not be exceeded.

Example diagram for laying the Mi-Heat heating film



1 Thermostat

4 Mi-Block heating film underlay

7 Floor covering

2 Corrugated pipe

5 Mi-Heat heating film

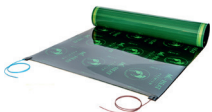
3 Temperature sensor

6 AquaStop PE-Film

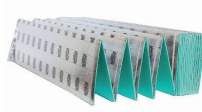
Installation material

No.	Designation	Specification	Purpose
1	Mi-Heat heating film (Comfort, Premium)	Width: 30, 50, 80cm Power: 60-130W/m ² Voltage: 230V, 50Hz	The film is suitable for underfloor heating under floating floor coverings (laminated, parquet, vinyl, carpet).
2	Mi-Block heating film underlay	1.5mm: for carpet or vinyl floor coverings without backing board 3 or 5mm: for vinyl on core board, laminate or parquet	The Mi-Block underlays have a low thermal transmittance value and are laid under the heating film as insulation.
3	Connection cable	Type: H07VV (double insulated) Diameter: min. 1.5mm ²	Double-insulated cable for electrical connection of the heating film.
4	Crimp connector *	Tin-plated copper connector with toothings on both sides	For secure connection between connection cable and heating film.
5	Vulcanising tape *	Self-sealing butyl adhesive tape, 50mm wide	Used to insulate the electrical connections on the heating film.
6	OPP adhesive tape	50mm wide	Temperature-resistant OPP tape for bonding/fixing heating film and PE film.
7	PVC insulating tape *	50mm wide	Water-repellent insulating tape for insulating cut edges on the heating film.
8	Corrugated pipe	Diameter: 16mm	For laying the electrical cables and the floor sensor. The floor sensor should be laid in a separate corrugated pipe.
9	Aqua-Stop / PE film / vapour barrier	AquaStop polyethylene film Film thickness: 120µ (0.12mm) Width: 4m	Is to be applied as an additional protective layer over all 230V heating films and protects the heating film from moisture.
10	Thermostat with external temperature sensor	Thermostat with floor sensor and adjustable floor limit temperature to the maximum temperature specified by the floor covering manufacturer (usually max. 26°C).	The thermostat is used to thermally monitor the heating film and control the desired temperature.
11	Aluminium/PET joint sealing tape	50mm wide	Optional: for bonding seams of the heating film underlay if there is no overlapping adhesive edge on the underlay.
12	Electrical terminal connectors (e.g. Wago)	for 230V / 16A	For connecting the electrical cables if more than one heating film is to be connected to the thermostat.
13	Solder connector for 1.5mm ² connection cable	for 230V / 16A	Optional: For extending the connection cables of heating films or the floor sensor
14	Cavity wall box / flush-mounted box / appliance installation box for thermostat	with appliance screw spacing of 60 mm	Optional: For holding/mounting the thermostat (if not already present)
13	Surface-mounted housing for thermostat	Suitable surface-mounted housing for the selected thermostat	Optional: For holding/mounting a flush-mounted thermostat that is to be surface-mounted.

* is not required if the heating film has already been delivered fully assembled (including connection cable and electrical insulation).



1



2



3



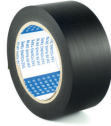
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5



6



7



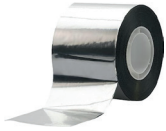
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9



10



11



12



13



14

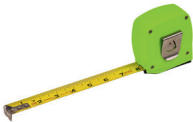


15

Installation tools

No.	Designation	Purpose
1	Measuring tape	To measure the areas
2	Scissors	For cutting films and tapes
3	Carpet knife (cutter)	For cutting the heating film underlay
4	Screwdriver	To install the thermostat
5	Wire stripper	For stripping the connection cable
6	Crimping pliers *	For pressing on the crimp connectors
7	Multimeter	For voltage and resistance measurement

* is not required if the heating film has already been delivered fully assembled (including connection cable and electrical insulation).



