

DURABASE CI-H/DEVI

INSTALLATION INSTRUCTIONS

DURAL

Laying the DURABASE CI-H decoupling mat for electric underfloor heating systems and installing the DEVI heating cable incl. thermostat.



DURAL.COM

1. COMFORT UNDERFLOOR HEATING

1.1. ABOUT THE SYSTEM

Optimum comfort

All heat rises upwards! This simple fact explains why underfloor heating provides more comfortable warmth than the alternative radiator system. The radiator system provides convective air movement up to head height and the ceiling, then travelling downwards and returning as a cold draught around the feet.

Thanks to heat distribution from the floor and precise temperature control with a DEVIreg™ thermostat, the average room temperature can be reduced by 1-2 °C compared to conventional radiator heating without affecting thermal comfort. This can reduce the energy losses of a home by 10-20 %.

Our comfort underfloor heating, a combination of DURAL DURABASE CI-H decoupling mat and DEVIcomfort™ heating cable, provides heated floor surfaces in all rooms, especially bathrooms and kitchens.



1.2. AREA OF APPLICATION

Suitable for floor surfaces that are only exposed to occasional and short-term splashing water (e.g. bathroom with bath or shower tray with normal household use without floor drain) The electric underfloor heating used must be suitable for suitability and embedding in the tile adhesive.

The connection and protection devices for the heating elements and electrical circuits must be designed in accordance with the provisions of VDE 0100.

The heating cable is laid in accordance with the information and markings on a layout plan.

Plan a distance of:

- at least 0.10 m to interior walls, partition walls, kitchen and bathroom elements, etc.
- at least 0.20 m to staircase eyes- at least 0.40 m to stoves, exterior walls
- at least 0.10 m to structural joints

2.2. PRODUCT OVERVIEW

2.1. CABLE

DEVI electric underfloor heating consists of two main components:

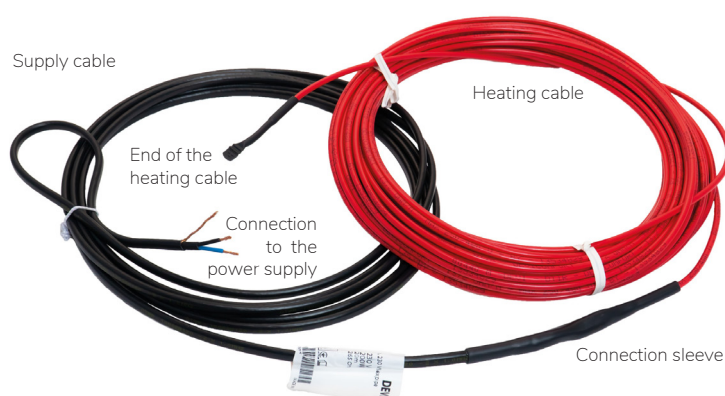
- Heating element (cable)
- Thermostat* with air and/or floor temperature sensors.

* Redundant installation of the additional sensor (art. no. 195000004) is recommended

Heating cables are usually laid in thick/concreted floor constructions. The main feature of the thin heating or decoupling mat is its low thickness. This means that it can be laid in a thin layer of tile adhesive without significantly increasing the floor structure.

The DEVIcomfort™ cable is available with 10 [W/m] for 230 V. The internal and external structure of the heating cable is shown in the illustrations below.

