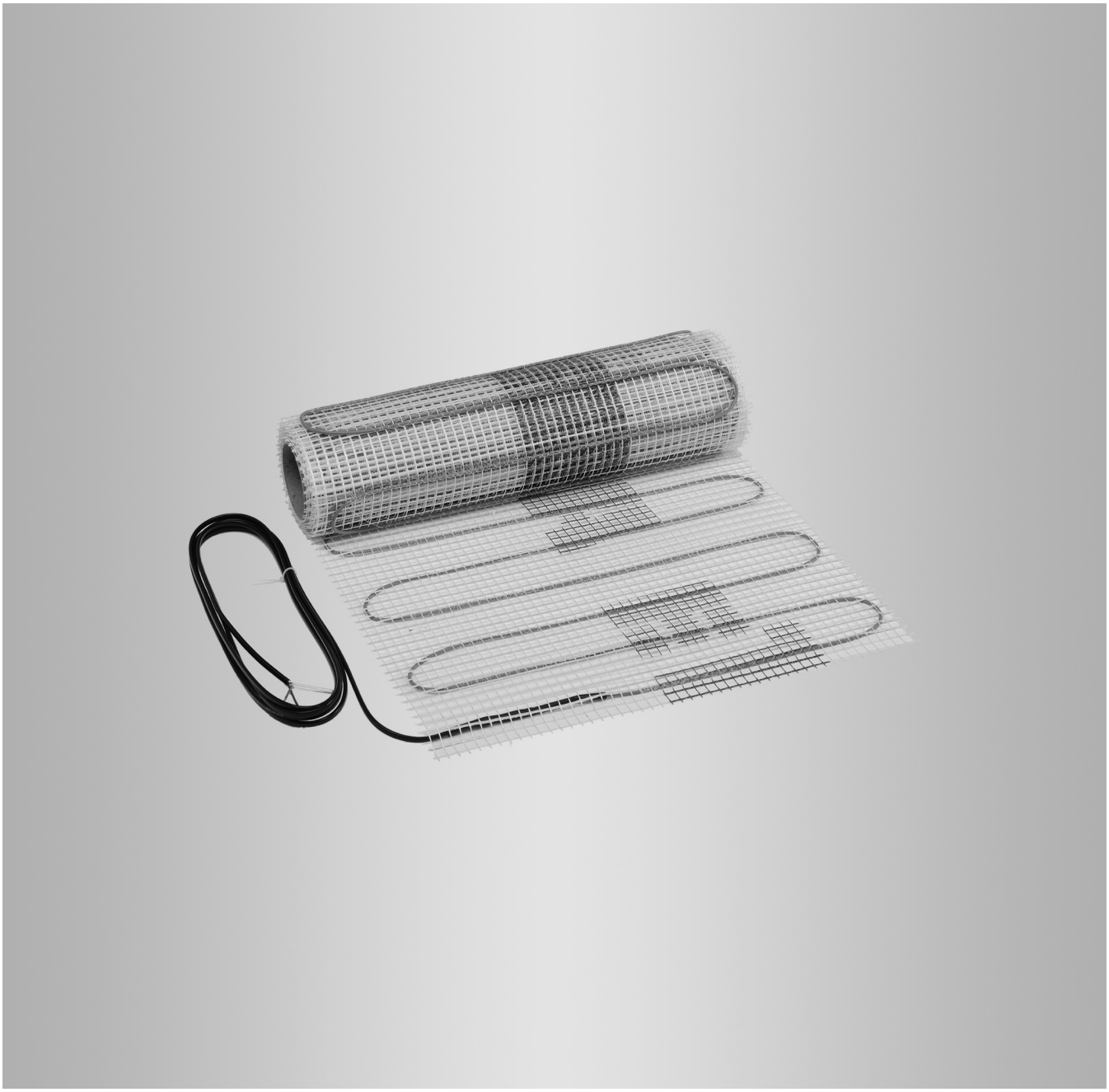
Installation instructions

for contractors

Vitoplanar EF2
Type EF2.A200.160D to EF2.A1400.1120D

Dipole mesh heating mat for installation in thin-set mortar
160 to 1120 W

VITOPLANAR EF2



5855579 GB 2/2018

Safety instructions

⚠ Please follow these safety instructions closely to prevent accidents and material losses.

Safety instructions explained

⚠ **Danger**
This symbol warns against the risk of injury.

! **Please note**
This symbol warns against the risk of material losses and environmental pollution.

Note
Details identified by the word "Note" contain additional information.

Target group

These instructions are exclusively intended for qualified contractors.

Installation and commissioning as well as repairs and service work may only be carried out by a licensed contractor or a qualified person in compliance with all safety regulations. This person must first check whether the electrical system in the building complies with the applicable standards. The manufacturer's responsibility is limited to the delivery of the appliance.

