Energy Solutions

uponor

VARICOOL Opti Y

THE LAMELLAE COOLING SYSTEM FOR MAXIMUM COOLING CAPACITY

Our experience, your added value

Uponor Energy Solutions offer integrated concepts for energy solutions and support non-residential construction projects in all project phases starting with initial design up to building utilisation.

The solutions for building temperature control, energy supply and energy distribution ensure the most comfortable climate in living and work areas. They also optimise costs and contribute to reducing energy consumption and CO_2 emissions for sustaining a comfortable living environment.

You will receive an energy-efficient building tailored to your needs with virtually no maintenance and low operating costs – a building that offers its users an optimum and comfortable working environment all year round.

Solutions from Uponor Energy Solutions stand for excellent quality and ensure easy integration into the construction process.

We provide safe and efficient installation technologies for heating/cooling and for the installation of potable water which guarantee the long-term, sustainable and trouble free operation of your building – all at low maintenance costs.

- Energy-efficient and sustainable solutions
- High comfort for an optimum working environment
- Easy integration of the systems into the building process
- High reliability and low maintenance costs
- Technical support starting with the initial design up to installation and building utilisation

1. Feasibility analysis

Based on the customer's individual requirements in terms of efficiency, sustainability and energy efficiency, we provide targeted advice with respect to the most appropriate solutions for a building.

2. Solutions and concepts

Using advanced engineering software, we develop design proposals according to customer needs, taking into account the specific circumstances.

3. Technical planning

We transform ideas into technical implementation, taking into account all relevant data and the applicable standards. Our Uponor planning experts, who manage your specific project, have many years of experience.

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4. Installation and project management

We support your project team in planning, organization and in the management of resources. In close cooperation with neighbouring trades we provide for an optimum flow of materials and efficient and trouble-free installation.

5. Commissioning and handover

The systems undergo extensive testing and are commissioned by us before they are handed over to you.

6. Customer services

To ensure long-term system availability, we offer professional inspections and maintenance along with quality control using modern testing techniques, such as thermographs, flow measurements and water quality analysis.

VARICOOL Opti Y

VARICOOL Opti Y – the lamellae cooling system for maximum cooling capacity

System description and applications

VARICOOL Opti Y is a high performance lamellae cooling system that utilises an open construction method for cooling rooms mainly via free convection and radiation. Featuring a fine ribbed surface these cooling lamellae elements can be installed as individually suspended ceiling modules, as a flat lamellae ceiling or as a concealed installation above the ceiling grid in rooms of all kinds. Special characteristics are the high surface area-related and primarily convective cooling capacity along with a large open ceiling section. Sprinklers, smoke detectors air outlets, lighting fixtures, etc., can be installed in the intermediate spaces between the lamellae.
A combination of any air distribution system is also possible. The modular designed ceiling system is suitable for meeting heating requirements as well.

VARICOOL Opti Y as a flat high-performance lamellae ceiling

VARICOOL Opti Y as a cooling module above air permeable ceiling panels

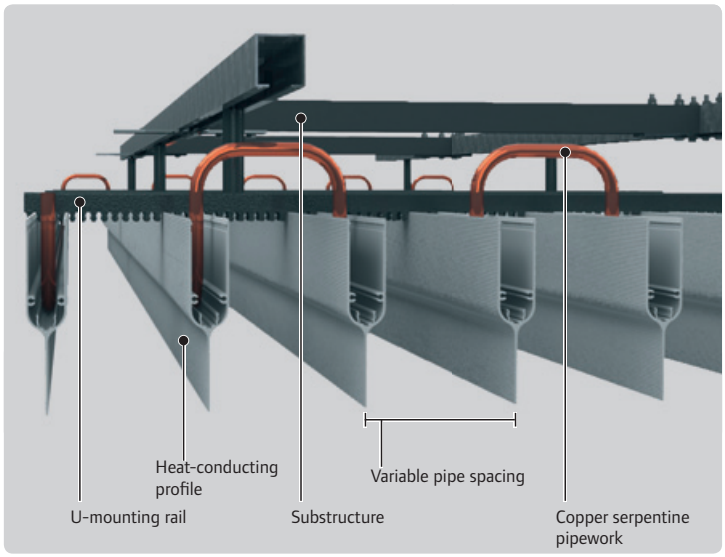
Your benefits

- High, noiseless cooling capacity without any draught
- Lamellae spacing of 100 to 150 mm allows for combination with ceiling fixtures such as sprinklers, lighting, etc.
- Compatible with any type of ventilation system
- Depending on the optical requirements, a visible or concealed installation is possible
- Modules with optional hinged folding frame
- Positive effect on the room acoustics

Typical applications include:

- Airports
- Television studios
- Exhibition halls
- Retail areas
- Show rooms
- Production facilities, etc.

