



INNSJØ

Passive cooling ceilings manufacturer

Elevating indoor climate



INNSJO

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Find your comfort zone

Every day, we have a certain amount of energy that we use to make decisions and perform daily tasks and activities. In order to maintain mental and physical balance, it is essential to create a space conducive to full regeneration – a place where you can achieve a state of deep relaxation.

We understand that your home should be just such a place. That is why we have designed a passive ceiling cooling system that operates completely discreetly and really changes the feeling of comfort in interiors.

Our cooling panels, integrated into the suspended ceiling structure, remain invisible to the eye. They operate in absolute silence – without noise, vibration or air currents. Using, for the most part, the phenomenon of natural heat exchange through radiation, ceiling cooling guarantees comfort while saving energy.

This is how INNSJO cooling ceilings work – silently.
Discover the solution for your interiors.

Thermal comfort

The way our bodies and senses react to air circulation caused by air conditioning differs significantly from the perception of passive ceiling cooling – this difference directly affects our subjective sense of comfort.

Thermal comfort is a state in which we feel that the environment is thermally neutral to us, we do not feel cold or too warm.

This is a subjective state that is directly influenced by environmental factors: air temperature and humidity, the temperature of surrounding surfaces, and air flow velocity. Individual parameters such as metabolic activity and clothing insulation also influence our perception of comfort.



Air circulation at a temperature even 10–15°C lower than the surface of our bodies, determined by the operation of the air conditioner, causes local cooling of the skin, activating thermoreceptors and autonomic reflexes such as vasoconstriction and increased muscle tension. Local cooling combined with constant gusts of cool air intensifies heat loss by our body, which can cause subjective discomfort, exacerbate symptoms in people with chronic joint pain and irritate the respiratory tract. As a result, even at an acceptable average room temperature, local temperature differences and intense air movement around our bodies negatively affect our perceived thermal comfort.

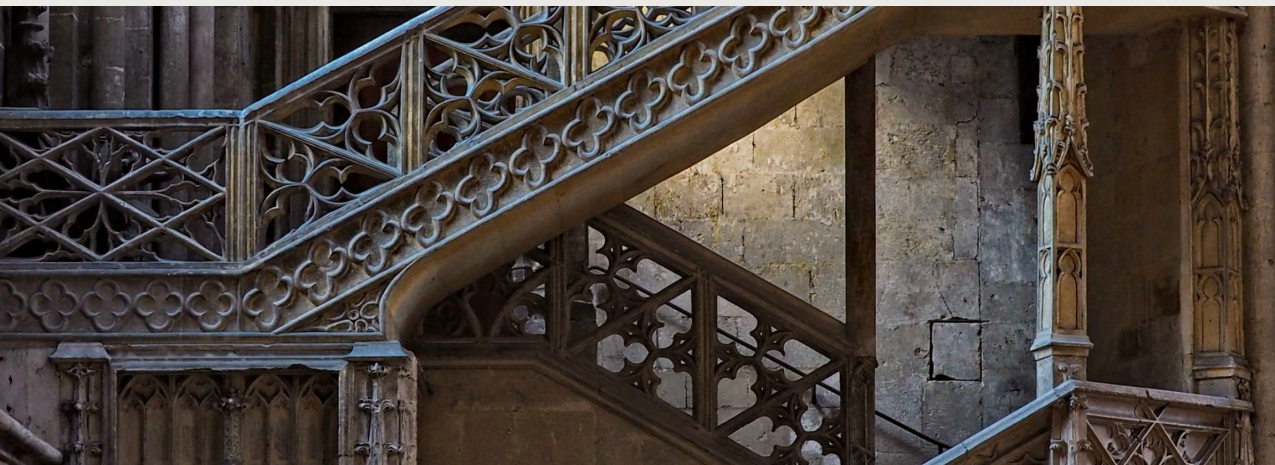
Cooling without air currents

INNSJO passive ceiling cooling works differently than conventional air conditioning. The ceiling surface absorbs energy from the environment mainly through thermal radiation (approx. 70-80% of the total heat flux). The rest is done by natural, imperceptible convection, which involves the air subtly washing over the cool surface of the ceiling and then falling back down by convection. The heat from our bodies and other surfaces in the room is absorbed by the surface of the cooling ceiling, which leads to a healthy, even reduction in its temperature.

This is exactly the mechanism we experience on a sunny winter day in the mountains: despite the sub-zero air temperature, direct sunlight keeps us warm. Solar energy reaches the surface of our body through radiation, bypassing the cold air. Radiant ceiling cooling works in an identical way—except the vector is reversed: the ceiling absorbs energy from our body rather than emitting it toward us.

Closer to nature than you think

We know a similar effect from historical buildings with thick stone walls in the hot cities of Southern Europe. When it is scorching hot outside and we enter a cathedral, castle, or other similar building, we immediately feel relief and a pleasant coolness. This is not because the air is actively cooled, but because the massive structural partitions have such high thermal inertia that they cannot heat up during the daily cycle. Their interior surfaces remain cool, and our body begins to release heat to them through radiation—just like in the case of ceiling cooling. It is this subtle, natural energy transfer that gives us an immediate sense of comfort in such interiors, even though the air temperature may be only slightly lower than outside.



The INNSJO ceiling acts as a large-surface energy absorber. Occupants and interior furnishings radiate their excess heat toward the cool surface of the ceiling. This process allows for thermal comfort even at higher indoor air temperatures, which is unachievable with conventional air conditioning.

An energy-efficient alternative

The basis for the efficiency of ceiling cooling is the method of heat exchange through radiation.

This phenomenon involves the absorption of thermal energy from our bodies and other surfaces in the room by the cool surface of the ceiling, rather than cooling the air alone. As a result, thermal comfort is achieved at a higher ambient air temperature. It is assumed that thanks to this specific feature, energy savings can reach up to 40% compared to conventional methods of air conditioning rooms.

An additional source of savings is the cooling medium itself. Water, thanks to its many times higher heat capacity than air, transports significantly more energy for the same volume. This means lower transmission losses and higher efficiency of the entire system compared to systems based on the distribution of cooled air.

