

# Assembly instructions

## BR-IM, BH-IM, -BH – (heating line)

Read these instructions carefully before starting placement work!



The electrical connection must be performed by an approved specialist.

### Important assembly notes

- Placement must comply with the valid VDE provisions. In particular DIN VDE 0100 part 753 (erection specifications), 0100 part 701 (requirements to rooms with bathtub or shower), 0100 part 520 (cables and line facilities).
- Scope of delivery and accessories must be reviewed for compliance with plans.
- The underground must be firm and vibration-free.
- Heat insulation below the underground is mandatory for placement against soil or above unheated rooms.
- The screed must be suitable for floor heating.
- The heating line and line sleeves must be completely embedded in the screed.
- Do not bend the heating line.
- Heating lines must not touch or cross. Minimum distance 10 cm.
- Do not place heating lines across expansion and dummy joints.
- Do not shorten or directly connect heating lines.
- During installation, provide a residual current switch (FI  $\leq 30$  mA) as protection against accidental touch.
- Observe the relevant VDE- and TAB-provisions.
- The lowest placement temperature of the heating line is 5 °C, the highest permissible surface temperature is 80 °C.
- The heating line may be installed on nearly any clean, dry, absorbent, load-bearing and frost-free underground.
- The heating line must not be placed on or in easily or normally flammable materials according to DIN 4701.
- Freshly cast concrete ceilings must dry for at least 4 weeks in summer and may take twice this time in winter, depending on temperature and weather.
- Never install heating lines in walls below 2.3 m or in ceilings with a slant of less than 45° to the vertical.
- The areas on which the lines are placed must be examined for sharp edges and pointy objects that may damage the heating mats. If present, they must be removed with care.
- The heating line or connection socket must be installed so that the cold lead or PE-protective ground can be guided to the connection sockets without extension.
- Sleeves (cold-hot transfers) must not be bent.
- Install warning sign for installation of the heating line close to the electrical distribution, as well as a chart (placement plan) of the heating line.
- Heating line must be installed at least 30 mm away from conductive building parts (e.g. water lines).
- The heating line must not be installed crossed.
- Only firm assembly of the heating line on the floor is permitted.

- The heating line must be separated from other heat sources like illumination and chimneys.
- The smallest permissible bending radius is 5 times the outer diameter of the heating line.
- The heating line must only be stepped on as absolutely required for placement. Wear suitable shoes with rubber soles. Devices for introduction of the cover substance must be put down or moved on suitable underground.
- Cabinets with full-area placement and fitted cupboards must only be put up on unheated placement areas.
- Usually, an unheated border zone of 60 cm must be provided for along the placement walls.
- No penetrating attachment parts (dowelled screws for door stopper, etc.) must be installed in the areas where heating lines are installed.
- Heating lines must not cross any present or intended expansion joints.
- Additional covers on the floor, e.g. carpets or rugs, exceeding a thickness of 10 mm are not permissible since they may cause heat accumulation and thus damage the heating line.

### Further notes

- When placing the heating lines in baths and showers, such areas must be kept free that are intended for assembly of sanitary facilities like tubs, showers, stand-alone toilet, stand-alone bidet and installation furniture (observe VDE 100, part 701!).
- The heating line and controller are not intended for use by persons (including children) with limited physical, sensory or mental capabilities or lack of experience and/or lack of know-how, unless they are supervised by a person responsible for their safety or instructed by such person in how to operate the devices. Children should be supervised to ensure that they do not play with the devices.

### Screed floor

- Cement screed or floating screed on calcium sulphate basis (e.g. Anhydrite) with at least solidity class F4 (former ZE/AE 20).
- The screed manufacturer must confirm suitability as heating screed for the electrical floor heating.
- The medium temperature in the area of the heating line must not permanently exceed 65°C.
- For floating, heated screed, see requirements in DIN 18560, part 2.
- An edge insulation strip must be placed at all opening and adjacent components (walls, columns, pipelines, stairs ...). The edge insulation strip must ensure a freedom of movement of at least 5 mm when installed. It and the heat insulation cover foil must remain uncut until the upper floor covering is finished. Only then must they be cut off flush.
- The rated thickness of the screed plate is according to the build of the heating screed and loading capacity pursuant to DIN 18560-2.

