

HOW IT'S DONE: LAYING UNDERFLOOR HEATING WITH KNOBBED MATS BY YOURSELF



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1 INSTALLATION OF FLEXIRO UNDERFLOOR HEATING – INTRODUCTION

The FLEXIRO thin-bed underfloor heating with knobbed mats is an installation kit designed for simple retrofitting of existing heating systems in individual rooms, such as bathrooms and kitchens. All required components are included in one kit. The use of a flexible 10 mm plastic pipe allows for a lower construction profile in comparison to conventional underfloor heating and an equal distribution of heat. Thanks to the use of plug-in connectors and temperature control boxes, FLEXIRO thin-bed underfloor heating for individual room temperature control is so easy to install that it is equally suitable for do-it-yourselfers and professional builders. The following images (beginning on page 4) illustrate the installation steps taken during a test setup of approx. 1.5 m².

Despite the simplified construction, as the manufacturer we would like to point out that we can only guarantee top quality delivered from the factory but bear no responsibility for installations and connections made by third parties. Furthermore, please observe current valid standards and regulations for heating systems.

2 SCOPE OF DELIVERY FLEXIRO UNDERFLOOR HEATING KIT WITH KNOBBED MATS

Kit size	Pipe (Ø 10 mm)	knobbed mat	Flow manifold (outlets)	Return manifold (outlets)	Blind plugs
2.5 m ²	30 m	2.5 m ²	1 (1)	1 (1)	0
5.0 m ²	60 m	5.0 m ²	1 (2)	1 (2)	2
7.5 m ²	90 m	7.5 m ²	1 (4)	1 (4)	4
10.0 m ²	120 m	10.0 m ²	1 (4)	1 (4)	4
Regulating boxes (depending on the selection)					
<ul style="list-style-type: none"> ○ Kompabox RTL – single room temperature control with flow cut-off ○ Multibox 4K-RTL – single room temperature control and maximum limitation of return temperature, smarthome integration possible 					

Kits and further accessories for underfloor heating can be obtained at the FLEXIRO shop: flexiro.de/en/underfloor-heating.

3 IMPORTANT NOTE BEFORE BEGINNING THE INSTALLATION

- At the beginning of the work, an insulating strip – at least 20 mm wide – is to be laid around the area that will have floor heating. Columns and similar structures are also to be edged with insulating strips to allow the entire floor structure to expand. Later, an elastic joint compound will be applied to the insulating strip.
- Determine the placement of the heating circuits. Select a location for the temperature control box that allows for it to be connected to all heating circuits without extending the length of the pipes. NOTE: Kit 2.5 m² corresponds to one heating circuit, Kit 5.0 m² corresponds to 2 heating circuits, Kit 7.5 m² corresponds to 3 heating circuits, Kit 10.0 m² corresponds to 4 heating circuits.
- Pipes for underfloor heating can be shortened. When doing so, however, you should ensure that the difference in the lengths between the individual connectors is not too large (max. 15 %). If a heating pipe needs to be shortened, every effort should be made to distribute this equally among the pipes. Otherwise, one runs the risk of an unequal distribution of heat.
- Flow manifold, return manifold and any plug-in connectors used may under no circumstances be embedded in a self-leveling underlayment. This could lead to damages to the connectors that could impair the entire heating system.
- Avoid crossing pipes so you can completely benefit from the low construction profile of the thin-bed underfloor heating.
- Always ensure that the pipes are cut straight across and are free from burrs. The pipes may not be crimped or bent.
- The installation of the distributors, manifolds and pipes requires no special tools.
- During the laying and installation work, avoid stepping on the heating pipes. Under no circumstances should you step on fully exposed pipes. The manufacturer is not responsible for damages incurred by disregarding this notice.

4 PREPARING THE INSTALLATION

As with all of our products, the following rule of thumb applies to FLEXIRO thin-bed underfloor heating: Working on heating systems requires sufficient craftsmanship knowledge and ability. If necessary, have the installation done by an expert.