Znakomita współpraca z pompami ciepła

Higher COP

The operation of the ceiling cooling system at a higher supply water temperature is also key to the energy balance. Unlike fan coil units, ceiling cooling allows heat pumps to operate at a significantly higher coefficient of performance (COP). It also enables extensive use of ground cooling (free cooling) without energy-intensive compressor operation. The whole system is complemented by the absence of fans, which eliminates additional electricity consumption and minimises operating costs.

Regeneration of the ground source heat pump's collector

In the passive operating mode of a ground source heat pump, cooling a house with a ceiling system can be virtually free. Electrical energy is required only to power the circulation pumps and, if applicable, the electric actuators for mixing or zone valves. Furthermore, operating a ground source heat pump in the summer helps regenerate the ground source (heat collector), which pays off in the winter with higher heat pump efficiency during heating.



INNSJO passive cooling

What is ceiling cooling?

Unlike air conditioners or fan coil units, which cool the air while causing intense circulation in the room, INNSJO ceiling cooling is mostly achieved through radiation. Approximately 70% of the heat energy is transferred to the cool ceiling in the form of radiation in the infrared spectrum, and 30% through natural convection.

Its intensity and share are so insignificant that it remains imperceptible to humans.

This fundamental difference in the physics of the process means that ceiling cooling does not cause unpleasant air movement forced by fans. All surfaces and users' bodies are cooled in a natural, subtle and quiet way – similar to how it happens in nature.

How does it work?

INNSJO ceiling cooling works thanks to a water installation that works with a heat pump or other similar device. Low-temperature water flows through panels optimised for this purpose, cooling the entire ceiling surface. This creates a pleasant climate for us and our pets. Your favourite activities take on a new quality when the ambient temperature does not distract you. You don't have to think about it. You don't have to adjust anything. You just relax. INNSJO ceiling cooling works silently in the background without causing any air movement, even at night, guaranteeing an undisturbed sleep.



Two functions



The INNSJØ ceiling installation is a year-round solution – it cools effectively in summer and can be used for low-temperature heating in winter. As a result, a single, simple hydraulic system combined with a heat pump provides full control over the indoor climate throughout the entire year, offering a modern alternative for contemporary low-energy and passive buildings.

In heating mode, the ceiling surface transfers energy to the environment through infrared radiation. It is worth noting that although the most physiologically natural temperature distribution is achieved with underfloor heating, in modern, well-insulated buildings these differences become almost imperceptible to the user. With the building's low heat demand, a heating ceiling is an excellent solution for warming interiors, offering unique advantages:

- Fast response and operational savings: The drywall boards recommended for ceiling cooling have significantly lower thermal inertia compared to underfloor heating embedded in a thick screed. This enables responsive, precise control of operating parameters, helping to avoid system oversizing and generating substantial energy savings. Additionally, the system operates efficiently at very low supply temperatures (as low as 28–35°C), thanks to the minimal thermal resistance of the boards. This ensures optimal and highly efficient cooperation with a heat pump, reducing heating costs.
- Interior aesthetics: Eliminating radiators and other HVAC devices provides complete freedom in interior design, which is especially important in spaces with large glazing and modern architectural concepts.
- Investment savings: In contemporary construction, this system can successfully cover the entire heating demand of a building, eliminating the need for an additional heating installation.

INNSJO ceiling panels are a versatile solution that adapts to your needs regardless of the season. The same installation can serve a dual function – heating in winter and cooling in summer.

Cooling

During the summer heat, the system will provide pleasant cooling of the rooms – silently and without draughts.

Heating

In the winter months, the same panels will heat the interior, responding immediately to the needs of users.



Which spaces feature INNSJO ceiling panels?

Ceiling cooling is a universal solution that works perfectly in residential, commercial and public buildings, providing comfort without noise or draughts.

Residential construction

- detached houses - especially energy-efficient and passive
- premium apartments - where silence and comfort are important
- temporary accommodation buildings - hotels, guesthouses, holiday cottages

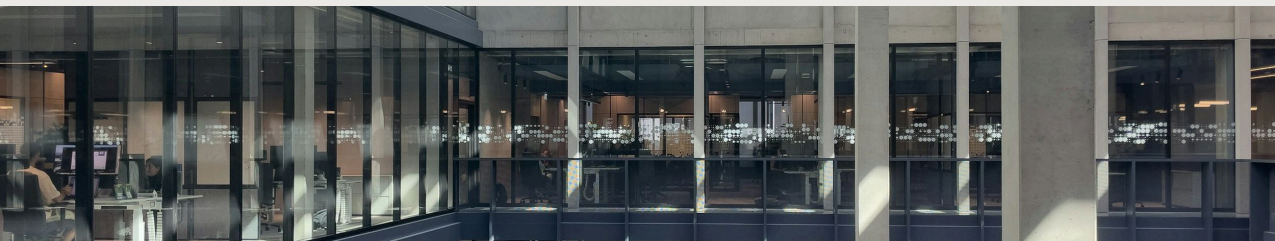


Traditional,
modular,
light-frame construction



Commercial and public buildings

- medical facilities - doctors' offices, clinics, treatment rooms and places with increased hygiene requirements
- business centres - conference rooms, open-plan offices, offices
- cultural institutions - libraries, museums, art galleries
- wellness facilities - beauty salons, spas, massage parlours
- educational facilities - lecture halls, reading rooms, computer rooms



Installation of a suspended ceiling with INNSJO cooling panels

Drywall panels, under which cooling panels are hidden, can be finished in any way. They can be painted, wallpapered, textured with plaster and stucco elements in accordance with the manufacturer's recommendations. In the case of large-area stucco elements made of plaster or foam-based materials or MDF, such as rosettes, it is recommended to bypass this area in the ceiling cooling installation diagram.

Ceiling cooling and other suspended ceiling elements

The ceiling cooling system successfully coexists with other technical installations, such as lighting, ventilation and security systems, integrating into a single suspended ceiling plane. However, it is important to remember the overriding principle: larger ceiling cooling area, higher efficiency. Therefore, in order to achieve an optimal design, it is worth coordinating the placement of other elements in such a way as to maximise the area covered by cooling panels while maintaining their full functionality.



