

# Ground-Therm pipe ground heat exchanger

## Energy efficient heating and eco-friendly air conditioning in your home

The Ground-Therm GHE is a pipe ground air heat exchanger that is a perfect addition to the efficient ventilation system. It is recommended both for energy efficient or passive houses and large area facilities (including commercial ones). It can be used with all mechanical ventilation systems. Depending on the season it heats or cools air passing through the GHE. In winter the GHE heats the air entering the house, using the heat stored in ground. The air heated to approx.  $+2^{\circ}\text{C}$  is transferred further to the heat recovery ventilation unit, where it is further heated up to a temperature close to room temperature (approx.  $16^{\circ}\text{C}$ ). In summer the GHE is cheaper to cool air than an air conditioner, eliminating the risk of air overheating, which increases allergies and feeling of discomfort. And importantly, it provides an optimum level of humidity for the entire year and therefore you can benefit from a healthy and comfortable microclimate everyday.

LATO



ZIMA



LATO - SUMMER

ZIMA - WINTER

temperatura powietrza za GWC - air temperature behind GHE

temperatura gruntu - ground temperature



GHE - why should you use it?

### **Renewable and clean energy**

Using natural and stable temperature conditions in ground to heat and cool buildings we can reduce the share and cost of fossil-based energy, which was previously the main power source. Modern energy efficient and passive buildings are designed to reduce and amount of energy required to ensure our comfort. The ground air heat exchanger coupled with a heat recovery ventilation makes it possible to achieve this goal.

### **With the PZH (National Institute of Hygiene) certificate**

The Ground-Therm pipe ground heat exchanger is the guarantee of healthy and hygienic air for the entire year, which was confirmed by special laboratory tests and the certificate issued by the National Institute of Public Health (PZH). Elements of the pipe GHE are covered with active microsilver which is renowned for its antibacterial properties. It prevents the growth of fungi, bacteria, dampness and mustiness. Therefore it eliminates the source of many diseases and bad smell associated with standard ventilation or air conditioning.

### **Lower bills for heating and cooling**

Most of the energy we consume or produce throughout the year is used for heating or air conditioning. The GHE allows you to really reduce the costs related to the energy needed for heating and cooling of air in the building. In winter it is possible to save even up to 30% on energy costs. When there is a heat recovery ventilation unit, the ground heat exchanger makes it possible to eliminate the need for heating the elements of a heat recovery ventilation unit to prevent their freezing. Whereas, in summer the system can provide from several to tens of kW of cooling capacity. For example the pipe ground heat exchanger is able to cool the air entering the building from +35°C to even +16°C.

### **Always fresh and humidified air**

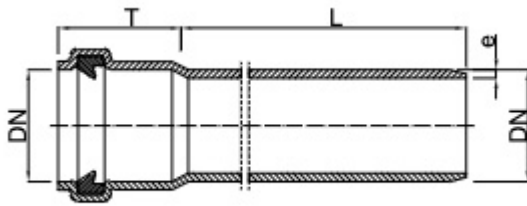
It is very important to ensure air circulation safe for health and comfort in modern buildings with air tight windows and doors and thermo-modernized facilities. The pipe GHE, as a part of the home ventilation system, thanks to temperature control in rooms affects the humidity level, prevents from overdrying and excessive moisture. Air passing through the GHE is also always initially cleaned in the air intake.

### **Guarantee of connection tightness**

Lightweight, durable and tough materials, from which we have made our original pipe ground heat exchanger and the patented sealing system of pipe connections allow the GAHE to be installed in each type of ground. They effectively prevent leaks, the entrance of insects and dirt or penetration of dangerous radon, which may cause cancer, from the ground. The pipe system elements are made from polypropylene, seals from EPDM, air intakes from stainless

steel, filtration mat for air intakes in G4 class, and the sealing system is strengthened by heat shrink tubes made from radiation cross-linked polyethylene.

Ground-Therm ground heat exchanger - system construction



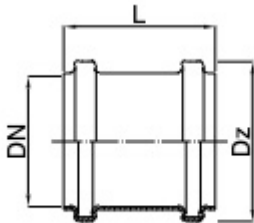
GROUND-Therm pipe with socket and seal

ring stiffness SN8

Name	CODE	DN	L [mm]	T [mm]	e [mm]	Weight [kg]
GROUND-Therm pipe 200/1000 with socket	RK200/1000	200	1000	106	7.7	4.30
GROUND-Therm pipe 200/3000 with socket	RK200/3000	200	3000	106	7.7	13.00
GROUND-Therm pipe 200/6000 with socket	RK200/6000	200	6000	106	7.7	26.00

Material:

Pipe - polypropylene with internal antifungal and antibacterial coating with the PZH certificate  
EPDM seal



GROUND-Therm double socket sleeve/coupler

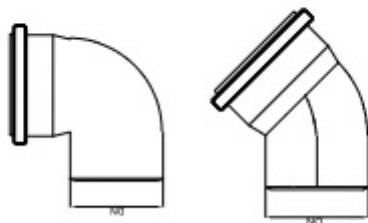
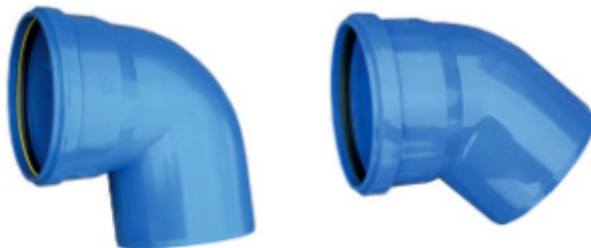
with seals

