

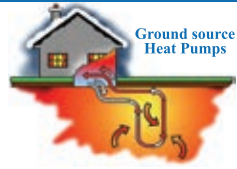
**HEAT PUMPS and
UNDERFLOOR HEATING**



Alternative Heating & Cooling Ltd.

**Heating & Cooling
Using Common Sense**

Alternative Heating & Cooling Ltd.



Alternative Heating & Cooling Ltd has been offering renewable energy systems since 2001. We provide high quality heat pumps which are carefully selected to provide heating, cooling or hot water solutions tailored to each individual project.

Product Knowledge and Technical Excellence

At AHAC, our thorough system design and troubleshooting service ensures that all projects will be designed, installed and maintained to the highest standards possible.

We aim to find the most suitable and cost effective renewable energy solution for our clients. The projects we work on are turned around quickly yet accurately and on budget while providing an exceptional level of product knowledge, technical excellence and installation support.

Our reputation has grown for installing well designed and efficient renewable heating systems that are supported by a sharp customer service team.

System Design

We provide a specific design for every project whether it be any residential, commercial or an industrial development.

Alternative Heating & Cooling Ltd.

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Who We Are

Alternative Heating & Cooling Ltd. was founded by Mike Cotter and Brendan Harte in 2001.

Since then the team has grown in numbers our qualifications are:

- Marine Engineer (steam and motor)
- Qualified plumbers through FAS training.
- Diploma in Instrumentation Physics.
- Computer Engineering
- Sustainable energy engineering
- All relevant safety courses to comply with Irish Building regulations.
- Electrofusion welding certification.
- GeoExchange designer course - certified by the International Ground Source Heat Pump Association (IGSHPA):

The Association of Energy Engineers (AEE) and Geothermal Heat Pump Consortium.

Alternative Heating & Cooling Ltd provide a wide variety of top quality heat pumps for the domestic and commercial markets, catering for all varieties of heating and cooling applications with over 1300 heat pump installations nationwide. The majority of these are ground source however in recent years air source systems have become very popular, due to the major advance in the air source technology. A very strong after sales service has boosted a reputation as an industry leader.



Our Aim

To put AHAC on the map as the leading supplier of Renewable Energy Heating and Cooling solutions and systems while continuing to sustain quality and perfection.

Here at AHAC we concentrate on the following approach:

- Provide excellence to our customers from the early stage of the project through to after sales service.
- To ensure quality is maintained throughout all procedures.
- To employ, train and retain the best people in the industry.
- To be flexible and responsible in meeting our customers expectations.
- Be a leader in innovation and new renewable energy technologies.
- Possess an in-depth product knowledge.

Customers V Products

With a vast amount of alternative energies and complex systems available, it is very difficult to know which the best solution is for you. AHAC can advise you on the best and most suitable technology to meet your needs. We work with you, the customer to provide you with a system that will achieve the highest efficiency within your budget, while also providing comfort 365 days of the year to suit your lifestyle.

Protecting the Environment

Renewable energy and sustainable development has moved to become a constant factor in every persons lifestyle, it is in this way we can protect the environment that we live in. The use of precious non-renewable resources is becoming a challenge for us all and any investment towards sustainable development will help in protecting the environment while in turn saving you money on energy bills.



What We Do

Feasibility Studies/Site Surveys/ System Specifications

Any person considering building or retro-fitting and is thinking of installing a renewable energy heating system can send in their plans or ideas to us and it will be dealt with in a quick and professional manner. We can visit you on site to get better understanding of what you want and sit down with you and discuss what the best solution is for you.

Ground Source Heat Pumps allow home owners to heat their homes via utilising the unlimited heat stored in the ground. They operate on the principle that the earth beneath the surface remains at a constant temperature throughout the year, acting as a heat source in winter and a heat sink in summer.

Water source Heat Pumps extract heat from the ground via an open loop heat collector. This uses well water or water from a stream/river as its heat source, which is pumped through the heat exchanger and is discharged back after the heat is extracted. Due to the relatively high temperature of underground water the efficiency of a water source heat pump typically exceeds 500%.

Air Source Heat Pumps absorb energy from the outside air in the same way as a fridge extracts heat from inside. It can absorb heat from the air when the temperature is as low as -20°C. These systems require no drilling or

excavation works and are therefore an ideal solution for most existing houses.

A heat pump installed correctly can reduce the amount of electricity you use for heating by as much as 30%-60%. All the above will cover 100% of your heating needs and hot water.

Underfloor heating systems are heated by warm water circulating in continuous pipe loops that are clipped to special tracking which is embedded in concrete. There are no joints in the pipe which ensures 100% reliability. The floors can reach a temperature of 30°C if necessary but normally 22 to 24°C surface temperature which leaves a comfortable room temperature of 21°C which can be adjusted to the users own desire.

Under floor offers numerous benefits such as:

- **Energy saving** – since under floor heating does not need to run at the higher temperatures that are associated with radiators, it can reduce your home heating bills considerably
- **Comfort** – under floor heating provides even temperatures throughout the whole house which eliminates the cold spots that are associated with radiators.
- **Cost Saving** – Maximise run cost by utilising night rate (1/2 price) electricity.

- **Hygiene** – under floor heating eliminates moisture and this in turn eliminates dust mites. This benefits people who suffer from asthma and other respiratory reactions.
- **Design** – with no radiators present, your furniture can be placed wherever suits you best.

Pool and Spa heating

Heat pumps are an ideal solution for swimming pool heating, providing an economic and energy efficient means of delivering constant pool water temperature throughout the year. Air source heat pumps are highly suitable due to their low installation cost and high efficiency at high ambient temperatures during the summer, the most frequent time of swimming pool use.

Heat pump Servicing and Maintenance

Alternative Heating & Cooling is capable of carrying out service/maintenance on most makes and models of heat pumps, including models no longer in production.

Bespoke systems

- Process heat recovery
- Tailor made solutions to your energy saving requirements

Supplier for:

- Waterfurnace
- Weider
- Euronorm
- Panasonic
- Nordic
- Roth



Why Use Heat Pumps?

A heat pump is one of the most effective ways to heat or cool a building using renewable energy. Unlike many other forms of renewable energy that depend on the sun shining or the wind blowing the energy for the heat pump is always available. Heat is widely available in the ground, air and water around your house. These natural sources of heat are constantly replenished by the sun, wind and rain. A heat pump system will harness these free and renewable energy sources for heating your house and supplying hot water at a very low cost.

Heat pumps are very economical, for every 1kW of electricity used to power the heat pump, 3 to 6 kW of heat is generated. This is called a Coefficient of Performance (COP).

Annual Costs of Heating Systems

Independent studies state that heat pumps are cheaper and more efficient than fuel oil, gas and wood pellet heating. However attention to detail on the installation is critical to success.



