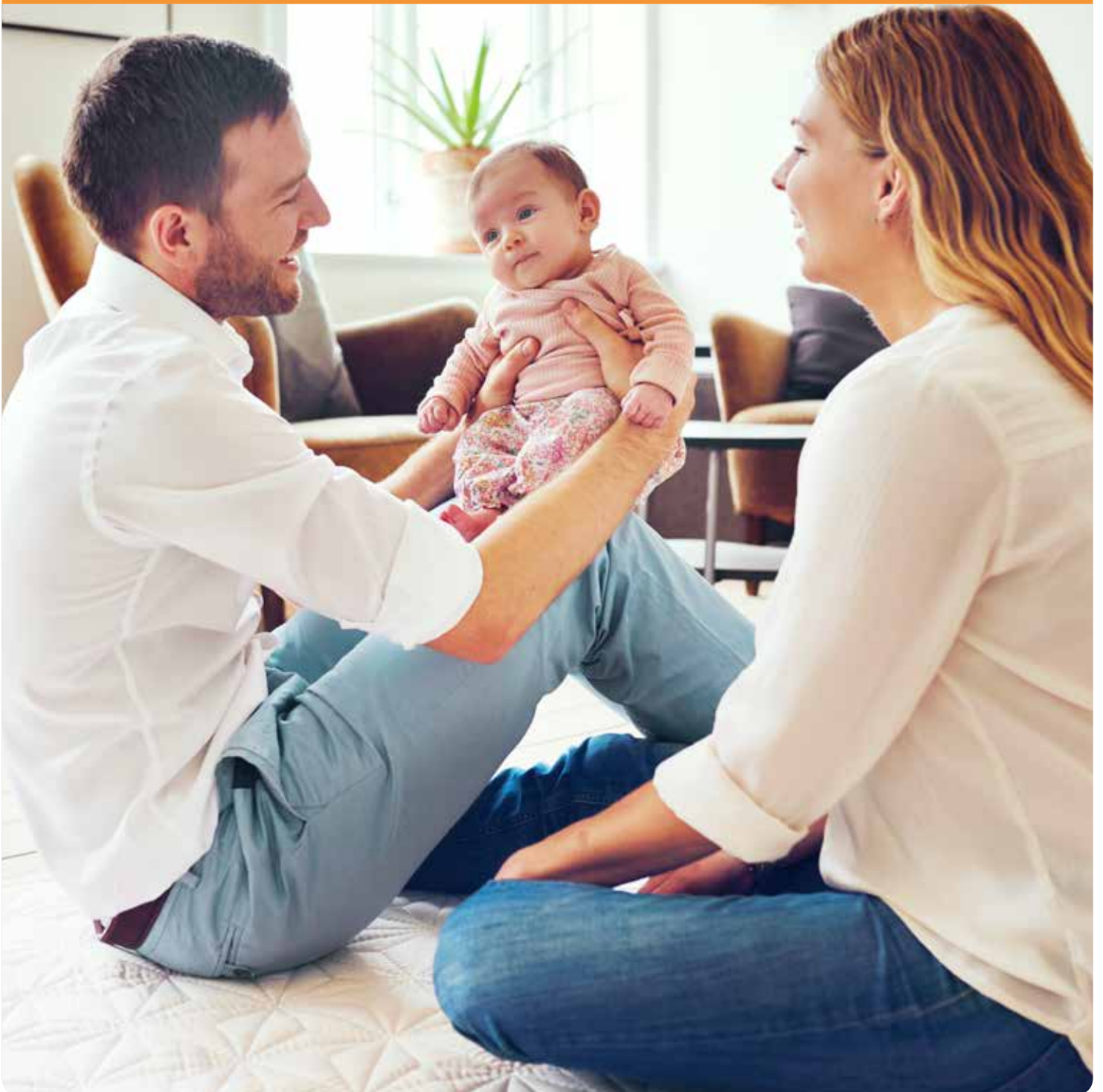
