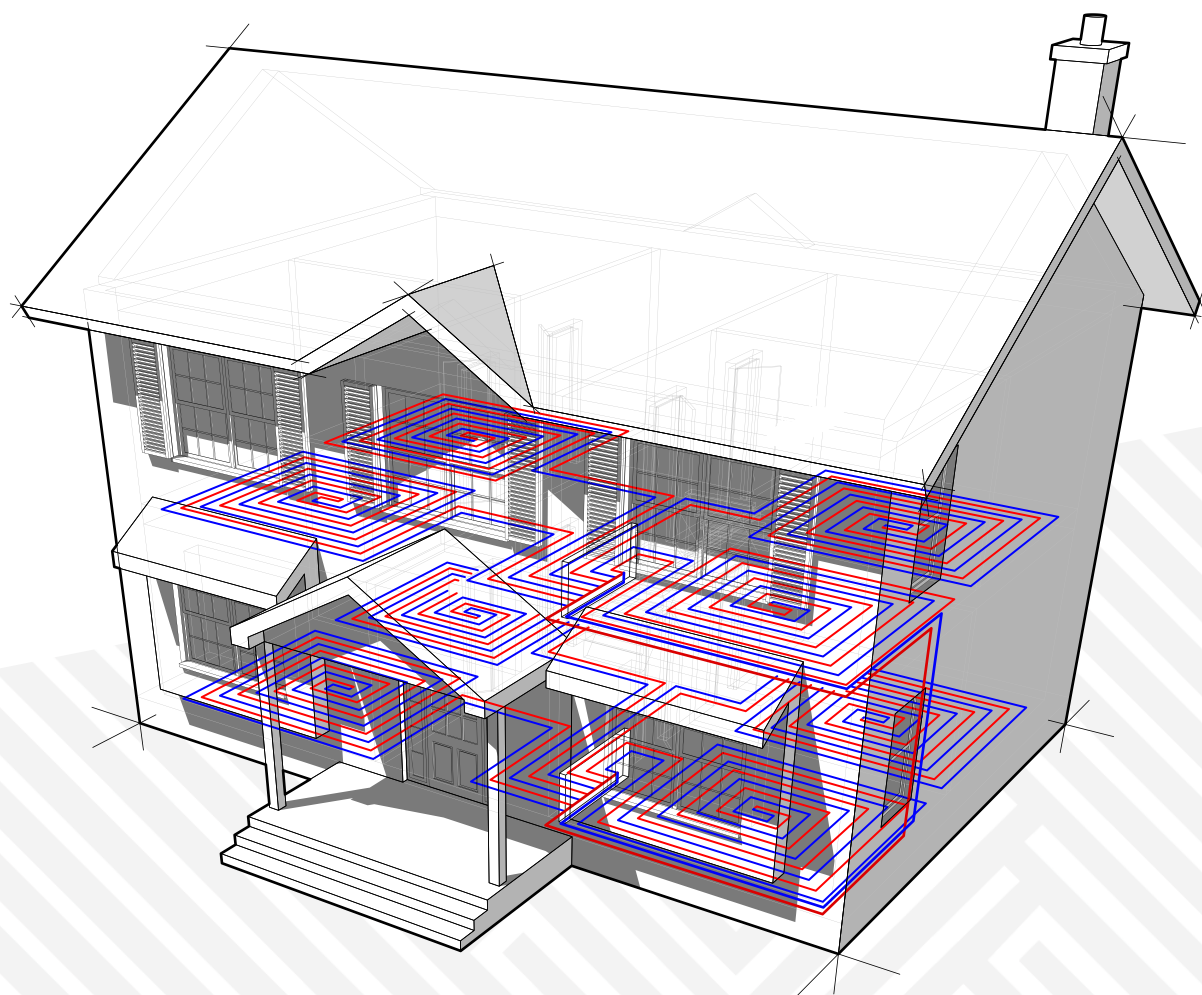


# **ACTIVE ELEMENTS**

BY **INNENCO**  
INNOVATIVE ENERGY CONCEPT

**LOW-ENERGY** SOLUTION  
FOR EVERY TYPE OF BUILDING



**ENERGY FLOOR**  
WITH THERMAL STORAGE





## **UNIVERSAL LOW-ENERGY SOLUTION FOR EVERY TYPE OF BUILDING**

With underfloor heating and cooling, "AE", is the Swedish system with a long tradition, which builds on the successful years of international cooperation and mutual development. Combining modern technologies, materials and an innovative way of thinking, we present a low-energy heating and cooling product.

