

# Nestsystems Radiant Conditioning Solutions

**zehnder**

always  
around you

Heating

Cooling

Fresh Air

Clean Air



# Zehnder – everything you need for comfortable, healthy and energy-efficient indoor living

Heating, cooling, fresh and clean air: at Zehnder, you will find everything you need for comfortable, healthy and energy-efficient indoor living. Zehnder's wide and clearly structured portfolio can offer the right product for any project, be it private, public or commercial, new build or renovation. And where service is also concerned, you'll find that Zehnder is "always around you".

## Heating

At Zehnder, **Heating** doesn't just come in the form of designer radiators. We offer solutions in all shapes and sizes, from radiant ceiling panels to heat pumps with integrated ventilation devices.

- Designer radiators
- Compact energy station with integrated heat pump
- Heating and cooling ceiling systems
- Comfortable indoor ventilation with heat recovery
- Nestsystems radiant conditioning solutions



Zehnder Designer Radiators, Zehnder Heating and Cooling Ceiling Systems

## Cooling

Zehnder also offers sophisticated solutions for indoor **Cooling**. These range from cooling ceiling systems to comfortable indoor ventilation with a supply of pre-cooled fresh air.

- Heating and cooling ceiling systems
- Compact energy station with heat pump and brine pipe
- Comfortable indoor ventilation with geothermal heat exchanger for fresh air pre-cooling
- Nestsystems radiant conditioning solutions



Zehnder Heating and Cooling Ceiling Systems





Most innovative brand  
in the category  
heating & climate

**zehnder**

always  
around you

#### Fresh Air

**Fresh Air** – a product range with a long tradition at Zehnder. Zehnder Comfosystems provides products and solutions for comfortable indoor ventilation with heat recovery for houses and apartments, for new builds and for renovation projects.

- Comfortable indoor ventilation
- Compact energy station with integrated ventilation device



Zehnder Comfosystems

#### Clean Air

Zehnder Clean Air Solutions provide **Clean Air** in buildings which are particularly prone to dust. In residential applications, the comfortable indoor ventilation provided by Zehnder Comfosystems filters external pollutants out of the air.

- Comfortable indoor ventilation with integrated fresh-air filter
- Compact energy station with integrated fresh-air filter
- Systems for clean air