1



2



3



4



5



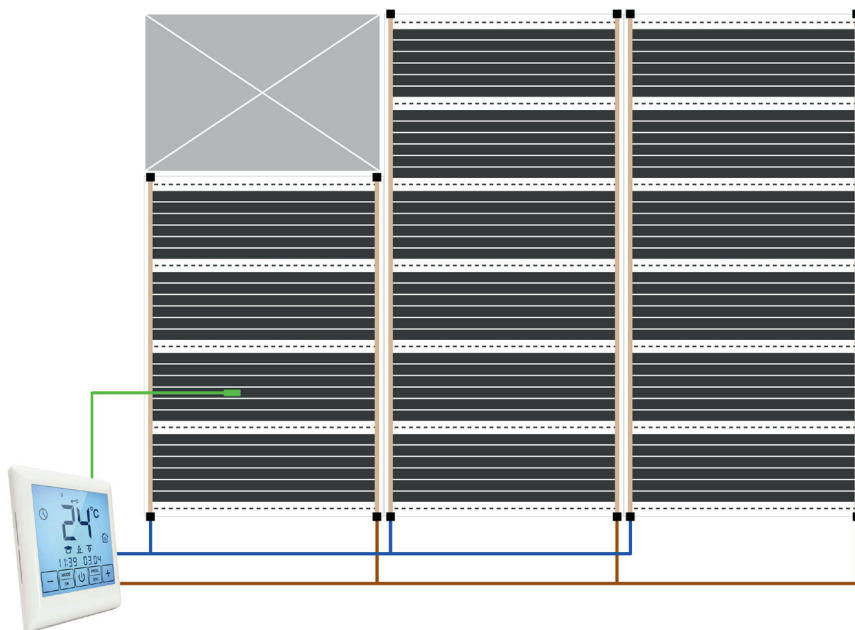
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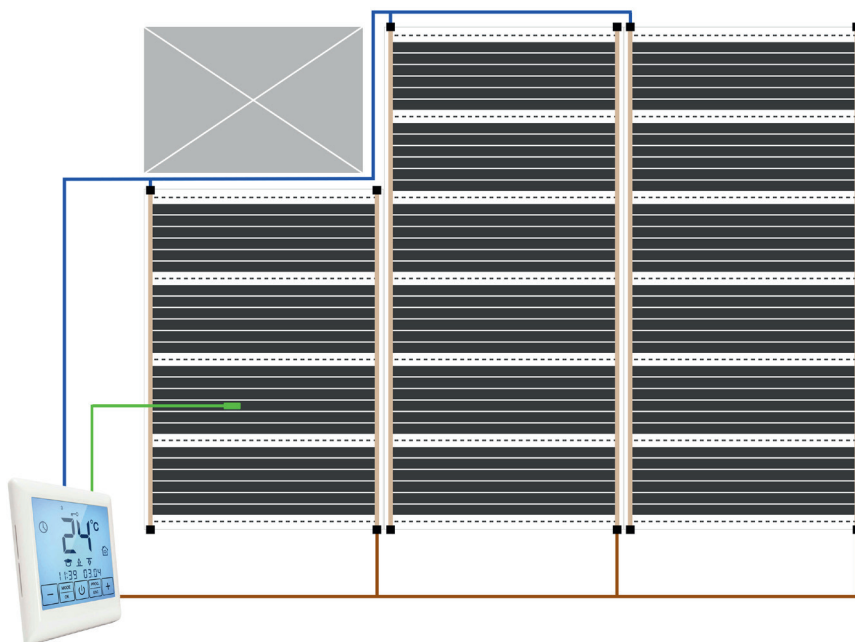
7