- The existing substrate must be level, clean, dry and sound.
- Any necessary primers or undercoats should be applied beforehand.
- Before installing the pipes, determine the position of the distributor for the underfloor heating, so you will know exactly where to place the pipes.
- The arrangement of the heating system and the placement of the temperature control box should be designed according to individual requirements. There is no uniformly valid

solution here. Please ensure that the regulating valve can always be reached later. After installation, the ends of the pipes will still have to be inserted into the individual connectors. (Observe the correct height from the floor.)

5 INSTALLATION

5|1 Installing the temperature control box single room controller

- For efficient temperature regulation, the control box should be placed in such a way that the thermostatic head can sense the room temperature and air can freely circulate around it.
- The distance from the temperature control box to the floor should be at least 20 cm, measured from the lower edge of the flush-mounted box.
- Please observe the instructions in the separate installation and operating manual, which is included with the temperature control box.



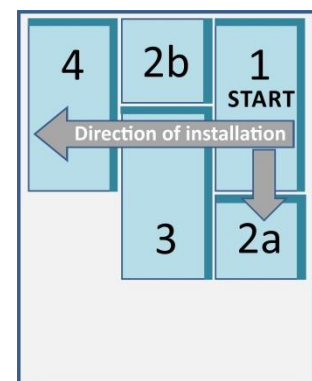
5|2 Applying the edge insulation strips

- A continuous insulating strip is to be applied along all walls and vertical structural elements (stairs, columns, door frames, pipes). In any event, this must reach at least as far as the upper edge of the final flooring. The insulating strip serves to separate the final flooring from masonry and other installations.
- The insulating strip is to be trimmed after the final flooring has been completely laid (and with ceramic tiles only after the grouting has been completed).

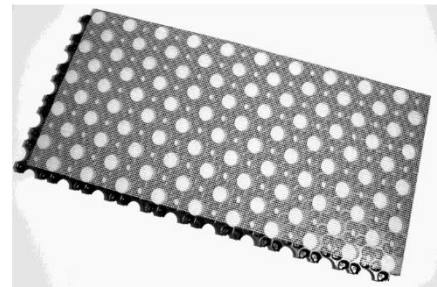
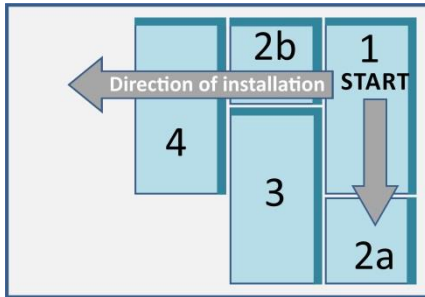


5|3 Installing the knobbed mats

- Before installation, it is necessary to mark the planned heating area on the floor and – if necessary – cut the knobbed mats to size.
- Note: The knobbed mats are asymmetrical! This means that it's important to pay attention to the direction of installation. The overlapping edges have no adhesive webbing or protective foil. Furthermore, they are not cleanly cut, but “wavy”. In the drawings, these edges are darker.

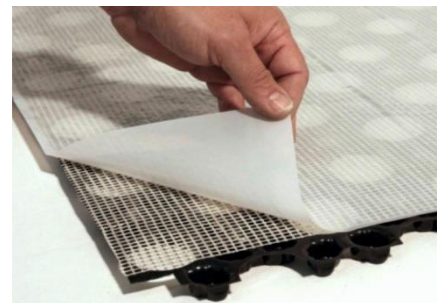


- There are many installation options. Here are two examples, one beginning with "start" in the left corner of the room and one beginning in the right corner of the room.
- Tip: To ensure that everything fits, lay out the pieces as a test run before removing the protective foil.