Regulations to be observed

- National installation regulations
- Statutory regulations for the prevention of accidents
- Statutory regulations for environmental protection
- Codes of practice of the relevant trade associations
- All current safety regulations as defined by DIN, EN, DVGW, TRGI, TRF, VDE and all locally applicable standards
  - (A) ÖNORM, EN, ÖVGW G K directives, ÖVGW-TRF and ÖVE
  - (CH) SEV, SUVA, SVGW, SVTI, SWKI, VKF and EKAS guideline 1942

Work on the appliance

- Work on electrical equipment may only be carried out by a qualified electrician.
- Only connect appliances to correctly installed sockets.
- Isolate the appliance from the power supply (e.g. by removing the separate fuse or by means of a mains isolator) and check that it is no longer live.
- Safeguard the appliance against reconnection.

Operation of the appliance

⚠ **Danger**
Damaged equipment poses a safety hazard. Check the appliance for external damage. Never start up a damaged appliance.

- The appliance may only be operated in its original condition without modifications and in perfect technical condition. All protection equipment must work faultlessly and be freely accessible.
- The appliance may only be commissioned once it has been installed.

Auxiliary components and individual parts

For replacement, use only spare parts supplied or approved by Viessmann.

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Disposal of packaging

Please dispose of packaging waste in line with statutory regulations.

DE: Use the disposal system organised by Viessmann.
AT: Use the ARA statutory disposal system (Altstoff Recycling Austria AG, licence number 5766).
CH: Packaging waste is disposed of by the HVAC contractor.

Symbols

Symbol	Meaning
	Reference to another document containing further information
!	Warning of material losses and environmental pollution

Intended use

Mesh heating mat for temperate heating of floors, for room heating or for wall heating.
The heating mat has been designed for installation in thin-set mortar.

Intended use presupposes that a permanent installation in conjunction with permissible components designed for this purpose has been carried out.

All other use is deemed inappropriate. Any resulting losses are excluded from the manufacturer's liability.

Any usage beyond this must be approved by the manufacturer in each individual case.

Product information

Vitoplanar EF2

Type	Dimensions in cm	Output in W
EF2.A200.160D	50 x 200	160
EF2.A300.240D	50 x 300	240
EF2.A400.320D	50 x 400	320
EF2.A500.400D	50 x 500	400
EF2.A600.480D	50 x 600	480
EF2.A800.640D	50 x 800	640
EF2.A1000.800D	50 x 1000	800
EF2.A1200.960D	50 x 1200	960
EF2.A1400.1170D	50 x 1400	1120

Pre-assembled heating mat for temperate heating of floors, for room heating or for wall heating.
- Low floor construction height due to low height of only 2.7 mm
- Self-adhesive
- Easy to install in a tile adhesive bed
- Operation with virtually no magnetic field
- Reliable, simple installation and high stability as heating conductor is sewn in place
- Dipole heating conductor
- Protective measure: RCD 30 mA required
- Connecting cable: 4 m, 2 x 1.0 (1.5) mm² with protective braid

Heating mat structure

Fig. 1 Extra thin sleeve

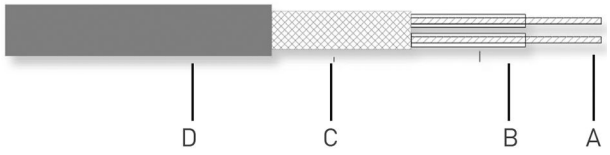

Fig. 2

A Resistance cables
B Inner Teflon insulation
C Protective aluminium sheathing and protective conductor
D Outer PVC insulation

Installation example

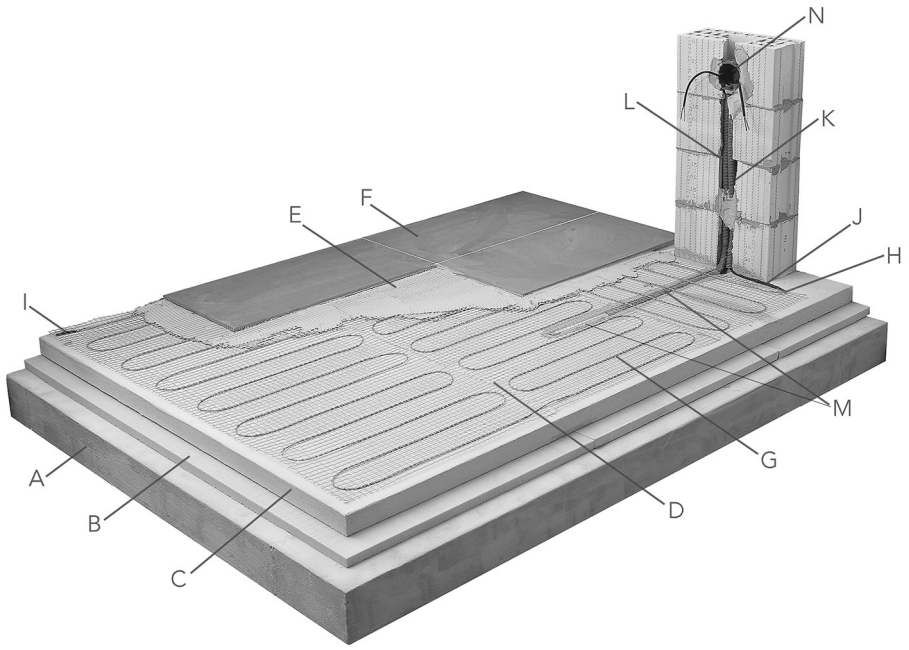

Fig. 3

A Unfinished concrete
B Existing insulation
C Existing subfloor
D Glass fibre mesh
E Flexible adhesive
F Flooring (top layer)
G Heating conductor
H Connection sleeve
I End closure
J Connecting cable
K Installation conduit for connecting cable
L Installation conduit for sensor lead
M Installation conduit and protective sensor pipe in copper
N Flush mounted junction box for thermostat

Installation example (cont.)