Benefits of using Heat pumps

- **Unlimited heat** available in ground or air.
- **Economical** – provides operating cost savings of 30% to 60%.
- **Comfortable** – maintains an even temperature and humidity level throughout your home.
- **Safe** – no open flames, no fumes and no soot.
- **Flexible** – one single unit handles heating, cooling and hot water.
- **Dependable** – contains few moving parts and requires little or no maintenance.
- **Value** – increase the value of your home along with decreasing your energy running bill.
- **Efficiency** - as much as five times as efficient as conventional systems.
- **Low running costs** – e.g. heat 2,500 sq ft house for as little as €400 per year. BER rating of B1.
- **Environmentally friendly** – our systems emit no carbon dioxide, carbon monoxide or other greenhouse gases.
- **Units available for all sizes of dwellings** – new and existing.
- **Improve Building Energy Rating.** (BER).

What is a BER?

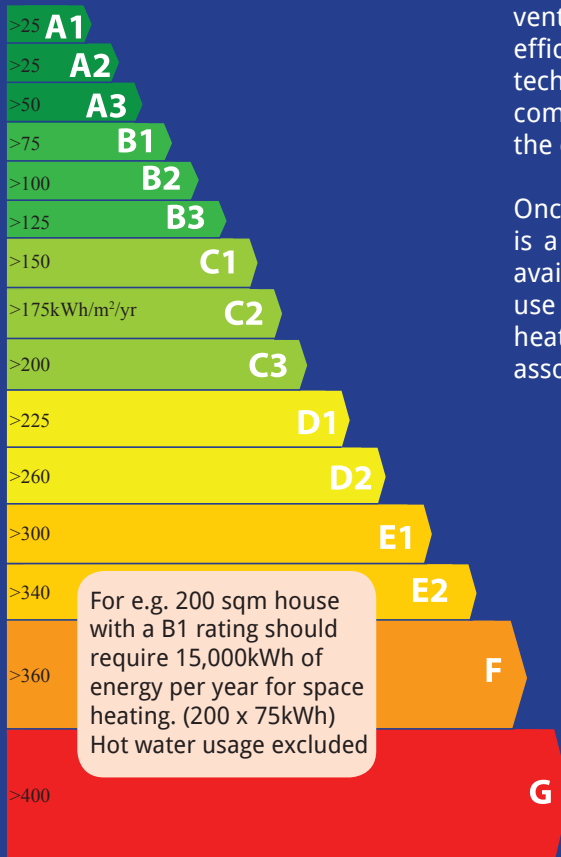
A BER Certificate calculates the energy performance of a building on a scale from A-G. A-rated houses are the most efficient and G the least efficient. All new dwellings and houses offered for sale or lease require a BER.

There are two types of BER, a provisional and a final BER. A provisional BER is based on plans and specifications of a new building and is valid for 2 years. A final BER is issued on completion

of a new building and is valid for 10 years once there is no material change to that building. Existing buildings can also have a BER assessment carried out to determine their efficiency and that certificate is also valid for 10 years.

The BER is calculated by assessing the major components of the building in detail. The u-values of walls, roofs, floors, windows and doors are calculated as well as the efficiency of the heating system and hot water system. Mechanical ventilation, air tightness, energy efficient lighting and renewable technologies are all assessed and combined in the calculation to give the energy rating of that building

Once the BER is calculated there is a large amount of information available such as annual energy use for space heating, water heating, ventilation, lighting and associated pumps and fans.



The Building Energy Rating (BER) is an indication of the energy performance of this dwelling. It covers energy use for space heating, water heating, ventilation and lighting, calculated on the basis of standard occupancy. It is expressed as primary energy use per unit floor area per year (kWh/m²/yr)

How Heat Pumps Work

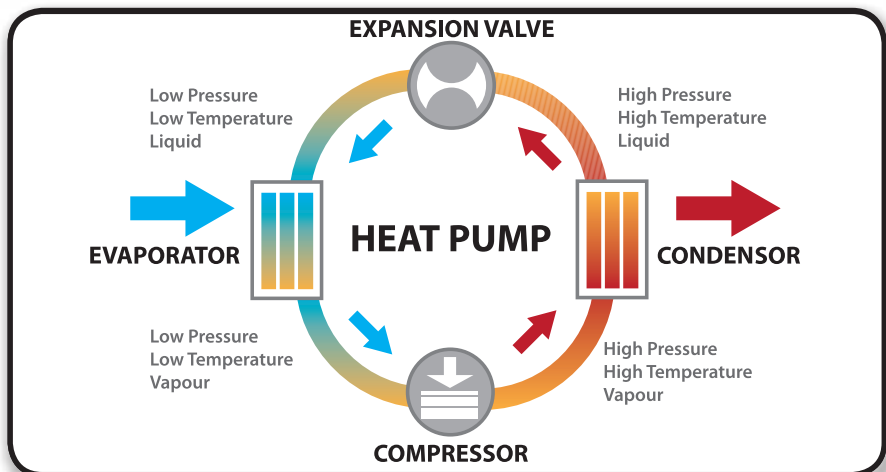
The heat pump has the ability to extract heat from one source (i.e. ground or air) and discharge it into another (i.e. underfloor or radiators).

How a Heat Pump works

The heat pump works on the same characteristics as a standard domestic fridge but, instead of cooling, it heats. Heating and cooling are achieved by moving a refrigerant through various indoor and outdoor coils and components. A compressor, condenser, expansion valve and evaporator are used to change the state of refrigerant from a liquid to a hot gas and from a gas to a cold liquid.

Main Stages

- The refrigerant (liquid state) passes through the outdoor evaporator coils at a low temperature.
- The water/antifreeze from the ground loop enters the unit and heat is transferred from this water/antifreeze to the refrigerant.
- The refrigerant begins to boil and changes to a vapour. The vapour is pressurised by the compressor where the temperature is increased to over 100 degrees.
- The vapour then enters the condenser heat exchanger and the heat is given up to the coils. At this point, the heat is transferred to the buildings heating, and hot water systems. As it passes through the coils, it cools and turns back into a liquid.
- The refrigerant which is now cooled liquid at high pressure passes through an expansion valve, which reduces the pressure so that the liquid can re-enter the evaporator and begin the cycle again.



