

A new generation of heat pumps
DESIGNED FOR EARTH



YOUR GUIDE TO HEAT PUMPS & SOLAR THERMAL



RENEWABLE
ENERGY
SOURCES

HOW MANY TYPES OF HEAT PUMP ARE THERE?

NIBE offer three types of heat pump:

- Exhaust Air
- Air to Water (Air Source)
- Ground Source

When to choose an exhaust air heat pump.

Choose a NIBE exhaust air heat pump at the planning stage and the necessary ventilation ducts will be included in your homes design.

For an exhaust air heat pump to work, the necessary ventilation system has to be constructed at the same time as the house itself.

It is neither cost effective nor practical to install an exhaust air system after the house is built. An exhaust air heat pump is the perfect choice for small houses and apartments.

An exhaust air heat pump is the perfect choice for small houses and apartments that are built to current Building Regulations or above.

How does an exhaust air heat pump work?

A NIBE exhaust air heat pump extracts air via the ventilation ducts positioned in the wet rooms of the house such as bathrooms, kitchens (but not cooker hoods) and utility rooms. Ventilation takes place in two different ways: by exhaust air only or by a combination of exhaust air and heated intake air. In the former, the air in the house is conveyed from rooms with outdoor air diffusers to rooms with exhaust air diffusers. The latter is designed for houses with heating systems where some of the heat supply is provided by a heated supply air.

The air in the house is conveyed from rooms with supply air diffusers to rooms with exhaust air diffusers. On its way out of the house, heat is extracted from the old air and transferred into the heat pump's refrigerant circuit. The cooled air is then discharged.



Meanwhile, the vapour compression cycle of the heat pump raises the temperature of the refrigerant and transfers the extracted heat into a water based system that can either warm the domestic hot water or heat the building or both.

An exhaust air heat pump can cover the heating requirements of a well insulated house in all but the coldest conditions. When working efficiently, it can reduce your homes energy consumption for heating by up to 50% when compared to conventional heating systems. The NIBE exhaust air heat pump also works well in conjunction with either radiators and / or underfloor heating systems to give you a comfortable indoor temperature, hot water, low running costs, a long service life and minimal maintenance.



When to choose an air to water heat pump.

Choose a NIBE Air to Water heat pump for either new builds or retro-fit. These heat pumps can be installed on almost any kind of terrain and come in a range of sizes to suit small, medium or large homes.

They can also be docked together for larger, perhaps commercial buildings.

You don't need a large amount of land either because NIBE Air to Water heat pumps only require 350mm clearance from the wall (if placing it against a wall) and 1 metre of free space in front of the unit.



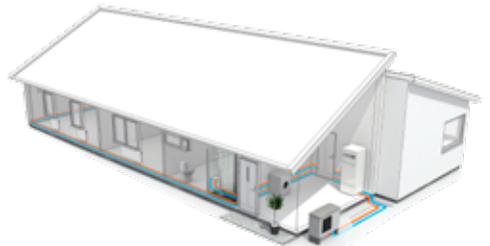
Air/Water Heat Pump

How does an air to water heat pump work?

Heat pump technology is actually based on a very simple, well known principle. It works in a similar way to any domestic refrigerator, using a vapour compression cycle. The main components in the heat pump are the compressor, the expansion valve and two heat exchangers (an evaporator and a condenser).

A fan draws the outdoor air into the heat pump where it meets the evaporator. This is connected in a closed system containing a refrigerant that can turn into gas at very low temperatures. When the outdoor air hits the evaporator the refrigerant will turn into gas. Then, using a compressor, the gas reaches high enough temperature to be transferred in the condenser to the house's heating system.

At the same time the refrigerant reverts to liquid form, ready to turn into gas once more to collect new heat. The NIBE Air to Water heat pump works well with underfloor heating systems and radiators and can also be docked to other heating systems including gas boilers and solar panels with the correct accessories.



NIBE Air Source Heat Pump

When to choose a ground source heat pump.

The term "ground source" covers four different heat sources: rock, surface soil, ground water or lake.

The one that suits your location best is determined by factors such as the building's energy needs, the current heating system and the kind of terrain the house stands upon and the amount of land available.

In all four cases, the heat pump concentrates the stored energy from one of these sources in such a way as to provide the hot water for radiators, underfloor heating, baths and showers.