Flooring

Please note
Incorrect installation may cause damage to the heating mat.
It is essential to follow the instructions of the flooring manufacturer.
Check the manufacturer's special requirements for electric underfloor heating.
If there are any inconsistencies between the instructions, please contact our customer service.

The following types of flooring (top layer) may be used:

Flooring	Max. thickness d in mm	λ W/mK	D = d/λ m²K/W	K = 1/D W/m²K
Parquet	15	0.14	0.1143	8.75
Cork	10	0.051	0.1176	8.50
Linoleum	4	0.17	0.0235	42.50
PVC flooring	6	0.23	0.0260	38.50
Fitted carpet	10	0.09	0.1100	9.00
Laminate floor	9	0.16	0.5000	20.00
Tiles including adhesive	12	0.95	0.0126	79.00
Slab flooring (granite)	30	0.75	0.0400	25.00
Marble	20	0.81	0.0250	40.00

- With an underfloor heating system, the thickness of the top layer of flooring must be at least 4 mm.
- If top layers other than those listed above are used, their permissibility must be checked with the manufacturer.
- Thermal insulation at least 20 mm thick under the substrate is required when laying against the ground or above unheated rooms.
- Do not bend the heating cable.

Installation versions

Installation below tile flooring

Install the mesh heating mat with the heating conductor facing **down** so that it is protected by the mesh during filling. This also makes it easier to apply the adhesive with the notched spreader.

Please note
Danger of damage to the heating conductor!
The heating conductor must be completely surrounded by the adhesive or levelling compound.
The adhesive or levelling compound must be applied with the correct consistency to completely surround the heating conductor.

If insulation is necessary (above garages or unheated cellars), a rigid foam support element board should be used. The boards consist of rigid extruded polystyrene foam with a layer of cement applied on either side. The boards must be glued to the screed with flexible adhesive.

Installation versions (cont.)

<table>
<tr><th colspan="2">VERSION A – Immediately in flexible adhesive</th><th>VERSION B – In free-flowing levelling compound</th></tr>
<tr><td colspan="2">Step 1:
Prepare the screed for laying the flexible mortar</td><td>Step 1:
Prime the screed diluted 1:1 with water. Drying time 12 hours</td></tr>
<tr><td colspan="2">Step 2:
Lay the heating mat.</td><td>Step 2:
Lay the heating mat</td></tr>
<tr><td>Step 3a:
Apply a layer (5 to 10 mm) of flexible adhesive and tile immediately.
(The flexible adhesive provides mechanical protection.)</td><td rowspan="2">Step 3b:
Apply a layer (3 mm) of flexible adhesive and allow to harden.
The following day, lay the tiles with a second layer of flexible adhesive and grout them.
Advantage:
The top layer can be renewed without damaging the heating mats.</td><td>Step 3:
Level out to a height of at least 5 mm with free-flowing levelling compound.
Hardening time: 1 to 2 days</td></tr>
<tr><td colspan="2"></td><td>Step 4:
Lay and grout ceramic tiles.</td></tr>
<tr><td colspan="2">Step 4:
Caulk the tile edges</td><td>Step 5:
Caulk the tile edges</td></tr>
</table>

On existing or new cement screed

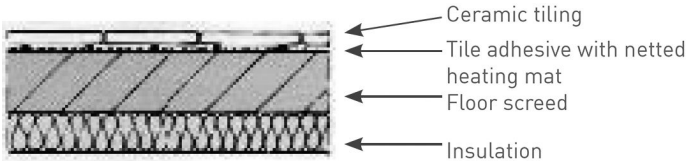

Fig. 4

Version
- As per version A or version B

On old ceramic flooring or Terrazzo natural stone slabs

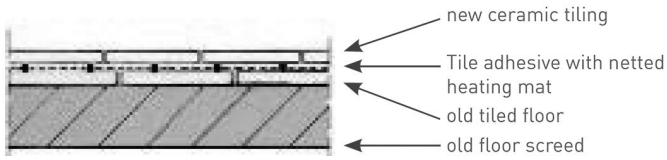

Fig. 5

Version
- Existing flooring must be free of wax and grease. Degrease, e.g. with 10 % sodium hydroxide solution, and scrub with warm water.
- Prime. Drying time at least 5 hours; no more than 24 hours
- Lay the heating mat.
- Continue with version A, step 3a/3b, or version B, step 3.

