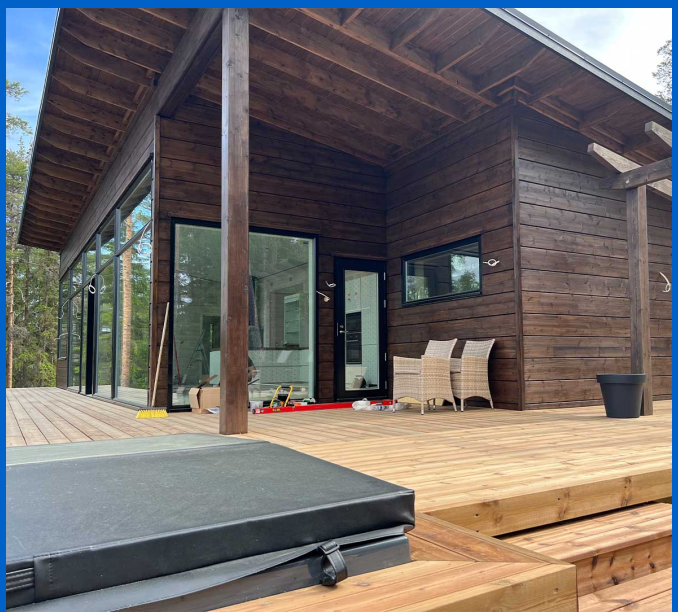
References

Underfloor heating and cooling for comfortable living in a summer cottage house



Uponor involvement

- Uponor Smatrix Pulse -säätöjärjestelmä

Underfloor heating and cooling for comfortable living in a summer cottage house

The new summer cottage house in Suolahti, Äänekoski, is using floor heating and cooling controlled by an Uponor Smatrix Pulse control system. The heat source will be a NIBE geothermal heat pump. Uponor and NIBE were responsible for the design and sizing of the heating and cooling system for the new house.
Tommi Heikkilä's family's cottage distance will be reduced from 50 kilometres to 80 metres when the detached house built on the hillside of the cottage plot will soon be completed. The windows of the new home in Suolahti, Äänekoski, will overlook Lake Keitele, whose scenery the family will be able to admire all year round.

"Our cottage house was built on top of a stone slope on a cottage plot. We wanted a single-level house with large windows to make the most of the view. The weightless laminated timber allowed us to use large windows," says Tommi Heikkilä.

Construction started a year ago at Midsummer with the clearing of the road leading to the house. The new 120-square-metre home will be ready to move into this summer. Geothermal heating was a natural solution for the house, which is located on a cliff top. Uponor's water-circulated underfloor heating and cooling system keeps the home warm in winter and comfortably cool in summer.

"The sun shines through the west-facing windows all day and brings in the heat, so cooling is necessary in the summer. The choice of underfloor heating was influenced by the comfort of its use."

A draught-free floor fan distributes air evenly and draught-free to all rooms. Its operation is based on a large floor area and a small temperature difference between the air and the floor surface. Fears of excessively cool floors are unnecessary, as the cooling system is always designed to keep the floor temperature at around 21 degrees Celsius.

Heikkilä also built the family's previous home in Jyväskylä, so he knows how many sub-projects make up a building project.

"Usually, I always want to make sure of every single thing and keep my finger on the pulse. This time, the heating and cooling of the new home was the first thing I entrusted entirely to professionals. I had full confidence in Uponor and everything went smoothly."

Piping provides hot water in winter and cool water in summer

Underfloor heating and cooling is controlled by an Uponor Smatrix Pulse control system and the heat source is a NIBE geothermal heat pump. Uponor and NIBE were responsible for the design and sizing of the heating and cooling system. Thanks to seamless and good cooperation, the deliveries arrived on time.

The HVAC contractor was the local company LVI-Makkonen Oy, with Henri Makkonen handling the installation work.

"The cooling system in the geothermal heat pump has its own pump group and heat exchanger, through which the cool water flows to the floor piping. The humid rooms have their own heat supply and manifold, so they can be heated in the summer while other rooms are cooled. The cooling trunk piping was insulated with cellular rubber insulation," says Henri Makkonen.

Underfloor heating is cost-effective because it uses the same piping, manifolds and control equipment as underfloor heating. The floor piping runs in a concrete casting. A vapour barrier and step sound insulation material was installed between the hardwood floor and the concrete casting.

The temperature is measured and regulated on a room-by-room basis with Uponor design room thermostats, which also take radiant heat into account, thus ensuring more precise heat regulation. The room thermostats also measure and monitor humidity.

As the squares were to be used as efficiently as possible for residential purposes, the technical space was kept to a challenging minimum for the installation work.

"The technical space had to accommodate the geothermal heat pump, IV unit, electrical cabinet and all the associated equipment in just over two square metres. The layout of the equipment and piping had to be considered particularly carefully, as space was limited," says Henri Makkonen.

"Henri was extremely careful with the installation work and even in the technical area, he did a great job using every square centimetre," says Heikkilä.

Adjusted system components bring comfort and peace of mind

The Uponor Smatrix Pulse control system is an intelligent solution for controlling heating and cooling in your home. Its latest feature, heat pump integration, enables interaction between the control system and the heat pump. For residents, this translates into comfort, energy efficiency and ease of maintenance.

Tommi Heikkilä expects the controls to be easy to use and worry-free.

"We want heating and cooling control that is as automated as possible, where you set the room thermostats to a certain temperature and that's it. The system then takes care of the comfortable living conditions."

With heat pump integration, the control system and heat pump automatically ensure that the optimum control curve is always in use, so there is no need for occupant intervention. The heat curve and the supply water temperature will always be adjusted to the optimum according to the current demand. In addition to comfort, this increases energy efficiency. Switching from underfloor heating to underfloor cooling is done at the touch of a button.

With the Smatrix Pulse mobile app, room temperatures, among other things, can also be monitored and adjusted remotely.

"Remote access brings peace of mind. If we are away from home for a longer period of time, we can use our mobile phone to check that the temperatures at home are just right. To save energy, temperatures can be lowered while you're away and remotely set them just right a little before you return home."

Project Facts:

Location	Completion
Äänekoski, Finland	2022
Building Type	Product systems
Single homes	Radiant Heating & Cooling

> Yleensä haluan aina varmistaa jokaisen asian ja pitää kaikki langat käsissäni. Nyt uuden kodin lämmitys ja viilennys olivat ensimmäinen asia, jonka annoin täysin ammattilaisten hoidettavaksi. Minulla on ollut täysi luotto Uponoriin ja kaikki on sujunut mallikkaasti, says Tommi Heikkilä.

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