### Connections

- Connection of the heating line and timers or switches must only be performed by a qualified specialist pursuant to VDE 0100 part 753 (erection provisions).
- The connection lines must be placed in a plastic conduit at a minimum wall thickness of 0.8 mm.
- If more than one heating line is placed, all connection lines must be inserted into the recessed socket through the conduit and connected via the included system connection. Cold leads und protective ground must neither touch nor cross the heating conductor.
- Heating lines, even of different sizes , can be easily switched via a joint system connection if they have the same output per sqm. The max. current of the controller must be considered.

### Constructional requirements

Sealing measures to seal the load-carrying underground against floor moisture or non-pressing water must be specified by the building planner. These measures must be executed according to DIN 18195 "Waterproofing of buildings". Interior plaster work must be completed.

The wall plaster must reach down to the load -bearing underground (concrete or wood beam ceiling).

The load-bearing underground must comply with the structure requirements for taking up the floor construction and the intended load capacity. The height and levelness of the surface of the load-bearing underground must correspond to the requirements of DIN 18202, table 2 and table 3, line 2, regarding angle tolerances and levelness tolerances.

To review the horizontal height of the subfloor, the specified installation thickness of the floor construction and same-height connections, a rule mark must be applied in each room. The height reference is used as indicated by the building planner or building management.

### Floor direct heating:

The heating lines are placed in or below the screed plate. The inner screed thickness is at least 45 mm. The cover over the heating line is at least 30 mm.

Pipelines, electrical lines and similar that are placed on load-bearing underground must be attached. Compensation is required to achieve a level surface to take up the insulation layer – but at least the impact sound insulation. The required construction height must be considered in the plans.

Balancing layers must be flush when installed. If the heated floor construction contains an effective slant, e.g. in showers or similar facilities, this slant must be created in the carrying underground to meet the requirement of even screed thickness.

Present building joints in the carrying underground must be even in their width, have a full edge, be straight-lined and flood-aligned. Joints must be placed in the insulating layer and screed above building joints.

The bearing underground must be visibly dry and free of contaminations and loose components.

Outer doors and windows must be installed, and any unglazed window openings must be covered with foil.

When the screed is applied, room temperatures and material temperatures must not be below + 5°C.

### Area of use

The heating line is used as direct heating in the screed.

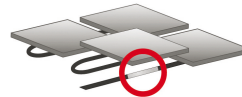
It is suitable as additional heating or full heating (observe heat demand!).

### Maximum floor covering thickness

|          |       |                               |
|----------|-------|-------------------------------|
| Tiles    | 30 mm | $\lambda = 1.00 \text{ W/mK}$ |
| Parquet  | 16 mm | $\lambda = 0.14 \text{ W/mK}$ |
| Carpet   | 10 mm | $\lambda = 0.09 \text{ W/mK}$ |
| Laminate | 8 mm  | $\lambda = 0.08 \text{ W/mK}$ |
| PVC      | 10 mm | $\lambda = 0.23 \text{ W/mK}$ |

In case of slanting materials, suitability must be verified with the manufacturer.

### NEW – sleeveless



Isolation sleeve continually chemicals and temperature-resistant

### Heating line construction BR-IM

The following information applies for item no.: 37710-....

BR-IM-heating line with unilateral connection for installation in screed.

### Placement of the heating line

Placement of the heating cables:

The distance between the heating lines may be determined as follows:

1:

Area to be heated (in m<sup>2</sup>) X 100 divided by the length of the heating line (m)

2:

Output per meter (W/m) X 100 divided by the surface output (m<sup>2</sup>)

### Placement notes

The BR-IM-heating lines are placed meander-shaped on the area to be heated.