Advantages of ceiling cooling

For your health

The dominance of heat exchange through radiation in passive room cooling minimises convective air movements. Dust particles, allergens and other pollutants are immobilised, whereas in conventional air conditioning, which causes air circulation in rooms, they are constantly stirred up and circulated in the area where people are present, which is crucial for people suffering from allergies and asthma. In addition, passive ceiling cooling does not expose the body to thermal shock and localised cooling, which is particularly appreciated by people struggling with rheumatoid joint pain.

Hygienic

An important advantage of a cooling ceiling is that it works on the principle of a dry cooler – there is no condensation of water vapour contained in the air on its surface.

This has two benefits: firstly, it eliminates the humid environment conducive to the growth of microorganisms, and secondly, it allows rooms to be cooled without changing the humidity of the air, i.e. without dehumidifying it. It is precisely excessively dry air that is a common cause of discomfort and even respiratory diseases in people staying in rooms with conventional air conditioning.

Maintenance-free and reliable

INNSJO ceiling cooling has been designed for decades of trouble-free operation. The system has no moving parts, such as fans or motors, which eliminates the risk of typical mechanical failures, and the entire installation is based on durable hydraulic components with a service life of over 50 years. The ceiling cooling installation has no filters that require periodic replacement, mould removal or other costly maintenance. Once commissioned, it becomes a completely maintenance-free part of the building's infrastructure.

Aesthetic

Ceiling cooling is a solution designed for modern, demanding architecture, where technology is meant to serve the user while remaining hidden. The entire installation is integrated into the ceiling structure, becoming completely invisible. The elimination of hanging air conditioning units and radiators frees up space and restores the original harmony of the interior. This opens up unlimited design possibilities for investors – the walls remain at the designer's full disposal, and the glazing is free from obscuring heating devices. It is the perfect complement to minimalist designs, where every detail counts and comfort is tangible but invisible.

Silence that transforms your senses

INNSJO redefines the concept of acoustic comfort in a building. Unlike traditional air-conditioning systems, where the noise of fans, moving louvers and airflow is clearly audible, ceiling cooling operates in complete silence. With no mechanical devices present in the room, the system becomes acoustically invisible. This silence creates ideal conditions for deep, restorative sleep and supports focus and intellectual work by eliminating the distracting background noise typical of standard HVAC systems.

About INNSJO

INNSJO is an invitation to slow the rhythm of everyday life — to shape spaces that embrace you with calm and offer a place where your senses can truly rest.



Innsjø — in Norwegian, it means “lake.” Large water bodies create an exceptional microclimate in their vicinity. Water absorbs the sun’s energy and releases it slowly, softening extremes. Thanks to this, summers and winters become gentler, and sudden weather shifts or rapid temperature swings occur far less often. It is nature’s own equilibrium.

In a world that moves ever faster, we choose harmony over haste. Great achievements are born from small, consistent actions — a principle nature has followed since the beginning. INNSJO draws inspiration from these mechanisms: subtlety, silence, and perfect balance. Together, we create a climate, one that helps you find balance again.



Book a consultation

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Technical and product
information

INNSJO Como
INNSJO Inari



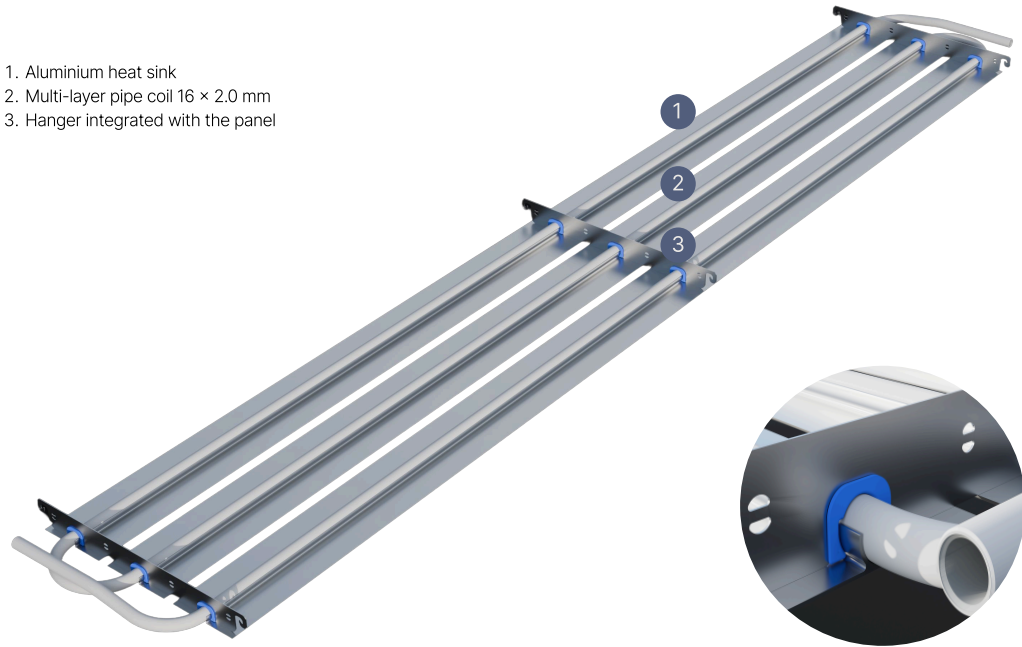
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INNSJO Como panel construction

Passive, hydronic ceiling panels designed for drywall installation in cross-shaped suspended ceilings

The product range consists of six sizes, differing in length (see table on the opposite page). Each panel is equipped with a plastic pipe coil and heat exchangers with a cross-section optimized for thermal performance. The panels come with factory-integrated hangers that allow installation between CD60 load-bearing profiles in a cross-suspended ceiling.

Thanks to high-quality components, their precise fit, and the use of an aluminum profile acting as a heat radiator, the INNSJO cooling system offers excellent performance while maintaining a self-weight not exceeding 6 kg/m².