AE system is the right choice of hot water heating and cooling floor for **BUILDINGS UNDER RENOVATION, NEW BUILDINGS, LOW-ENERGY AND PASSIVE HOUSES, INDUSTRIAL AND SPECIAL BUILDINGS.**

In comparison with conventional floor heating there are differences in the materials used, fluid flow, temperature of the hot water and the way of laying bifilar lines. The big advantage is the minimalistic design height of up to 15 mm.

**INNENCO**  
INNOVATIVE ENERGY CONCEPT

A unique energy concept guaranteeing a complex approach, use of special products and technologies.  
SIMPLE, ECONOMIC and  
CONVENIENT solution for heating and cooling your home.

**WWW.INNENCO.COM**

# COMPOSITIONS OF FLOORS

1

## AE SPRINT

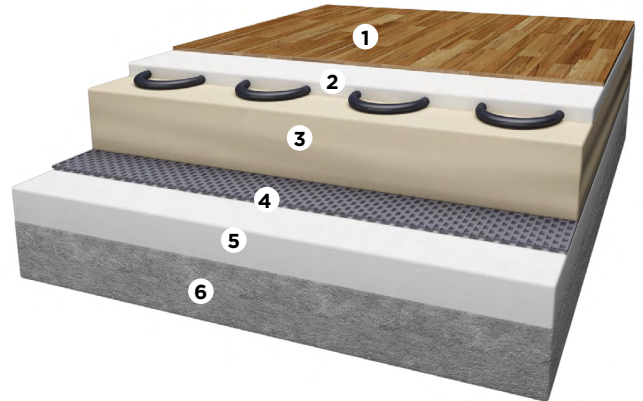
The piping is placed directly under the top layer of the floor. The Heat Up! system retains all the benefits of floor heating and brings an added benefit of the rapid heat-up and precise self-regulating effect. In this arrangement, receiving energy from the environment and redistribution of heat in the building works very well.

The low-profile system can be implemented using several methods - levelling screed, dry system or burying pipes into the existing floor by cutting the floor.

This floor composition features an extremely low temperature of the heating water (26 - 34°C), quick response times when firing up, cooling down or at the emergence of heat gains (sunshine, electrical appliances, etc.). The basic principle is to lay water pipes directly under the floor covering.

**OPERATING TEMPERATURES: 26 - 34°C**

**REACTION TIME OF FLOOR: 15 - 60 MINUTES**



1 - floor covering | 2 - levelling screed 15 mm, pipes  
3 - floor layer (floor screed, dry floor, etc.) | 4 - PE separation foil  
5 - EPS heat insulation | 6 - supporting structure

2

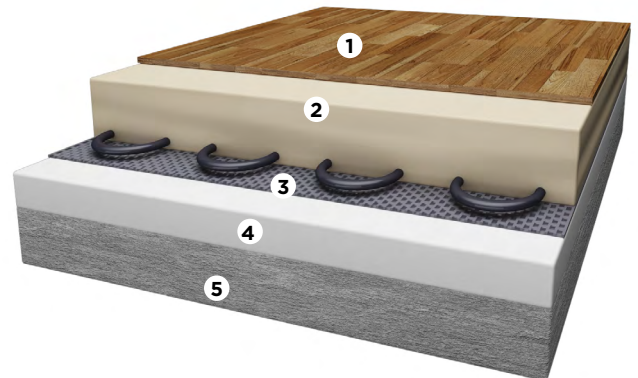
## AE CLASSIC

Laying heat pipe on top of thermal insulation with a layer of cement screed (anhydrite) over the pipe in a thickness of about 40 mm. It's a classic installation method, which is characterized by a longer period of accumulation, but also heat inertia (about 2 - 4 hours). Heating water temperature corresponds to the standard values for underfloor heating systems (35 - 40°C).