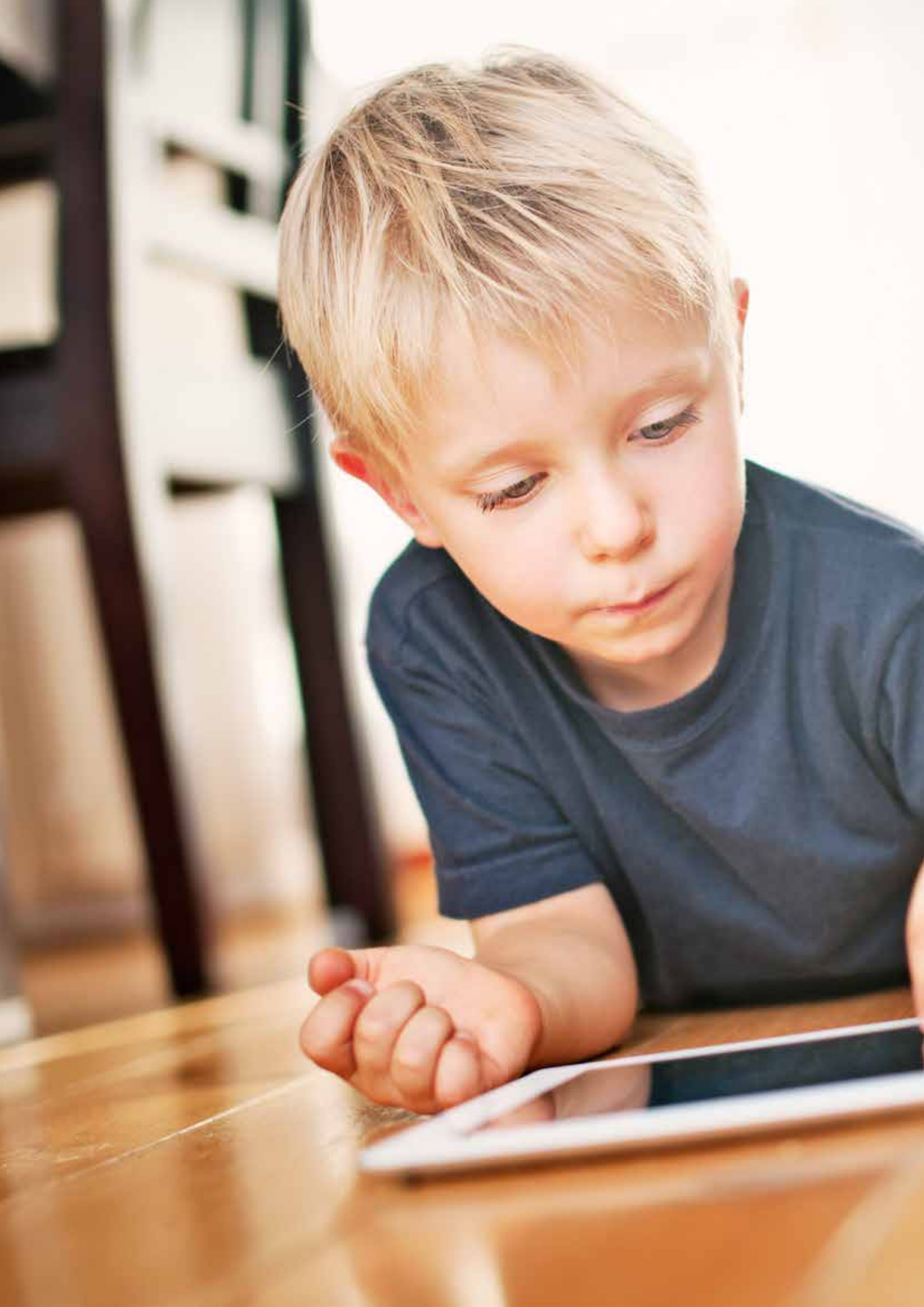