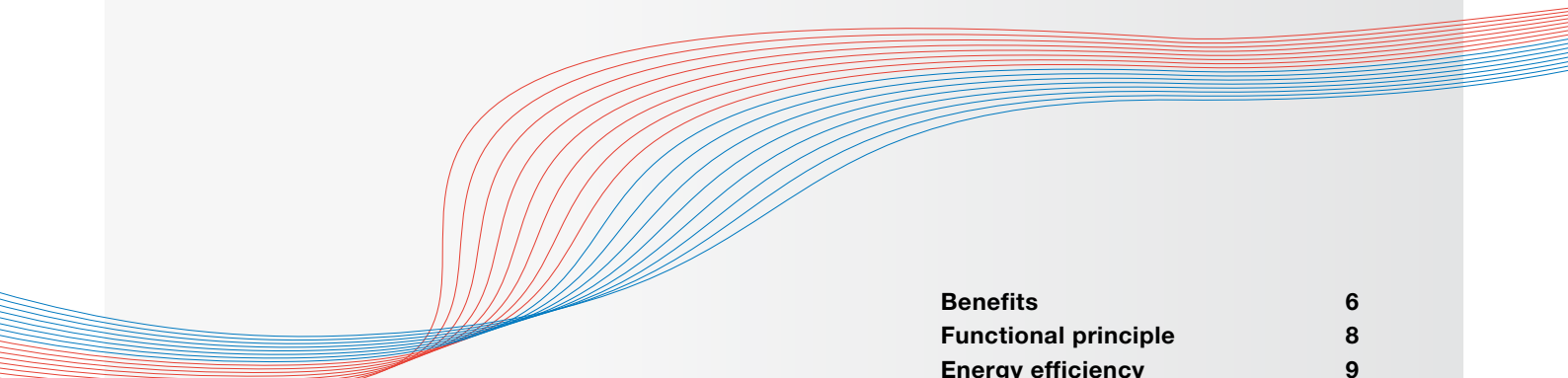


Zehnder Clean Air Solutions



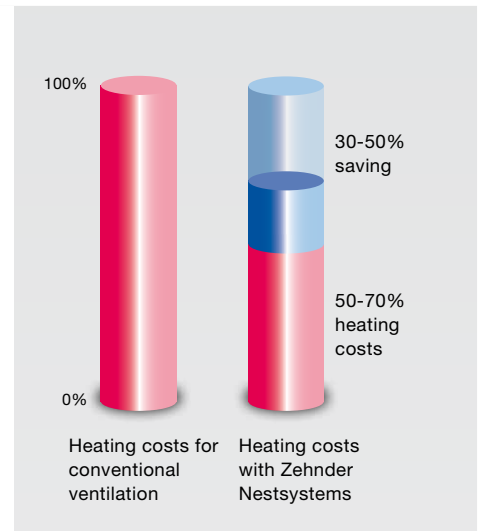
Since we spend more than 70% of our lives inside buildings, a fully controlled indoor climate is essential to our health and well-being.

**Zehnder Nestsystems** guarantee totally comfortable indoor conditions with heating, cooling, dehumidification and digital control. Zehnder products and systems provide ideal solutions for comfortable, healthy and energy efficient indoor climate.



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# Zehnder Nestsystems – healthy, energy-efficient and comfortable



## 1 Health

Zehnder Nestsystems promotes a feeling of comfort and well-being. The uniform temperature distribution created during both, heating and cooling, minimises air movement and circulation of dust and pollutants. Therefore it is a very clean and hygienic solution. All of this aids concentration, productivity and when appropriate, healthy sleeping.

- Hypoallergenic: reduces respiratory disorders
- Gentle effect of heating
- Unique feeling of freshness in cooling mode
- Even temperature distribution in all modes
- No draughty air movements

## 2 Energy savings

As buildings get tighter in construction Zehnder Nestsystems really comes into its own: with energy costs continuously increasing, significant cost savings can be realised with approximately 95% of all heat being recovered and the possibility to use with renewable energy sources.

- Energy savings of up to 50%
- Heat recovery of approx. 95%
- Use of renewable energies for heating, cooling and hot water production



## 3 Comfort

Zehnder Nestsystems provides comfort every moment of the day: Zehnder can provide a total control solution, operable remotely using the latest telemetry technology, to manage the individual requirements of each room in a building. This simple to operate system has hourly and weekly programmes and combines with humidity sensors to provide a totally controlled and pleasing indoor climate.

- Totally uniform temperature and humidity
- Digital control of each room
- Comfort on demand all day and night
- Remote control over the internet
- Simple to operate



## 4 Retention of value

For home owners, Zehnder Nest-systems is an investment that really pays back, making a vital contribution to retaining and increasing the value of a property: The system is virtually invisible and yet provides total control of comfort conditions, including humidity, with smart controls which can be adjusted remotely over the internet: a future proof solution!

- Low heat dispersion in winter
- Low heat transmission in summer
- High efficiency of boilers and chillers thanks to low (winter)/ high (summer) water temperature for Zehnder NIC panels
- Low maintenance costs



## 5 Appearance

The new sensor which measures temperature and humidity (dew point control) is stylish and user-friendly. The backlit screen is easy to use and the whole unit sits close to the wall.