Ground Source Heat Pump

Exploring Rock

In the lower subsoil of the so called "near surface geothermal layer" lies a heat source with an almost constant temperature that can be utilised all year round.

The heat pump collects the stored solar energy from a collector in a hole drilled in the rock (this is using a ground probe).

The depth of the hole can vary between 90 - 200 metres, depending on the size of heat pump selected and on local building regulations.

NIBE ground source heat pumps come in a variety of sizes from 5kW to 60kW and like the NIBE air source heat pump range, can be docked together for larger buildings giving a total output of 540kW.



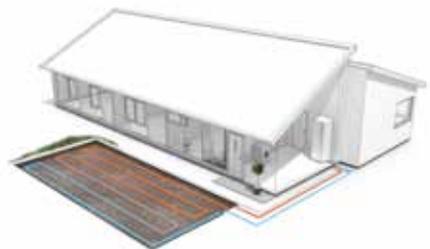
Exploring Surface Soil

During the summer, solar heat is stored in the soil. This is either directly absorbed as insulation or as heat from rain and the air from the near surface layer of soil.

The heat pump collects this stored solar energy from a buried collector (surface collector or ground loops). That is, a hose filled with antifreeze, and buried at a depth of about 80cm - 100cm.

The length of hose varies between 250 and 400 metres depending on the size of the heat pump selected.

Using this energy for heating is a cost effective method. The highest yield can be obtained from soil with a high water content.



How does a ground source heat pump work?

The earth absorbs and stores heat from the sun year after year, providing us with a constant source of naturally renewed energy. Just a few feet under the ground, there is a fairly constant average temperature of between 4°C and 12°C.

This trapped energy represents a vast reserve of low grade heat waiting to be tapped. The ground source heat pump gathers heat from the solar energy stored underground, either using collectors buried at a shallow depth, or from boreholes deeper underground.

The heat is transferred from the ground to the heat pump using a mixture of water and an environmentally friendly anti-freeze solution.

It circulates through the closed loop, absorbing thermal energy from the earth and carrying it to the heat pump.

The refrigerant circulates in the heat pump and thus the heat from the ground is retained and converted into high grade heat to be released into your home via an underfloor heating system, water based radiators and into your hot water tank.



Exploring Ground Water.

Ground water can also be utilised as a heat source since it has a temperature of between 4°C and 12°C all year round.

The heat pump collects stored solar energy from the ground water. Normally, there is one well for drawing up water and one for returning it. (these wells are similar to ground probes).

Exploring Lake Collectors.

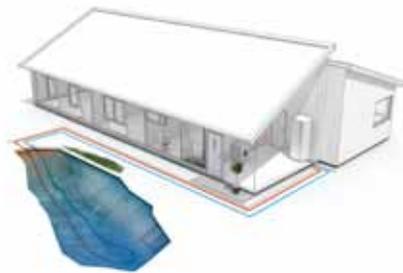
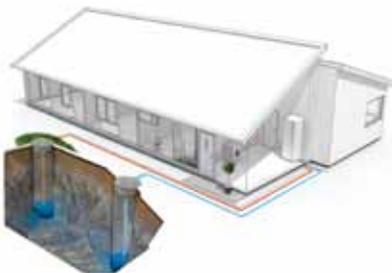
If your home is built beside a water source such as a lake, heat from the lake water can be extracted using a surface soil collector anchored at the bottom of the lake.

The pipes for transporting heat from the energy source to your home contain a solution of water mixed with anti-freeze.

This means that even in the depths of winter, you can rest assured the heat pump will keep doing its job!

It is possible for the NIBE ground source heat pump to give you four functions in one; heating, cooling, domestic hot water and ventilation.

Water-borne distribution of heating takes place via radiators or an underfloor heating system; cooling takes place via fancoils or the same underfloor system.



THREE GREAT REASONS TO CHOOSE A HEAT PUMP:

You save money!

Installing a heat pump can lead to a reduction in energy consumption of up to 80% (compared to direct electricity).

Although the heat pump doesn't pay for itself in the first month, you will notice the financial benefits right away because your heating bills will be much lower.

You reduce your carbon footprint!

The second reason for choosing a heat pump is that it's so environmentally friendly.

A heat pump has a very low environmental impact, in fact, installing a heat pump can cut your home's carbon emissions in half.

This is mainly because there is no combustion process involved. The heat pump merely upgrades naturally occurring energy in order to create heating and hot water for your property.