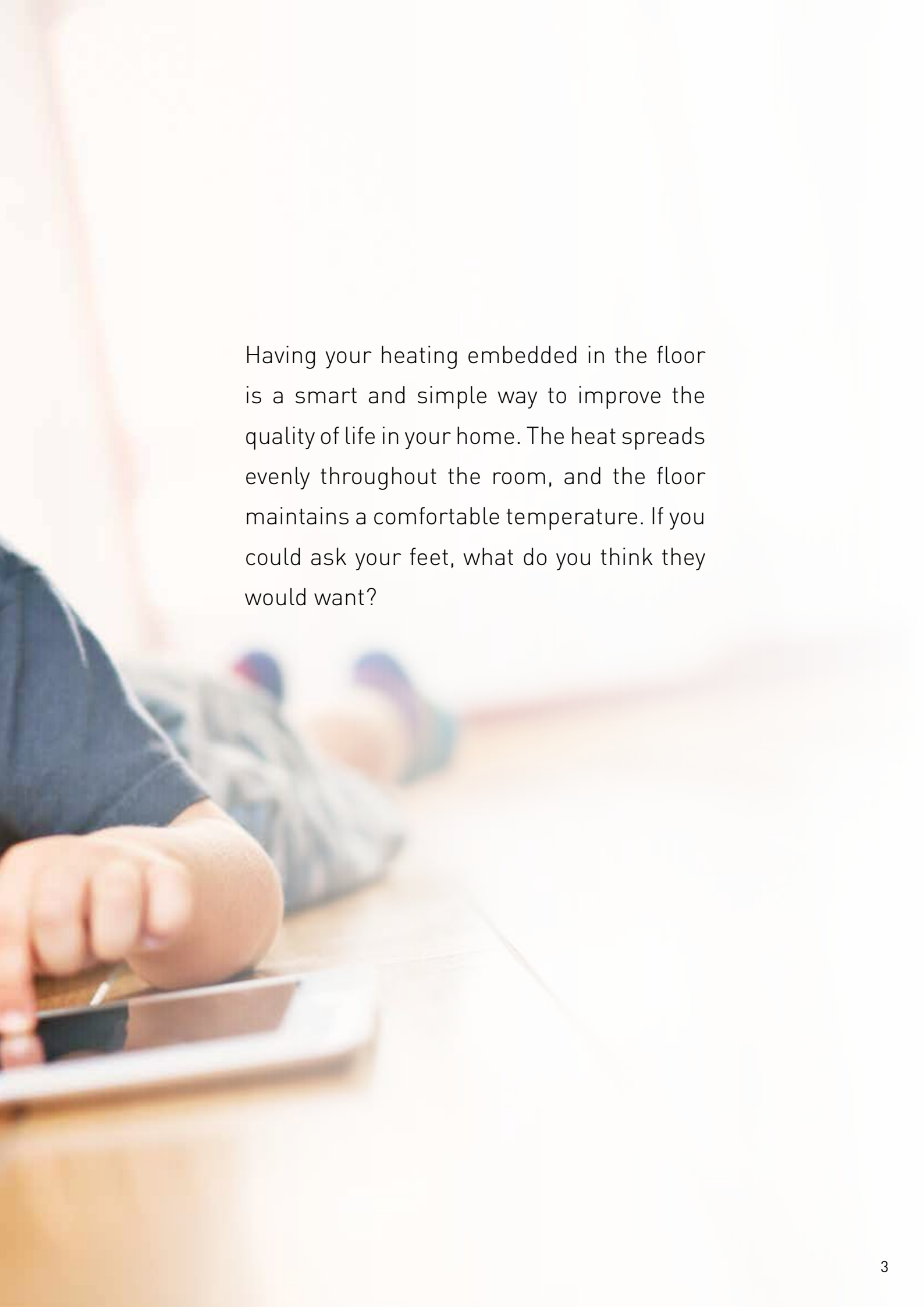


# Underfloor heating

Improve the quality of life in your home







Having your heating embedded in the floor is a smart and simple way to improve the quality of life in your home. The heat spreads evenly throughout the room, and the floor maintains a comfortable temperature. If you could ask your feet, what do you think they would want?



# Maintain heat in a sustainable way

## Future-proof your heating

Waterborne underfloor heating is a future-proof solution, both for your home and for our planet. The indoor temperature can be lowered because the entire floor emits heat. The water temperature in an underfloor heating system is about 15 degrees lower than in a standard radiator system. When used in combination with a heat pump, there are even greater savings since the pump works best at low water temperatures. Naturally, the underfloor heating system can also be combined with a solar thermal collector. LK Underfloor Heating is a quality system, developed in Sweden.