Spacer strips (support strips) are used as an assembly aid item no. 20063.

### Heating line construction BH-IM, BH (heating mats)

The following information applies for item no.: 31801, 31802, 31804, 31806-.... und 31323, 31324-....

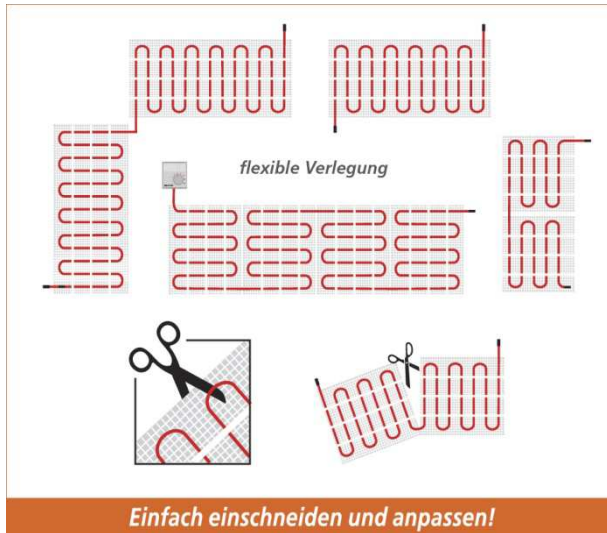
BH-IM-, BH-heating lines with unilateral connection for installation in screed.

### Placement notes

Place heating mats on the floor with the plastic grid up, according to the placement plan. The shape indicated in the plan is achieved by cutting the elastic grid at the indicated turning point.

### Flexible placement

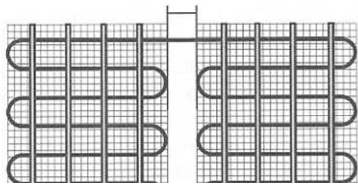
Cutting in of the heating mats permits various constructions situations.



Example placement of the heating mats

**Attention!** Do not damage the heating line. The heating mat is bent and placed in parallel to the first lane at the cut.

**Keep a minimum distance of 8 cm between the heating lines!**



### Further placement notes

**The following information applies for any item no.**

The terminal ends (cold leads) are guided to the connection socket at the side of the heating line.

When placing the heating lines in bathrooms and showers, the areas that are intended for installation of sanitary facilities like tubs, showers, stand-alone toilet, stand-alone bidet and fitted furniture must remain free (VDE 0100).

Drawing across area 0, area 1 und area 2 pursuant to VDE 0100-701.

### Insulation test

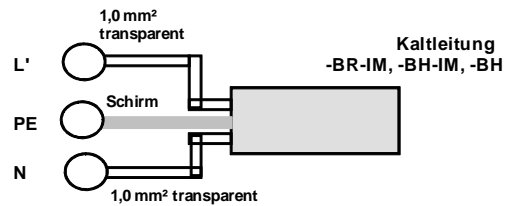
Insulation tests must be performed before placement, after placement of the heating mat and after placement of the floor covering; the resistance value of the heating mat must be measured and entered into the inspection record as well at these times.

### Upper floor covering

Ceramics tiles and natural stone are particularly suitable for floor heatings. However, textile, plastic and parquet coverings may be used as well. The upper floor covering generally needs to be attached with an adhesive suitable for floor heatings.

### Connection of the cold leads

The cold lead ends are connected in the wall connection socket according to the following chart.



**BR-IM, -BH-IM, -BH – (heating line)**



Attention!

Several heating lines are connected in parallel!

The maximum permissible current at the switching contact of the control device must be complied with!

L' Terminal for switched phase (230V~) via control facility (B1), e.g. temperature controller.

PE Connection terminal for cold lead shield for line protection and FI-monitor.