On anhydrite screed

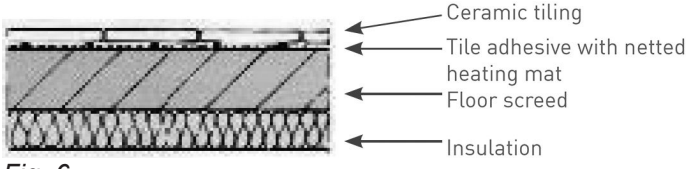

Fig. 6

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Installation versions (cont.)

Version
- Anhydrite screeds must be dry; max. humidity is 1 %. Sand the surface (grain size 16)
- Prime with water diluted 1:1.
- Lay the heating mat.
- Continue with version A, step 3a/3b, or version B, step 3.

On gypsum subfloors

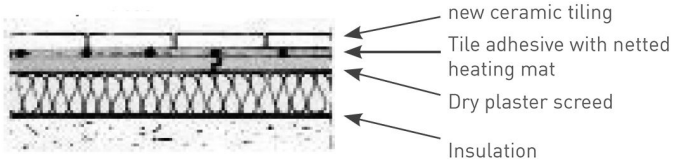

Fig. 7

Version
- Prime undiluted.
- Lay the heating mat.
- Continue with version A, step 3a/3b, or version B, step 3.

On wooden floorboards and chipboard

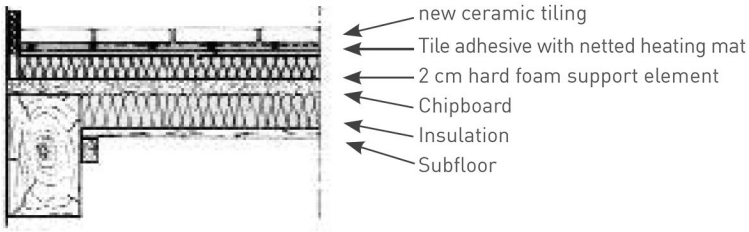

Fig. 8

! **Please note**
The floor must not vibrate!
Screw the rigid foam support element boards (2 cm thick) to the existing floor with drywall screws.

Version
- Secure the rigid foam support element boards with screws. Seal the joints.
  Note
  For chipboard of quality class V100G (min. 25 mm thick) with tongue and groove, friction-fitted, this step can be omitted. However, the chipboard must be primed.
- Lay the heating mat.
- Continue with version A or version B.

Installation under carpet, adhesive parquet or PVC flooring

For these types of flooring it is necessary to produce a smooth and even surface, which is best achieved with a flow levelling compound.
The mesh heating mat must be installed with the heating conductor facing **down** so that it is protected by the mesh during filling and to make it easier to apply the adhesive with the notched spreader.

The heating conductor must be completely surrounded by the adhesive or levelling compound.

Note
With parquet, wooden floors and laminate, the surface temperature must be limited to 28 °C!

Installation versions (cont.)

On existing or new cement screed

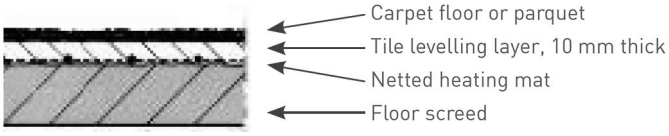

Fig. 9

A flow levelling compound must be applied to screeds, old ceramic floors, anhydrite screeds and gypsum subfloors.

Version
- Pre-treat the subfloor accordingly.
- Lay the heating mat. Fasten the mesh to the substrate with flexible adhesive.
- Apply the flow levelling compound (10 mm thick).

On wooden floorboards and chipboard

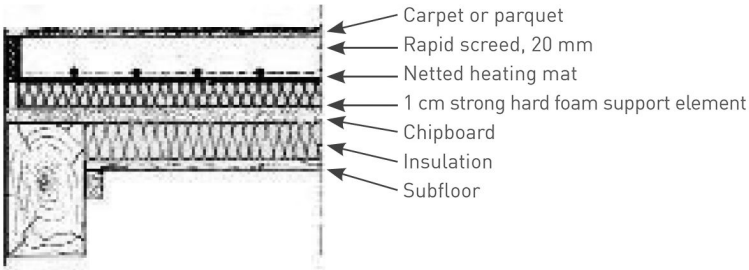

Fig. 10

A rigid foam support element board (10 mm) must be used on wooden floorboards and chipboard. Mesh heating mats must not be laid on wood.

Version
- Secure the rigid foam support element boards (10 mm thick) to the existing floor with drywall screws. Seal the joints.
  Note
  For chipboard of quality class V100G (min. 25 mm thick) with tongue and groove, friction-fitted, this step can be omitted. However, the chipboard must be primed.
- Lay the heating mat. Fasten the mesh to the substrate with staples.
- Apply the flow levelling compound (20 mm thick). (Quick drying screed)

Installation under marble slabs in thin-set mortar

The mesh heating mat must be installed with the heating conductor facing **down** so that it is protected by the mesh during filling and to make it easier to apply the adhesive with the notched spreader.

