

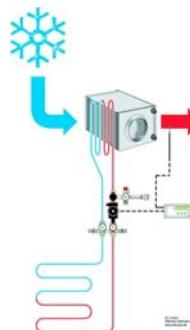
netec Brine-To-Air Heat-Exchangers for ventilating systems with heat recovery

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 ?

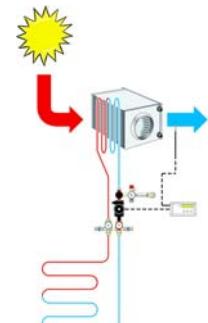
In winter - defrost fresh air

In frosty weather conditions, ventilation systems with efficient heat recirculation can freeze inside their heat-exchanger, obstruct the airflow and cause damage to the unit. To avoid this, the fresh air must be pre-heated to $-4\dots+1^\circ\text{C}$, depending on the efficiency of the heat recirculation. For that pre-heating, geothermal energy can be used, because in the winter in 1-3 m of depth the earth is warm enough to heat air from for example -15°C up to $+1^\circ\text{C}$.



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 with outside shutters. If you have a ventilating system, a ground heat exchanger can pre-cool incoming air from f.e. $+36^\circ\text{C}$ to $+24^\circ\text{C}$, 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 for comfort in hot summer as well.



Construction types of heat exchanger units

Heat exchanger units are available as fresh air channels (left picture) and as brine pipework to be dug into the earth (right picture). Fresh air channels transfer the earth warmth straight into the airflow. 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 ?

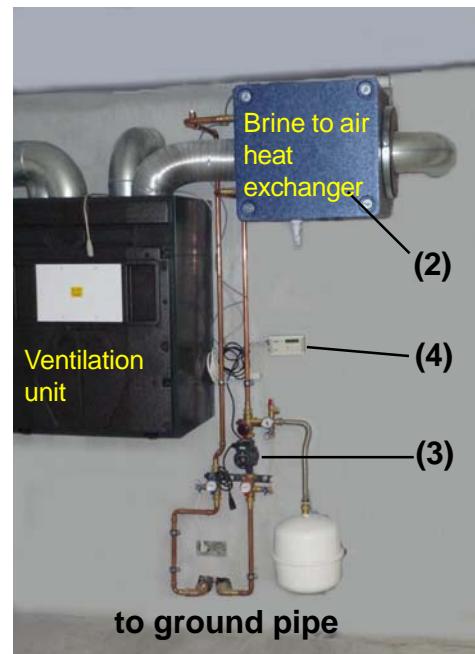
Brine-to-air heat exchangers consist of four main components:

(1) robust flexible pipework to collect the heat in the ground. Usually its a Polyethylene pipe with 32 mm outer diameter, as used for drinking water supply, dug 1,5 to 2 meters deep into the ground. In northern german climate 50-75 m pipes length is required to supply 100 m³/h airflow. For a one-familiy home best is to lay the pipe two to three times around the cellar. If there is no cellar, you may dig a trench or you can place it under the house or you may taken the heat from deep drillings in combination with heat pump installations.

(2) 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. Quality features are a low air pressure drop, a high heat exchange rate, a sure condens water drain, an well insulated body and an integrated large air filter in high quality (F7), like in the model Netec CWK 300.

(3) a pump- and safety unit, containing all components needed for filling and draining, circulating and pressure control with low-energy pump, like in model Netec PGR-2.

(4) a brine pump controller, that optimizes brine flow in adaptation to variable outdoor climate, ground temperature and user-specified settings with low energy consumption, like Netec model HTR2-2.



Brine-To-Air Heat Exchanger
Netec CWK 300
for 100 - 400 m³/h airflow



Brine-To-Air Heat Exchanger
Netec PGK / WCS
for 500 - 12.000 m³/h airflow



Pump and Safety Unit
Netec PGR-2
for systems up to 500 m³/h air



Brine Pump Controller
Netec HTR2-2
stepless temperatute controled

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 delivers NETEC (see www.sole-ewt.de, English text available). Installers will assist you in finding antifreeze fluid an additionally needed connection parts. If the installation is done in an area with sensitive ground water conditions, please ask local authority about possibly needed allowances or additional security needings. Netec controller HTR2-2 can monitor fluid pressure drop and stop the pump and give alarm in case of fluid leakages.

Published by: Netec Energietechnik, Klaus Michael, Sachsenstr. 27, D-32756 Detmold,
Tel. 0049 - (0)5231 390 748, Fax: 0049 - (0)5231 390 749, info@sole-ewt.de, www.sole-ewt.de