N Connection terminal for cold lead neutral conductor.

### Covering the heating lines

The heating lines are placed in or below the screed plate. The inner screed thickness is at least 45 mm. The cover over the heating line is at least 30 mm.

### Installation

Installation of the electrical heating facility must only be performed by a qualified electrician (EN60335-1). The heating facility requires an all-pole separating device for disconnection from the mains with at least 3 mm contact opening with per pole.

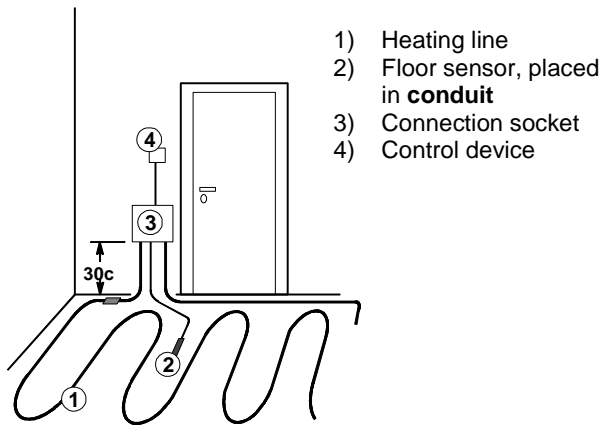
As protection against indirect contact, a residual current switch (FI  $\leq 30$  mA) must be provided.

The floor sensor of the temperature controller must be guided through a unilaterally closed conduit right into the heated floor. The floor sensor is placed centrally between the heating conductors.

The cold leads of the heating line must be guided to the wall socket in a conduit in the transfer area between floor and wall.

The cold lead ends of each heating line must be connected to the mains voltage 230V~ controlled via the control unit.

The protective mains conductor is connected to the protective ground. Also see section "connection of the cold leads".



**Documentation**

The following documents must be submitted to the operator:

- Assembly instructions with completed inspection minutes.
- Revision plan with location of the heating line, temperature sensor and placement areas, as well as connection points of the heating and cold leads.
- Description of the floor structure.

**Temperature control**

Exposed and recessed controllers are available to control the floor or room temperatures. In rooms with several heat sources (e.g. bathrooms), only floor temperature controllers must be used.

A timer can be connected upstream of the floor heating for time-dependent temperature-control. An alternative is a floor temperature controller with programmable reduction times and temperatures.

**Floor temperature**

The permissible floor temperature (sensor temperature) in the floor storage heating is max. 60°C, in the floor direct heating and floor temperature control, it is max. 45°C. The permissible floor temperature must be set at the controller.

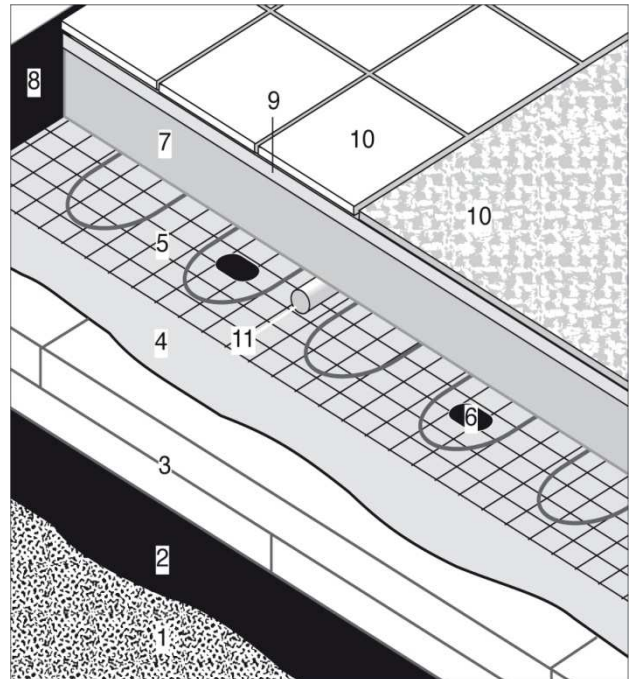
**Floor temperature controller:**

- Point scale controller HEM TP-uP (item no.: 93088)
- Timer thermostat HEM U-uP (item no.: 93089)