This floor composition ensures high thermal stability of the building at a cost of less flexibility in changing heat output, for instance during a sudden drop of the outside temperature. The accumulation system is suitable for new buildings and renovations.

**OPERATING TEMPERATURES: 35 - 40°C**

**REACTION TIME OF FLOOR: 2 - 4 HOURS**



1 - floor covering | 2 - anhydrite/floor screed, piping  
3 - PE separation foil | 4 - EPS heat insulation  
5 - supporting structure

3

## AE SCANDINAVIA

The floor has a unique composition that allows to temper building substructures and create maximum thermal stability of the building. For tempering the bottom layer, waste heat from the recovery system, solar gains, or any other source of heat is used. For tempering this layer, the temperature of the medium is 22°C - the material enabling the heat transfer is sufficient.

The top layer of piping is the heating layer. It connects to the heat source and typically operates at temperatures of 26 - 34°C. With this composition the system ensures efficient storage of heat in the building mass and enables its subsequent use. The benefit of the system is not only a low heating layer thickness, which provides advantages of extremely low operating temperatures, but also fast control and redistribution of heat. On the other hand, in summer, the system can be operated in passive cooling mode. The result is maximum comfort and minimum operating costs of heating. The building and its substructure become a "live" accumulator.

**OPERATING TEMPERATURES: 26 - 34°C**

**REACTION TIME OF FLOOR: 15 - 60 MINUTES**

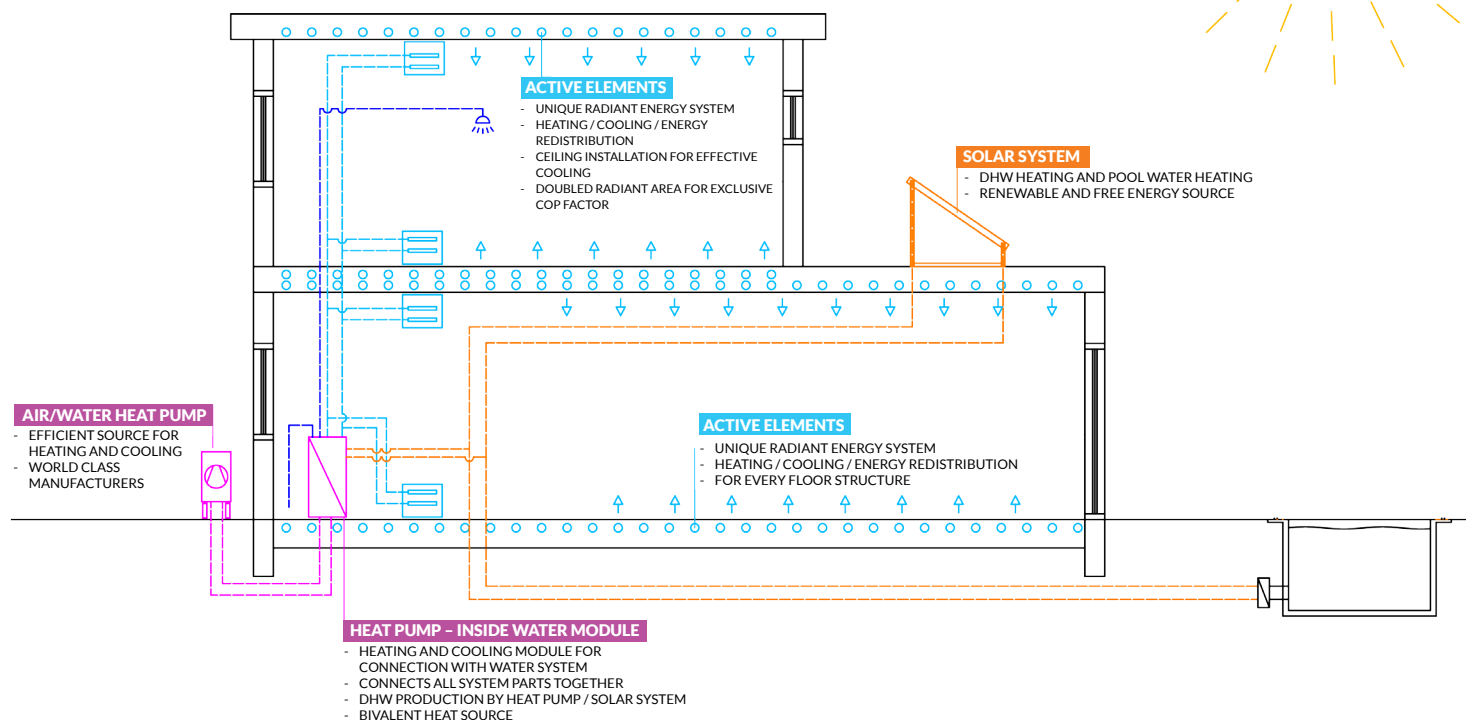
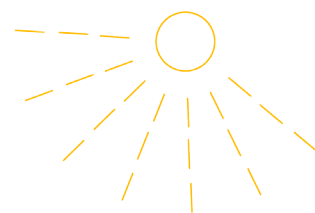