Edges that have to be "on top" when overlapping

- When installing, remove the protective foil, bring the knobbed mat into position with the adhesive side down and press firmly. It is essential that you observe the installation direction here and arrange the knobbed mats correctly.
- The second knobbed mat overlaps the edge of the first one.
- The mats are connected by pressing together the overlapping knobs. The foil of the second knobbed mat should also be removed and the knobbed mat pressed firmly.
- Continue working in this manner until the entire area has been laid out.
- Before installing the pipes, you should ensure that the knobbed mats adhere well to the substrate everywhere.



5|4 Laying the heating pipes

- The ideal place to start laying the pipes is near the distributor arms to keep the length of pipe necessary for the connection as short as possible.
- The minimum distance between the pipes is 10 cm. The distance of the underfloor heating to the walls of the room should be at least 5 cm. In areas where the pipes curve, a minimum bending radius of 10 cm must be observed, and it is recommended that the radius be as large as possible.
- Crimped or damaged areas on the heating pipes should be removed. The pipes are linked with a permanently sealed connector (see plug-in connectors in accessories). The connector has to be wrapped with a PE film to protect it from direct contact with the self-leveling underlayment and the final flooring. The position of the connector has to be marked. If pipes have to be extended, the same procedure should be followed.
- If you have to step on the knobbed mats for installation, please be careful.
- The pipes should be laid without any twisting.
- Various installation patterns for laying the pipes are possible. The meandering pattern is particularly advantageous. In addition to an even distribution of heat, it features large radii, which makes it easier to avoid twisting the pipes.
(see 5|11 Installation drawing)
- Before pouring the self-leveling underlayment, ensure that the pipes are fastened everywhere and the knobbed mats are firmly attached to the floor. Hooks mounted to the floor can be used to help secure everything.



5|5 Connecting to the temperature control box

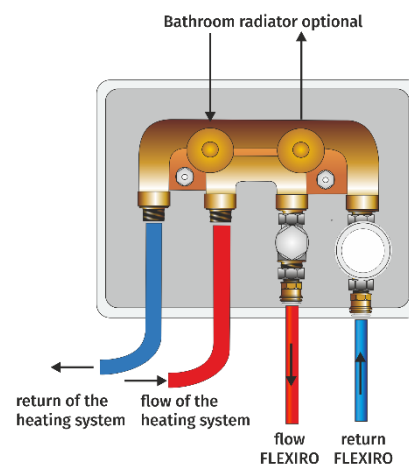
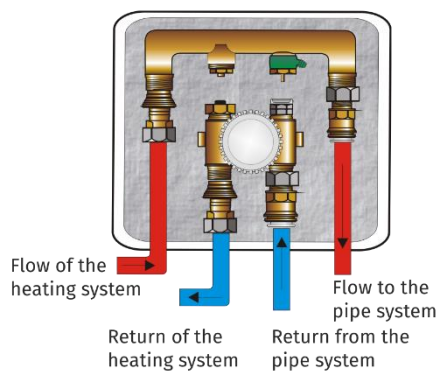
- The distributor arms are connected to the temperature control box using the Eurocone connector. The Eurocone has a self-sealing effect while the metal screw connection has a purely safety-related function. It is essential to avoid over-tightening as this would compromise the safety of the heating system.
- The following illustrations show the arrangement of the heating pipes in the temperature control box. The sequence of connections differs depending on the control box. The heating pipes are connected to the distributor arms using the simple plug-in assembly. The heating pipes, which have been cut straight and possibly shortened, are inserted directly into the plug-in connections of the distributor arms up to the stop.



Multibox 4K-RTL



Kompabox RTL



Making a plug-in connection:

- Cut the heating pipe straight and burr-free.
- Insert the pipe up to the stop (approx. 20 mm).
- Note: The retaining element grips before it seals.
- Make sure that the pipe is inserted to the stop. The pipe is now in a fixed position.
- Pull the heating pipe to check that the connection is secure.

Note: The pipes must go vertically into the distributor and must not exert any tension or pressure on the connection box!