Supply water temperature

The system is supplied with water cooled by a heat pump.

The ceiling panels are supplied with a medium at a temperature determined on the basis of measurements the humidity and air temperature in the room. This is usually between 14 and 18°C.

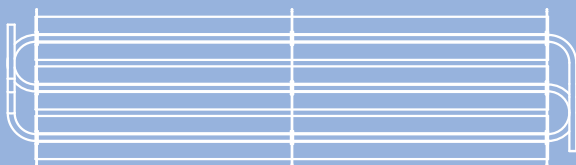
Thanks to the relatively high supply temperature of the ceiling cooling system, heat pumps achieve a very good COP, resulting in their efficient and economical operation.

INNSJO Como ceiling panel series

Como12



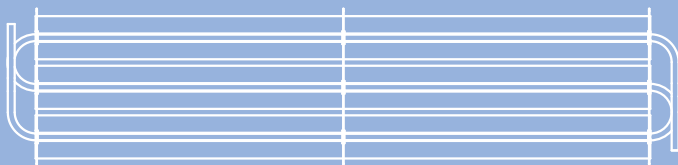
Como23



Como13



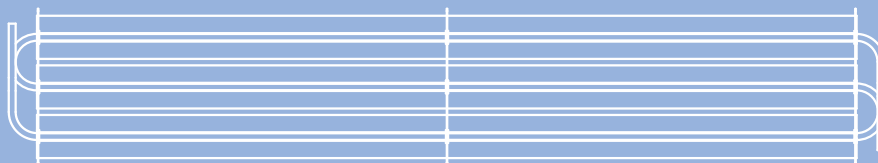
Como34



Como14



Como1

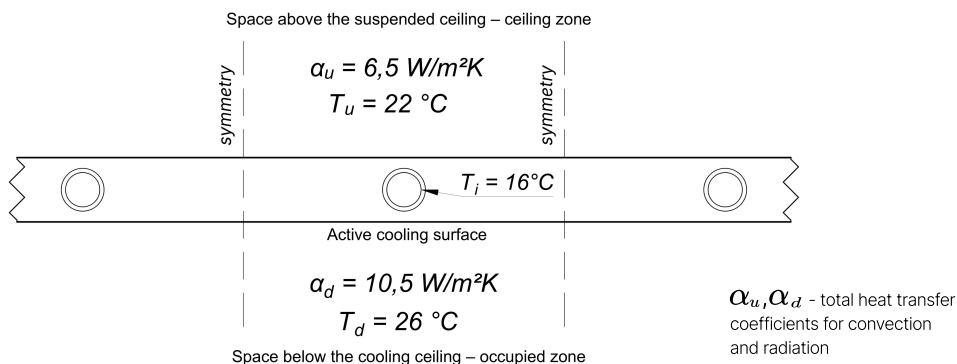


Type	Total panel length (mm)	Pipe spacing (mm)	Spacing between CD60 profiles (mm)	Number of hangers (pcs.)	Weight (kg)
Como 14	595 ±20	115 ±1	400	2	1,1 ±0,1
Como 13	832 ±20	115 ±1	400	2	1,5 ±0,1
Como 12	1070 ±20	115 ±1	400	2	1,9 ±0,1
Como 23	1308 ±20	115 ±1	400	3	2,4 ±0,2
Como 34	1545 ±20	115 ±1	400	3	2,8 ±0,2
Como 1	2020 ±20	115 ±1	400	3	3,5 ±0,2

Cooling capacity of INNSJO Como ceilings

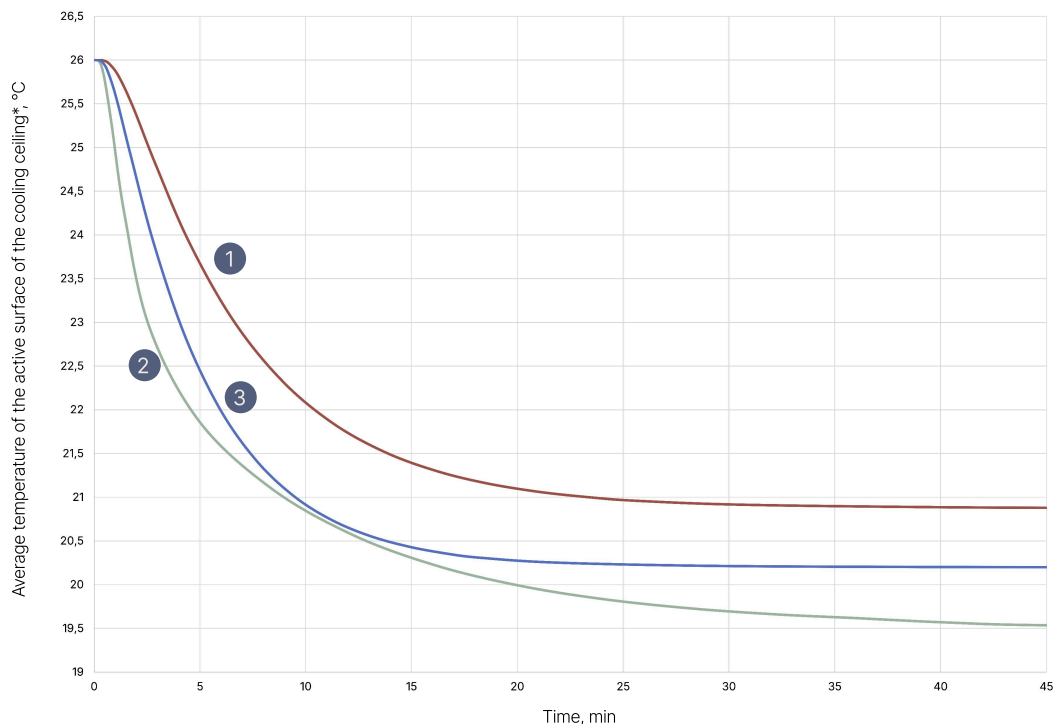
The basic thermal parameters of the INNSJO Como ceiling cooling system were developed on the basis of conducted thermal-flow simulations.