The heating conductor must be completely surrounded by the adhesive or levelling compound.

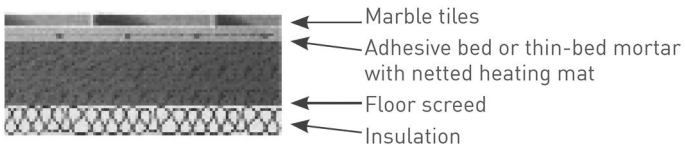

Fig. 11

A flow levelling compound must be applied to screeds, old ceramic floors, anhydrite screeds and gypsum subfloors.

Version
- In the adhesive bed with marble slabs (installation in thin-set mortar)
- Lay the heating mat on the screed.
  Lay thin-set mortar with marble slabs as usual.

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Heating mat adaptation options

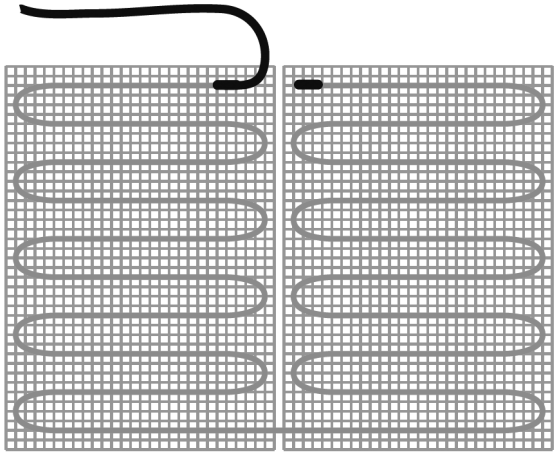

Fig. 12 Rotated 180°

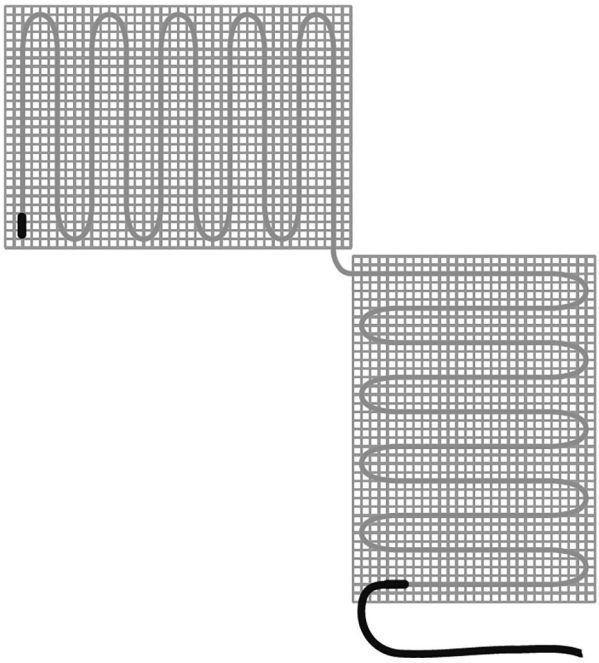

Fig. 13 Rotated 90°

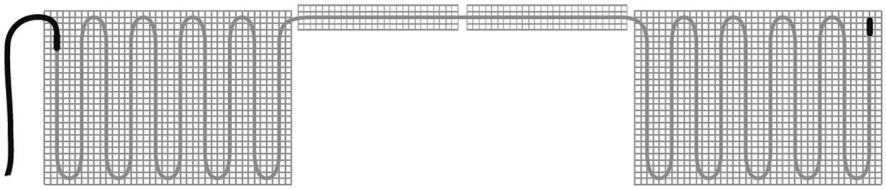

Fig. 14 Adaptation for recesses, obstacles, furniture, etc.

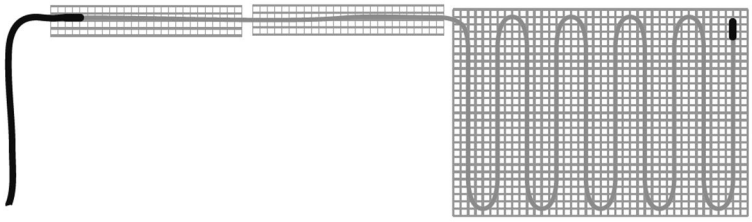

Fig. 15 Adaptation directly downstream of the connecting cable

! **Please note**
Risk of damage!
Where adaptations are made directly downstream of the connecting cable, do not pull the heating conductor into the installation conduit. The heating conductor must not be used to extend the connecting cable.

Preparing the subfloor

See "Installation versions".
The substrate must be clean, dry and level.

There must be no objects such as nails, screws or similar on or protruding from the substrate.

Checking the connecting cable

Check whether the connecting cable extends to the flush mounted junction box.

Note
The connecting cable must be protected against mechanical influences in the wall by a protective pipe or hose.

Note
The connecting cable is routed at the edge of the floor to the junction box. The connecting cable must not be routed under or over the heating mat.

Positioning the sensor

Note
It is best to position the sensor in front of a door so that it cannot later be covered with furniture.