Heating cable



Thermostat with floor temperature sensor



2.2. THE MAT

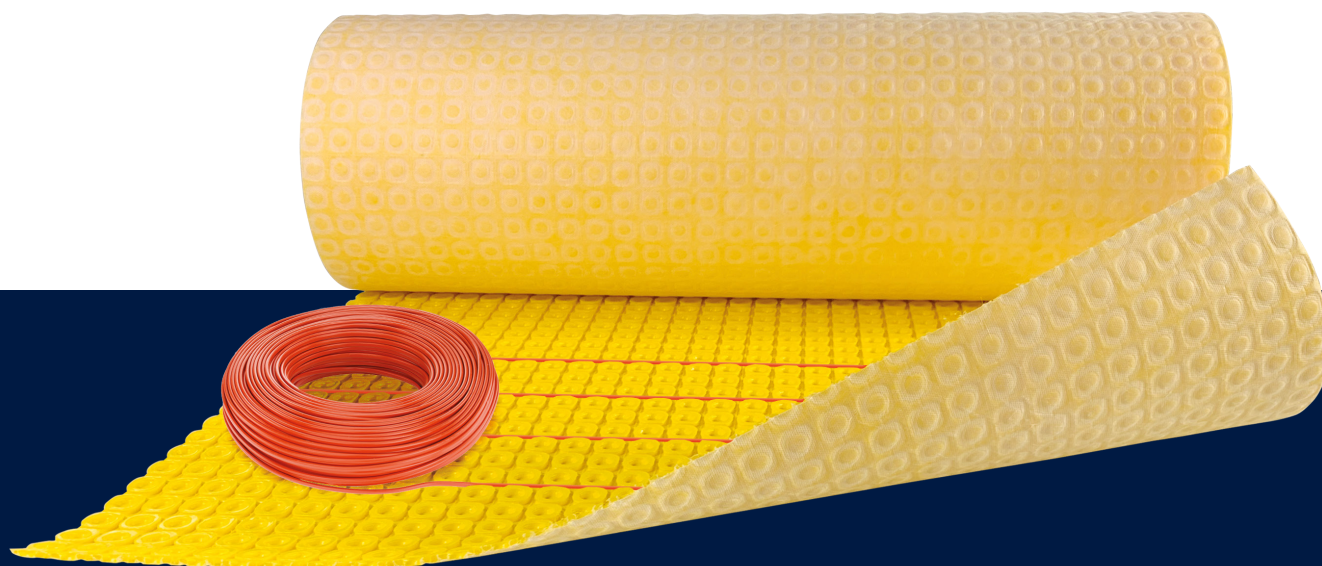
The DURAL DURABASE CI-H decoupling mat is designed for installation with tile adhesive using the thin-bed method.

As the thickness of the DURABASE CI-H decoupling mat is only 5.5 mm, the rise in floor level is minimised.

The DURABASE CI-H decoupling mat is made of recyclable polyethylene.

The DURABASE CI-H decoupling mat is suitable for all commercially available electrical heating cables with a thickness of 2 to 4.5 mm.

4 mm diameter DEVI cable systems are particularly quick and easy to install and are held securely between the DURABASE CI-H studs.



2.3. THERMOSTATE

DURAL offers special DEVI thermostats for electric underfloor heating systems. All thermostats are electronic devices with precise control of the floor surface or air temperature. Three types of thermostats are available:

- for air/room temperature control and limitation of floor temperatures: with room sensor and floor sensor
- for floor temperature control: only with floor sensor

- for air/room temperature control: only with room sensor

The CI-H / DEVI comfort heater may only be operated with a thermostat.



DEVIreg™ Basic is an intuitively programmable timer thermostat for floor temperature control that is used to control electric underfloor heating elements. The thermostat is intended for fixed installation only. The specially developed two-part design makes it suitable for a wide range of frames measuring 55 mm x 55 mm. The thermostat has a rotary control for manual temperature setting, a function release and intuitive controls.

DEVIreg™ Basic can be set up quickly and intuitively with the in-app wizard. It has an energy-saving programme - including optimum start control (preheating), which ensures the desired temperature at the right time and thus significantly reduces heating costs.

DEVIreg™ Basic only works with **floor temperature sensor**.



DEVIreg™ Room is an intuitively programmable timer thermostat used for floor temperature control of electric underfloor heating elements. The thermostat is intended for fixed installation only. The specially developed two-part design makes it suitable for a wide range of frames measuring 55 mm x 55 mm. The thermostat has a rotary control for manual temperature setting, a function release and intuitive controls.

DEVIreg™ Room can be set up quickly and intuitively with the in-app assistant. It has an energy-saving programme - including optimum start control (preheating), which ensures the desired temperature at the right time and thus significantly reduces heating costs.

DEVIreg™ Room works with **floor temperature sensor** or **room sensor**.



DEVIreg™ Touch is an intuitively programmable thermostat with timer function for controlling electric underfloor heating systems. Thanks to its special 2-part design, the thermostat is compatible with many common switch programmes.

DEVIreg™ Touch can be set up quickly and intuitively using the app wizard. It has an energy-saving programme including a prediction function to determine

the optimum switch-on/switch-off times.

DEVIreg™ Room works with **floor temperature sensor** or **room sensor**.