1 - floor covering | 2 - piping - heating layer  
3 - levelling screed 15 mm | 4 - concrete floor  
5 - piping - accumulating layer | 6 - cement screed  
7 - waterproofing | 8 - foam glass thermal insulation (th. approx. 200 mm)

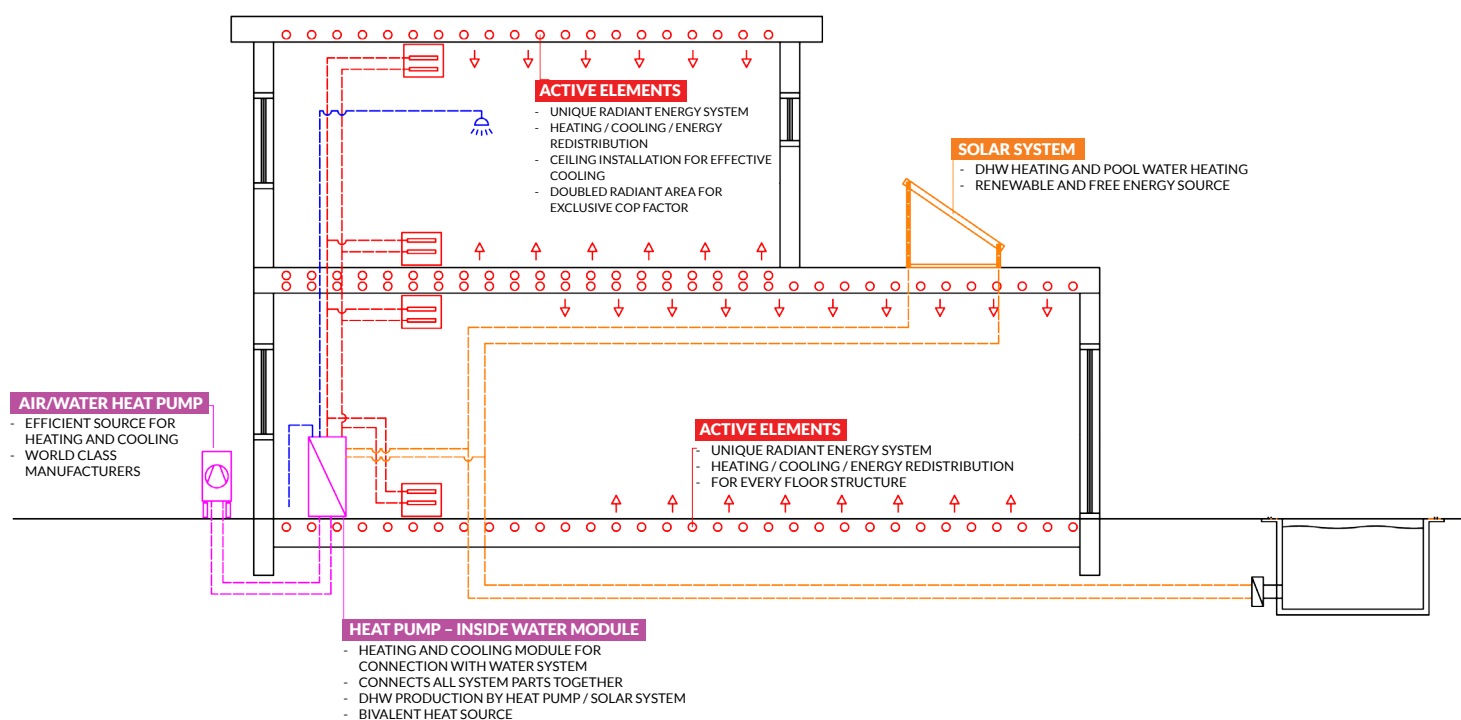
**THE BOTTOM LAYER WORKS WITH A TEMPERATURE UP TO 22°C, WHERE YEAR-ROUND ACCUMULATION OF WASTE HEAT TAKES PART.**