Heat Pump efficiency

Heat pump efficiency (COP) is obtained by comparing how much energy it consumes in order to complete the heating and cooling cycle. Coefficient of performance (COP) defined as: "The ratio of heat delivered by the heat pump and the electricity supplied to the compressor"

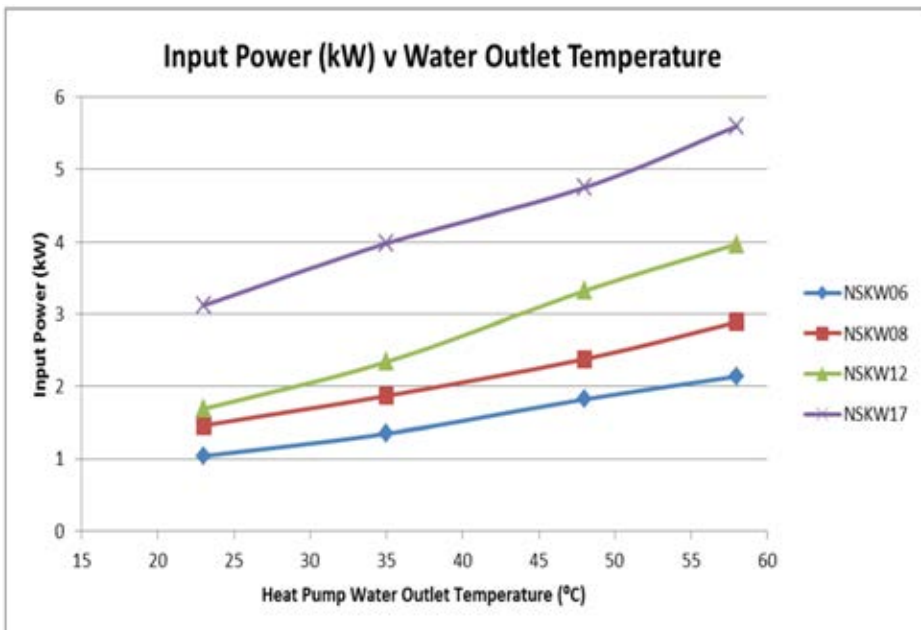
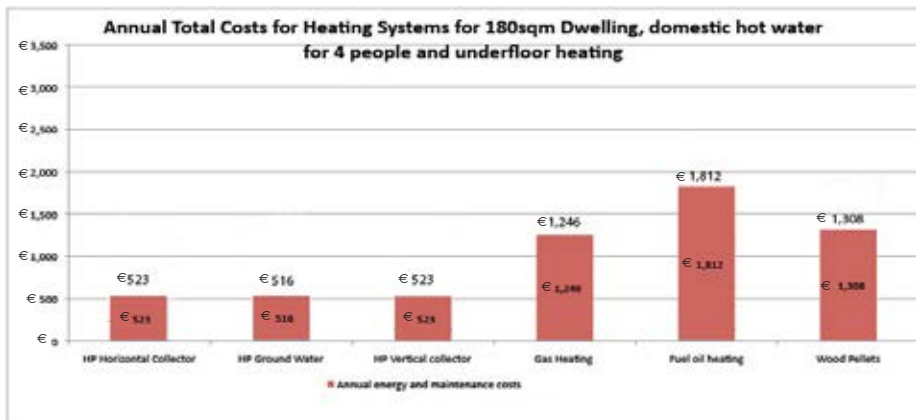
Electricity is needed to power the heat pump, but for every unit of electricity used, it will generate 3 to 6 units of useful heat, largely dependant on output temperature.

$$\text{COP} = \frac{\text{Kilowatts Delivered}}{\text{Kilowatt Input}}$$

(E.G Wieder SW 90 B0/W35)

$$\frac{7.5\text{kW}}{1.5\text{kW}} = 5$$

output ÷ input



Heat Sources

As we are at the forefront of heat pump installation we are able to undertake all aspects of ground preparation for our clients. We offer the full range of collectors and will design the system that fits best with the land or available water source, the local geology and the heating requirements. Since the early days we've installed collectors in hundreds of different soil conditions and rock formations. This experience combined with close cooperation with the best drilling operators in the country gives us local knowledge from Malin Head to Mizen Head.

The main types of collector are described below:

Closed Horizontal loop

Horizontal loops are often considered when adequate land surface is available. Pipes are placed in trenches in lengths that range from 30m to 120m and at a min. depth of 1m.



Closed Vertical loop

Vertical loops are the ideal choice when available land surface is limited. Well drilling equipment is used to bore 150mm diameter holes from depths of 60m to 120m (200 to 400 feet).



Pond (lake)

Pond (lake) loops are very economical to install when a body of water is available, because excavation costs are virtually eliminated. Coils of pipe are simply placed on the bottom of the pond or lake.



Open loop system

Open loop systems utilize ground water as a direct energy source. In ideal conditions, an open loop application is the most economical type of geothermal system. Although predominantly used for commercial applications these can be economically utilized for domestic use where the water table is high.



Air

The heat is extracted from the outside air, this heat is transferred into your home using sophisticated heat exchangers.



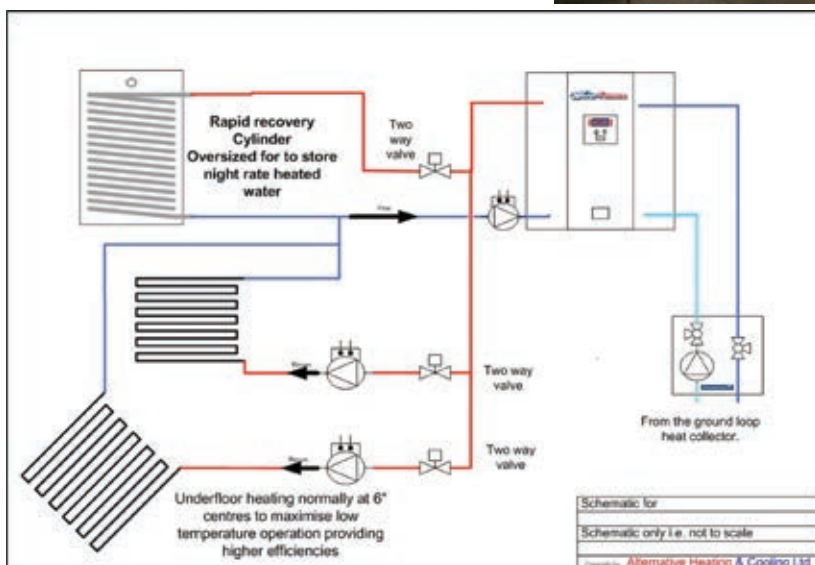
Mallow GAA Sports Complex Horizontal Collector Installation



Ground source heat pump



At Alternative Heating & Cooling, we have been using Waterfurnace heat pumps since the company started in 2001 and have over 1000 machines installed nationwide. Chances are there's one near you, at this stage there are installations in all 32 counties. These units are very efficient and reliable and we know the machine inside out.