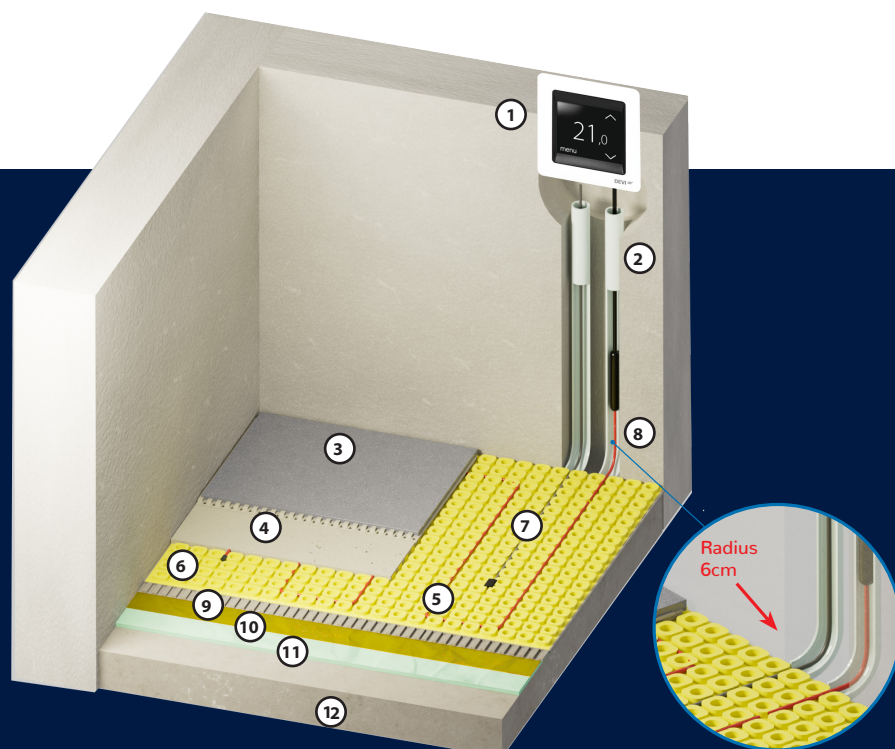
DEVIreg™ Touch can also be used to control other heating systems.

The thermostat is available in the colours pure white and black.

3. INSTALLATION GUIDELINES

- It is recommended not to install the DEVI heating cable at temperatures below 5 °C.
- Always wear shoes with soft soles if you have to walk on the elements during installation.
- Take care not to damage the heating cables with sharp tools, shovels, buckets, etc.
- The minimum distance between heating cables, power cables and lines and other heat sources such as hot water pipes and chimneys must be at least 2 studs.
- The heating elements must not touch or cross each other.
- The bending diameter of the cables must be at least 24 mm. The studs of the CI-H decoupling mat are specially designed for this.
- The subfloor must be level, secure and stable to prevent slipping and shifting after installation.
- Before laying, carefully clean the subfloor to remove foreign bodies, dirt and residues that could prevent adhesion.
- Do not lay the heating cable under walls or solid obstacles.
- The surface temperature of the finished top floor covering must not exceed 35°C.
- To ensure the heating of a room and prevent heat loss downwards, the existing floor must have insulation that complies with the applicable standard. A thermal analysis of the project must be carried out in advance.
- The thermal resistance (insulation value R) of the floor coverings must not exceed 0.18 m²K/W (1.8 Tog).
- Do not place any objects with poor thermal conductivity.
- Lay the heating cables away from insulating material and heat sources.
- The heating cable must be fully embedded in the tile adhesive.
- **The heating cable must not be laid under or through a separating or expansion joint.**
- The heating cable must always be in good contact with the DURABASE CI-H mat.
- The heating cables must never be cut (red cable). Only the black cable may be shortened.
- The heating cable and especially the connection must be protected from mechanical stress and strain.

- 1 - Thermostat
- 2 - Empty conduits
- 3 - Tiles
- 4 - Tile adhesive
- 5 - Heating cable
- 6 - DURABASE CI-H decoupling mat
- 7 - Floor temperature sensor*
- 8 - Floor / wall transition
- 9 - Adhesive
- 10 - Primer
- 11 - Insulation
- 12 - Concrete base



* We recommend the blind installation of an additional sensor (art. no. 195000004)