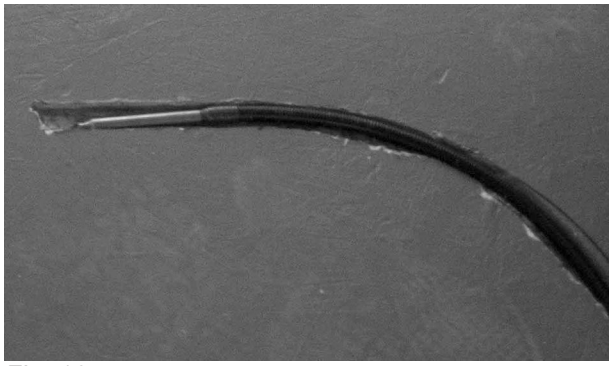

Fig. 16

1. Route the sensor lead in an installation conduit.

2. ***Note***
   *The sensor **must** be located between two heating conductors.*
   The sensor must not be located directly below a heating conductor.

   Lay the installation conduit in the screed (or other subfloor).

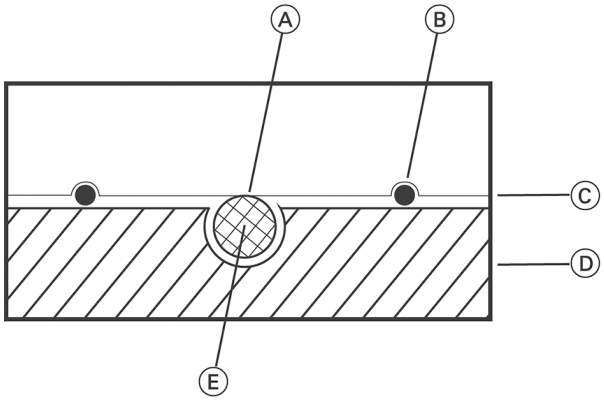

Fig. 17

3. Fit a protective aluminium or copper pipe at the end of the installation conduit. The sensor must be located in this protective pipe. The protective pipe must only be laid at a depth that ensures it is in contact with the heating mat along its entire length.

Ⓐ Full-surface contact
Ⓑ Heating conductor

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Positioning the sensor (cont.)

Ⓒ Heating mat
Ⓓ Floor
Ⓔ Protective pipe

4. Connect the protective sensor pipe.

Lay the heating mat

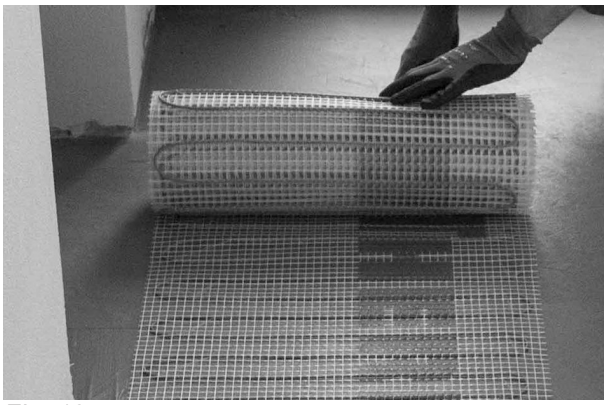

Fig. 18

Please note
Risk of overheating
- Never lay heating mats on top of each other.
- The distance between heating conductors must not be reduced! The minimum distance is 3 cm!
  Only lay the heating mat stretched out. Avoid the formation of creases.

Note
Minimum distances of 100 mm to walls must be maintained.

Note
Do not run heating cables over expansion joints.

Roll out and press down the heating mat starting at the junction box.

Note
*The sensor **must** be located between two heating conductors.*
The sensor must not be located directly below a heating conductor.

Adapting the heating mat

The heating mat can be tailored to the floor plan by cutting the glass fibre mesh to size.
See "Heating mat adaptation options"

Note
The heating conductor must not be trimmed.

Note
Do not bend the heating cable.
Smallest permissible bending radius: 15 mm

Please note
Damaged heating conductors can lead to accidents due to electric shock.
Do not damage or sever the heating conductor!

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Adapting the heating mat (cont.)

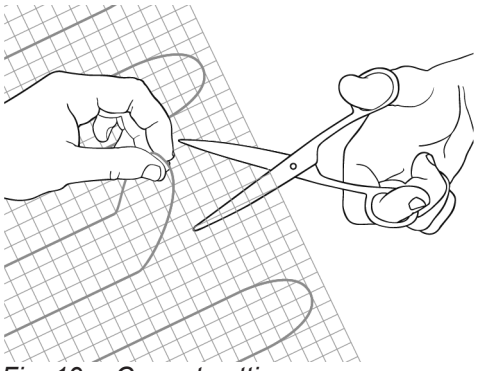

Fig. 19 Correct cutting

1. Cut through the glass fibre mesh with scissors or a knife.

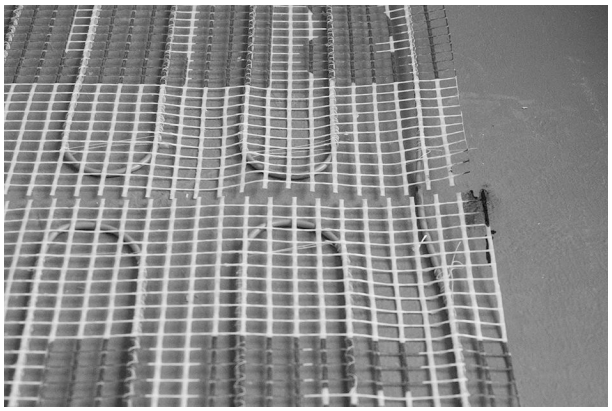

Fig. 20

2. Rotate the heating mat.

3. ***Note***
   Ensure that the inserted protective sensor pipe is located between the two heating conductors.