Installation

Possible variants for laying the connecting cables



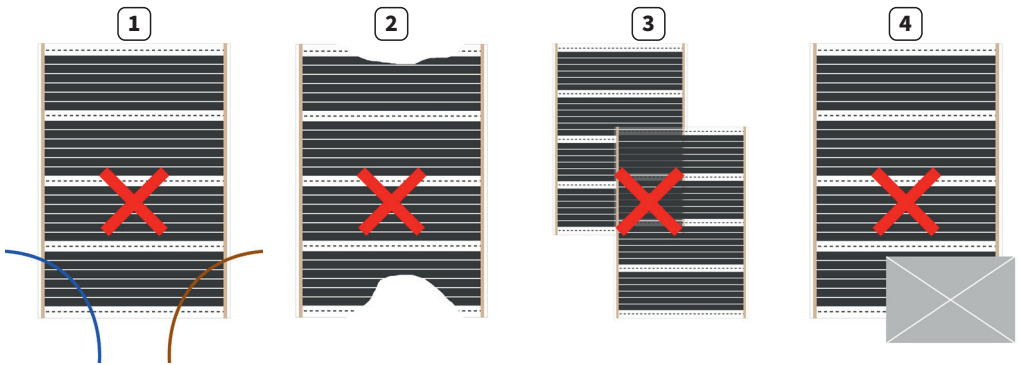
One-sided installation of the connection cables (L and N) / green = external floor sensor



Separate installation of the connection cables (L and N) / green = external floor sensor



Attention: Here you can see some examples of unauthorised installation of the Mi-Heat heating film.



1. The electrical connection cables for the power supply must not be laid on the heating film or under the heating film.
2. Do not shorten the heating film at any point, but only at the designated cutting points.
3. Do not lay the individual strips of heating film overlapping or overlapping.
4. The heating film must not be laid in areas where there is fixed or fully supported furniture/objects with a diameter of more than 6 cm. The heat build-up that would otherwise occur can lead to damage to the floor covering, the furniture/objects and ultimately also the heating element. If a heating film is installed in these areas, the furniture/objects must be placed on furniture feet (max. 6 cm diameter and min. 3 cm height) or otherwise raised to ensure air circulation and thus the escape of heat.

Preparation of the electrical installation



First sketch the room including its dimensions and draw in the position of the Mi-Heat heating film, the floor sensor and the routing of the electrical cables. The instructions should be kept together with the completed sketch for other users and future installation and maintenance work. Also carry out a check measurement for the insulation resistance and the total resistance of the Mi-Heat heating film(s). You will find a sketch of the installation plan on page 14 and the test report on page 13.



If not already present, drill a hole with a diameter of 68 mm in the wall at the desired position for the appliance box in which the temperature controller (thermostat) will later be installed.



The position should be in a freely accessible location and not be exposed to direct sunlight. If possible, a cold external wall should also not be used for installation.

Recesses must be made in the wall and floor for a total of two corrugated pipes. One corrugated pipe should protrude approx. 10 cm into the room and will later be used to accommodate the connection cable(s) for the Mi-Heat heating film(s).

The second corrugated pipe is used to lay the external floor sensor (temperature sensor) and should protrude into the room so that it ends as centrally as possible, but at least 10 cm below one of the installed heating films (active heating surface).

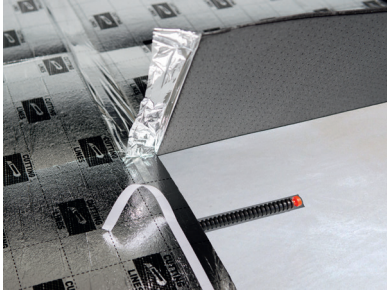
The floor sensor should be pushed through the corrugated pipe before the heating film underlay (page 8, point 1) is laid.



The corrugated pipes should be positioned so that no heavy objects (e.g. cupboard, bed, etc.) stand on them and could damage the floor sensor.

The following steps explain how to install the Mi-Heat heating film. Steps 2, 4 and 7 - 10 contain some important information for pre-assembled heating films (including connection cable and electrical insulation), but the steps shown in the illustrations can be omitted. If the heating film is supplied in rolls, the installer must carry out the assembly (shortening the heating film strips, fitting the connection cables and the correct electrical insulation) himself.

1



Make sure that the floor is clean and dry before you start laying the Mi-Block heating film underlay. The floor must be as even as possible and free of sharp elements (e.g. nails, screws, etc.) or dents to avoid scratches, creases and other damage to the heating film underlay or the MiHeat heating film.