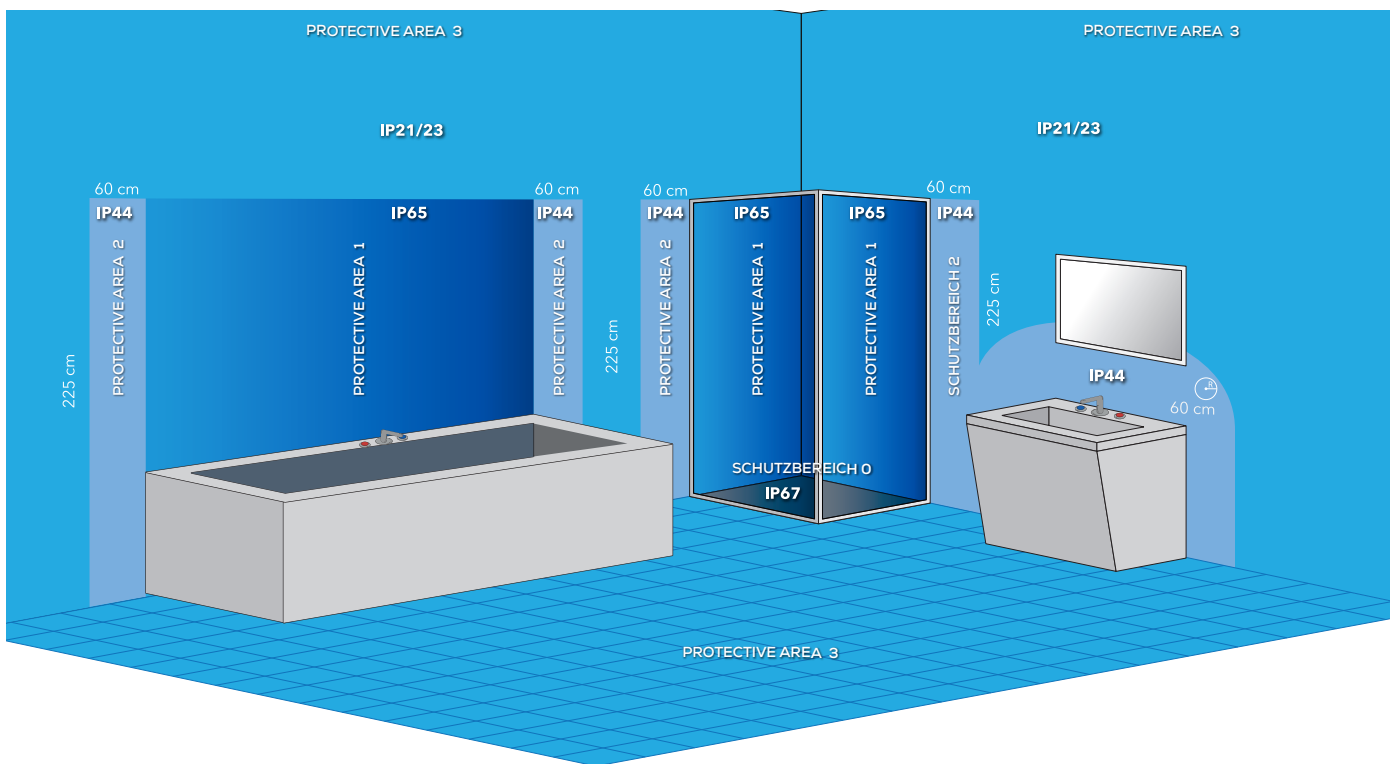
3.1. IMPORTANT NOTES:

Control circuit thermostat, regulation and electrical protection

Thermostats should be installed on an interior wall that is protected from external influences (heat sources, direct sunlight, draughts, electrical appliances, etc.). With additional underfloor heating, the temperature is measured exclusively by the floor temperature sensor.

With pure underfloor heating, on the other hand, the thermostat measures the room and floor temperature. In order to avoid incorrect measurement of the room temperature due to draughts inside the appliance boxes, we recommend using airtight switch boxes.

In bathrooms, it is best to use the sensor on the floor for control so that it is not influenced by a towel dryer.



- 1 - Preferably install the thermostat in a deep switch box with a diameter of 67 mm, at a suitable height (typically 80 - 170 cm).
- 2 - Install the thermostat at a distance of more than 50 cm from external windows and doors.
- 3 - The thermostat must not be installed in bathrooms in protection zones 0, 1 and 2. Always observe the local regulations regarding IP protection classes, this does not mean that the thermostats cannot be installed in bathrooms.
- 4 - Do not install the floor sensor in places where sunlight or other heat sources are present, e.g. heating or hot water pipes.

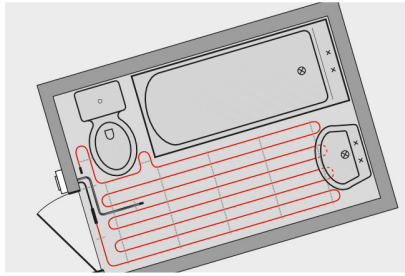


An electrician must carry out the connection in accordance with the manufacturer's installation instructions. The recognised rules of technology must be observed.

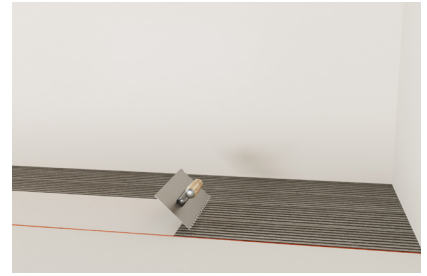
4. INSTALLATION STEPS



4.1. The set:
Heating cable, thermostat with floor temperature sensor, mounting tape, conduit pipe, DURABASE CI-H decoupling mat.