| Heat Pump Model | EKW06 | | EKW08 | | EKW12 | | EKW17 | |
|----------------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| Electric supply | 230V/400V | | 230V/400V | | 230V/400V | | 230V/400V | |
| Weight | 102kg | | 131kg | | 147kg | | 157kg | |
| Operating Range (°C) | W10/W35 | B0/W35 | W10/W35 | B0/W35 | W10/W35 | B0/W35 | W10/W35 | B0/W35 |
| Heating output kW | 7.3 | 5.8 | 10.6 | 8.3 | 14.4 | 11.6 | 21.4 | 16.6 |
| Input Power kW | 1.52 | 1.53 | 2 | 1.98 | 2.72 | 2.8 | 4.55 | 4.49 |
| COP | 4.8 | 3.8 | 5.3 | 4.2 | 5.3 | 4.2 | 4.7 | 3.7 |
| Harp database | 420% | 272% | 470% | 394% | 470% | 385% | 425% | 335% |

Range extends up to 140kW

W10/W35 = water in at 10°C/water out at 35°C

B0/W35 = brine in at 0°C/water out at 35°C

Features

- Designed to operate with entering source water temperatures of -1°C to 43°C .
- Heated or chilled water (or process liquids) from the same machine.
- Modularized design for optimum capacity matching and staging.
- Stackable for space conservation.
- Water Heating to 55°C
- Water Chilling to -12°C
- COP's are between 3 and 6 - delivery temperature dependant.
- Long-life Copeland scroll compressors.
- Reliable
- Low Maintenance
- Economical.



Ground source heat pump



For more than 30 years the name Weider is connected with excellent heat pump technology in Austria.

For the customer who wants the best efficiency, AHAC needed to be able to offer a true market leader. The Weider heat pump delivers the highest efficiencies and is designed to run on a trickle of electricity.

Intelligent Solution

The control of the Weider heat pump

The electronic control in this heat pump is weather compensated control. This means that the heat pump correlates to the degree of temperature difference between indoors and outdoors in order to replace heat loss through the walls, roofs etc.

Weather compensate controls work by ensuring that the heat pumps space heating output matches the heat loss from the building. This eliminates the need for individual room thermostats. Sensors are placed outside which provides information back to the heat pump every few seconds. When the outside temperature changes, the heat pump responds and starts to increase or decrease the heating



output temperature to compensate for new rate of heat loss, and maintain the comfortable inside temperature. This allows the heat pump to operate very efficiently.

Additionally, the electronic device controls your solar heating system, provides time schedule programmes for boiler and heating and can managed if desired by a GSM mobile phone.

[illegible]

Features

- Designed to operate with entering source water temperatures of -6°C to 20°C
- COP's are between 4 and 7 - highest available
- Very quiet system
- Stackable for space conservation
- Low maintenance
- Includes controls for other heat sources.
- Mobile phone control enabled
- Reliable
- Scroll compressor
- Plate heat exchanger is nickel soldered for groundwater system and copper soldered for brine systems
- Plain text LCD display

WeiTronic⁰⁸ – Module

The controller is in a separate housing and thereby allowing quick and easy replacement if required.

Weider-Two Step

The Weider heat pump controller allows you to control two modules assembled over each other simultaneously.

Pure Design

Behind the simplistic design you'll find the complete competence and quality that stands for Weider heat pumps. The clarity of all the element arrangements and the compact construction promises the highest level of innovation.

Plain text LCD Display

The plain text-LCD-Display instantly indicates where you are within the program at that moment and which adjustment possibilities are available to you.

Plate Heat Exchanger

The plate heat exchanger is nickel soldered for the groundwater system and copper soldered for brine systems.

Quick Change Insertion Module

The world-wide unique system from Weider! Is the heat pump, against expectations, defective? Simply loosen the four ball valves, take out the defective insertion module, insert the replacement module – and the heat pump runs again.

Expansion Valve

To optimise the injection of the refrigerant, Weider uses an electronically controlled expansion valve.

Scroll-Compressor

Weider uses time tested and approved compressors from well known manufacturers that are ideally suited for use with heat pumps.

Small Dimensions, Big Performance

The Weider heat pumps hardly need any space thanks to their compact dimensions (50cm x 52cm x 87cm) – small as a washer machine and big in performance.

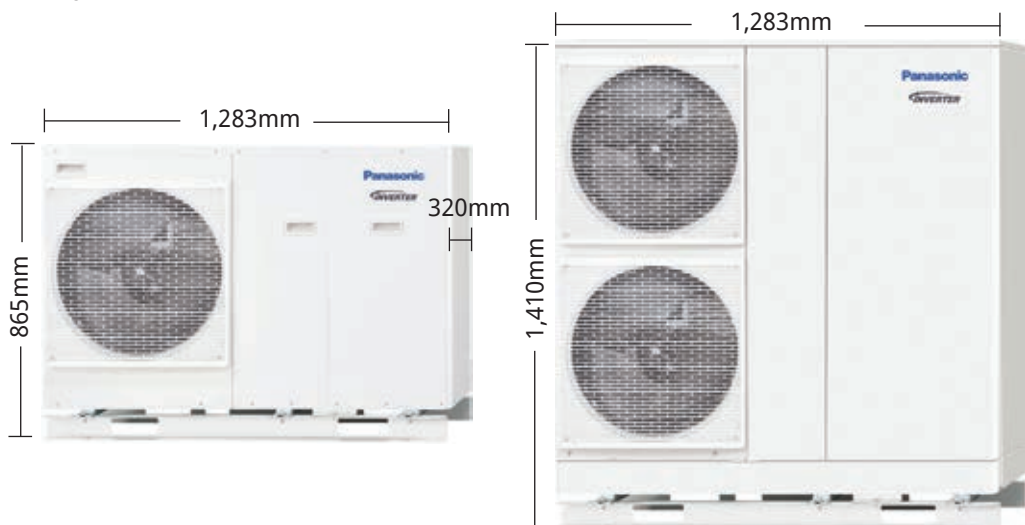


Air source heat pump

Panasonic ideas for life

We didn't choose Panasonic, they chose us and we are glad they did. This machine has surprised us geothermal installers with its high efficiency.