- Modern, functional design
- Large screen display



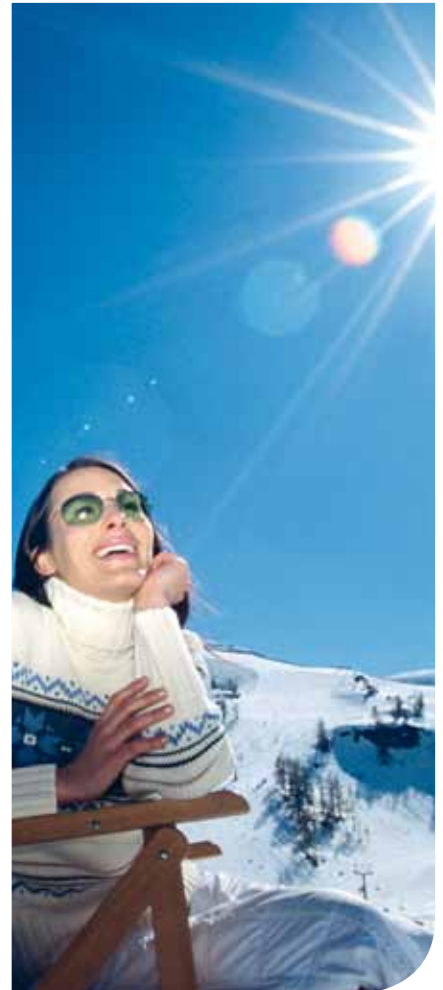
## Functional principle

Radiant ceiling panels from Zehnder operate according to a basic, natural principle, which is identical to the thermal effect of the sun: Direct radiation on a cold winters' day allows us to develop a feeling of warmth which is considered to be comfortable despite the cold ambient air. The heating effect of the sun is produced by electromagnetic waves that penetrate the air without a loss of energy. Only upon contact with the human body is this energy converted into heat.

Zehnder radiant ceiling panels copy this natural principle. Radiant panels ensure pleasant and comfortable heat on the ground with the highest energy efficiency.

### Heating effect

The mode of operation of the heating is as simple as it is effective: The radiant panels are heated by hot water and give off energy into the room. This energy is only converted into a heating effect when it meets the human body or an object.



### Cooling effect

A system that is used for heating buildings in a cost-saving and efficient manner, can also be used for cooling. Cold water flows through the cooling ceiling. Due to their higher temperature, the people and objects in the room give off heat by radiation to the ceiling. The warm air in the room simultaneously rises up to and along the ceiling where it gives off its heat to the cooling ceiling. The cooled air flows back into the room.





# Energy efficiency

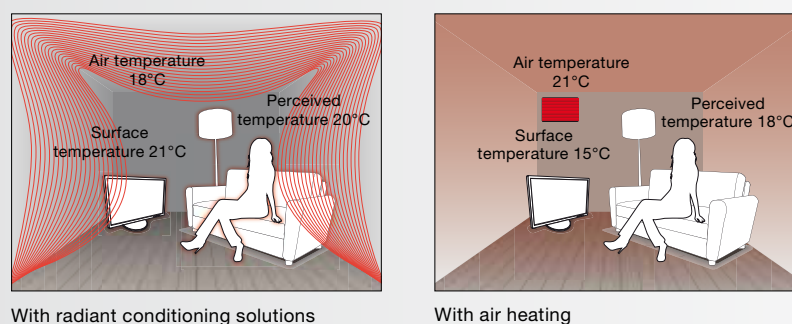
Energy efficiency is of prime importance when choosing a heating and cooling system. By comparison to other systems, Zehnder Nestsystems for radiant heating and cooling can achieve an energy saving of 30 to 50%, whilst maintaining a pleasant indoor climate.

- Energy saving with the same sensation of temperature
- Uniform temperature distribution over the height of the room
- Very high heating capacity according to EN 14037
- Short heating up and cooling down time
- Free choice of the source of energy; also suitable for alternative energies, heatpump, condensing boiler technology or waste process heat
- No additional electricity costs for air distribution

When heating with radiant ceiling panels, the room air temperature is lower than the resultant temperature but with the same sense of comfort.