4.2. Draw a plan to position the heated area, the cable, the floor temperature sensor, the thermostat and the switch box.



4.3. Apply the tile adhesive to the surface. TIP: Only apply as much CI-H decoupling mat as you can lay in 30 minutes.

Laying DURABASE CI-H

New substrates: Cement-based substrates, calcium sulphate-based screed, dry screed and wooden substrates.

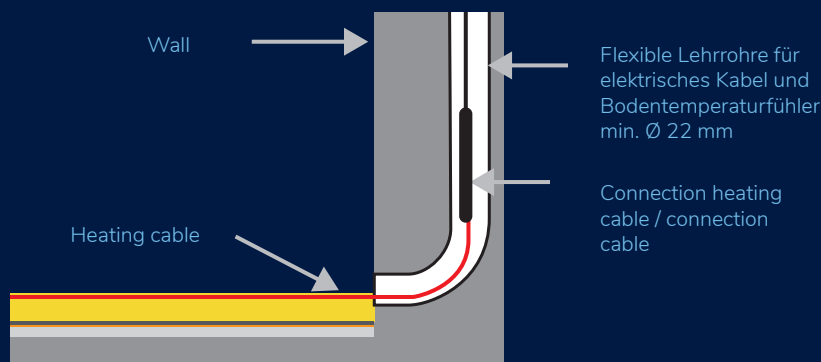
Old substrates: Exposed cement-based substrate, old concrete substrate or painted cement screed, old wooden substrate, old tiles.

The substrate must be dry, free of non-adhesive components, stable and level. Any levelling measures must be carried out before laying DURABASE CI-H. Depending on the covering construction and site conditions, edge joints with a width of approx. 5 - 10 mm (larger if required) must be created.

Prime the prepared substrate with a suitable primer in accordance with the manufacturer's instructions and apply thin-bed mortar to the substrate using a 6 x 6 mm notched trowel. Important: Do not use a larger notched trowel, otherwise the decoupling effect of the CI-H mat will be impaired. The choice of adhesive depends on the type of substrate. The adhesive must adhere to the substrate and bond mechanically to the backing fleece of the DURABASE CI-H mat.

For most substrates, a hydraulically setting flexible mortar or fast-setting flexible adhesive in accordance with DIN EN 12004 / C2 can be used, and the cut-to-size sheets must be embedded in the adhesive over the entire surface of the backing fleece. Loose laying of the CI-H mat is not possible. The sheet is worked in using a pressure roller or other suitable tool. The open time of the flexible mortar must be observed according to the manufacturer's instructions.

Please do not use any metal materials for pressing down in order to avoid damaging the sheets. After installation, the sheets must be protected from damage.

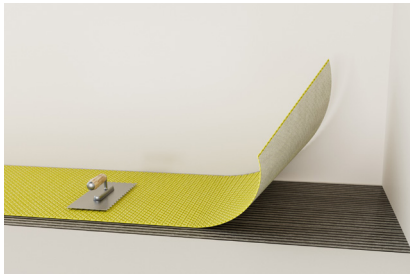


To prevent the heating cable connection from resting too thickly on the mat, it should be laid in the empty conduit that runs up the wall to the thermostat.

Part of the heating cable must also be pulled up in the empty conduit (maximum 10 cm).



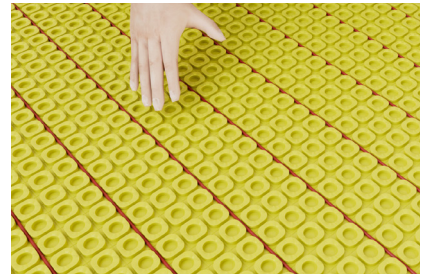
Note : The connection cable of the heating cable and the cable of the floor temperature sensor must be laid in separate conduits.



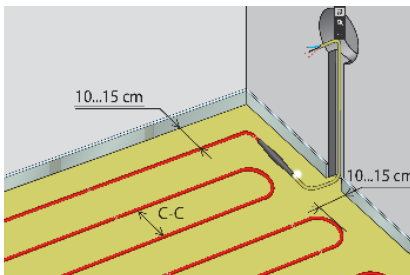
4.4. Align the DURABASE CI-H and lay without creases (butt joint installation). Attention: Field boundary and expansion joints must be adopted.



4.5. After full-surface installation of all DURABASE CI-H decoupling mats, the adhesive manufacturer's drying times must be observed before further processing.



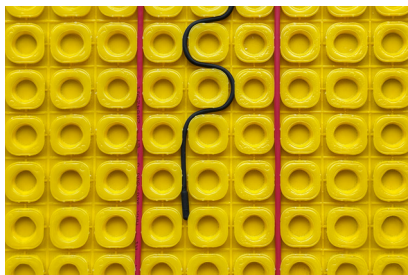
4.6. Observe the installation guidelines when laying and connecting the heating cable.