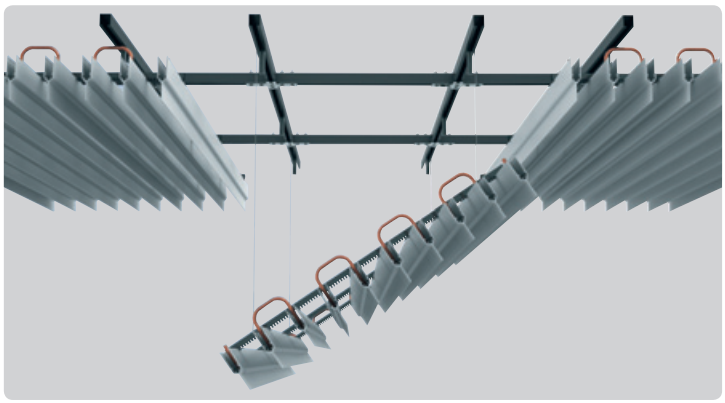
Design



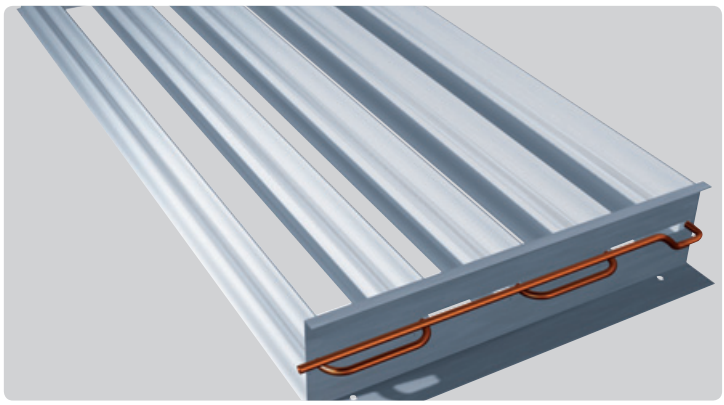
Structure of the VARICOOL Opti Y high performance cooling elements

The VARICOOL Opti Y high performance cooling elements are made of extruded aluminium sections (lamellae) with integrated pipe routing. Several parallel lamellae are factory-fitted with a copper serpentine pipework and interconnected. The elements can be easily suspended with threaded rods through slots in the U-mounting rail. The elements can be brought into exact position via a suitable support structure.

The elements mounted to the ceiling can be connected by means of flexible and oxygen diffusion tight connection tubes, which can be plugged together and connected to the power supply.



Suspended with wire cables VARICOOL Opti Y high performance cooling element



VARICOOL Opti Y as a heating/cooling module e.g. above air permeable ceiling panels or freely suspended in the room.

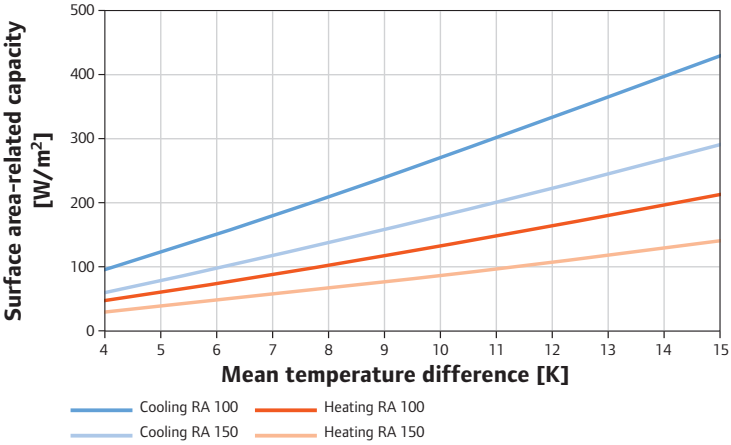
Several parallel lamellae with front end plates form a ceiling module which can be fixed with adjustable hangers to the ceiling.
These modules are installed for example above air permeable ceilings. Heating/cooling modules with diagonally mounted heat conducting lamellae (45 ° angle) can be implemented as an option.