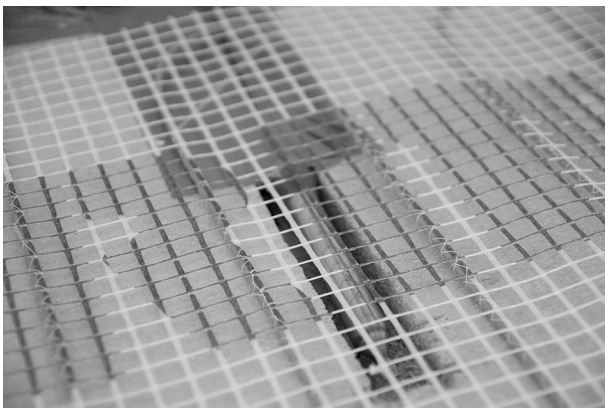

Fig. 21

Fix the heating mat to the floor to prevent it from slipping. See "Installation versions".

Routing the connecting cable

1. Route the connecting cable at the edge of the floor to the junction box.

   Note
   The connecting cable must not be routed under or over the heating mat.

2. Draw the connecting cable into the protective pipe.

Checking the heating mat

See "Test report".

Applying the protective layer and floor covering

See "Installation versions".

Applying the protective layer and floor covering (cont.)

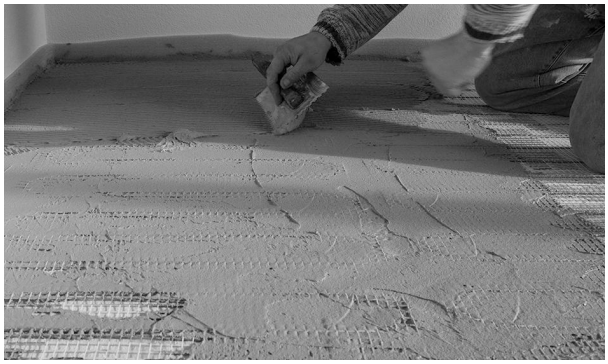

Fig. 22

Checking the heating mat

See "Test report".

Electrical connection

Danger
Incorrect wiring can lead to serious injury from electrical current and result in appliance damage.
The connection must only be made by a qualified contractor.

Danger
Damaged connecting cables can lead to electric shock and short circuits.
Check the connecting cable for damage before installation.

The appliance must be disconnected from the mains across all poles over an isolating distance of at least 3 mm.
The power supply must be protected by an RCD not exceeding 30 mA.

Danger
Incorrect core assignment can lead to serious injury from electrical current and result in appliance damage.
Never interchange cores "L" and "N".

Note
Requirement from VDE 0100 Part 520:
The connecting cable of the heating mat (cold end) must be routed in an installation conduit.

Note
The heating mats are intended for permanent connection in a flush mounted junction box.

Control

The heating mats must be controlled and limited by a thermostat with a remote sensor.
For additional safety, a capillary thermostat can be used as a maximum temperature limiter.
The maximum temperature of 28 °C must not be exceeded on the surface of the wooden floor.
We recommend installing the thermostat in a plaster box at a height of 150 cm.

Control via room thermostat

If the underfloor heating system is controlled via a room thermostat, a capillary thermostat or an electronic underfloor temperature limiter for manifold installation (separate supply cable for sensor) must be provided as a maximum temperature limiter. A 100/100 junction box or larger is required for the capillary thermostat.

Total power consumption

All heating mats are connected in parallel; take the total power consumption into account.

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Electrical connection (cont.)

If the total current exceeds the max. switching current of the thermostat, a contactor must be used. The thermostat then only switches the control current to the contactor.
An additional terminal box must be installed for this purpose.