**Charge controllers and central control units are available for floor storage heatings.**

**Example floor structure**

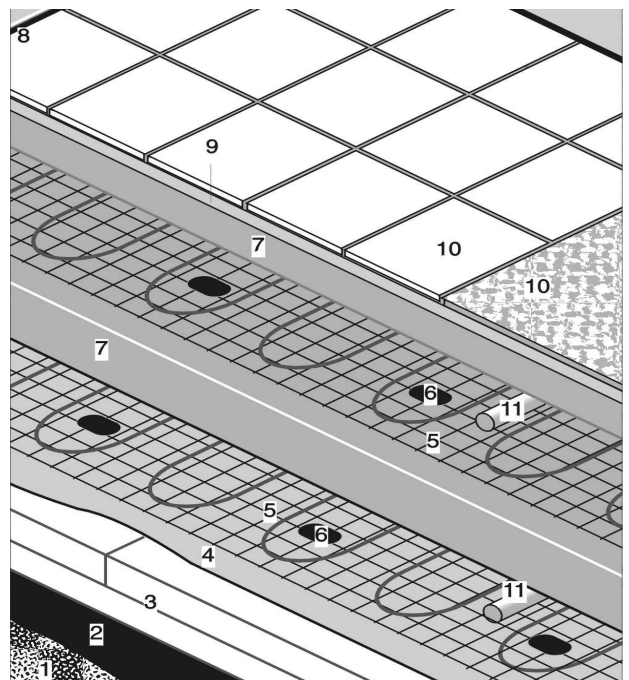
**Floor direct heating\* or floor storage heating\*\***



\*Depending on area-related input, screed thickness and upstream control. To warrant short heating times, the screed is to be kept as thin as possible or the heating mat placed as close as possible to the surface (approx. 2 cm coverage), under compliance with the minimum thickness and minimum coverage pursuant to DIN 18560.

\*\*The heating lines are placed in or below the screed plate above the insulation layer. The screed internal thickness is approx. 80 mm.

**Floor storage heating with edge zone heating**



Edge zone heating mats are placed before outer windows or outer doors approx. 20 mm below the screed surface at a room depth of up to 1 m. The area-related intake must not exceed 250 W/m².



1. Raw concrete
2. Moisture barrier/steam barrier (e.g. foil)
3. Heat and impact sound insulation (two-layer if applicable)
4. Cover (e.g. PE-foil)
5. Heating line
6. Plastic nails for attachment
7. Load distribution layer (screed)
8. Edge insulation strip
9. Adhesive for flooring
10. Flooring
11. Conduit for temperature floor sensor

**Insulation sleeve, continually chemicals and temperature-resistant**

**Note on the sleeve-less cold-hot transfer of the connection line to the heating line:**

The connection line (cold lead) is placed to the connection socket or thermostat. Shortening of the connection line up to 1.00 m before the sleeve to the cold-hot transfer is permissible. To extend the connection line, use assembly sleeves (installed in the factory – length on request).