Panasonic Aquarea's new air to water heat pump is cost effective and environmentally friendly, the system provides maximum efficiency and capacity even at -20°C, which will provide heat for your home and hot water.



| Heat Pump Model | | | MHT 09 D3E5 | | MHT 12 D3E5 | | | | | |
|-----------------------------|------------|------|---------------|------|---------------|------|---------------|------|---------------|------|
| | | | MXF 09 TCAP | | MXF 12 TCAP | | | | | |
| | MDF 06D3E5 | | MDF 09C3E5/E8 | | MDF 12C6E5/E8 | | MDF 14C6E5/E8 | | MDF 16C6E5/E8 | |
| KW | 6 | | 9 | | 12 | | 14 | | 16 | |
| Electric supply | 230/400V | | 230/400V | | 230/400V | | 230/400V | | 230/400V | |
| Weight | 112kg | | 153kg | | 153kg | | 153kg | | 153kg | |
| Operating Range (° C) | 7/35 | 2/35 | 7/35 | 2/35 | 7/35 | 2/35 | 7/35 | 2/35 | 7/35 | 2/35 |
| Heating output (kW) | 6 | 5 | 9 | 9 | 12 | 11.1 | 14 | 14 | 16 | 14 |
| Input Power (kW) | 1.36 | 1.36 | 1.9 | 1.9 | 2.6 | 2.6 | 3.2 | 3.8 | 3.8 | 3.8 |
| Max Water temp (MDF/MXF) | 55°C | 55°C | 55°C | 55°C | 55°C | 55°C | 55°C | 55°C | 55°C | 55°C |
| Max Water temp (HT) | 65°C | 65°C | 65°C | 65°C | 65°C | 65°C | 65°C | 65°C | 65°C | 65°C |
| COP | 4.41 | 3.4 | 4.8 | 4.1 | 4.7 | 3.9 | 4.5 | 3.51 | 4.3 | 3.51 |
| Harp Database | 396% | | 410% | | 385% | | 359% | | 337% | |

Features

- A wide range from 6 to 16kW, single and three phase, mono bloc and bi – bloc.
- 3 versions:
 - The standard heat pump (MDF)
 - High temperature heat pump (output water temperature of 65°C) (MHT)
 - The total capacity (TCAP) heat pump even at - 20°C (MXF)
- Can provide cooling in summer
- High efficiency heat pump which operates at outside temperatures as low as - 20°C
- Reduces energy costs with its COP of 4.8
- Reduces energy consumption and CO2 emissions
- Highly flexible: Can connect to an existing heating system.

Aquarea HT

For a house with high temperature radiators or high hot water usage, the Aquarea high temperature solution is probably the most adequate as Aquarea HT provides output water temperatures of 65°C even at -15°C. Aquarea HT is able to deliver 65°C with the heat pump alone.

Aquarea High Connectivity

For a dwelling with low temperature radiators or underfloor heating, our high connectivity aquarea heat pump is a perfect solution working as a stand alone unit or can be combined with a gas or oil boiler depending on requirements. This solution has the best ratio for heating capacity and efficiency.

Aquarea T – CAP

This heat pump will deliver the same kW at all times even when the outside temperature is as low as -20°C. For eg. a 12 kW tcap is 12 kW @ +7°C and 12 kW @ -7°C. Our best seller, a complete stand alone system.

New Panasonic R2 Rotary Compressor

Panasonic Rotary delivers high performance, efficiency and reliable service, no matter where you are.

Why is the Compressor so efficient?

1. High Efficiency motor. The premium silicon steel motor exceeds industry efficiency requirements.
2. Improved Lubrication of High Volume Oil pump. The extended, high volume oil pump in conjunction with a larger capacity oil reservoir provides superior lubrication
3. Accumulator has Larger Refrigerant Capacity. The Larger accumulator accommodates generous refrigerant amounts needed for installation flexibility.



Air source heat pump



Euronom have been at the front edge of development of efficient and operational long life heat pumps in Sweden since the company introduced the first air to water heat pump in 1977. The result of the development is a complete program of world-leading heat pumps for the Scandinavian Climate.



We picked Eurnom heat pumps for their robustness and their unique ability to survive in coastal salt air conditions. The heat pump has a life expectancy of twenty years which is more than the industry norm.

The control board remains in the house – not outside in the elements.

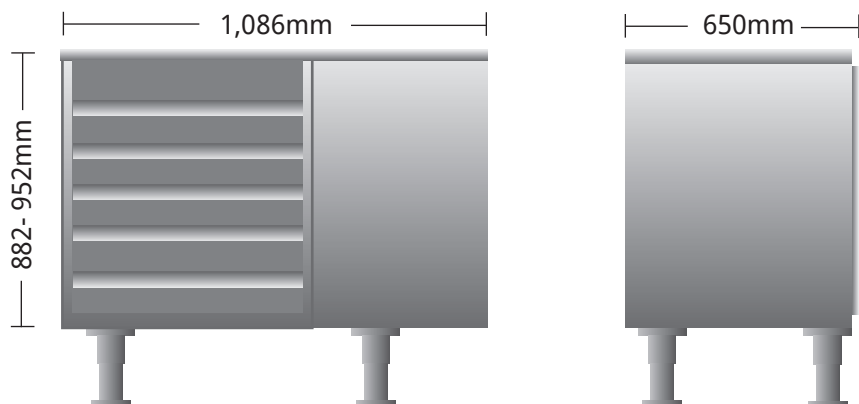
ExoAir is an air to water heat pump for private houses and small premises. The heat pump is delivered in a complete unit that only needs external connections for water and electricity.

7.5 to 20kW are available on request.
All models listed are available as single and three phase.
All other models are three phase only.

| Heat Pump Model | 10.5 | | 14 | |
|----------------------|----------|------|----------|------|
| kW | 10.5 | | 14 | |
| Electric supply | 230/400V | | 230/400V | |
| Weight | 140kg | | 175kg | |
| Operating Range (°C) | 7/35 | 2/35 | 7/35 | 2/35 |
| Heating Output kW | 11 | 9.84 | 14.3 | 11.0 |
| Input Power kW | 2.67 | 2.62 | 3.20 | 3.15 |
| COP | 4.1 | 3.74 | 4.4 | 3.5 |
| Harp Database | TBA | TBA | TBA | TBA |

Features

- Generates heat at -25°C outside.
- Cost efficient heating.
- Extra large vaporizer.
- Robust Quality - Built for Scandinavian Climate.
- Epoxy coated heat exchanger for anti – corrosion protection (Coastal, Salt, Air)
- Two way condenser with double thermal length.
- Fix speed scroll compressor for continuous performance.
- The most silent unit on the market thanks to extra sound damping material and the specially designed fan.
- Stainless steel components that withstand Nordic climate conditions
- The combination of long experience and modern technique.
- The third generation control system ensures cost savings.
- Three models for different heating requirements
- ExoAir is simple to install, maintain and operate.
- Adjustable feet of stainless steel which gives a fast and simple installation.
- Extra sound insulation on the inside of the compressor chamber for both low and high frequency sound waves.
- Defrost function is reduced which gives longer total operating times reducing the amount of energy required from other sources.