## Systems for all floors

When choosing a waterborne system, it is important to be careful. The system must be safe and durable. LK has vast experience in manufacturing and developing different underfloor heating systems for different types of spaces, floor structures, and floor coverings.

In this brochure, we guide you through three steps to find the system that suits the floors and spaces you want to heat, whether you are building new or renovating. Always employ a qualified professional if you are the least bit unsure, since improper installation could lead to major problems. LK trains and provides support to professional installers so that you can feel completely confident with your solution.

## Monitor the temperature

LK has developed advanced control systems for controlling the room temperature. While the technology is advanced, controlling it has been kept simple. With the LK AtHome app, you can read and adjust the temperature of your home or your weekend cottage from anywhere in the world.



# Step 1

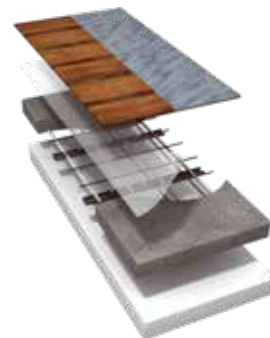
## Smart systems for every floor

### Embedding in concrete

Underfloor heating embedded in concrete is suitable for both new construction and renovation. When the heating circuits are embedded in the concrete, the underfloor heating installation does not increase the height of the floor. With renovation and rebuilding projects, the circuits are normally laid on top of existing floors and covered with self levelling screed. The construction height varies depending on which system is chosen.

#### Embedding in slab-on-ground foundation

During new construction or an addition with a slab-on-ground foundation, the clip rail is pressed into the building insulation with pipe holders. The pipes are easily pressed down into the rail, where they are positioned safely and at the right distance for perfect heat emission. The pipes are embedded in the concrete slab, and the floor material is installed over top.



LK Clip Rail 16

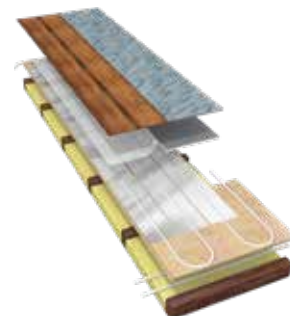
### Installation on wooden joists

If you want to install your underfloor heating on wooden joists, the standard floor grade chipboard can often be replaced with LK's slotted chipboard for underfloor heating pipes.

LK has flexible and simple solutions for both today's standard joists with c/c 600 and for other dimensions that are common in older homes.

#### For standard floor joists

Load-bearing slotted board for standard wooden joists with c/c 600 mm that replaces the standard floor grade chipboard. Usually installed early in the construction process, before it is time to lay the underfloor heating. The slotted board is installed across the floor joists and is clad with heat distribution plates. The floor pipes are then pressed down into the slots. The floor material is installed over top.



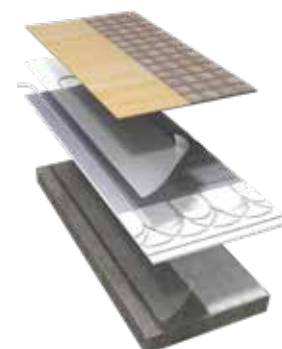
LK HeatFloor 22

### For load-bearing floors

When installing underfloor heating as part of a renovation project, you usually want to keep the construction height as low as possible. LK therefore developed smart solutions for spaces with low ceiling height and for projects involving the installation of additional insulation. The boards are clad in aluminium heat distribution plate that distributes the heat uniformly across the surface. We also developed a foil board with impact-sound reducing properties.

#### With low ceiling height

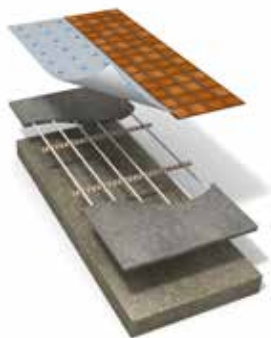
A 16 mm slotted board with underfloor heating circuits is ideal for any room with a low ceiling. The board is installed on top of the existing floor and the pipes are pressed down into the slots. The floor material is installed directly on top of the slotted board. With floor tiles, the total construction height is just 26 mm.