4.7. Check the resistance and insulation values of the cable. Lay the heating cable: approx. 10-15 cm away from the walls.

Preferred for comfort heating
C-C = 3 studs*

* For possible stud spacing, see page 9



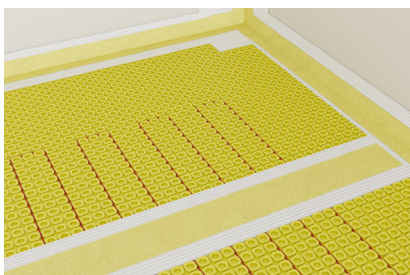
4.8 If possible, install the **floor temperature sensor** in the door swing area of the inside room door and more than 50 cm from outside window and outside door openings and 50 to 100 cm from the wall.

A separately available replacement sensor can be added for redundancy.

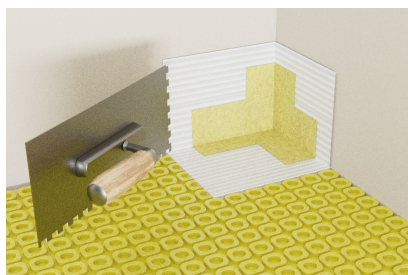
Check the resistance of the sensor before installing it in the pipework.



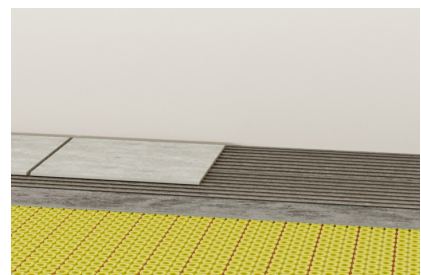
Note : The supply line of the heating cable and the line of the floor temperature sensor must be laid in separate conduits.



4.10. The area between 2 sheets is treated with DURABASE WP 150/30 sealing tape. The adhesive mortar is applied to the two adjoining sheets of Durabase CI-H using a 4 x 4 mm notched trowel, then the DURABASE WP 150-30 sealing tape is pressed firmly over the two sheets.



4.11. The area between the wall and floor is treated with Durabase WP 150/30. The adhesive mortar is applied with a 6 x 6 mm notched trowel in the connection area between the DURABASE CI-H and the wall, then the DURABASE WP 150-30 sealing tape is pressed firmly over the two surfaces and the DURABASE corners WPFX (outside) and WPFXI (inside) are laid in the same way.






4.12. The following products can be laid on the DURABASE CI-H:

- Ceramic tiles
- natural stone



An electrician must measure the electrical resistance and insulation resistance again and enter the results in the warranty certificate. The measured resistance value must correspond to the factory value (-5% / +10%) (the value is specified on the label on the heating cable).

4. COMFORTWARMTH

		
Dry rooms, thermally insulated floors	Floors without thermal insulation	Wet rooms
$\geq 100 \text{ W/m}^2$	130-160 W/m^2	150-180 W/m^2

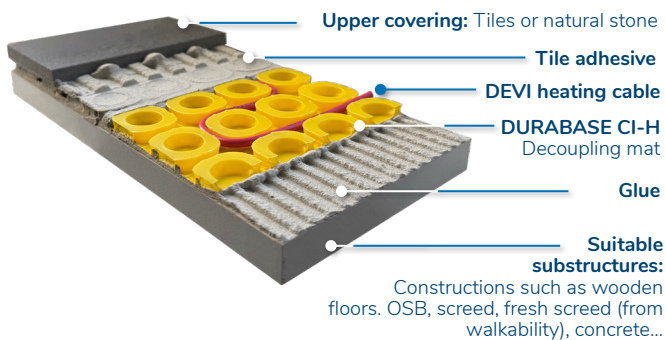
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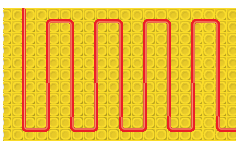
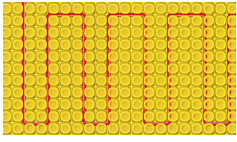
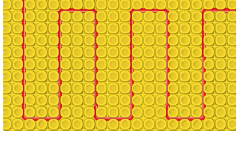
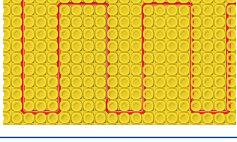
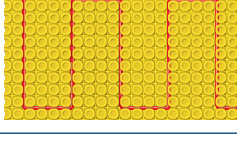


The desired power output can be achieved by adjusting the cable routing within the DURABASE CI-H mat. A smaller number of stud spacings when laying the cable in the mat increases the output power. Below you will find recommendations for five different cable laying distances and their effects on the power output.