The calculations were performed for the boundary conditions presented below:



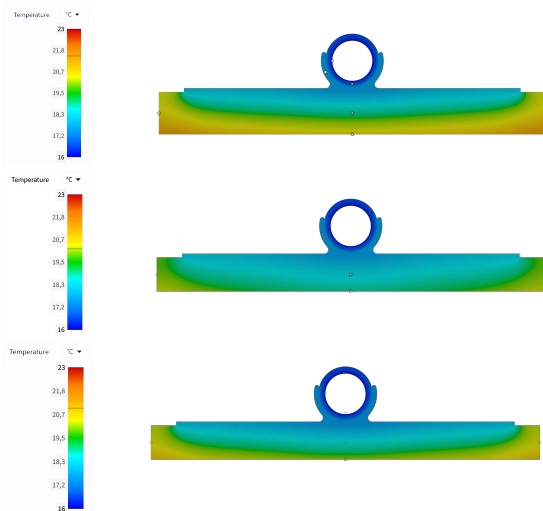
The calculations were performed for three different cases, differing in the type of finishing panel:

1. Standard 12.5 mm plasterboard
2. 10 mm plasterboard with expanded graphite additive
3. 10 mm plasterboard with with increased thermal conductivity/ Fermacell gypsumfibre board



* Change in the average temperature of the active ceiling surface, determined under transient conditions

Temperature maps of cross-sections in a steady state for each of the analysed cases



1. case

INNSJO Como finished with a standard 12.5 mm thick plasterboard.

Average temperature of the active surface of the ceiling in a steady state: **20,9 °C**

2. case

INNSJO Como finished with 10 mm plasterboard with graphite additive.

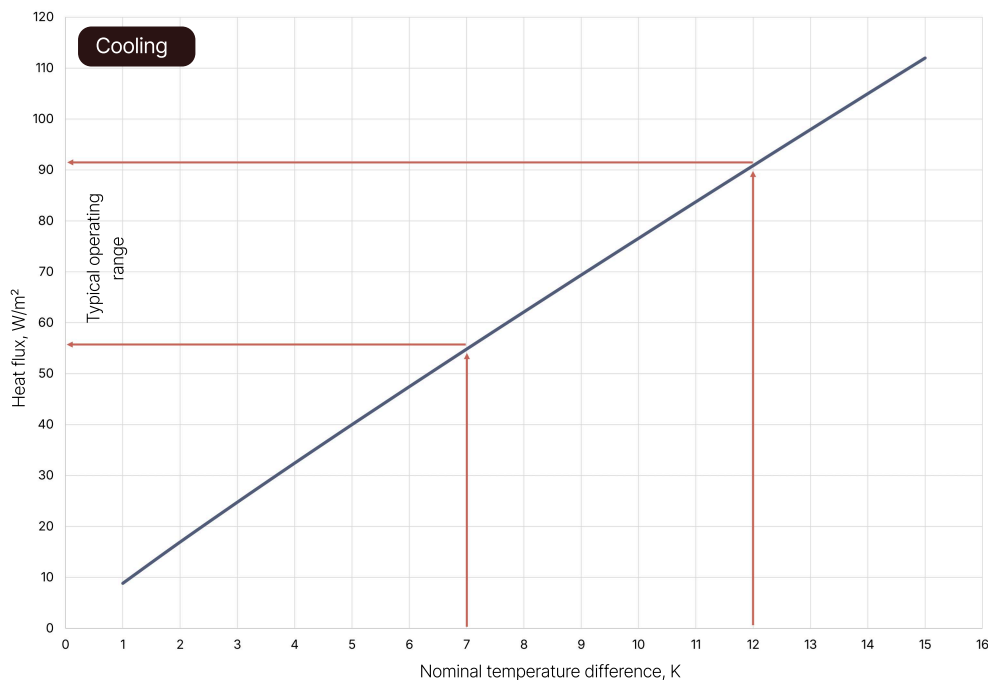
Average temperature of the active surface of the ceiling in a steady state: **19,5 °C**

3. case

INNSJO Como finished with 10 mm plasterboard increased thermal conductivity.

Average temperature of the active surface of the ceiling in a steady state: **20,2 °C**

Calculated heat flux



* Difference between the average water temperature in the pipes and the ambient temperature expressed in Kelvin.

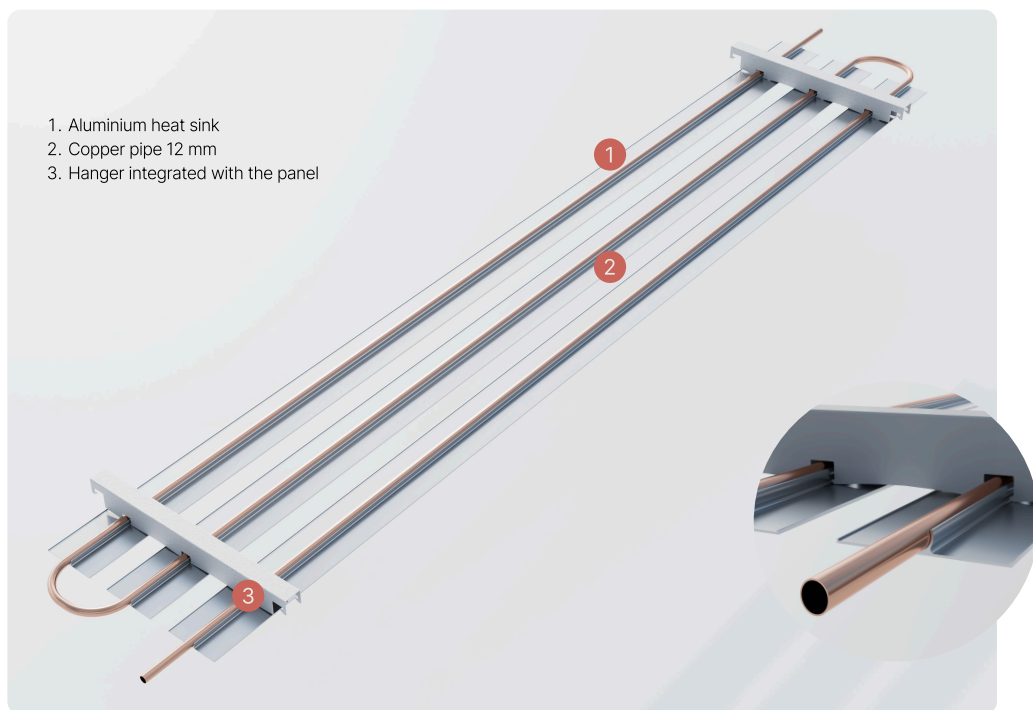
** Heat flux determined by comparison based on CFD simulation for INNSJO Como ceiling cooling, finished with 10 mm plasterboard with graphite additive - 2. case.

