

Rekomendacja ITB
GWC Provent-Geo posiada pozytywną Rekomendację Techniczną Instytutu Techniki Budowlanej stwierdzającą przydatność do stosowania w budownictwie.

[Więcej](#)

Pomiary skuteczności

Jako jedyni podajemy codzienne pomiary skuteczności działania wymiennika z dokładnością do jednej godziny.

Sprawdź wysoką skuteczność naszego wymiennika.

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Atesty i badania

GWC Provent-Geo posiada atest higieniczny i badania mikrobiologiczne potwierdzające pozytywny wpływ na poprawę jakości powietrza.

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Bądź na bieżąco w swojej branży.

Wpisz adres e-mail

Zapisz

GRAVEL HEAT EXCHANGER

It is a device for ventilation of a building which allows for gaining natural, renewable energy (heat in winter and the cold in summer) from the ground, from a shallow depth. The idea of the device operation is based on the fact that at a depth of 1-4 m the ground has almost constant temperature throughout a year. In our climatic zone at this depth the ground temperature is approx. +10°C (+/-1.5°C). Practically gravel in the GWC is placed very shallowly, even above the ground level (above underground water). However, thanks to good thermal insulation above a GWC it is simulated that it is placed at a depth of 5-6m below the ground.

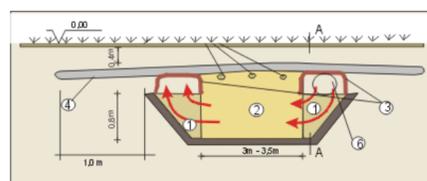
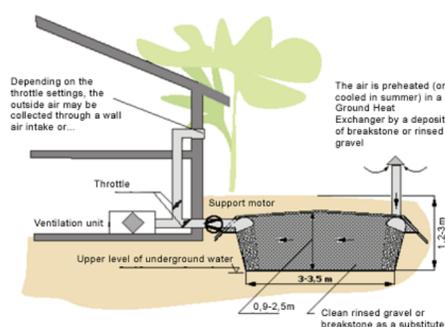
Results of long-standing operation confirm that the outside air flowing through the gravel deposit at this depth is heated at winter peaks e.g. from -20°C up to 0°C (i.e. by 20°C), while in summer it is cooled by approx. 10°C, i.e. from +30°C down to +20°C which allows for satisfying the demand for the cold for ventilation purposes. In winter, preheating the air it reduces fuel consumption by 25 up to 40% (the harsher winter the greater reduction).

It improves humidity of fresh air. In winter it humidifies it through the increase in absolute humidity by 1 to 3 g/kg of dry air. In summer it dries the air from 3 to 6 g/kg eliminating a feeling of air stuffiness in rooms.

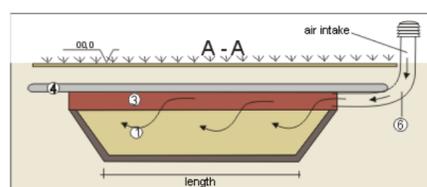
A direct contact of the deposit with the ground results in quick regeneration of the deposit. It allows for maintaining air parameters unchanged at the outlet from the heat exchanger over a long period of time. A performance factor of the heat exchanger amounts to 1:35 (while for example a heat pump 1:4).

Throughout a year it efficiently filters the air purifying it from bacteria, fungi and allergens. Maintenance costs of a GWC are only costs of air transport through a gravel deposit, not heating or cooling it.

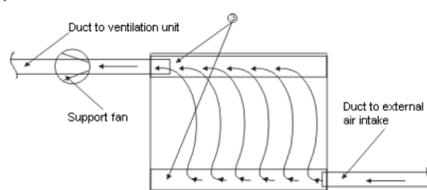
See the article **Microbiological purity of GWC** at www.taniaklima.pl



1. Rinsed stone or crushed granite of granulation 60-90 mm
2. Gravel of granulation 30-50 mm
3. Concrete troughs
4. Thermal insulation 10 cm thick
5. Pipes sprinkling the surface
6. Duct to air intake



View from the top



The length of a heat exchanger depends on the unit it is to work with:

- MISTRAL 250 L=3 m
- MISTRAL 400 L=4 m
- MISTRAL 650 L=5 m
- MISTRAL 1100 L=7 m

A gravel heat exchanger practically always requires a support fan.

When selecting a ground heat exchanger type and size for a ventilation system you should know that:

1. This heat exchanger substantially improves the system operation in winter protecting the heat recovery unit against freezing (the unit operates continuously with maximum heat recovery). It is the advantage that cannot be overestimated, in particular in highly efficient heat exchangers (e.g. counter-current ones) whose actual effectiveness in freezing cold weather may be low.
2. Due to considerable resistance an additional support fan is required (it would be best if it were supplied from the unit).
3. A large enough heat exchanger ensures the supply of cooled air during hot days creating pleasant microclimate in a building. In particular, if a high temperature is accompanied by high humidity, a heat exchanger in addition dries the air. However, in sun-warmed rooms and attic ones the amount of "cool" air will be definitely insufficient to successfully lower the temperature in them. EXAMPLE: for a residential house of capacity approx. 500 m³ and average insolation (4-6 kW heat gains), the required amount of air is 1500-1800 m³.
4. In summertime ventilation units should have a summer heat exchanger mounted (or a proper bypass).
5. Air distribution ducts should be carefully insulated, in particular ducts in the attic (5-10 cm layer of wool).
6. Throttles which switch over from a wall air intake to the ground one have to be tight when they close. It is a mistake to use unsealed, cheap throttles, especially if there is no support fan.
7. An air intake for the heat exchanger has to be necessarily protected against insects and rodents.

Some people, considering pros and cons of having a heat exchanger, ask also a question: "A heat exchanger is a good thing, indeed, but what with radon?".

Radon in amounts exceeding the imposed standard threshold values occurs only in a few regions in Poland. As in other countries, also in Poland we have defined radon concentrations for houses which should not be exceeded. The Chairperson of the National Atomic Energy Agency ordered ("Monitor Polski" No. 35 of 26 July, 1995 item 419) that for old buildings as well as those to be constructed before 1 January, 1998 the permissible value is 400 Bq/m³, while for the ones constructed after 1998 only 200. Radon concentration in flats can be determined by means of typical dosimeters sent to anyone who wishes that, and next the results are interpreted in relevant laboratories (everything done by mail, no visit at home required). Such measurements, for a fee, are made by the National Institute of Hygiene in Warsaw, Department of Radiation Protection and Radiobiology, ul. Chocimska 24, 00-791 Warszawa. I recommend reading an article from the magazine "Wiedza i Życie" to anyone interested in the problem of radon.

"Afraid of radon" (PDF 231 KB)



PRO-VENT Ventilation Systems
ul. Posilkowa 4a
47-300 Dąbrówka Górna
post office: Krapkowice
commune: Krapkowice
province: opolskie
country: Poland / Europe tel.: 77 440 44 98
fax: 77 440 44 92

info@pro-vent.pl
www.wymiennikgruntowy.pl