- With a distance of 2 nubs – **167 W/m^2**
- With continuous change between 2-3 nubs – **133 W/m^2**
- With a distance of 3 nubs – **111 W/m^2 = Standard distance**
- With continuous change between 3-4 nubs – **95 W/m^2**
- At a distance of 4 nubs – **83 W/m^2**

SYSTEM CONSTRUCTION DURABASE CI-H WITH HEATING CABLE



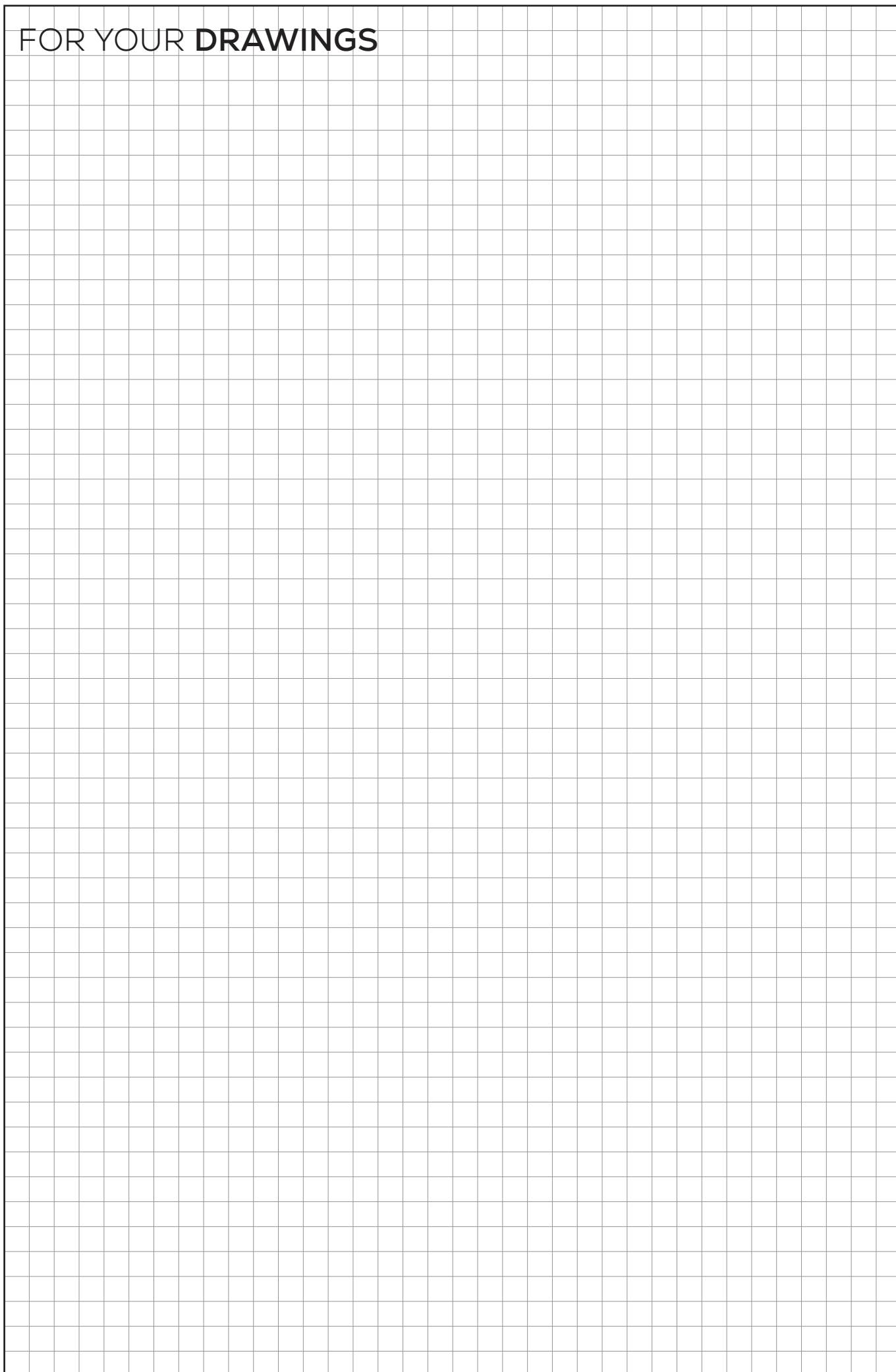
Nubs	Performance	
2	167 W/m^2	
2-3	133 W/m^2	
3	111 W/m^2	
3-4	95 W/m^2	
4	83 W/m^2	