INNSJO Inari panel construction

Passive, hydronic ceiling panels designed for drywall installation in cross-shaped suspended ceilings

The INNSJO Inari product line does not have a fixed range of standard sizes. The length of the panels is adjusted individually to the installation conditions and manufactured exclusively for the needs of a specific project. Producing the panels based on individual design requirements ensures an optimal ratio of active surface area to the total ceiling surface.

INNSJO Inari panels are made from materials with a high thermal conductivity coefficient, in particular using coils made of copper pipes and aluminium heat sinks, which results in high overall efficiency of the ceiling cooling system. Additionally, the panels are equipped with factory-integrated hangers that allow installation between CD60 load-bearing profiles in a cross-suspended ceiling structure.



Types of plasterboards and pipe spacing

INNSJO Inari panels are designed for installation both with solid drywall boards and with perforated boards that provide acoustic damping properties. When solid boards are used, the spacing between the CD load-bearing profiles is 416 mm, whereas with perforated finishes this spacing is 333 mm.

In each of the above variants, it is possible to manufacture panels with a pipe spacing smaller than the standard. Reducing the distance between the pipes increases the overall performance of the ceiling cooling system.

INNSJO Inari ceiling panel series

Inari93



Inari124



Inari92



Inari123



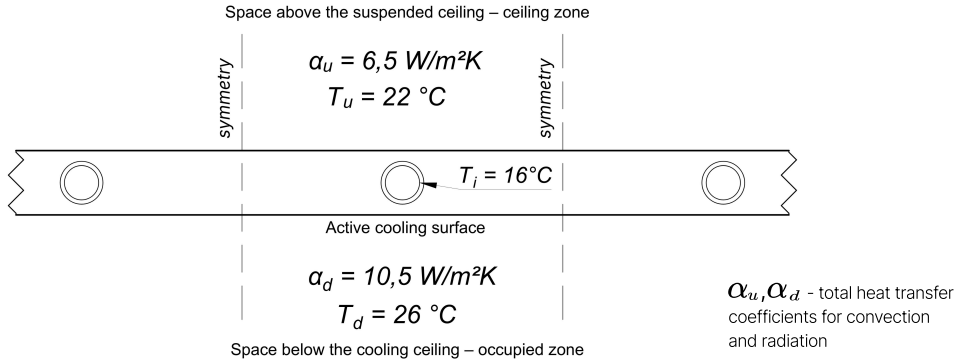
Type	Total panel length (mm)	Pipe spacing (mm)	Spacing between CD60 profiles (mm)	Number of hangers (pcs.)	Weight (kg)	Finishing layer
Inari93	500 - 3000	88 ±1	333	2 or 3	1,9-6 ±0,1	Perforated, acoustic plasterboard
Inari124	500 - 3000	120 ±1	416	2 or 3	2,5-8 ±0,1	Plasterboard
Inari92	500 - 3000	88 ±1	333	2 or 3	2,2-5 ±0,1	Perforated, acoustic plasterboard
Inari123	500 - 3000	120 ±1	416	2 or 3	1,9-6 ±0,1	Plasterboard

INNSJO Inari panels are available as bespoke production with individual quotations.

Cooling capacity of INNSJO Inari ceilings

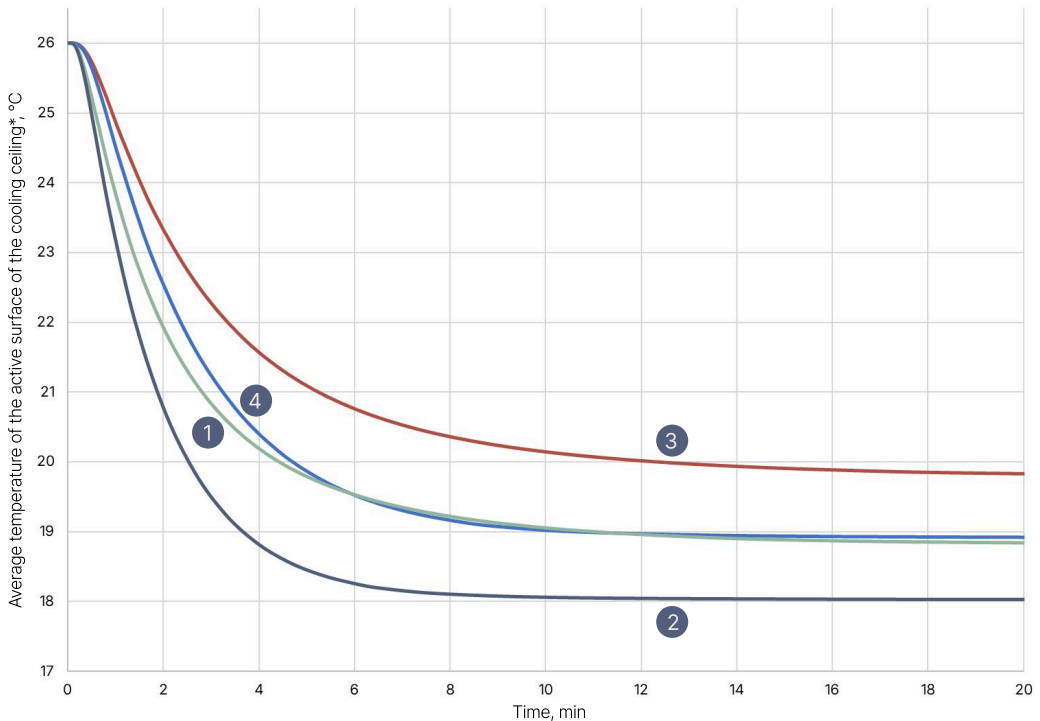
The thermal inertia of the INNSJO Inari ceiling cooling system has been developed on the basis of conducted thermal-flow simulations.