# PERFORMANCE OF THE SYSTEM

## SUMMER



## WINTER



# SYSTEM COMPONENTS

## 1 PIPING

A unique system of flexible pipes allows the installation of radiant heating and cooling systems in the most demanding conditions. Piping can be laid in a standard screed, anhydrite and cement liquid screeds, thin screeds up to 15 mm in height, into walls and ceilings or massive structures for a concrete core activation.

### SPECIFICATION

Diameter out	10 mm
Diameter in	6 mm
Material	EPDM
Application	heating and cooling
Max pressure	6 bar
Max temperature	+90°C

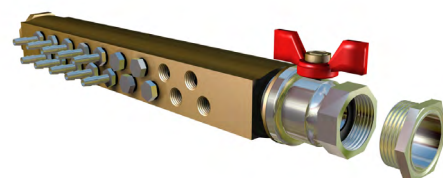


## 2 DISTRIBUTOR

Brass distributor for hot water radiant underfloor heating system AE is used to connect the distributions of heating fluid in the individual piping circuits.

### SPECIFICATION

Diameter in/out	46/26 mm
Connection	3, 6, 12, 18, 24
Material	brass
Application	heating and cooling
Max pressure	10 bar
Max temperature	+120°C



## 3 COMBI STATION

The station provides the function of heating and cooling a building. It is connected to sources. It includes a stainless steel plate heat exchanger, efficient circulation pump and safety assembly. It is manufactured completely in stainless steel design.

### SPECIFICATION

Model	Combi S, M, L
Power	7, 12, 17 kW
El. Connection	230 V, 45 W
Max pressure	3 bar
Max temperature	+90°C
Dimensions	440 x 930 x 280 mm
Ingress protection	IP 44
Pipe connections	3/4" / DN20
Material	stainless steel, brass, bronze
Application	heating and cooling



## 4 ELECTRA STATION

The station provides complete functionality for heating the building and is useful also as bivalent source for a heat pump. It contains its own electric boiler, efficient circulation pump and safety assembly. It is manufactured completely in stainless steel design.