Connection without contactor

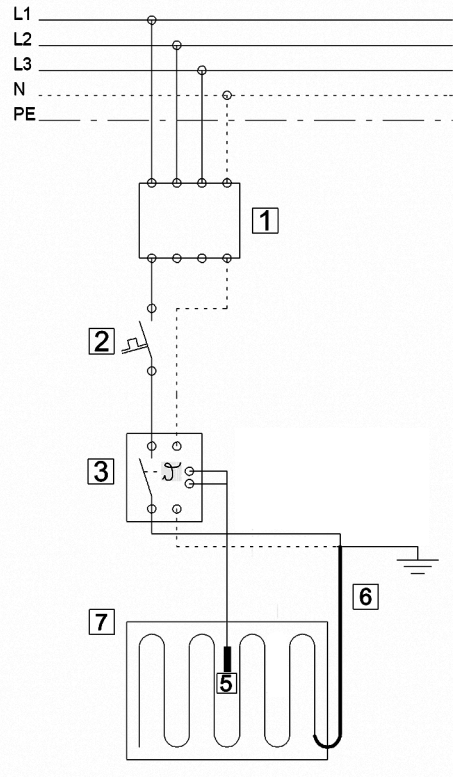

Fig. 23

1 RCD 30 mA
2 Circuit breaker
3 Thermostat, e.g. eTouch
4 Contactor
5 Sensor
6 Connecting cable
7 Heating mat

Connection with contactor

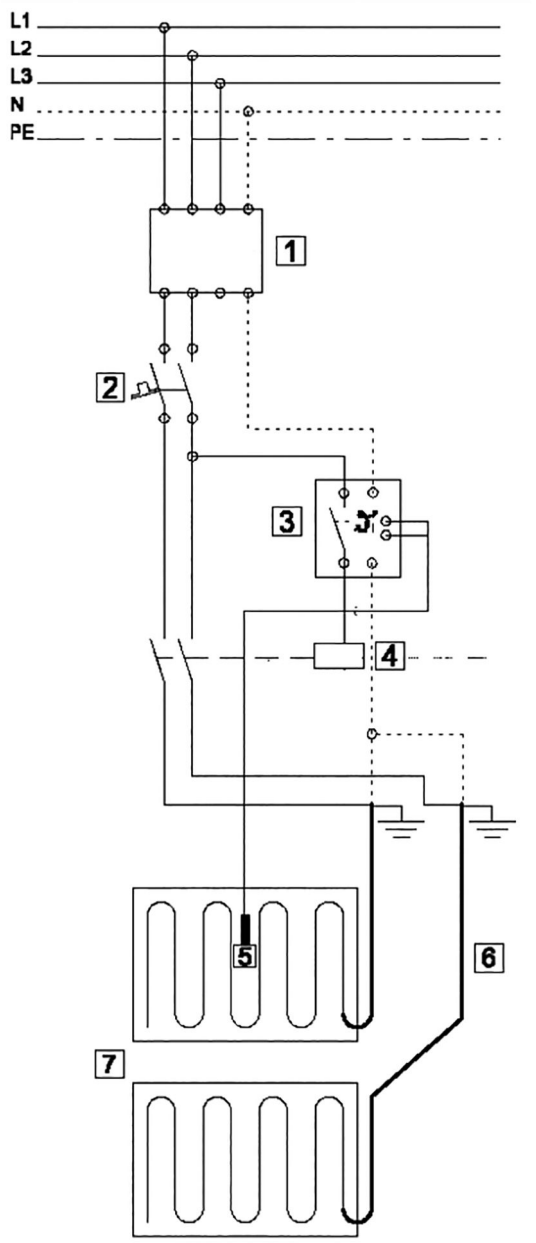

Fig. 24

Warning sign

The label "Caution underfloor heating" must be permanently affixed in the distribution cabinet.

Commissioning and instructing the user

After the tile adhesive or levelling compound has dried, but at the earliest after 24 hours (observe manufacturer's instructions), the heating system can be put into operation.
Commissioning and user instruction must be carried out by the contractor performing the installation. The user must be instructed as to how the appliance works.

The following documents must be handed over to the user and always kept in the distribution cabinet:
- Mat cards/rating plates
- Layout diagram
- Completed test report

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Specification

Output	W/m²	160
Nominal temperature	°C	90
Thickness of heating conductor	mm	2.7
System construction according to		VDE 0700
IP rating		IP X7

Energy consumption data

In conjunction with the Vitoplanar switch mounting thermostat, the product data corresponds to the EU regulations of the directive on the environmentally sound design of energy related products (ErP).

Final decommissioning and disposal

Viessmann products can be recycled. Components and substances from the system are not part of ordinary household waste.

For decommissioning the system, isolate the system from the power supply and allow components to cool down where appropriate.
All components must be disposed of correctly.

Declaration of Conformity

Using the serial number, the Declaration of Conformity can be found on the following website:

www.viessmann.co.uk/eu-conformity

Test report

After the heating mat has been laid and the flooring has been finished, the heating mat must be checked for continuity, resistance and isolation value, and compared with the resistance value on the rating plate. Enter the values in the test report:

Note
Isolation value test with min. 500 V, max. 1000 V test voltage

Resistance and isolation value test
Date
Created by

Heating mat	**Target resistance**	**After laying**			**After completing the flooring**		
		Resistance	**ISO value**	**Date**	**Resistance**	**ISO value**	**Date**

Permissible deviations:
- Resistance: -5 % to +10 %
- Minimum isolation value: 2 MOhm

This report must be kept carefully with the layout diagram and the mat cards. **Otherwise the warranty claims will be invalidated!**	**Specialist dealer's stamp**

5855579

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