LK Slotted Board EPS 16

### Renovation of small spaces

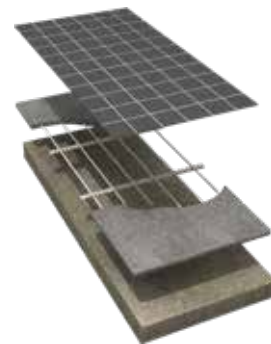
When renovating small spaces, like a bathroom, laundry or entryway, it is perfect to secure the clip rail directly to the sub-floor with double-sided tape. The circuits are positioned in the rail and covered with self levelling screed or embedded in concrete. Then, all that's left is to install the floor material.



LK Clip Rail 12

### For extra low construction height

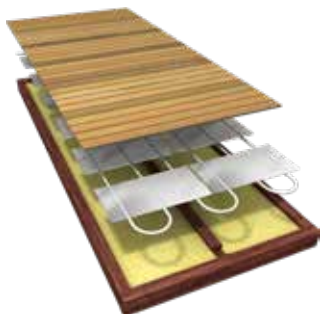
When installing underfloor heating in an existing room, you usually want to keep the construction height as low as possible. With the system designed for our 8 mm underfloor heating pipes, the construction height is just two centimetres plus the flooring. The rail is secured with double-sided tape, and the pipes are covered with self levelling screed.



LK Clip Rail 8

### For load-bearing floors

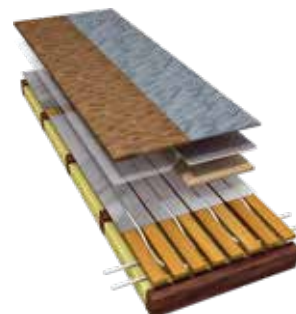
If installing a load-bearing floor directly on the joists (e.g. a solid wood floor) the floor joist plates are installed in the longitudinal direction of the joist compartments and nailed into place on the top of the joists. The total construction height is the same as that of the floor material.



LK Floor Joist Plate 16

### With non-standard floor joist dimensions

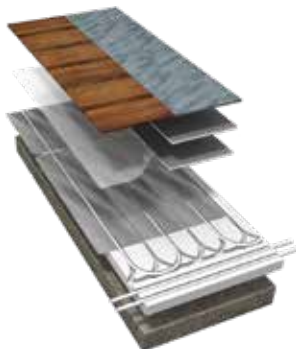
If the floor joist has non-standard dimensions, you can install the heat distribution plate on the cross battening, which is nailed into place over the floor joist. This produces a construction height of 28 mm. The structure can also be lowered into the floor joist, which means the floor level is not raised at all. The heat distribution plate is positioned in the slots between the cross battening and is secured there. The pipes are pressed down into the slots, and the floor material is installed on top.



LK Heat Distribution Plate 16

### For slab-on-ground foundations and basements

When you need additional insulation downwards to install underfloor heating on a load-bearing floor, slotted boards of various thicknesses are available. They are suitable for an existing slab-on-ground foundation, on intermediate joists, and in basement spaces. The slotted board comes in thicknesses of 30, 50 and 70 mm, and is clad with plates for uniform distribution of heat. The floor covering is installed floating over the heating installation.



LK Slotted Board EPS 30/50/70

### For a quieter room

For load-bearing concrete floor structures in dry spaces, a foil board made from 30 mm EPS can be installed. The board insulates against heat transfer and dampens impact sounds. The circuits are installed following the printed grid pattern and are secured with LK Staple Gun and LK Staples. They are then embedded in concrete or self levelling screed.



LK Foil Board 30 Silent

# Step 2

## Smart systems for temperature regulation



Once the underfloor heating and the floor material have been installed, the thermostats are the only components that are visible. They are positioned one per room and communicate with the manifold through a wireless or wired connection. LK has developed self-modulation technology that optimises the flow in the pipes based on room needs. This provides better comfort and saves energy compared with traditional On/Off technology.