Do not use any underlays that could damage the heating film underlay or the heating film, e.g. metal sheets or metallised primers. Moisture-absorbing underlays such as paper, wood, cellulose or similar materials must also not be used as underlays.

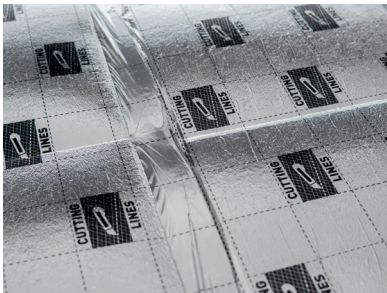
The floor sensor should be pushed through the corrugated pipe before the heating film underlay is laid.



Only Mi-Block heating film underlay in 1.5 mm thickness may be used for carpet or vinyl flooring without a backing board.

For vinyl floors with HDF core board, laminate and parquet, you can use the heating film underlay in either 3 or 5 mm thickness.

Seal the seams between the individual sheets of the heating film underlay with the protruding aluminium films (if present). Alternatively, you can also use our aluminium/PET joint sealing tape (page 4, no. 11) or the temperature-resistant OPP adhesive tape (page 4, no. 6).



2



The Mi-Heat heating film must not be installed at temperatures below 5°C.

Roll out the Mi-Heat heating film on the floor and cut it to the required length for the intended area.

Always shorten the heating film at the official cut edges intended for this purpose (see image on the left).

The individual strips of heating film must not overlap or intersect.

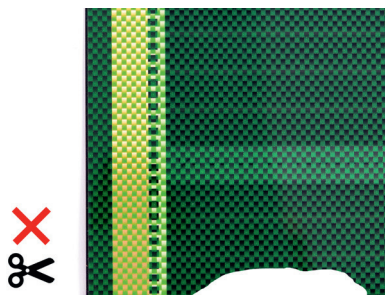
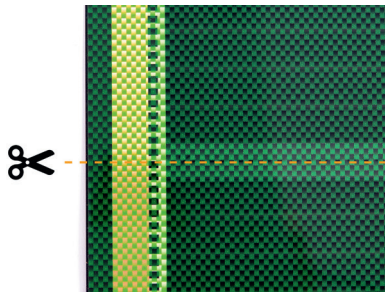
Lay out the heating film so that you can read the Mi-Heat logo from above.

The heating films should be laid at least 5 cm away from walls.

A distance of 0.5 to 1.0 cm should be maintained between the individual heating film strips.



The maximum length of the heating film strips depends on the heating output and can be found in the table with the technical data on page 3.



3



Shorten the Mi-Heat heating film only at the designated points (see illustration on page 8, point 2) and insulate the ends of the heating film where no connection cables are fitted with self-sealing adhesive tape (page 4, no. 5) or PVC insulating tape (page 4, no. 7). The tape must be folded over from bottom to top so that the electrically conductive copper tape is completely covered.

4



Do not lay the heating film in areas where furniture/objects with a diameter of more than 6 cm will later be fixed or fully supported. The heat build-up that would otherwise occur can lead to damage to the floor covering, the furniture/objects and ultimately also the heating element.

If a heating film is installed in these areas, the furniture/objects must be placed on furniture feet (max. 6 cm diameter and min. 3 cm height) or otherwise raised to ensure air circulation and thus the escape of heat.

5

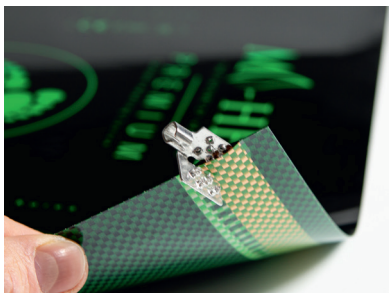


Tape the seams between the individual strips of the Mi-Heat heating film with the temperature-resistant OPP adhesive tape (page 4, no. 6). Also tape the outer edge of the heating film to the Mi-Block heating film underlay to prevent the heating surface from slipping.



Ensure that the Mi-Heat heating film is not damaged during installation. It is not permitted to fasten the heating film with screws, bolts, nails or similar metallic objects.