Heat pumps are versatile!

Heat pumps can be combined with a variety of different sources, depending on availability, accessories and price. Heat pumps not only provide domestic hot water but also provide heating.

They work with underfloor heating and water based radiators. NIBE's heat pumps can come with accessories that provide ventilation, cooling and heat recovery.

Most of NIBE's heat pump range can be controlled remotely via a computer or mobile phone and have a USB port for uploading new software and downloading heat pump data.

With the arrival of the new generation of heat pumps from NIBE, the concept of user-friendliness has reached a whole new level.

A large multicolour display features clear information about status, operation time and all temperatures in the heat pump; an easily navigated control unit enables users to get the best performance out of the heat pump.



When to choose Solar Thermal?

If you have a south facing roof, harnessing free energy from the sun is an ideal choice for your hot water production. Combine your solar panels with a heat pump and you can take advantage of solar energy whenever it is available, without being fully dependant on it. Integrating NIBE solar panels with a new generation NIBE heat pump means that you don't have to have a separate solar controller as the new generation controller on the heat pump will control both systems.

NIBE have a solar system to suit whichever heat pump. You choose. Your choice

How does it work?

Solar energy is created by light and heat which is emitted by the sun in the form of electromagnetic radiation.

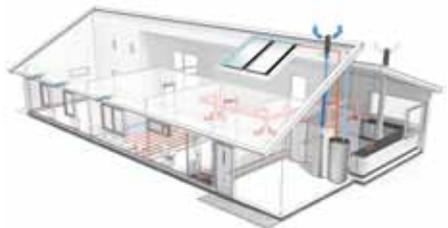
NIBE solar panels absorb this heat in a liquid and pump it into your hot water cylinder. The temperature of your hot water is dependent on the heat from the sun. A correctly designed system will provide over 60% of your hot water needs.



NIBE Solar Thermal



Solar Thermal



GRANTS AVAILABLE FOR RENEWABLE TECHNOLOGIES

The government and regional authorities offer subsidies to home owners and businesses to switch from fossil fuel based heating to more modern renewable energy, there couldn't be a better time to change!



RHI - Renewable Heat Incentive

DECC have announced full details of the RHI (Renewable heat incentive). The world's first financial incentive of its kind to revolutionise the way heat is generated and used in buildings has been launched by the Energy Secretary Chris Huhne.

The RHI will support emerging technologies and businesses in the UK, strengthening security of supply by reducing dependence on fossil fuel heating and emissions.

RHI tariff payments will start for homes alongside the Green Deal to allow a more whole-house approach to heat production and energy saving.

In the meantime, up to 25,000 installations from July 2011 will be supported by a "RHI Premium Payment" to help people cover the purchase price of green heating systems.

Those taking up the premium will then be eligible for the RHI tariff from spring 2013 as will anyone else who has had eligible equipment installed from July 2009. There will also be clear eligibility criteria in order to qualify for a Premium Payment and tariff including:

- A well insulated home based on its energy performance certificate
- Agreeing to give feedback on how the equipment performs
- Air source and ground source off gas grid properties only.

The levels of support for RHI Premium Payments are until March 31st 2013 and are as follows::

1. Solar Thermal - £300/unit
2. Air Source Heat Pumps - £850/unit
3. Ground Source Heat Pumps - £1250/unit

Ground Source Heat Pumps



The tariff below for Ground Source Heat Pumps is for non-domestic installations and is available from November 2011:

- For small Ground Source Heat Pumps less than 100kWth the tariff is 4.3 pence/kWh.
- For Large Ground Source Heat Pumps more than 100kWth the tariff is 3 pence/kWh.

Air Source Heat Pumps



The tariff for Air Source Heat Pumps has not been announced as yet but may be announced in the next phase of the initiative.



Solar Thermal

And the tariff for Solar Thermal for non-domestic installations is: Less than 200kWh 8.5 pence/kWh.

For both of these technologies the Tariff duration is 20 years and the Support Calculation is done via metering.