### SPECIFICATION

Model	Elektra 6	Elektra 9
Power	6 kW	9 kW
El. Connection	400 V 3/N/PE	3f 230 V AC
Max pressure	3 bar	4 bar
Max temperature	+60°C	+90°C
Working temperature	20-57°C	34-75°C
Dimensions	440 x 930 x 280 mm	
Ingress protection	IP 44	
Pipe connections	1" / DN25	
Material	stainless steel, brass, bronze	
Application	heating	



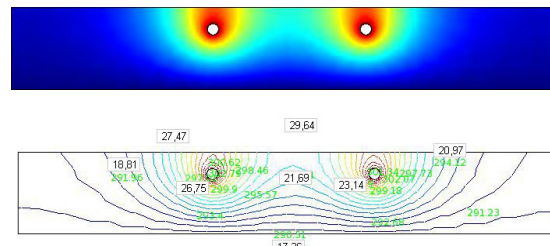


## MERITS

## 1 LOW TEMPERATURE SYSTEM

AE is an extremely low temperature system of hot water underfloor heating. It saves energy due to the low temperature of water in the piping. This is achieved by a small temperature gradient (3 K) and the possibility of laying pipes directly beneath the top layer of the floor. For heating the water temperature needs to be in the range of 26 - 34°C.

The low temperature of the heating water naturally reduces heat transfer from the building to the outdoor environment and enables the redistribution of heat inside the building. The underfloor heating system also achieves the same thermal comfort in a room at a temperature of 1 - 2°C lower compared to conventional heating radiators. This corresponds to a 6 - 12 % saving of heat.



## 2 TEMPERATURE SELF-REGULATION

The redistribution of heat is a process by which the heat gains in a room or a building are transferred to another room or building, which is cooler. During sunny days, especially in the transitional heating season (spring and autumn), the system will automatically turn off the heat source. When a certain part of the building warms up by sunshine, its other parts will automatically get heated too. This is happening thanks to the constant circulation of water in the system between all parts of the building. This process saves 5 - 10 % of the cost of heating throughout the season. Conventional underfloor heating systems or radiators do not allow this due to higher operating temperatures and switching circulation on and off.

### 3 SAVE YOUR ENERGY

With the Active Elements systems you are guaranteed to save more than 60% of energy costs compared to traditional energy systems. Our consultancy, the low-temperature distribution systems from Active Elements and combined with the right heat source will reduce the energy costs and future proof it for the coming centuries. The system itself is already below today's regulation from the European Union. The operating costs from our concept is so low, that when it's time to invest in a new heat source, it's already paid back from a long time ago.