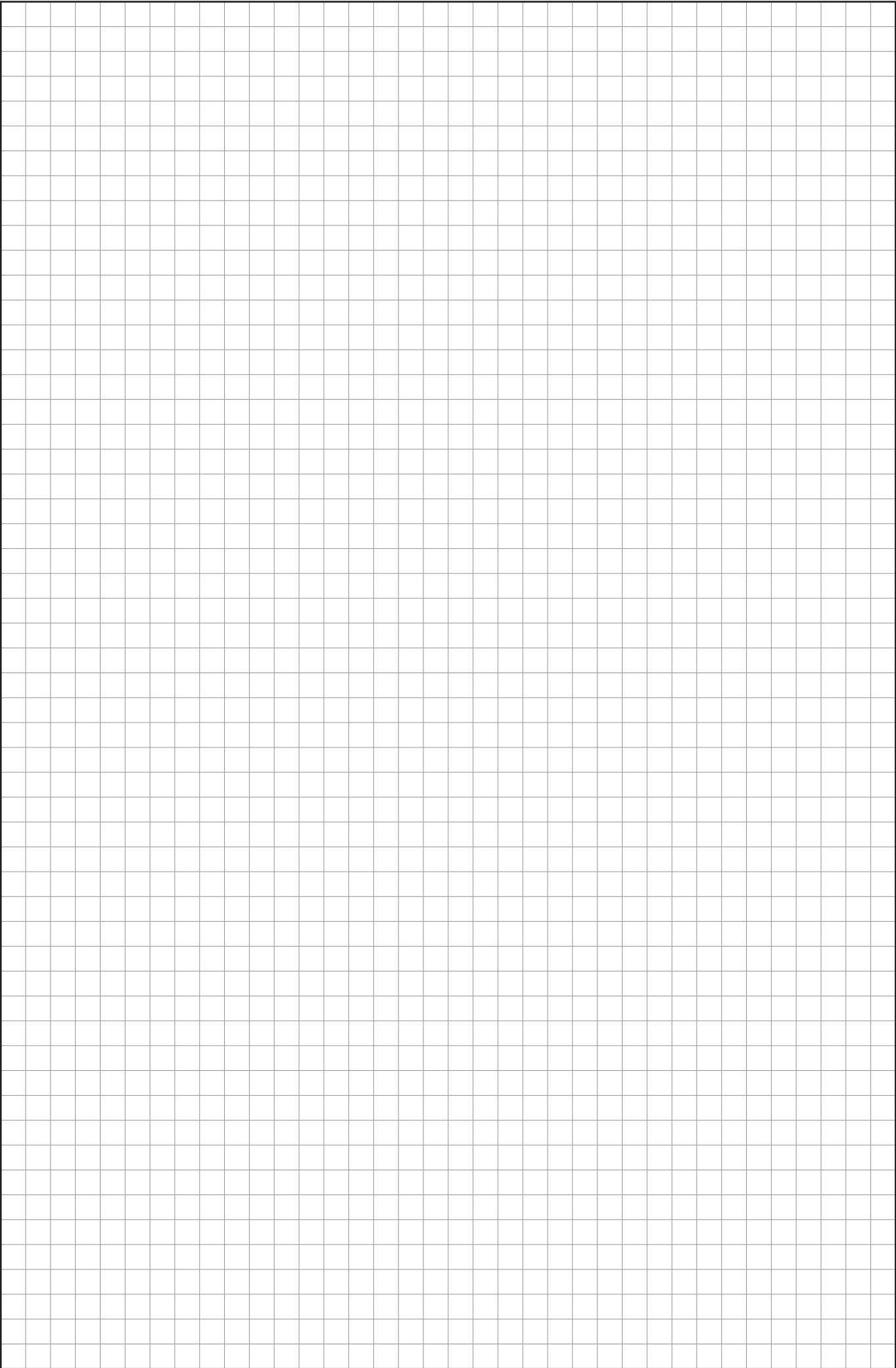


Note! Always install the thermostat and floor temperature sensor together with the heating cables. Use the thermostat to limit the power output of the cable.

Tip! Even if a sensor defect is rare, we recommend blind installation of the optional additional sensor in the CI-H decoupling mat and in the empty conduit.

FOR YOUR **DRAWINGS**







PROFILES, SYSTEMS, SOLUTIONS

DURAL

DURAL GmbH | Südring 11 | 56412 Ruppach-Goldhausen | Germany | +49 2602/9261-0 | info@dural.de
DURAL UK LTD | Unit 6a | Wakefield Business Centre Denby Dale Rd | Wakefield | WF2 7AZ
+ 44 (0)1924 360110 | ukinfo@dural.com

dural.com

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