The calculations were performed for the boundary conditions presented below:



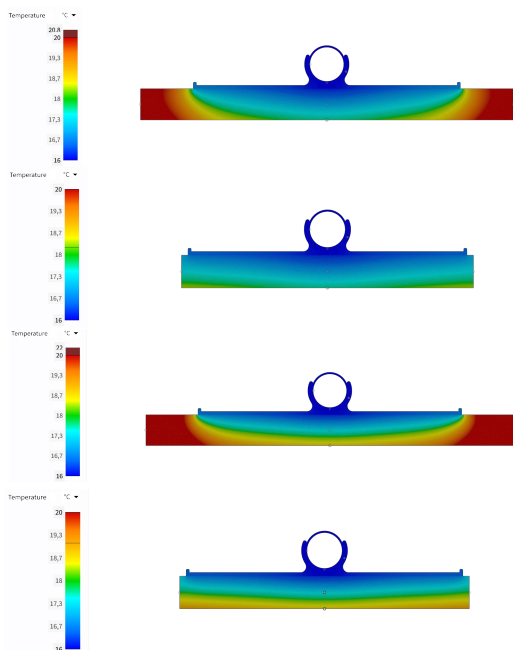
The average ceiling surface temperature values were determined for the same system in two variants of pipe spacing and types of plasterboards:

1. Case – 10 mm graphite-enhanced plasterboard, pipe spacing: 120 mm
2. Case – 10 mm graphite-enhanced plasterboard, pipe spacing: 90 mm
3. Case – 10 mm plasterboard with increased thermal conductivity, pipe spacing: 120 mm
4. Case – 10 mm plasterboard with increased thermal conductivity, pipe spacing: 88 mm



* Change in the average temperature of the active ceiling surface, determined under transient conditions

Temperature maps of cross-sections in a steady state for each of the analysed cases



1. case

INNSJO Inari with a pipe spacing of 120 mm, finished with 10 mm graphite-enhanced plasterboard.
Average active ceiling surface temperature in steady-state conditions: **18,8 °C**

2. case

INNSJO Inari with a pipe spacing of 88 mm, finished with 10 mm graphite-enhanced plasterboard.
Average active ceiling surface temperature in steady-state conditions: **18,0 °C**

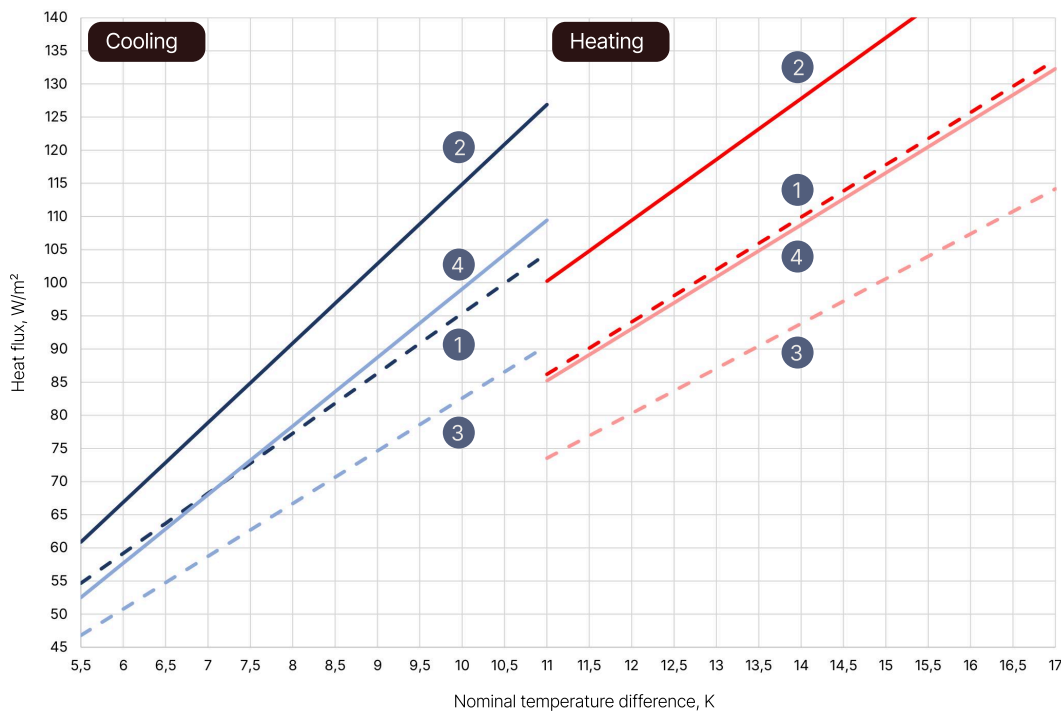
3. case

INNSJO Inari with a pipe spacing of 120 mm, finished with 10 mm plasterboard with increased thermal conductivity.
Average active ceiling surface temperature in steady-state conditions: **19,8 °C**

4. case

INNSJO Inari with a pipe spacing of 88 mm, finished with 10 mm plasterboard with increased thermal conductivity.
Average active ceiling surface temperature in steady-state conditions: **18,9 °C**

Heat flux



* Difference between the average water temperature in the pipes and the ambient temperature expressed in Kelvin.

Drywall suspended ceiling

INNSJO cooling panels are designed for installation in a standard cross-suspended ceiling system. Their low weight does not require any additional reinforcement — the spacing of the main and secondary profiles remains standard. The only essential requirement is maintaining a 400 mm centre-to-centre spacing of the load-bearing profiles.



Cross-suspended ceiling structure.