Planning and dimensioning

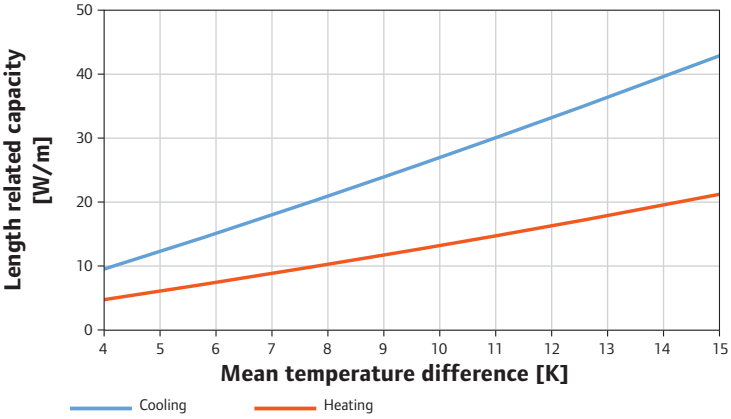
Services

The cooling and heating capacity of VARICOOL Opti Y high-performance elements is specified either according to length or surface area with pre-defined pipe spacing. Both values can be read from the diagrams below.

Heating/cooling capacity for system VARICOOL Opti Y
Pipe spacing 100 mm / 150 mm
Capacity reference: Number of profiles x pipe spacing x profile length [m]



Heating/cooling capacity for system VARICOOL Opti Y
Capacity reference: lfm profile length [m]



Surface area or length-related capacity - sample reading for RA 100 mm:

Surface area related cooling capacity 10 K	mean temperature difference approx. 275 W/m²
Length related cooling capacity at 10 K	mean temperature difference approx. 27.5 W/m²
Surface area related heating capacity at 15 K	mean temperature difference approx. 210 W/m²
Length related heating capacity at 15 K	mean temperature difference approx. 21 W/m²

Water volumes

The circulating water volume (mass flow) required for heating and cooling is calculated from the surface area-related capacity q and the desired temperature difference α_S between the forward and return flow (spread).

The amount of water is usually determined based on the following relationship when planning the cooling capacity of a cooling water temperature of approx. 16 ° C and a spread of 3 or 4 Kelvin:

$$\dot{m} = \frac{q \cdot 0.86}{\Delta\vartheta}$$

Building temperature control, energy supply and power generation with Uponor Energy Solutions everything under one-roof