Bespoke Systems

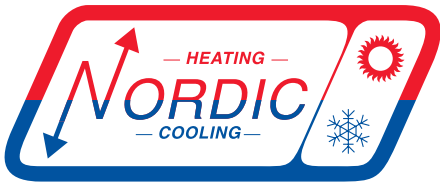
Our range of heat pumps encompasses the following (Source > Delivery):

- Air > Water
- Ground > Water
- Water > Water
- Brine > Water
- Water > Air
- Brine > Air
- Air > Air (split/mono bloc)

Sizes vary from 4.5kW to 400kW.

Our five main suppliers are:

- Waterfurnace
- Weider
- Panasonic
- Euronom
- Nordic



When we need something different, we turn to Canada. As each unit is hand built , nothing is a problem, for eg titanium heat exchangers and different shapes etc.

Nordic is a small dedicated heat pump manufacturer that can make any required size and configuration of a heat pump that we need. Take for e.g. the pool air conditioner.

The PC series unit is a high efficiency heat recovery unit with coated air coils, titanium exchanger and stainless steel case. The unit cools and dehumidifies the pool area and can reject the heat back into the air stream, into the pool, or to an additional external outdoor condenser unit. An electrically commutated ECM fan with several speed options is standard. The motor has a soft start function for improved efficiency and reduced wear.

| Rating Conditions | Model | Input Energy kW | Heating Capacity kW |
|--------------------------------------|---------|-----------------|---------------------|
| EWT 27°C Heating EAT 28°C Cooling | PC - 55 | 3 | 18.3 |

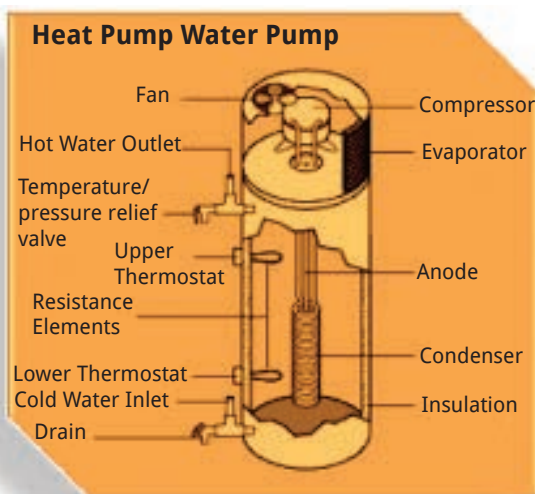
These bespoke systems can cover a wide range of applications such as residential, commercial, industrial, new and existing dwellings, milk pre – cooling, cheese manufacturing, drying seaweed, fish farms, evaporating salt from the sea water. Our heat pump design is only limited by your imagination.



Heat Recovery Solutions

Exhaust air heat pumps utilise the heat from warm air spaces within a building. Heat within the building such as cooking, lighting, bathrooms, solar gain, computers and people can all be utilised. The hot water produced is primarily used for hot water production however this hot water can be used for underfloor heating, radiators are pumped to an area where this heat can be utilised.

For e.g. a space that needs air conditioning can now be used as a heat source for hot water production.



Nordic W series

W series units are high efficiency two stage geothermal heat pumps with R410A refrigerant. This product is designed to produce large quantities of hot water. It is very popular for use with concrete in floor heating systems, swimming pool heating, or any other application where large quantities of hot water are required.

Design Features

- Bronze head domestic hot water circulation pump
- Bi – flow filter drier
- Copeland Scroll compressor
- 4 way reversing valve
- Sight glass and suction accumulator
- Vibration absorbing compressor feet.
- High and low refrigerant access ports
- High efficiency Turbotec coaxial heat exchangers-Copper or CuNi available



Main Dealer in Ireland for Roth Products



We are the sole supplier in Ireland for Roth products. Roth is an international supplier of energy and sanitation systems. Roth are one of the largest suppliers of Underfloor heating and solar thermal systems in Europe and being on OEM they operate a fully automated production line and manufacture and distribute high quality products and services. Roth are experts within the market and manufacture one of the most advanced solar thermal collectors available. The collectors have a unique polycarbonate case making them the lightest and easiest collectors to install in today's market.

The products that they supply include:

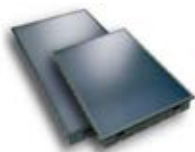
- Solar systems
- Heat pump delivery systems
- Heat storage
- Rainwater storage
- Underfloor heating

The sun radiates an immense amount of energy to the earth. The solar radiation on the globe of half an hour would be enough to meet the worldwide energy demand.

The new solar systems, an optimal combination to the company's proven heat distribution systems. The solar systems are high efficient and come complete. They are able to supply up to two thirds of the projected annual median energy requirements needed to provide warm water to a dwelling. When combined with Roth floor heating systems, the stored solar energy can ideally be used for heating support.



Roth Heliostar 252 S4 collector



- Case construction made of high – performance, weather proof and heat – resistant polycarbonate.
- Two connections in each case on the long side of the collector for connecting the collectors using Roth, plug-in connector technology.
- Absorber with selective vacuum coating, highly transparent solar one – pane safety glass.
- Gross surface area: 2.52m²/aperture surface area 2.30m²
- Dimensions: 2100 x 1200 x 109mm (L x B x H)
- Total weight 36kg

Roth Heliopool



- The Roth Heliopool consisting of black HDPE, is used mainly for the direct solar heating of swimming pool water using the constant flow principle. Each absorber has 8 connections which can be used variably.
- Installation type: horizontal or vertical.
- Area 2.22m²
- Dimensions: 2m x 1.11m x 0.015m/weight 14kg

Twin coil unvented indirect stainless solar cylinder available from 180L to 400L.



- Dedicated solar volume
- Component kit includes: Combination inlet group incorporating pressure reducing valve, strainer, check valve, balance cold take off point, expansion relief valve, expansion vessel connection points, Potable expansion vessels c/w flexible hose and wall bracket, Dual control thermostat, combined overheat thermostat.

Roth System Pipes X-PERT S5



Five layer safety pipe in accordance with DIN 16833/16834 and DIN 4721, with an oxygen barrier layer in according to DIN 4726, protected from increased mechanical demands by a PEX coating. The special yellowish surface layer signifies the highest degree of resistance against external influences during storage, transport and installation.

The X-PERT+ material which is improved by additives is resistant to stress cracking, stable against thermal ageing and DIN CERTCO registered.

- The X – PERT S5+ pipe is highly flexible.
- Max Temperature: 70°C; short time 100°C
- Sizes available: 11mm to 20mm

Roth ClimaComfort Compact system panel



High – strength transparent system panel with 14mm installation height, of semicrystalline material. The special panel structure with undercutting allows standardised and secure fixation of the pipes. The system pipes ClimaCor S5 11 x 1, 30 mm are installed in a coiled or meandering shape as desired, in an installation grid of 75mm, diagonal installation with spacing of 105mm is possible. ClimaCompact system panels overlap 22mm on both sides to facilitate interconnection of the panels and have an adhesive back to ensure all-over adhesion of the panels as well as secure fixing to the subsurface.