For full details of this incentive please visit www.decc.gov.uk



The Green Deal

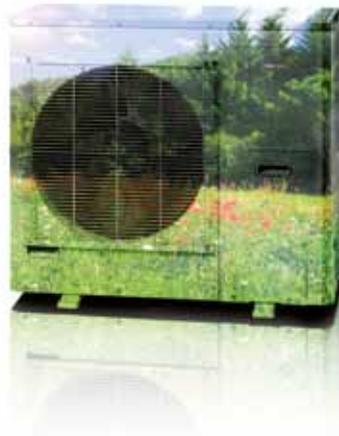
The Energy Bill includes provision for a new "Green Deal" which is believed to revolutionise the energy efficiency of British properties. Put simply, the Government is establishing a framework to enable private firms to offer consumers energy efficiency improvements to their homes, community spaces and businesses at no upfront cost, and recoup payments through a charge in instalments on the energy bill.

At the heart of the Government's proposals is the "Green Deal Plan", an innovative financing mechanism which allows consumers to pay back through their energy bills.

This means consumers can see the Green Deal charge alongside the reductions in energy use which generate savings on their energy bill. It also means that if they move out and cease to be the bill-payer at that property, the financial obligation doesn't move with them but moves to the next bill payer:

the charge is only paid whilst the benefits are enjoyed. In this way, the Green Deal differs from existing lending - it is not a conventional loan since the bill payer is not liable for the full capital costs of the measures, only the charges due whilst they are the bill payer.

For full details of the green deal please visit www.decc.gov.uk



MCS - MICROGENERATION CERTIFICATION SCHEME

Both the Renewable Heat Incentive and the Green Deal will require that an installation must be carried out by an accredited installer and that the product must also be accredited in order to obtain any funding.

The MCS (Microgeneration Certification Scheme) is an internationally recognised quality assurance scheme and mark for low and zero carbon technology, installers and products. It was designed with input from installer and product representatives. Similar to the Gas Safe Register, the MCS gives you a mark of competency and demonstrates to customers that you can install to the highest quality everytime.

The MCS (Microgeneration Certification Scheme) exists as an accreditation body for both the installer and the product.

The MCS demonstrates an installers competence to carry out an installation to his / her customers.

In this rapidly growing industry, installers and products that carry the MCS mark are likely to be seen as the preferred option in the market place. This is because the MCS is linked to many key factors such as:

- The Renewable Heat Incentive. The government has indicated that this incentive will be linked to MCS products and installers
- The Code for Sustainable Homes, which is a mandatory requirement for all newly built homes to meet sustainability ratings, including certificated technologies can be used to meet the requirements of this Code
- Planning permission for consumers for certain renewable energy technologies has now been made a lot simpler thanks to permitted development rights introduced in England and Scotland
- The Standard Assessment Procedure (SAP) for Energy Rating of Dwellings recognises MCS certified products when determining whether products are eligible for inclusion in SAP assessments

The scheme is based around a set of written standards. They contain some requirements that apply to all installers and others specific to the technology that you wish to install. NIBE have MCS approved products and others can be found on the MCS website. For further information regarding the MCS Scheme please visit www.microgenerationcertification.org



To search for your nearest MCS and NIBE accredited installer, please visit www.nibe.co.uk

APPOINTING A NIBE VIP INSTALLER TO CARRY OUT YOUR NIBE INSTALLATION CAN GIVE YOU LOTS OF BENEFITS!

Our NIBE VIP Accredited installers have attended all of our manufacturer training courses and have successfully installed NIBE heat pump products. In order for an installer to reach VIP status they must meet certain criteria that are strictly adhered to.



The benefits of employing a NIBE VIP installer are:

- A professional Installer
- Knowledgeable of NIBE products
- Fully qualified and certified within the industry
- Able to offer a 5 year guarantee
- MCS registered and, thus, able to offer grants and tariffs via the Renewable Heat Incentive and also Renewable Heat Premium Payments.

A NIBE VIP installer is not an employee of NIBE Energy Systems Limited, but is a bone fide company in its own right that will comply with all relevant UK regulations. By choosing a NIBE VIP installer you are investing in a professional, competent and responsible installer*

** Whilst we try to ensure that you are being put in contact with a highly trained experienced installer, some information provided to us from the installation company is received in good faith and we recommend that you complete an independent check with the installer. NIBE Energy Systems Limited do not accept responsibility for the operation, workmanship or service that the installer will provide.*



Please contact us for further information.

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This brochure is a publication from NIBE. All product illustrations, facts and specifications are based on current information at the time of the publication's approval. NIBE makes reservations for any factual or printing errors in this brochure.

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