Releasing a plug-in connection:

- Make sure the system is pressure-free.
- Press the retaining element against the front of the housing. Now the pipe can be easily removed by pulling.

The distributor arms supplied can be installed without tools.

5|6 Connecting to the heating system

- Make sure that the flow and return lines are correctly connected in the temperature control box. Mixing up the flow and return lines in the temperature control box will disable the thermostatic valve and even prevent the flow through the FLEXIRO underfloor heating.
- As a rule, you should be able to integrate your FLEXIRO underfloor heating system into the existing heating system in parallel.
- To do this you will need to insert T-pieces (not supplied with the FLEXIRO kit) into the flow and return lines for the heating system.
- Pipes (not included in the FLEXIRO kit) should be routed from the respective T-pieces for the flow and return lines to the inlet of the temperature control box and connected there by means of a suitable transition screw connection. Suitable transition fittings for different pipe qualities and dimensions can be found as accessories in the FLEXIRO webshop or in specialist hardware stores.



5|7 Pressure testing the heating system

Before putting the thin-bed underfloor heating system into operation, you must make sure that the system and all corresponding components have been properly installed. Even when installing a new product, the following procedure should be followed:

- Close the flow and return valves in the heating system.
- Flush the heating circuit until the water in the return pipe no longer contains air bubbles.
- Afterwards, the system should be pressurized with 10 bars for at least 10 minutes.
- Check the pipe system and all connectors to see that they are watertight.
- Release the pressure from the heating system.
- Afterwards, the system should be tested with an operational pressure of 2 bars for an additional period of 10 minutes.



A suitable pressure test pump is available at the FLEXIRO Shop:
flexiro.de/en/product/d/86/pressuretestpump.

Please note that if no pressure test is conducted the manufacturer cannot guarantee the long-lasting operation of the heating system.

5|8 Testing the underfloor heating system

Make sure to carry out a test run before casting the pipe system. This is the last opportunity to correct installation errors or repair damages.

- Unless you have prefilled the wall elements, the pipe system fills itself via the heating system. When using the Multibox 4K-RTL, venting the pipe system directly via the vent valve is possible and advisable.
- Now fill the heating system and restore the operating pressure of your system.
- Check the tightness again.
- Check the pipe system and all connections for leaks.
- Completely open the thermostat valve on the temperature control box and check whether all areas and heating circuits in the FLEXIRO underfloor heating system become warm.



5|9 Laying the final flooring

A self-leveling underlayment for underfloor heating must generally be of a "flexible" nature to allow the floor to withstand the stresses of expansion caused by heat.

- Before you begin to apply the self-leveling underlayment, make sure that the underfloor heating is completely turned off.
- Operating the heating system during the drying process can adversely affect the self-leveling underlayment or even damage it.
- The heating pipes must now be embedded in a self-leveling underlayment. The minimum covering for the pipes here is 3 mm, if ceramic final flooring is selected.
- With other final floorings, the self-leveling underlayment must provide a covering of at least 5 mm.
- All floorings must be rated by manufacturers as "suitable for underfloor heating."



Additional remarks on underlayment compounds:

We would like to mention once again the importance of adhering to all laws, ordinances, guidelines and standards when planning and installing heating systems.

Leveling and underlayment compounds must have the following characteristics:

- Suitable for leveling concrete floors, cement, calcium sulfate, magnesite and poured asphalt layers.
- Suitable for leveling ceramic floorings and application on coatings.
- Suitable as a leveling and underlayment compound for hot water underfloor heating systems that are recommended for thin-bed underfloor heating.