Dimensions: 1072 x 772 x 14mm

Underfloor Heating



Why underfloor heating?

Underfloor gives a nice comfortable heat evenly around the room, eliminating hot and cold spots, no drafts and no unsightly radiators which frees up space for furniture.

The dryness and constant heat deprives bacteria and mites of the moisture they need to survive.

It is highly efficient when used in conjunction with a heat pump, due to the low water temperature needed.



Underfloor heating has been used back as far as 5000BC. Today's Underfloor heating standards were set in 1980.

Underfloor is suitable for domestic houses, schools, hospitals, open areas and industrial applications.

Principles of Underfloor Heating

Sheets of high density insulation, on average 125mm thick, are laid out on top of the subfloor, onto which a layer of polyethylene pipe is placed, spaced on average 150mm apart covering all the floor area.

Concrete is then poured on top of the pipes and insulation, this concrete is the finished

floor, on top of which you place your choice of floor covering.

These pipes are then heated with warm water passing through them, this heats the slab of concrete to 24°C, this heat will naturally rise into the room giving a comfortable 21°C.

Design

The industry standard in Ireland is spacing the pipes at 200mm (8") apart. In our design we keep pipe spacings to 150mm (6") for standard rooms and 100mm (4") spacings in bathrooms, sunrooms and vaulted areas to compensate for areas of greater heat loss. This is primarily to improve heat pump performance.

We also take into account pipe lengths, room zoning, manifold sizing, pumping losses and thermostat locations for the best control.

The design would have to allow for screed thickness, insulation levels and final floor coverings. All of this has to be balanced with the customer's needs and budget.

Controls

To get the best efficiency from the underfloor system we use an intelligent thermostat controller, this controller will regulate the air temperature to us as little as 0.1°C . Even on the sunniest of days the building will be very comfortable. We have a full range of actuators for subzoning, room thermostats and motorised valves.



Underfloor Installation

In a regular house installation is done at foundation level, which will take one day to install, all rooms piped back to the underfloor manifold which is then tested with air to five times the working pressure, this test will be kept on until the final commissioning of system. The concrete floor can then be poured usually the day after the pipes are installed.

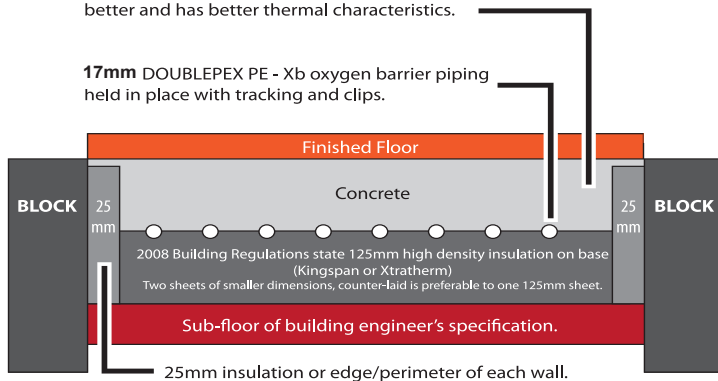
SBK Manifolds

Our SBK manifold kits are available as a modular system which makes them one of the most flexible manifolds around, always the right size manifold for the job. Distinct colours red for hot and blue for cold. SBK have a minimal restriction by flow optimized geometry. They are corrosion resistant and extremely tough modules manufactured from glass fibre reinforced plastic.

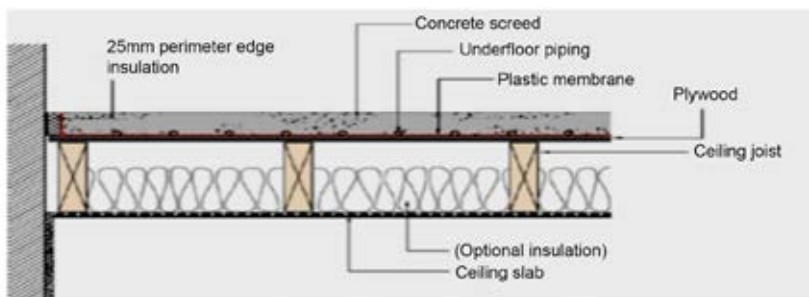
Underfloor Heating Ground Floor Layout (not to scale)

75 to 125mm of concrete screed poured on top of pipes.

We recommend a number 10 aggregate cement as it bonds around the pipe better and has better thermal characteristics.



Underfloor Heating First Floor Layout (not to scale)



First floor with Ducon slab is similar to Ground Floor Layout

Sample Projects worked on



Abalone Fish Farm – Castletownbere, Co Cork
102kW Water to Water



Garryhankard Stud – Upton, Co Cork



Euronom Air Source Heat Pump Installation
10.5 kW Air to Water



Mark Eire, Macroom, Co Cork
34kW Water to Water



Nemo Rangers GAA Complex, Co. Cork
45kW Water to Water



Mallow GAA Complex, Co Cork
68kW Water to Water



Sligo Regional Sports Centre – Swimming Pool
57kW Air to Water



National University of Galway
– Engineering Building - 34kW Water to Water



Skibbereen Credit Union, Co Cork
40kW Water to Water



Flor McCarthy's Panasonic Air Source
Heat Pump Installation 9kW



Irish Atlantic Sea Salt, Castletownbere, Co Cork



Animal Care Building – Fota Wildlife Park
40kW Water to Water

Equipment & Accessories

Geothermal Collector Pipe

| Size | Length |
|------|----------|
| 40mm | 100-150m |
| 32mm | 75-150m |



Roth Underfloor Heating Pipe

Size 17mm x 200 + 600m coils
PERT. Oxygen Barrier



SBK Manifolds



Heat Exchangers



Depala Motorised Valves



Actuators



PUMPS

From manufacturers such as:

Lowara

Wilo

ESPA



Electrofusion Fittings



Heating Controls

Weather compensating controls to simple thermostats



Underfloor Tracking



Hot water and Buffer tanks

Available from 100L to 5000L

Cold water storage tanks

Available from 100L – 10000L

Heat Pump Servicing and Maintenance

Our fully trained service and maintenance staff cover the whole of Ireland and provide our customers with an exceptional technical diagnostics, repair services and maintenance capability. We work closely with our clients to develop a precise solution for individual projects.

We are capable of servicing any model and type of heat pump out there, including models no longer in production. Our store is well stocked with spare parts for all the heat pumps we supply. Many components are interchangeable and controls can be adapted from one manufacturer to another.

We also offer a controls and equipment upgrade, which includes oil boiler

systems, wood pellet boilers, solar systems, stoves, back boilers etc.