6



Now take a closer look at the crimp connector. This has an eyelet on one side into which the electrical connection cable will later be inserted and crimped.

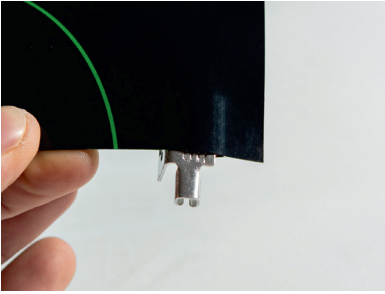
Make sure that the crimp connector is placed on the heating film so that the thickening of the eyelet later points downwards towards the heating film base.



For heating film underlays with a thickness of 3 or 5 mm, the connection point and connection cable will later be pressed into the material of the underlay or the underlay can be cut out or milled in these areas to create a flat surface.

If a heating film underlay with a thickness of 1.5 mm is used, a small cut-out and, if necessary, a milled recess must be made in the subfloor to accommodate the connection points and connection cables later.

7

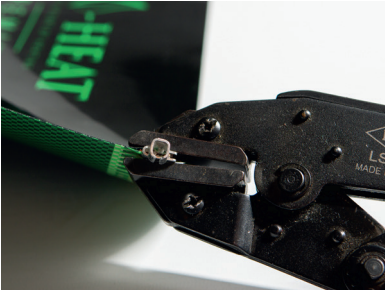


Slide the crimp connector with the contact surface below the upper insulation layer of the Mi-Heat heating film in the centre of the copper strip. The other contact surface of the crimp connector is outside the insulation.

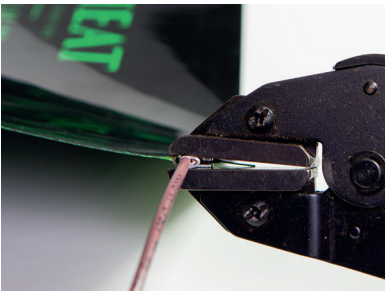
Now crimp the crimp connector several times from the left and right using the crimping pliers until it is firmly seated on the Mi-Heat heating film and makes good contact with the copper strip.



Before continuing with the installation of the connection cables, carry out a check measurement of each individual heating film track and enter the resistance values on page 13 under check measurement 1.



8



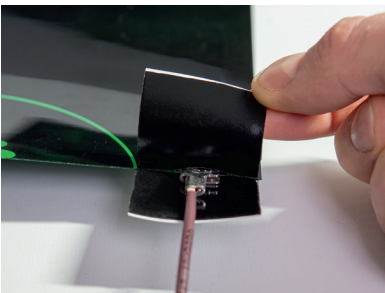
Now strip the insulation from the connection cable and insert it into the eyelet on the crimp connector. For a better hold, we recommend twisting the stranded wire and feeding it through the eyelet twice. Now crimp the eyelet from the left and right using the crimping pliers (page 5, no. 6) until the connection cable is held securely in the crimp connector. Alternatively, it is also possible to solder the connection cable in the crimp connector.



Only use double-insulated cable of type: H07VV (page 4, no. 3) for the connection.

The heating films may only be wired 'in parallel' as shown on page 6.

9



Insulate the electrical contact surfaces thoroughly from the top and bottom with approx. 4x5cm strips of self-sealing adhesive tape (page 4, no. 5).

Now secure the Mi-Heat heating film and all electrical connection cables thoroughly to the Mi-Block heating film base using the temperature-resistant OPP adhesive tape (page 4, no. 6).



Make sure that the electrical connection cables for the power supply are not laid on the heating film or under the heating film!

10



Installation of ready-made heating films:

Before connecting the individual wire pairs of the heating films in parallel, e.g. using Wago terminals (screen 4, no. 12), carry out a check measurement of each individual heating film track and enter the resistance values on page 13 under check measurement 1.

After measuring the individual resistances, the parallel wiring can be carried out and check measurement 2 for the insulation and total resistance can be carried out. Also enter these values on page 13.

Assembly of roll goods:

Before continuing with the rest of the installation, carry out check measurement 2 for the insulation and total resistance. Also enter these values on page 13.