**Water-tight sleeve transfer**

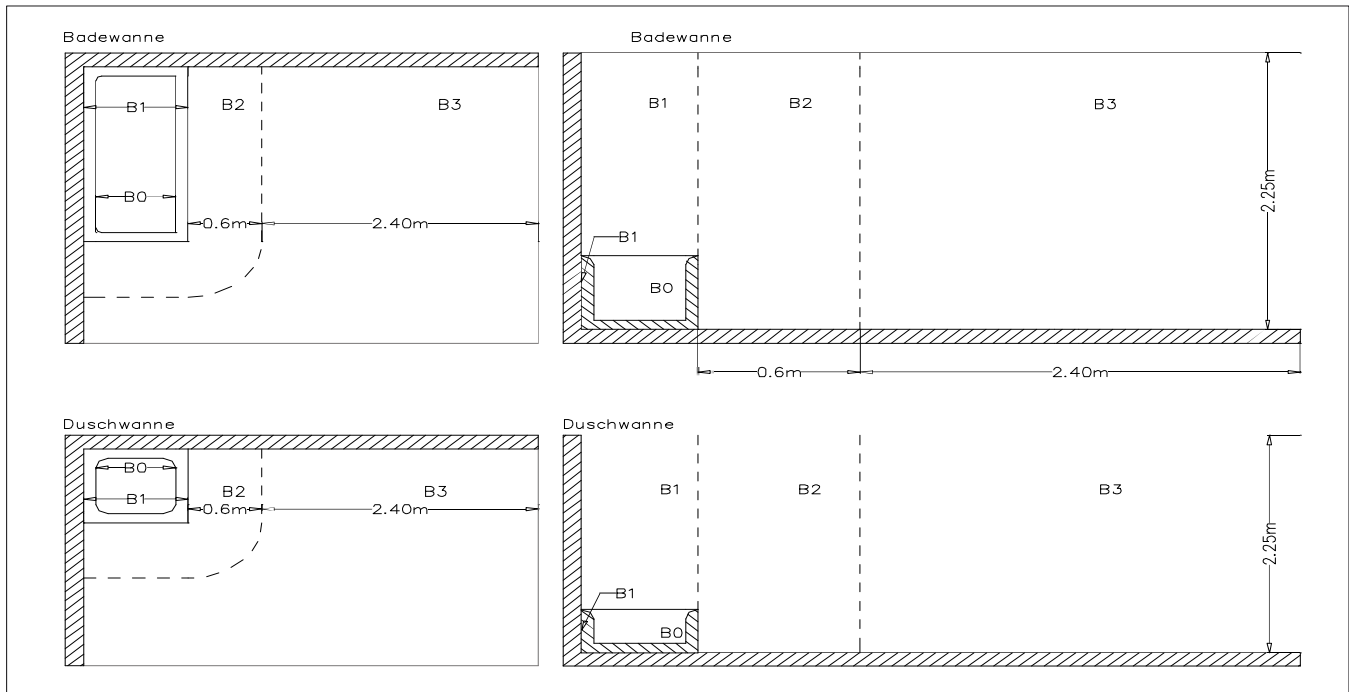


Figure: protective zones in the area around bath tub and shower tray

|   |  |   |
|---|--|---|
| Hemstedt GmbH<br>Schleicherweg 19<br>74336 Brackenheim  | <b>Abnahmeprotokoll</b><br><b>Протокол приёмки</b><br><b>Test Report</b>   | Formular: FO-10-45<br>Формуляр: FO-10-45<br>Form: FO-10-45  |
| Telefon: ++ 49(0) 71 35/98 98 -0<br>Telefax: ++ 49(0) 71 35/21 97<br>eMail: office@hemstedt.de<br>Internet: www.hemstedt.de | <b>Beton-Freiflächenheizmatten/Ringe</b><br><b>Нагревательный мат/кабель</b><br><b>для обогрева открытых площадок</b><br><b>Heating Mats and cables</b><br><b>for outdoor and concrete areas</b> | Erstellt/Составлен/Provides:15.05.13/LV<br>Revision/ревизия/Revision: 07.05.03/AS<br>Seite/страница/Page: 1 - 2 |

**Kontrollmessungen** werksseitig: nach DIN VDE 0700 Teil 1/10.95 und 500/02.97/ Prüfung nach Prüfanweisung FO-10-28

**Контрольные измерения производителя:** по DIN VDE (Пром. стандарт ФРГ, Общ-во нем. электротехников) 0700 ,часть 1/10.95 и 500/02.97 / (Контроль по инструкции: FO-10-28)