Please contact us on 028 23701 or email info@ahac.ie for any queries.

**Alternative Heating
& Cooling Ltd.**





Over 1,300
installations
nationwide

- Newcastle West Creche, Limerick
- Tralee Community Nursing Home, Co. Kerry
- Sean O' Casey Community Centre, Dublin
- Reenascreena National School, Co. Cork
- Tory Top Road Library, Cork City
- Seaweed drying Process, Co. Cork
- Weener Plastics, Limerick
- St Lazerians church Carlow
- Spice of Life, Dunmanway, Co. Cork
- Cope Foundation, Motenotte, Co. Cork
- Nazareth House, Co. Sligo
- The water school, Bantry, Co Cork
- Bottlehill Landfill Admin Building, Cork
- Derreen House, Coachford, Cork
- Lettercollim House, Timoleague, Cork
- Kells, Country House B&B, Co. Clare

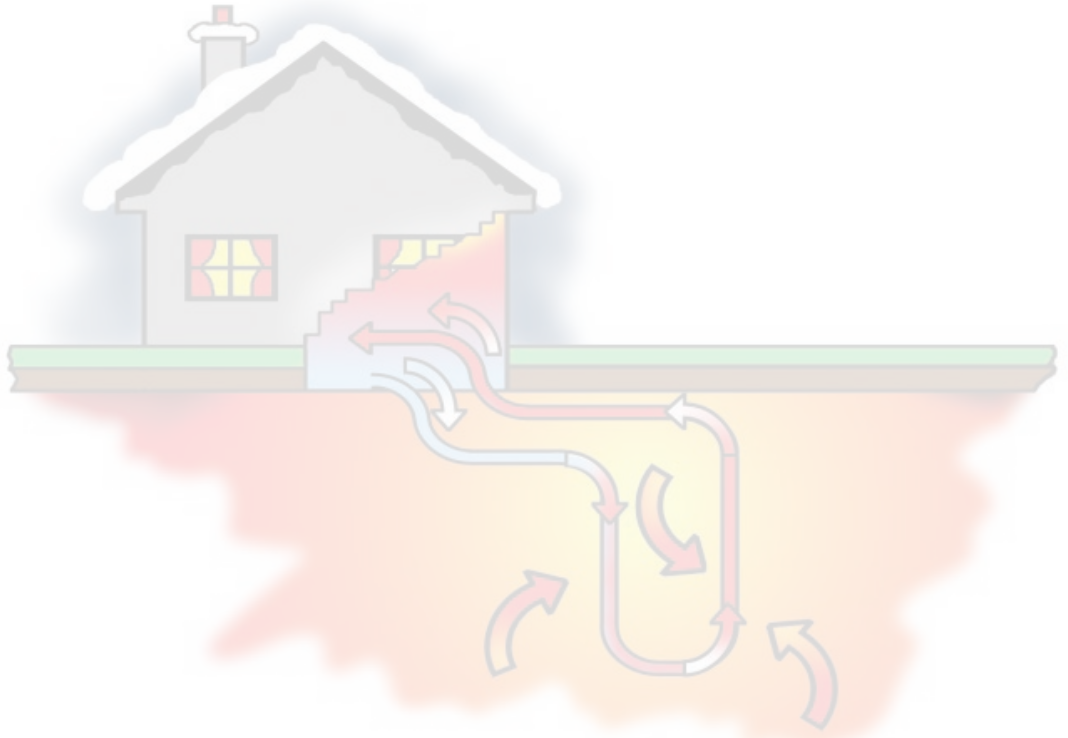
Sources of heat

- Ground & Air
- Milk straight from the cow and/or cooling system
- Rivers
- Streams
- Ponds
- Lakes
- Reservoirs
- Rain water harvesting
- Thermal springs
- IT rooms
- Plastic injection moulding
- Cooling plants
- Central refrigeration unit

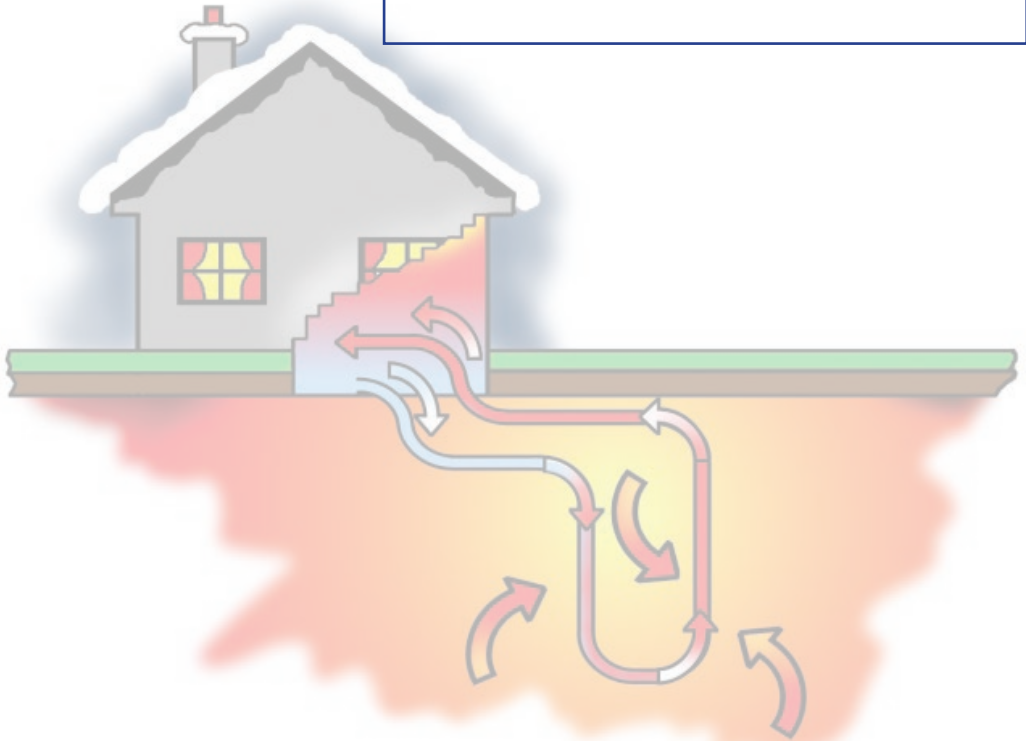
Delivery of heat

- Any property 50m² - 2,100m² (500 - 22,000 sqft)
- Timber Frame houses
- Block houses
- ICF
- Passive
- Near passive
- Swimming pools
- Sports complex
- Aquaculture
- Cheese dairy
- Radiators
- Underfloor heating
- Fan coils
- Outdoor swimming pools
- Sea weed drying

Notes



Your Local Distributor:



Alternative Heating & Cooling Ltd.



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