Name	CODE	DN	Dz [mm]	L [mm]	Weight [kg]
GROUND-Therm coupler 200 with seals	ZL200	200	146	217	0.78

Material:

Sleeve/coupler - polypropylene with internal antifungal and antibacterial additive with the PZH certificate

EPDM seal



GROUND-Therm elbow with socket and seal

Name	CODE	DN	$\alpha$	L1 [mm]	L2 [mm]	Weight [kg]
GROUND-Therm elbow DN200 45° with	KU200/45	200	45°	100	93	1

seal

GROUND-Therm elbow DN200 90° with seal

KU200/90 200 90° 100

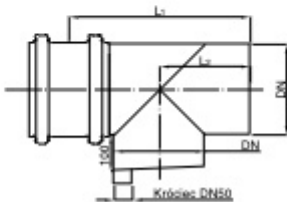
93

1.35

Material:

Elbow - Sleeve/coupler - polypropylene with internal antifungal and antibacterial additive with the PZH certificate

EPDM seal



GROUND-Therm condensate drain

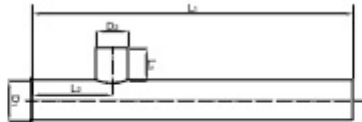
with connection spigot DN50

Name	CODE	DN	DN wlotu	L1 [mm]	L2 [mm]	Weight [kg]
GROUND-Therm condensate drain	200 OK200	200	200	400	200	5.5

Material:

Condensate drain - polypropylene with internal antifungal and antibacterial coating with the PZH certificate

EPDM seal



GROUND-Therm condensate catch

Name	CODE	DN	Inlet DN	L1 [mm]	L2 [mm]	Weight [kg]
GROUND-Therm condensate catch 250/200	SK250/200	250	200	2500	30	12

Material:

Condensate catch - polypropylene with internal antifungal and antibacterial coating with the PZH certificate  
EPDM seal



Ground-Therm Grip heat shrink tubes

Name	CODE	DN	L [mm]	Weight [kg]
GROUND-Therm Grip heat shrink tube 200	OP200	200	-	0.5

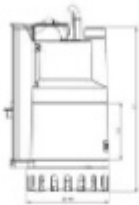


GROUND-Therm tower air intake

made of stainless steel with filter basket

Name	CODE	DN	height [mm]	Weight [kg]
Stainless steel air intake DN 250/800	CK250/800	250	800	6.00
Stainless steel air intake DN 250/2000	CK250/2000	250	2000	10.00

Material: Stainless steel



Condensate pump, discharge port diameter 1"1/4

mains: 220-240 V, 1.5 A, nominal power P2: 0.21 kW

Name	CODE	Delivery head [m]	Capacity [l/min]	Weight [kg]
Nova Up 300 M-AE pump PK-NUP 300		2.6	120	5.6
		4.5	80	
		6.0	40	
		7.0	10	



Filter for GROUND-Therm air intake

G4 class

Name	CODE	DN
Filter for air intake DN250 F-G4	DN250	250

Material: Filtration mat in G4 class

The pipe GHE means easy installation and maintenance - what is worth knowing?

The use of basic recommendations concerning installation and maintenance ensures many years of trouble-free use of the system. What to pay attention to?

### Step by step installation

1. The pipe ground heat exchanger is laid on the flat and initially compacted ground with sand bed (trench  $\geq 1.5$  m). We also recommend to compact the ground around the system (up 0.5 m from a pipe or trench wall).
2. Depending on the plot size it is possible to choose the ring configuration around the building (for small buildings) or meander configuration (longer systems with several bends of the laid piping).
3. Pipes are laid close to each other, over its entire length on the trench bottom, without any gaps under them. Drive pegs near pipes to ensure their stability.
4. When the ground air heat exchanger is installed, maintain the necessary slope (1.5-2% towards the air intake). This slope enables condensate of clean water, that is collected inside the pipe GHE, to naturally discharge to the condensate catch under the air intake.
5. Pipes are connected with couplers, marking the depth for element insertion. Use also a lubricant to avoid a risk of the seal turning over during inserting next pipes. Remember to ensure the tight connection of the air intake with the condensate catch to prevent water from getting inside the pipe ground heat exchanger.
6. Seal the connections with the patented Ground-Therm Grip heat shrink tubes that thanks to special adhesive that, once heated, melts and fills the gap between the pipe and the coupler.
7. During backfilling, follow the rule of the GHE trench backfilling to the pipe height and compacting the soil surrounding the pipe (distance up to 0.5 m, degree of compaction  $ID \geq 0.93$ ) and under the condensate catch.
8. When installation work is finished, carry out hygiene inspection during the system acceptance.





### **Maintenance**

Keeping the system in full efficiency requires cyclic maintenance - cleaning of an air intake and pipeline (on average every 12 months) and replacement of air filter (on average every 3-6 months). We recommend to carry out cleaning work with water under appropriate pressure so as not to damage elements (water flow rate of 70-120 l/min) or with rotating brushes made of natural or plastic bristles. The brush must be inserted into the pipe ground heat exchanger through the inspection opening.

### **Hygiene inspections**

To maintain the highest hygiene parameters of the ground air heat exchanger it is necessary to provide periodic inspections of the system carried out by the specialists. Every 3 years it is recommended to carry out a full hygiene inspection of the air intake, air filter and piping. Every year (preferably in spring) it is worth performing a visual hygiene inspection of the entire system to detect any faults as soon as possible.

Order the GAHE from Ground-Therm

Are you wondering how to design a system that will give you the highest savings? Please contact our [representatives on the territory of entire Poland](#). Find out more about the Ground-Therm pipe ground heat exchanger from our [catalogue](#).

Contact

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Design and implementation