**Test measurements** factory-installed: according to DIN VDE 0700 part of 1/10.95 and 500/02.97

Testing instruction FO-10-28

|           |
|-----------|
| TYP       |
| IST WERTE |

**Nicht unter 5°C verlegen**  
**Montage- und Verlegeanleitung beachten**  
**Vor Beschädigung schützen**  
**Aufheizen mit 5°C / Tag**  
**Die Heizmatten dürfen nur in Verbindung mit einem Fehlerstromschalter**  
**mit 30 mA Fehlerstrom betrieben werden**

**Не укладывать при температуре ниже +5° С.**  
**Соблюдать указания по монтажу и укладке.**  
**Защищать от повреждений.**  
**Ежедневное повышение температуры нагрева на 5°С согласовывать с укладчиком стяжки.**

**Do not lay less than 5°C**  
**Please note assembly instructions**  
**Protect against damage**  
**Heating up with 5°C/day**  
**The heating mats need to be operated only combined with a fault current switch with 30 mA fault current**

Kontrollmessung durch den Installateur:

|                       |                 |                           |
|-----------------------|-----------------|---------------------------|
|                       | vor dem Einbau: | nach dem Einbau:          |
| Gesamtwiderstand:     | _____ Ω         | _____ Ω                   |
| Isolationswiderstand: | _____ Ω         | _____ Ω                   |
| _____                 | _____           | _____                     |
| Datum                 | Unterschrift    | Firmenstempel (Errichter) |

**Контрольные измерения монтажника:**

|                             |               |                           |
|-----------------------------|---------------|---------------------------|
|                             | до установки: | после установки:          |
| общее сопротивление:        | _____ Ω       | _____ Ω                   |
| изоляционное сопротивление: | _____ Ω       | _____ Ω                   |
| _____                       | _____         | _____                     |
| дата                        | роспись       | печать фирмы установителя |

**Test measurement by the installer:**

|                        |                          |                         |
|------------------------|--------------------------|-------------------------|
|                        | Before the installation: | after the installation: |
| Total resistance:      | _____ Ω                  | _____ Ω                 |
| insulation resistance: | _____ Ω                  | _____ Ω                 |
| _____                  | _____                    | _____                   |
| Date                   | Signature                | Company                 |

**Dieser Anhang gilt nur nach durchgeführten Kontrollmessungen als Garantiekarte-**

*Anmerkung: Wenn die Dünnbettheizmatte eine der Prüfungen nicht besteht, wird sie nach der Reparatur oder Nachbesserung noch einmal allen Prüfungen unterzogen.*

**Это приложение после проведённых контрольных измерений является гарантийной картой.**

*Примечание: если отопительный мат не прошёл заводской контроль, то после доработки он должен подвергнуться всем видам контроля.*

**This attachment only will be accepted as warranty policy after performing the test measurement**

*Please Note: If the thin bed heating mat does not exist one of the examinations, it becomes after again all examinations submitted of the repair or rework.*

**CAUTION ONLY ORIGINAL TEST REPORT FILLING OUT!**

\*By entering of the date, proper function of the installed heating line incl. temperature control is confirmed.

**Warranty claims apply only if the inspection and heating minutes and temperature control are completed in full**

**Important danger note!**

To acquire warranty claims, the inspection and heating minutes included with the project planning documents or the inspection and heating minutes in the assembly instructions must be returned to the address below or by fax to:..... within **3 weeks** of installation of the heating. Warranty services shall lapse if the end user or a third party did not observe our assembly and operating instructions. The warranty shall cover only the period indicated in the warranty statement. The original purchase receipt shall be submitted including purchase and/or delivery date.

**Disposal notice**

The product must not be disposed of in the general household waste.



Company stamp:

Technical changes reserved. No liability for print errors