## A thermostat that learns how you want things

### LK Room Thermostat ICS.2

With LK Room Temperature Control ICS.2, the thermostats communicate with the receiver unit of the manifold's motorised valves through a wireless or a wired connection. The flow in the underfloor heating circuits is controlled based on heating needs in a self-learning system. The thermostats have a discreet and stylish design. There are three colours to choose from – high gloss white, high gloss black or silver grey.

### Detail control with programs

LK ICS.2 is a system with many different features. There are several different pre-programmed settings, such as adaptive week program, holiday function, fire-place function, and the option of connecting an external sensor. The adaptive function learns when it needs to enable the underfloor heating in order to reach the desired temperature at a specific time of day. In this way, the system helps you save energy while reducing heating costs.

### Control your heating with the LK AtHome app

LK AtHome is one more way to make your day-to-day life a little easier and smarter. With an interface that is easy to understand and use, you can monitor and control your underfloor heating system from anywhere in the world. If something is not right, the app will send you an alert.





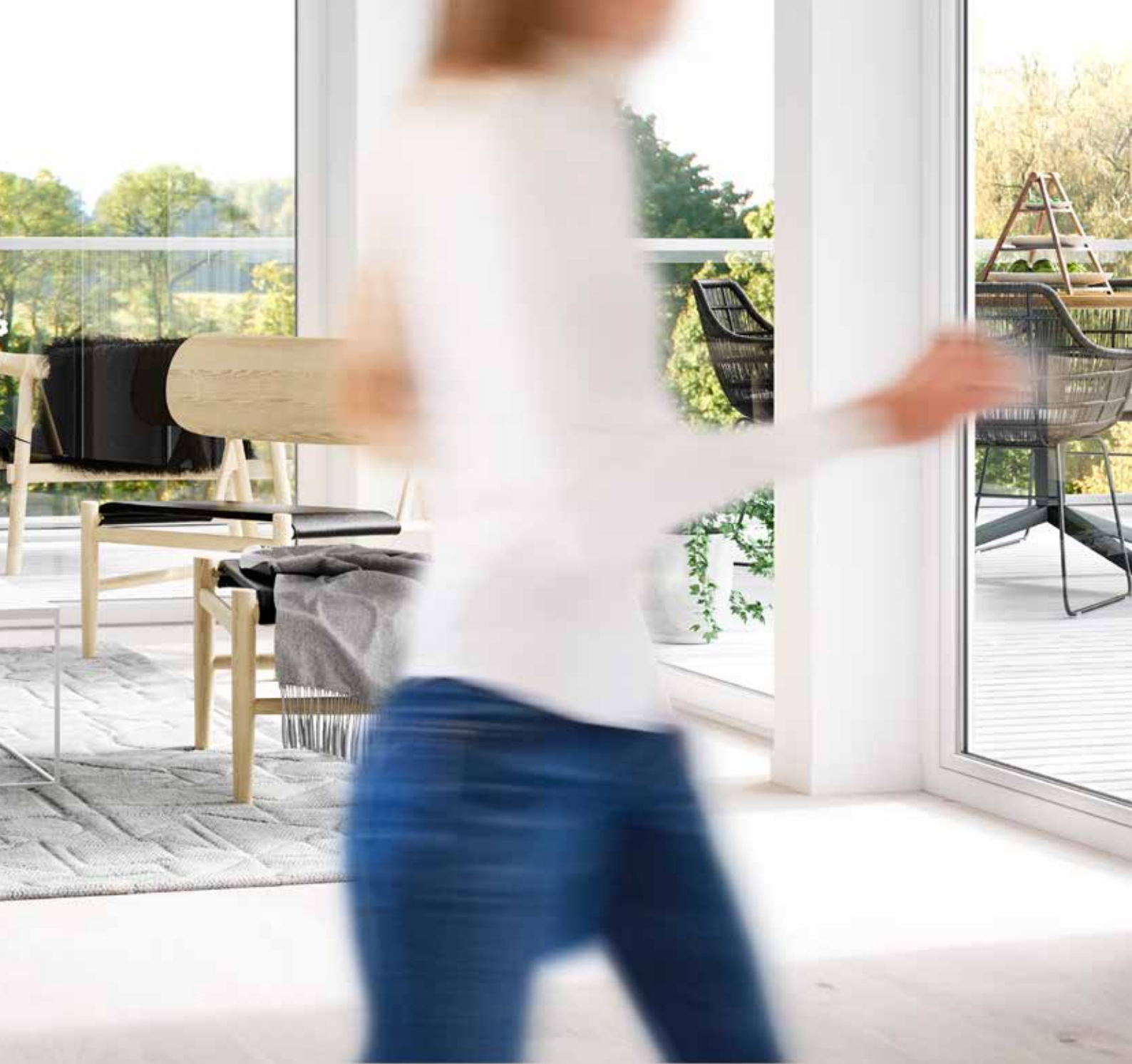
## Control technology that saves money

### **LK Room Thermostat S2**

Installed as standard with LK Underfloor Heating. It has a modern design with glassy surface and white LED display. With self-modulating control technology, you get the best energy efficiency. In other words, lower energy consumption.

If required, the room temperature can be locked to a temperature interval or to a fixed setting.





### **LK Room Thermostat S1**

Mounted directly on the wall or connected to an electronic connection box. The very thin thermostat easily blends into the room environment. It has self-modulating control technology and is available in three designs (two of which are adapted for connection of an external temperature sensor). An LED signal shows the function, and the thermostat can be locked to a temperature interval or to a fixed setting.



