

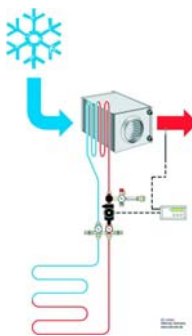
netec Brine-To-Air Heat-Exchangers for ventilating systems with heat recovery

The low-cost, robust and hygienic alternative to dug-in air ducts and other systems for pre-heating fresh air

Underground heat exchangers - what for ?

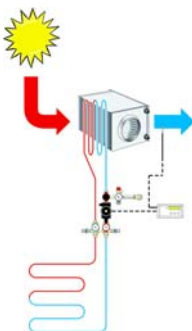
In winter - defrost fresh air

In frosty weather conditions, ventilations systems with a highly efficient heat recirculation can cool down the warm exhaust air of the house below the freezing point. Under this conditions the outward-air humidity however can freeze inside the air-to-air heat-exchanger, obstruct the airflow and cause damage to the unit. To avoid this, the fresh air must be pre-heated to $-4...0^{\circ}\text{C}$, depending on the efficiency of the heat recirculation of the ventilating system. This pre-heating is, what an brine-to-air heat exchanger is developed to do.



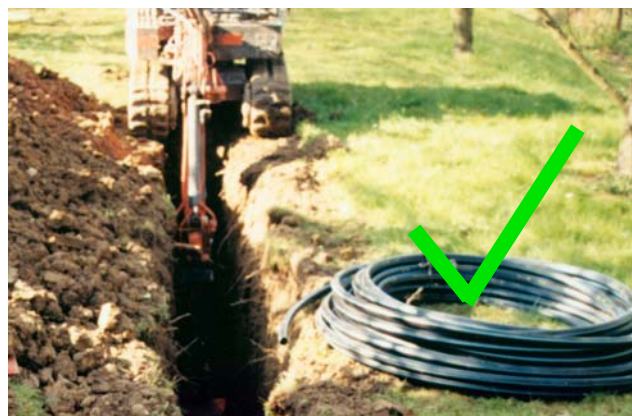
In summer - comfortable air pre-cooling

In hot summers you will want a cool house. But how to achieve this? First, ward off incoming heat by applying an efficient heat insulation to the house and shade the windows against straight sunlight with outside shutters. Then, keep ground-level windows closed to keep the cool air from escaping. If this does not help, and if you have a ventilating system, a ground heat exchanger unit is next offering a low-wattage alternative to air conditioners. This works because in 1-3 m of depth the earth is a lot cooler than the outer air in summer. So a brine-to-air heat exchanger is useful in hot summers as well.



Construction types of heat exchanger units

Heat exchanger units are available as fresh air channels (1st picture) and as brine pipework to be dug into the earth (2nd picture). Fresh air channels transfer the earth warmth straight into the airflow whilst in brine systems the liquid is heated by the earth and exchanges this with a radiator into the fresh air. Brine-to-air heat exchangers are cheaper, more hard-wearing, hygienically the better choice, and their output is easier to control.



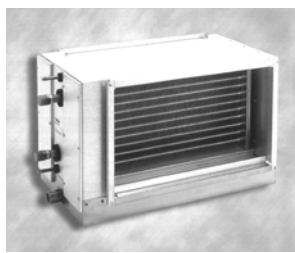
How is a brine-to-air heat exchanger constructed ?

Brine-to-air heat exchangers consist of four main components:

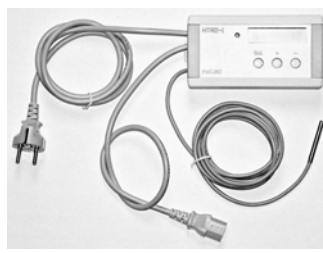
- robust flexible pipework to collect the heat in the ground. Usually its a 32 mm Polyethylene pipe as used for drinking water supply, dug 1.5 to 2 metres deep into the ground. The length required, in metres, is half the air volume of the ventilation unit in cbm/h. For a one-family home best is to lay the pipe two to three times around the cellar; if there is no cellar, you will need to dig a trench.
- a brine-to-air heat exchanger, to be placed in the fresh air supply duct straight after the first filter. Here, the brine give the heat collected underground to the cold inward air in winter keeping the unit free from frost, respectively cools the hot inward air in summer. Exchanger quality features are a minimal air pressure drop, a high exchange rate, a sure condens water drain and a unit easily accessible for cleaning since air is our most important source of life,
- a brine pump control module to optimize brine flow in constant adaptation to outdoor and user-specified indoor settings,
- a pump- and safety unit, containing all components needed for filling and draining, circulating and pressure control.



Brine-To-Air Heat Exchanger
Netec CWK-F-iso (insul. with
filter) for up to 350 m³/h air



Brine-To-Air Heat Exchanger
Netec PGK / WCS without filter
for 500 - 12.000 cbm/h airflow



Brine Pump Controller
Netec HTR 2-1
stepless temperaturue controled



Pump and Safety Unit
Netec PGR 1-40 or 1-60
for systems up to 400 cbm/h air

What advantages do brine-to-air heat exchangers have ?

They distinctly require less energy than conventional antifreeze systems, powered by electricity or heating fuel, as they take the energy from the ground. Also, in summer, they provide comfortable low-energy air cooling. Compared with underground air ducts, they are easier to keep clean as the brine pipes do not require access to the inside for cleaning. Also they are less elaborate to install and are better to regulate. So the ground heat stock is better used and smaller sizing of units is possible.

Who supplies brine-to-air heat exchangers ?

The PE pipework is available in 50- and 100-metre rolls or can be measured to need and can be obtained from building material stores and from water supply companies. Brine-to-air heat exchangers in many sizes and the control and safety units are listed on the NETEC website (www.sole-ewt.de, English text available). Solar energy specialists will assist you in finding antifreeze fluid an additionally needed connection parts. The pump required must have one-phase-motor without any electronic controls of its own as the NETEC controller HTR2-1 controls the pump speed by electronic pulse modulation if with a dimmer.