Building temperature control

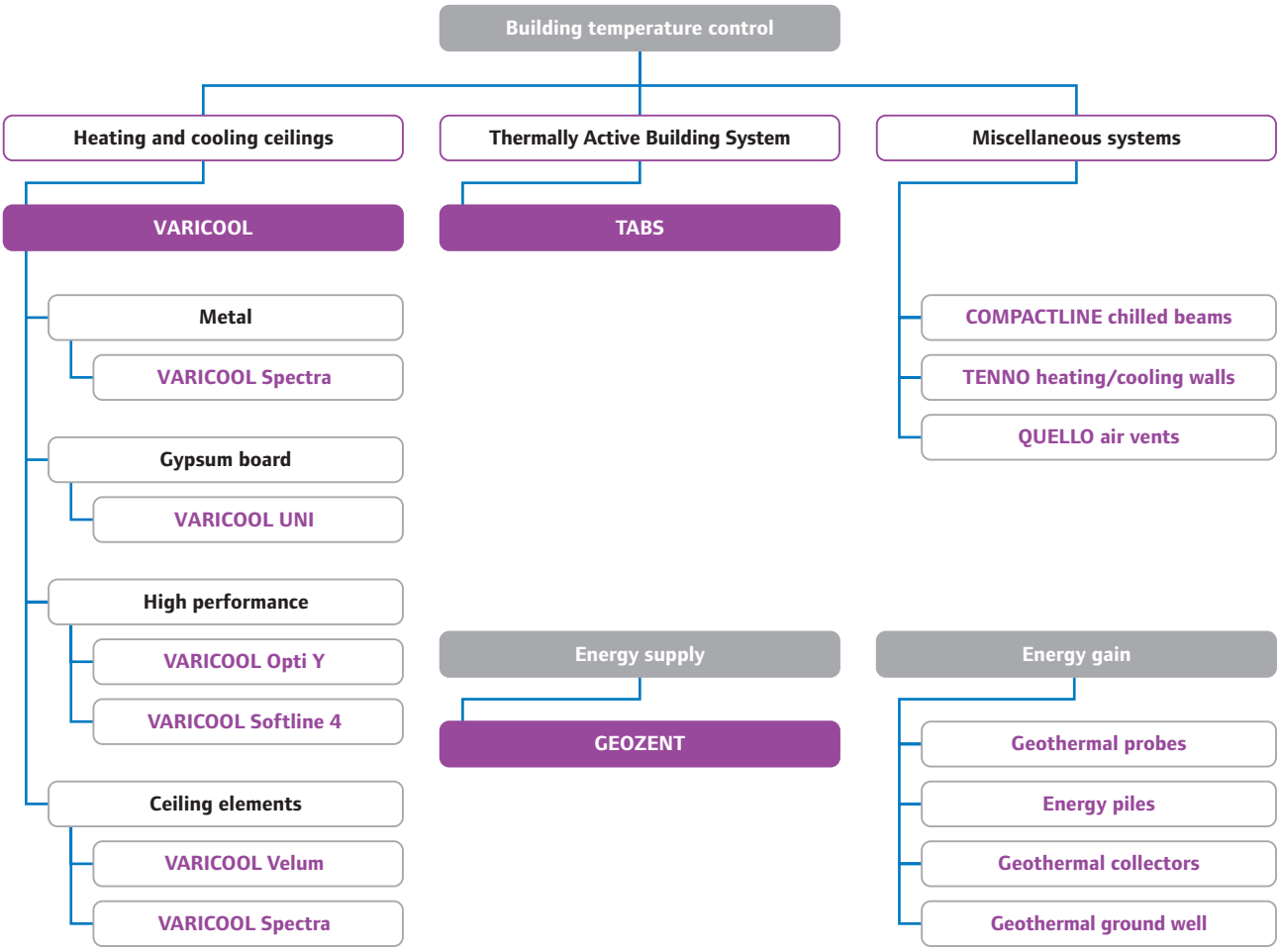
Uponor Energy Solutions surface systems, such as heating and cooling ceilings and concrete core temperature control are established technologies for regulating room temperature and have been a market leader for more than 50 years. The numerous technical developments have made us a pioneer in the field of advanced building system technology.

Energy supply

For commercial buildings, we have developed a large geothermal heat pump, as a ready for connection power station with its own integrated hydraulic system: The multifunctional heat pump simultaneously produces heating and cooling energy as needed and is manufactured according to individual requirements in modular design ready for connection.

Power generation

As an ideal basis for the sustainable, ecological and highly economical supply of commercial real estate with thermal energy, Uponor Energy Solutions have many years of know-how in the use of geothermal probes, energy piles, ground heat collectors and geothermal groundwater wells.



Technical features

	Flat ceiling	Modules
Length	unlimited through a series of individual elements (element length up to 4,000 mm)	1,000 to 2,200 mm, construction length over 2,200 mm on request
Width	4 to 10 pipe rows	400 to 1,500 mm
Heating/cooling lamellae	aluminium extrusions, height 145 mm, width 30 mm	
Copper serpentine pipework	Outer diameter da = 10 and 12 mm (d_a 10 mm only possible in modular design)	
Pipe spacing	RA =100 to 150 mm (in 10 mm stages)	RA = 150 mm, optional 100 mm
Surface profiles	RAL-Fcolours or anodised	
Surface of the supporting structure	wet painted optional, jet black (similar to RAL 9005)	
Assembly frame for folding down	–	Optional
Installation height	170 mm	180 mm
Nominal cooling water flow at $\Delta\vartheta$ = 10 K | 3 K spread	56 l/h·m²	
Free flow area of the element	70 % to 80 % at RA 100 mm to 150 mm	
Hydraulic connection	flexible oxygen-diffusion-resistant hoses with plug-in connection or solder tail, optional threaded bushing	
Mounting clearance	min. 150 mm distance between concrete ceiling and element	

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