## 4 GREAT INDOOR CLIMATE

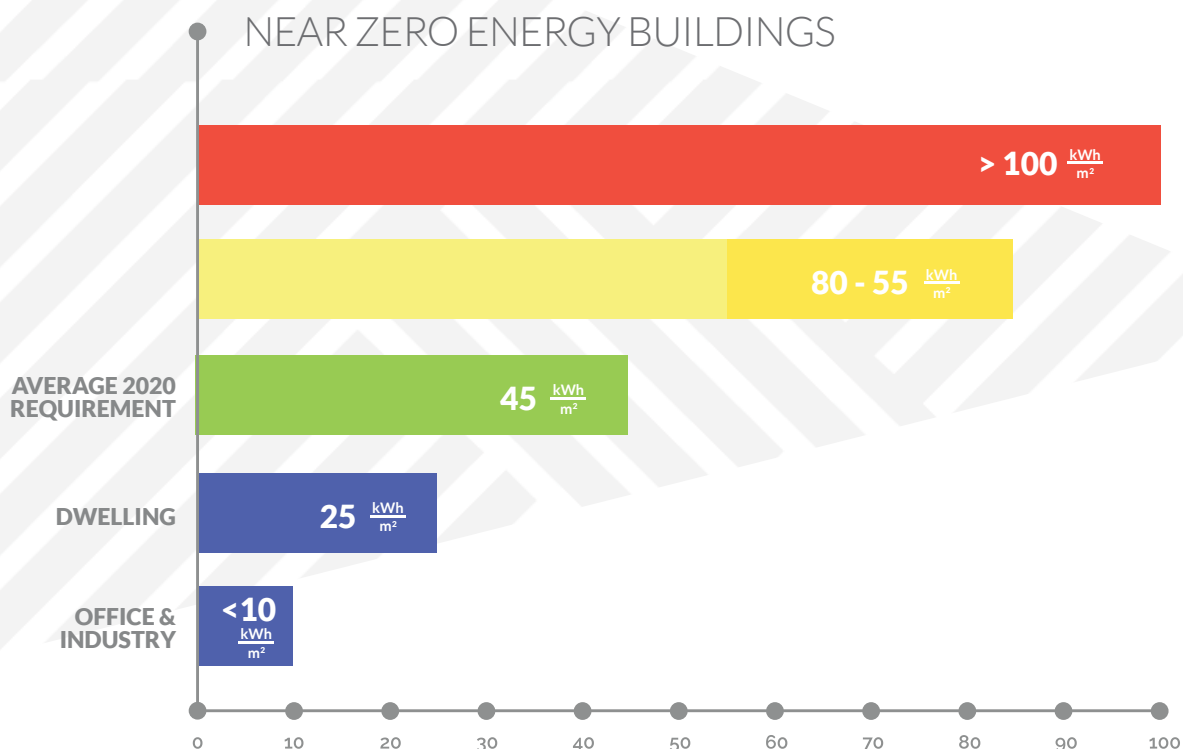
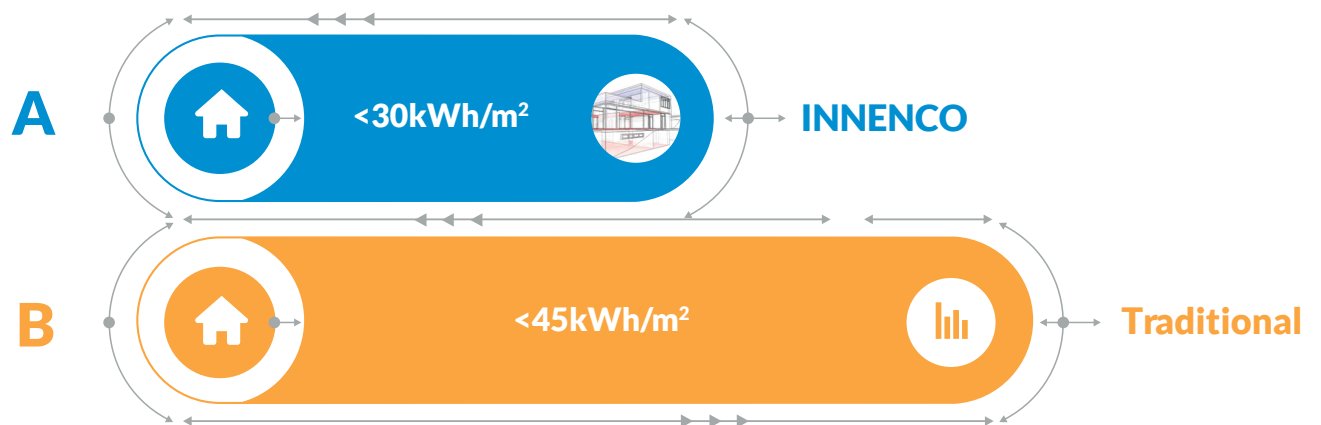
The system has an extraordinary capability to maintain the internal temperature smoothly and comfortably. This reduces the generation of dust, caused by air convection due to convection heating, and therefore creates a healthy microclimate in the building. All our references are so happy about the radiant effect caused by the distribution system, that they prefer to have their traditional air convection switched off, because of the natural radiation.



# RESULTS OF SOLUTION

EU requirements 2017  
(Based on EU-directives)

EU Near Zero Buildings 2020  
(Based on EU-directives)



Suitable both for new construction and **RENOVATION**

Low height up to 15 mm

An innovative **SWEDISH TECHNOLOGY**

Higher COP for heat pumps

**LIFETIME** of the pipes is 80 years

Environmentally friendly product

Quick response of the system

**REDISTRIBUTION** of heat in the building

Allows passive cooling in summer



WORKS FOR  
**YOUR SAVINGS**

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**WWW.INNENCO.COM**