The following **manufacturers** sell relevant products via retailers and provide further instructions:

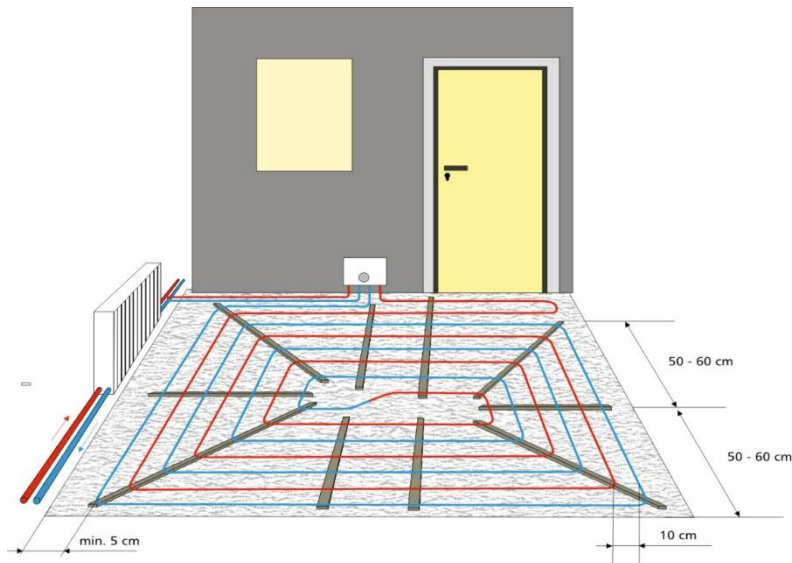
- Knauf
- Maxit
- Bostik
- PCI
- Kiesel
- Sopro

Additional information is available from the manufacturers of underlayment compounds.

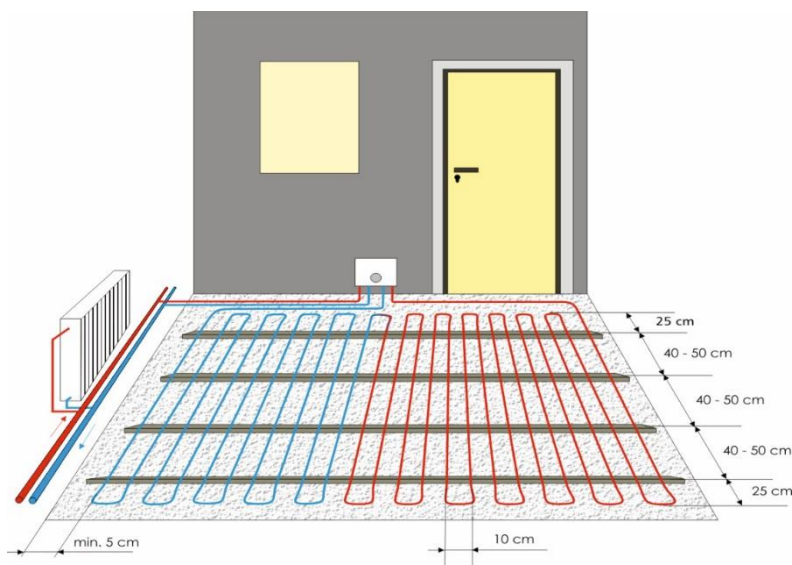
5|10 Commissioning (heating up process)

- After completion and the natural drying of the underlayment, the heating-up process begins. If you are laying tiles on the floor, do not put the heating system into operation before the tile adhesive is completely hardened. Please follow the manufacturer's application instructions.
- The heating-up usually follows a specific protocol. It is essential that you follow the manufacturer's instructions here.

5|11 Installation drawing



*FLEXIRO thin-bed underfloor heating, pipe installation pattern: spiral pattern. **Preferable for installations with knobbed mats!***



FLEXIRO thin-bed underfloor heating, pipe installation pattern, meandering pattern. Due to the many tight radii, it is recommended that you use hold-down devices.



It can't be easier
FLEXIRO underfloor heating

Kit selection, prices and technical specifications at:
flexiro.de/en/underfloor-heating



Questions? Service hotline +49 30 474 114 33
 (weekdays 8 am – 4 pm)