The consequence: Heat loss is reduced due to the lower difference between the room air and the outside air temperature (Fig. 1).

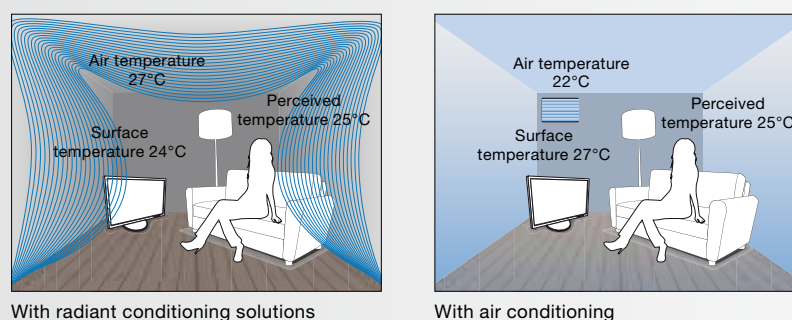
**Fig. 1:** Air temperature and perceived temperature

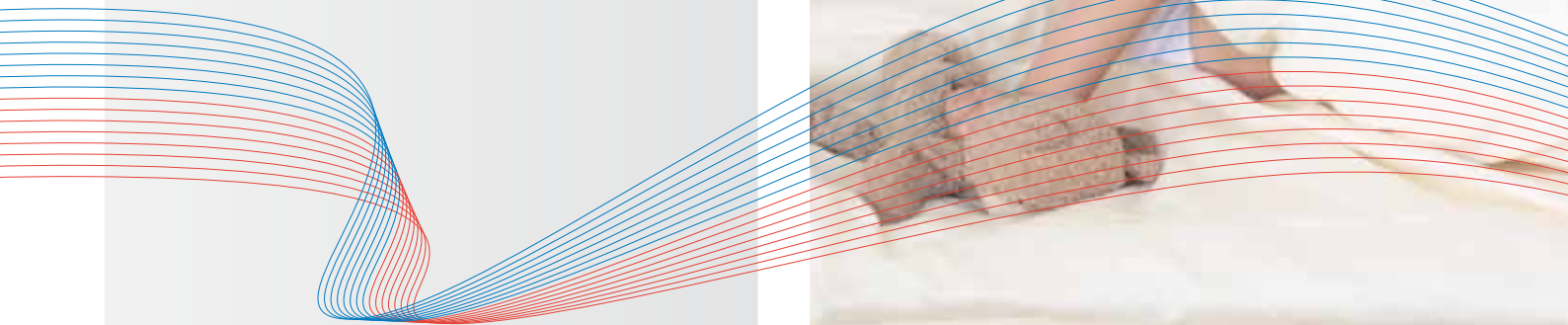


In summer, while cooling with radiant ceiling panels, the room air temperature is higher than the resultant temperature but with the same sense of comfort.

The consequence: The reduced difference between the room air temperature and the outside air temperature reduces the total cooling load (Fig. 2).