11



Now carry out a functional test of the heating film laid out. We recommend using an infrared thermometer (IR thermometer) or a thermal imaging camera for this purpose. For the first functional test, the heating film can initially be supplied directly with mains voltage for a few minutes.

Please note that the heating film must never be operated later without thermal monitoring by the thermostat with external floor sensor.

12



If you do not have an electronic measuring device, you can carry out a simple check using a cushion or by covering the floor covering with two planks. To do this, cover the heating film for a maximum of 15 minutes. The heat generated underneath can then be felt with the foot (on socks). Do not use the palm of your hand to measure the temperature, as this may have approximately the same temperature as the film.



Disconnect the heating film from the power supply again for the next steps.

13



After checking the Mi-Heat heating film, spread the AquaStop PE film (page 4, no. 9) over the entire surface of the room. The individual sheets should overlap by at least 10 cm.

Also tape the seams with the OPP adhesive tape (page 4, no. 6).



14



You can now lay the floor covering. When laying, make sure that the heating and PE films are not damaged.



It is advisable to wear shoes with soft soles or only socks when installing the floor covering to avoid possible damage to the heating film or the PE film.

15



Finally, the temperature controller (thermostat) is installed.

Please note that the thermostat must be equipped with an external floor sensor for thermal monitoring and enables an adjustable floor limit temperature to the maximum temperature specified by the manufacturer of the floor covering (usually max. 26°C).



Operating the heating film without suitable thermal monitoring is not permitted and will invalidate all warranty claims.



Please refer to the enclosed instructions for the temperature controller for precise installation instructions.

Customer

Company:	
Name:	
Street:	
ZIP / City:	
Phone:	

Client

Company:	
Name:	
Street:	
ZIP / City:	
Phone:	

Electrician

Company:	
Name:	
Street:	
ZIP / City:	
Phone:	

Laying date:	
Installation date:	

Company stamp

Control measurement 1 (before installation)

Date:		Signature:	
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Before installing the heating film, the following resistance values were measured per heating film sheet

Lane name/No.:		Resistance:	
Lane name/No.:		Resistance:	
Lane name/No.:		Resistance:	
Lane name/No.:		Resistance:	
Lane name/No.:		Resistance:	
Lane name/No.:		Resistance:	
Lane name/No.:		Resistance:	
Lane name/No.:		Resistance:	
Lane name/No.:		Resistance:	
Lane name/No.:		Resistance:	
Lane name/No.:		Resistance:	
Lane name/No.:		Resistance:	



Store the installation plan for the panel heating system in a secure location, for example in a document holder in the switch cabinet. The documents should always be accessible, even to people from outside the household (e.g. tradesmen). Also take into account your labelling obligation in accordance with the DIN VDE 0100 standard for electrical panel heating systems. For this purpose, your heating film is supplied with a warning sticker in a yellow signal colour, which must be affixed in the switch cabinet or the associated sub-distribution board. On page 16 of these instructions you will find this warning sticker again as a template to cut out.

Control measurement 2 (after laying the heating film)

Date:		Signature:	
-------	--	------------	--

After laying the heating film, the following resistance values were measured

Total resistance:		Insulation resistance:	
-------------------	--	------------------------	--

Control measurement 3 (after laying the floor covering)