# Step 3

## Smart systems for all rooms

Which system is used to control the underfloor heating varies depending on the type of room or the size of your underfloor heating system.



### **For new construction or renovation projects**

When you are building a completely new home or doing a more extensive renovation, it is a good idea to install the LK Manifold Cabinet if you are installing underfloor heating in the entire or the majority of the space. All of the underfloor heating circuits are housed in the cabinet and hidden behind a discreet hatch, where they are easy to inspect. The manifold cabinet is available in sizes ranging from one circuit to twelve circuits.

### **Underfloor heating in a bathroom**

Many want to have a heated floor in their bathroom, even in the summer when the heating in the rest of the house is switched off. The solution, called LK Heater 350, has an electric comfort heater that replaces the standard heat pump in the summer. For spaces up to 12 square metres.



### **Underfloor heating in an individual room or extension**

If you are renovating or adding on to a system that also includes standard radiators, LK Shunt is also recommended. This keeps the water in the underfloor heating circuits at a lower temperature than in the radiators. This is necessary since underfloor heating is a low-temperature system.

LK Shunt is available in three sizes depending on the size of the space involved.

### **Frost-free solution for conservatories and driveways**

By separating the heating system of the conservatory from the rest of the house, you don't have to worry about the floor freezing in the winter. With the LK Heat Exchanger Pack, you use the house's waterborne system but can protect the underfloor heating pipes of the conservatory with glycol. You can confidently switch off the heating in the conservatory in the winter without worrying about frost damage.

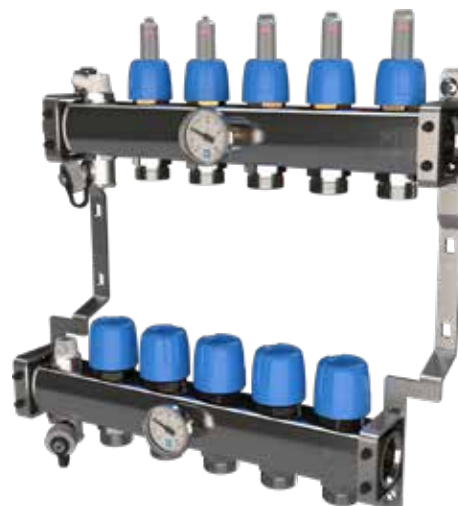
The heat exchanger pack works equally well in a garage or a greenhouse where you want to maintain a low temperature or switch off the underfloor heating system completely. You can also install heating in the ground if you want to keep your driveway or the paths of your property free from snow and ice.