**Fig. 2:** Air temperature and perceived temperature





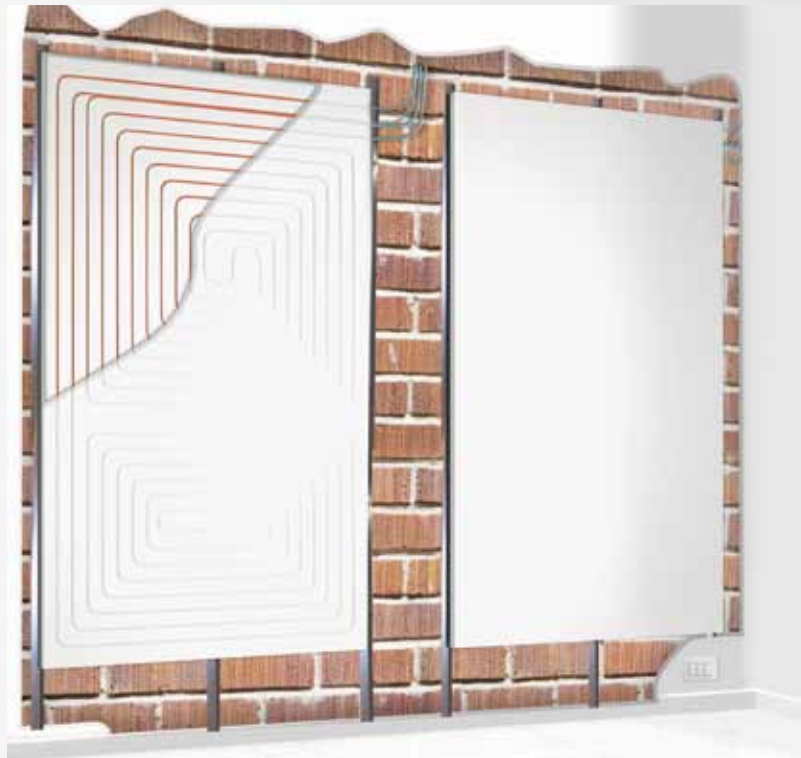
**Zehnder NIC radiant system for ceiling and wall.** Radiant panels uniformly placed on the ceiling create a perfect, naturally comfortable climate; the heat is distributed in a balanced manner over the complete area.



By comparison to conventional air heaters, radiant panels are a totally clean entity. The heat they produce causes no air movement, consequently there is no distribution of dust. This is a considerable advantage not only for those suffering from allergies, but also for people exposed to dust-laden rooms. Furthermore, less dust means less cleaning costs.

- Natural principle of radiant heat
- Uniform heat distribution throughout the room
- Heating and cooling effect immediately perceivable
- Silent operation
- No dust dispersal – advantage for people suffering from allergies
- Reduced cleaning costs for your building

#### Version for mounting on wall



#### Version for mounting on ceiling





## How the Zehnder Nestsystems Conditioning works

**1** The boiler or heat pump produces water at different temperatures according to pre-determined indoor conditions. The water flows into the pipes through the plastic manifolds and is then hydronically distributed through the panels.

**2** The temperature of the water which heats or cools the plaster-board panels activates the radiation between the Zehnder NIC ceiling system and the other surfaces which are giving or receiving heat.

**3** The Zehnder Control system determines the optimum water temperature of the system in consideration of internal and external conditions and dew point calculation. The comfort conditions in each room are monitored to manage the ON/OFF state of each component in the system (zone valves, mix valves, pumps, dehumidifiers, heat pumps, boiler).

**4** Zehnder Dew Dehumidifier completes the Zehnder Nestsystem. Zehnder Dew controls the humidity of rooms to be at 50-55% which is the optimum condition for human comfort.







## Benefits

Constantly monitored comfort conditions in each room:

- Condensation free solution for cooling with Zehnder Control
- Accurate and safe dew point control
- Promotes good health
- Full telematic system enabling remote control via the internet
- For new-build and refurbishment projects: quick and easy to install
- Working parts out of reach of occupants

Almost invisible system:

- Does not tie up wall, floor or ceiling space
- Rapidly responds in both heating and cooling modes
- Very low air speed, no noiseless system



### **Zehnder Dew Dehumidifier**

completes the Zehnder Nestsystem. Zehnder Dew controls the humidity of rooms to be at 50-55% which is the optimum condition for human comfort. It also avoids condensation whilst cooling with Zehnder NIC panels for the perfect climate solution.



The Zehnder Dew dehumidifiers have been developed for conditioning the air in combination with ceiling panels as well as underfloor heating.

Focussed on the dehumidification of small up to middle-sized rooms, such as offices, Zehnder Dew supplies a pleasant humidity and comfortable indoor climate.