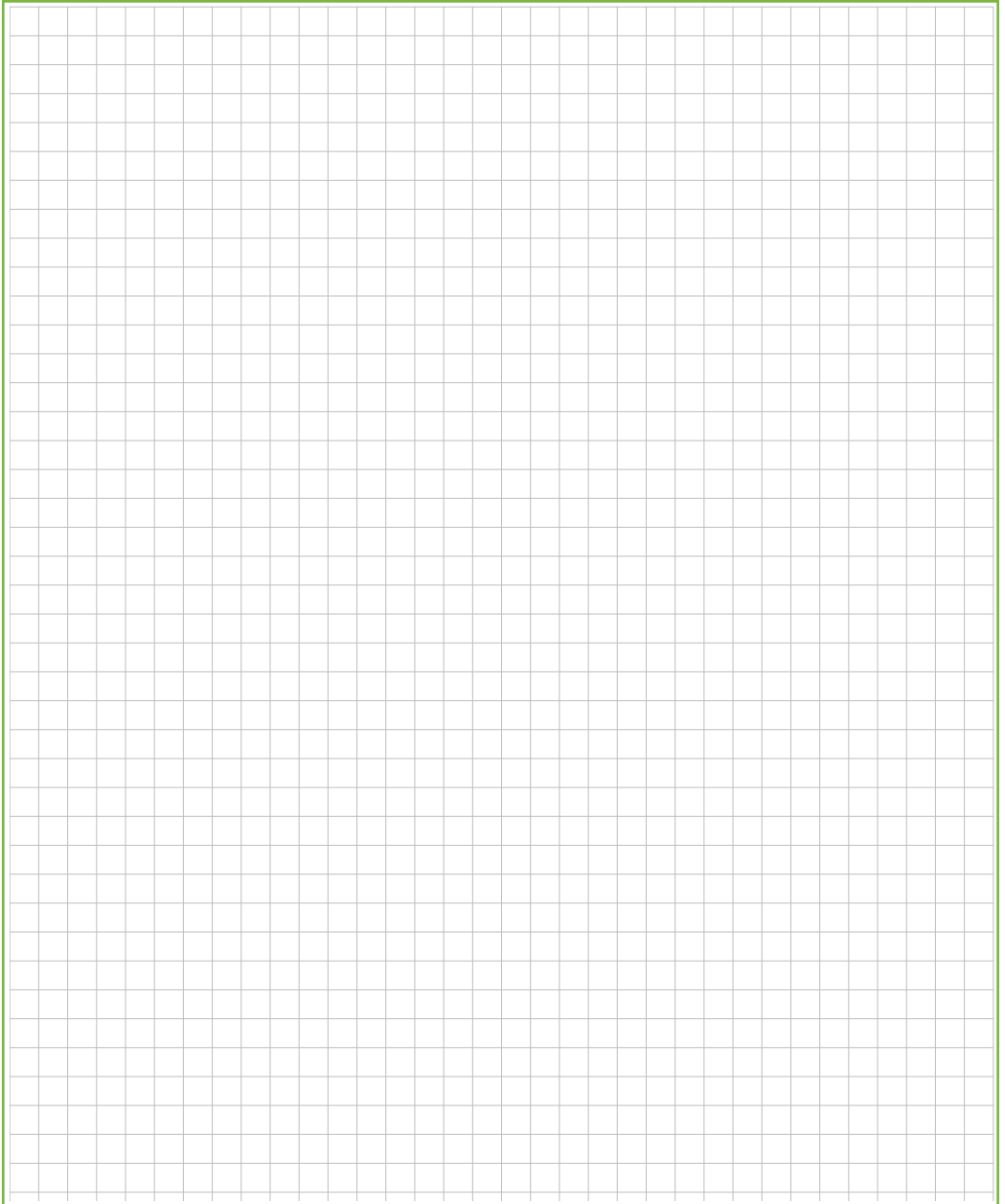
Date:		Signature:	
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After laying the floor covering, the following resistance values were measured

Total resistance:		Insulation resistance:	
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Laying plan





Draw a sketch of the room including its dimensions and mark the position of the individual Mi-Heat heating films, the floor sensor and the routing of the electrical cables. The instructions should be kept in a safe place (e.g. in the electrical distribution box/fuse box) together with the completed sketch and the control measurements from page 13 for other users and future installation and maintenance work.



Warning notice for the switch cabinet

! WARNUNG: ELEKTRISCHE FLÄCHENHEIZUNG
WARNING: ELECTRICAL HEATING FILM

 BODEN / FLOOR	<input type="checkbox"/>	RAUM / ROOM: _____ _____ _____
 WAND / WALL	<input type="checkbox"/>	
 DECKE / CEILING	<input type="checkbox"/>	

FAQ - Questions about products and the topic of electric heating

Do you have questions about one of our products and would like more information about electric heating?

Then take a look at our extensive FAQ database.



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