INNSJO ceiling panels installed within the ceiling structure.



Appliance:

Ceilings
Walls
Slopes

1. Cross-suspended ceiling structure
2. INNSJO Como panels suspended from the load-bearing profiles
3. Finishing plasterboard – view of the ceiling from inside the room

To ensure optimal system performance and maintain the highest possible cooling efficiency, low-thermal-resistance drywall finishing boards should be used. Highly recommended are 10 mm plasterboard with increased thermal conductivity, or 10 mm boards containing graphite additives within their core.

Type of board	Thickness (m)	Thermal conductivity (W/mK)	Thermal resistance m ² K/W	Comment
Standard plasterboard board 12.5 mm	0,0125	0,25	0,05	Not recommended
Gypsum fibre board 10 mm	0,01	0,32	0,031	
Plasterboard with increased thermal conductivity 10 mm	0,01	0,3	0,033	Recommended
Plasterboard with graphite additive 10 mm	0,01	0,52	0,019	Recommended

Proper operation of the INNSJO ceiling cooling system

Preventing condensation of water vapour in the air

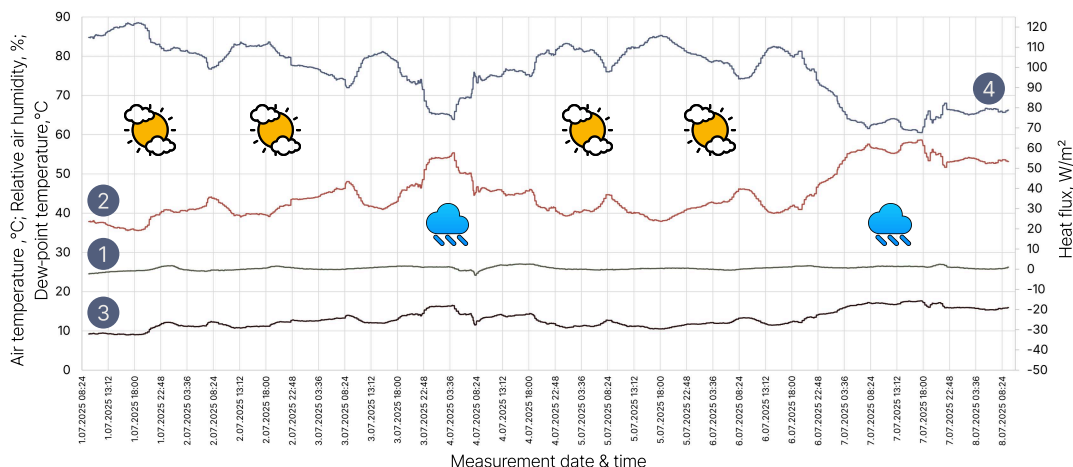
The foundation of safe operation of a ceiling cooling system is effective protection against water-vapour condensation. This is achieved through two proven approaches, depending on the type and use of the building or room:

1. **Residential buildings or commercial spaces with low occupant density (stable, low humidity)** – Safety is ensured by dedicated control automation that continuously monitors temperature and humidity in each room. The system constantly calculates the dew-point temperature and adjusts the supply-water temperature to maintain a safe margin (e.g., 1–2 K) above the condensation threshold.
2. **Rooms with high or unpredictable occupant density (variable, high humidity)** - Hybrid solutions managed by a BMS are recommended, combining passive ceiling cooling with air conditioning. When humidity rises rapidly, the air-conditioning system activates pre-emptively to dehumidify the air and enable continuous, efficient operation of the ceiling cooling system.

Active optimisation of cooling capacity

The control system does not operate solely in a defensive manner. Its second, essential function is to maximise cooling capacity. Whenever room conditions allow it (low dew-point temperature), the control automation dynamically lowers the supply-water temperature, maximising the performance of the ceiling cooling system while maintaining full operational safety.

1. Measured air temperature in the room.
2. Measured relative humidity of the room air.
3. Calculated dew-point temperature.
4. Calculated maximum cooling capacity of the INNSJO Como ceiling system.*



The chart presents the measured air temperature and relative humidity in a room without a ceiling cooling system, with a north-eastern exposure in Kraków, Poland, recorded between 1 and 8 July 2025.

Based on these measurements, the dew-point temperature was calculated, and from it the maximum possible cooling performance of the INNSJO Como ceiling system, shown on the secondary axis on the right-hand side of the chart.*

* Values determined based on the calculated heat-flux density

System control – ceiling cooling management

The safety and efficiency of a ceiling cooling system depend on one key factor: dynamic control of the supply-water temperature. Appropriate automation is essential to react to humidity changes in real time and protect the system from condensation forming on cooled surfaces. system operates preventively, avoiding moisture formation and ensuring the safety of the entire installation. At the same time, the automation maximises cooling performance by dynamically adjusting the supply-water temperature to the lowest possible yet safe level under the given conditions. To meet the diverse expectations of investors, we recommend two control standards:

- the basic one Olte system
- for users who require full Smart Home integration within a BMS environment.

Basic system control

olte

Olte is a wireless, pre-configured and easy-to-install control-automation system. Its purpose is to precisely measure air temperature and humidity, and to regulate the supply-water temperature of the ceiling cooling system so that it always remains above the dew-point temperature. All devices in the set communicate wirelessly, and the entire system can be operated through a convenient mobile application.

Integration with Building Management System

We offer full support in integrating our installations with Building Management Systems (BMS). An integrated system is about much more than just temperature control.

It serves as a central command hub that optimizes the entire facility's performance by linking ceiling cooling with systems such as: lighting, ventilation and Heat Recovery (HRV), shading systems (blinds and shutters), energy management and monitoring, security and access control.

We assist in integrating our ceiling cooling with management systems based on the most popular and reliable communication protocols, including: KNX, Modbus, DALI, Zigbee, and BACnet.

Common questions

- How long does the ceiling cooling system operate at a time?
- Are any special lighting fixtures required?
- Can I control each room individually?
- Is it possible to install a ceiling cooling system in a renovated building?

Visit our website
to learn more:





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