The temperature of the air output is some degrees lower than the indoor temperature which ensures the optimum humidity and a comfortable indoor climate. The water used for Zehnder NIC panels can also be used for the Zehnder Dew dehumidifier as no lower temperature water is needed.

#### **Version for mounting on wall** installed vertically



#### **Version for mounting on ceiling** Connection to the ventilation tubes, installed horizontally





## Applications

The principle of radiant heating and cooling can be used in many applications for rooms and buildings. Zehnder Nestsystems have been used for decades to provide indoor climate solutions for various build-

ings including factories, sports centres, retail outlets, offices and public buildings such as schools and hospitals. For some considerable time they have been an essential component of innovative construction projects.

### Residential houses

Zehnder NIC is the ideal system for residential buildings: The new requirements for construction are ideally suited to low inertia radiant systems with no intrusion on the living space. Quiet, healthy, natural and uniform comfort conditions especially for children and the elderly.



### Offices

Zehnder NIC is the answer to the needs of the modern office building; The false ceilings which house the electrical and mechanical services can be finished with Zehnder NIC panels. The interior environment nurtures healthy and productive employees and avoids sick syndromes.





## Hotels

Zehnder NIC is the most attractive solution for acoustic and comfort considerations in hotel rooms. Free spaces, no air movement, no noise and a uniform feeling of well-being which is appreciated by the clients. The Zehnder Control can manage all the hotel room conditions from the lobby desk or a remote location.



## Schools

Zehnder NIC provides an ideal solution for educational buildings with safety as a prime concern: with no dangerous corners, edges or exposed surfaces it provides a healthy, comfortable and safe environment which is perfect for high performance and productivity from the occupants.



## Hospitals

Zehnder Nestsystems is an especially hygienic alternative in the hospital and nursing home sector: with no exposed parts to keep clean and no parts which present any hazard to the patients it is the ideal solution for healthcare applications.



## **Zehnder Nestsystems – Frequently asked questions**

### **1. Can condensation be formed on the surface of Zehnder NIC panels during the cooling mode?**

Digital control of the free condensation dew point is fundamental to Zehnder Nestsystems. The sensors in each room monitor temperature and humidity and sends the data to the central controller to continuously adjust the water flow temperatures to provide the perfect surface temperature by Zehnder NIC panels, effectively eliminating condensation.

### **2. Why should I install Zehnder NIC panels at all?**

A radiant conditioning system is necessary to provide interior comfort in winter as well as summer. In both refurbishment and new-build projects demands are increasing for comfort conditions which cannot be achieved by conventional air-conditioning due to noise, air movement, even temperature requirements, increased demands on interior space and energy efficiency.

### **3. May the windows be opened if I have Zehnder Nestsystems?**

Windows can be opened if really necessary, but it is the best to combine Zehnder Nestsystems with Zehnder Comfosystems ventilation. If a window is opened for a short while, Zehnder Nestsystems quickly restore comfort conditions once it is closed.

### **4. Does a Zehnder Nestsystems decrease energy consumption?**

A radiant conditioning system with control and dehumidification can considerably reduce energy consumption. A conventional air conditioning system may use twice as much energy to try and achieve similar comfort conditions, thus significantly reducing the comparative cost of Zehnder Nestsystems.

### **5. Can I hear noises from neighbouring rooms through Zehnder Dew Dehumidification system?**

Zehnder air distributors are designed such that there is no direct connection between rooms. All air ducts lead directly from the manifold to the respective rooms. Noise transmission via the air distribution network does not occur. In case of wall dehumidifier version the installation is preferred in living rooms or corridors, rather than in bedrooms, in which case it is practically impossible to hear it.

### **6. How can soiling in the air-pipes be prevented?**

Dirt particles in the outside air are removed by the filter in the ventilation device. In addition, extract air filters and the special, smooth internal coating in the airducts prevent dirt deposits. The distribution system is designed to allow easy cleaning of the airducts.

## **More questions?**

[www.zehnder.it](http://www.zehnder.it)