# Installations for all types of operating systems

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## Balance the system

The heat circuit manifold is positioned centrally in the area where the circuits are installed. LK Manifold RF comes in different sizes, ranging from one to twelve floor heating circuits. Feed pipes are routed from the heat source to the manifold, where the water flow to each underfloor heating circuit is controlled individually. This makes it possible to balance the underfloor heating system so the different spaces or rooms have the right temperature.



## For electric comfort heating

Sometimes, you want to keep a floor warm when the house's heat source is switched off, for example in the bathroom during the summer. LK Heater 350 works for spaces up to 12 square metres when coupled with LK Minishunt M60n.

## Heat exchanger pack for conservatories

In a conservatory, waterborne underfloor heating is often not considered an option due to the risk of the heating pipes becoming damaged through freezing. The options have been to let the heating run year-round, or to install electric underfloor heating.

LK Heat Exchanger Pack utilises the house's waterborne system. The underfloor heating system of the conservatory is separated from that of the house. It is then protected against frost using glycol, making it possible to switch it off during the winter with no risk of frost damage.

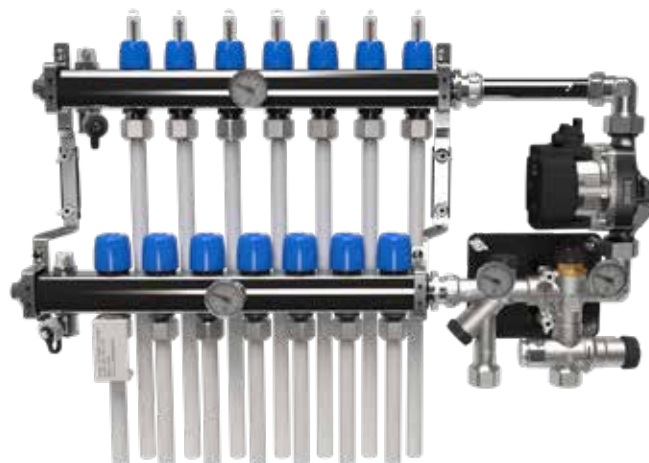


Should the underfloor heating installation work together with radiators? Is the floor surface large or small? Should it be frost-free? Different types of installations require different solutions for operation and distribution of the underfloor heating.

### Use a shunt with radiators

Underfloor heating is a low-temperature system with a supply temperature that is usually about 15 degrees lower than that of conventional radiators. A shunt is therefore required if underfloor heating is installed in a system that also includes radiators.

LK Shunt mixes the hot radiator water with the cooled water from the underfloor heating circuits before the water is returned to the underfloor heating system. This way, both the underfloor heating and the radiators are supplied at the right temperature. LK Shunt is available in several sizes so it can be adapted to the size of the underfloor heating system.



### Minishunt for mixed systems

LK Minishunt M60n is a complete shunt unit for floor areas of up to 60 square metres. The minishunt is connected directly to radiator pipes in the system if there is underfloor heating in one or a few rooms and radiators in the rest of the house.



### Mini loop valve for small floor areas

With a mini loop valve, it is easy to connect small underfloor heating areas (up to 5 square metres) to an existing heating system. The small in size valve is installed simply and discreetly in the wall in a recessed cabinet.

# We are with you all the way from consulting to installation

At LK, we are passionate about developing and manufacturing quality products that are easy to handle.

LK is a leader in the underfloor heating sector, with over 35 years of experience. You can feel confident with our solutions, which are developed in Sweden, comply with industry standards, and always have spare parts available.

We suggest system solutions tailored to your project and your personal choice of floor material. We provide training and advice to professional installers of our systems, and your LK installer can answer your questions.

To learn more about underfloor heating, please visit [lksystems.se/en](https://lksystems.se/en). There, you will find videos, answers to frequently asked questions, and virtual environments with true-to-life installations.

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## LK Systems AB

### Stockholm

Box 66  
SE-161 26 Bromma  
Sweden  
Phone: +46 (0)8-506 851 00  
Email: [info@lksystems.se](mailto:info@lksystems.se)

**LK Systems** is a Nordic leader in solutions for heating and tap water systems. Our systems are easy to install, and we are more than happy to use our prefabrication plant to manufacture customised systems that further simplify installation. From idea to finished product, we have the smartest solutions for both today and tomorrow.

