NIBE

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GROUND SOURCE HEATING FOR FLOATING HOMES

Launch of renZERO:

TRADITIONAL HOUSES CAN BE AS ENERGY EFFICIENT AS PASSIVE HOUSES

Remotely operated HEAT PUMPS

WORLD-CLASS ENERGY RENOVATION

THERE ARE ALMOST 100 MILLION single-family and duplex homes in Europe today. An average of five million old heating systems are replaced by new ones each year. And about one million new homes are built in Europe each year. They all have to comply with the increasingly stringent building codes and take into account the targets of the European energy policy. Buildings account for 40% of energy consumption in Europe today. The agreed target for the whole of the EU is half that amount by 2050. About 80% of all buildings that will exist throughout Europe in 2050 have already been built.

Most of them have insufficient insulation, poor-quality windows, inadequate ventilation, inefficient heating systems and therefore poor indoor comfort. Their energy consumption far surpasses the set targets and the new and upcoming construction code requirements.

There is a colossal and growing need to upgrade the energy performance of existing buildings if we are to have any chance of meeting the EU targets for energy consumption.

All countries in Europe have long-term goals to reduce energy consumption in all buildings and thereby bring energy consumption per square metre of living space down to a minimum.

Sweden is one of the countries leading the way towards this goal with its extremely interesting renZERO project. A single-family house built in 1945 in Stockholm is undergoing "global energy renovation". The goal is to take various measures to reduce the annual energy consumption of the house from 128 kWh/m^2 to 25 kWh/m^2 which is the consumption level of a new passive house. The renovation will also incorporate improvements in ventilation.

The annual energy consumption will fall to one-fifth of what it used to be and there will be a noticeable improvement in indoor comfort with fresh air ventilation. You can read about how NIBE is engaged in this project with our products in this edition of Expert News.

The Swedish heat pump market experienced an upswing in the third quarter and there is also, at last, cautious growth in the construction of new small residential properties in Sweden, even though the level is still alarmingly low. There was considerable activity during the autumn months and your response to the new generation of products has been tremendously positive.

Our country has been buffeted by one storm after another this autumn and 2014 is rushing towards us. We are already planning for the first week of April when we will be rolling out a powerful line of products at the NORDBYGG exhibition in Stockholm, the largest event of the year in the industry. Make a date in your diary right now. You're most welcome to visit NIBE's booth for a closer look at our latest products and to discuss how we can create opportunities together.

FROM EVERYONE HERE AT NIBE, thank you for a productive and successful partnership in 2013. We look forward to an even stronger relationship in 2014. The outlook has never looked so promising as now.

A Very Merry Christmas and a prosperous and Happy New Year to all readers of Expert News.

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WATER-BORNE HEATING – IN A DIFFERENT WAY...
Geothermal heating usually comes from bedrock and the ground. Yet there's nothing to say that you can't heat floating structures too. You could call it water-borne heating...

Ground source heating for floating homes

Aquavillan's permanently anchored houseboats are classified as properties with their own plot. Although in this case, the plot is water. However, since it is possible to move these floating homes elsewhere, it makes sense if their heating system can move with them.
This was solved by casting the collector hose inside the "hull".
Ground source heating loops in water, you could say...

"MORE AND MORE SWEDISH TOWNS are realising that there are considerable untapped resources in their harbours," says Richard Bergström at Aquavillan.

"Our floating houses can easily transform harbours into attractive residential areas."

Three-storey houses with living areas of between 100 and 150 m^2 are moored at special jetties. They have electricity, water and wastewater connections and shared logistics on land. Obviously, site preparation is minimal and the location offers a unique means of heating and cooling the homes.

"We are using NIBE F1245 ground source heat pumps and have cast the collector hose inside the 230-tonne caissons which form the "hull" of the floating homes. This affords the same benefits as when you lay the hose on the bed of a lake or river, but without any risk of it getting caught in anchors or other objects. What's more, it means the entire structure can be moved elsewhere!"

In the summer months, the system can be reversed to allow heat from the house to be transported down and cooled by sea. This ensures a comfortable indoor climate.

You can find out more at www.aquavillan.se

VICE VERSA – on the lightship

IT'S QUITE COMMON TO LAY COLLECTOR HOSES on the bottom of harbours and lakes to transfer the heat to properties on land. The opposite has been done at Biskopsudden on Djurgården in Stockholm.

The former lightship, which now houses a restaurant and conference space, is heated, quite literally, by ground source heating. The heat comes from a borehole in the ground, not from the water.

"It's a vice versa solution," says Thomas Andersson at TA Energy Systems, the company that installed the new NIBE F1145/8 on board the lightship last autumn.

"We'd never installed ground source heating in a boat before," he laughs.

"The installation wasn't the difficult part. It was carrying the pump on board and getting it into place! Steep stairs, narrow passages and door steps that you almost had to climb over. It wouldn't have been possible if we hadn't been installing the 1145 which is a low model!"

Launch of renZERO:

Traditional houses can be as energy efficient as passive houses!

1.5 million homes in Sweden need to be renovated to meet the European energy efficiency criteria.
But renovating a house to improve its energy performance is such a complex project involving extensive planning by the owners that many have found it an impossible task. Everyone's had to "reinvent the wheel" and there's great uncertainty as to which measures are the right ones to take.


Before


After

RENZERO IS BEING LAUNCHED BY THREE SWEDISH COMPANIES, Elitfönster, Paroc and NIBE. This new concept makes it possible to renovate individual houses to improve their energy performance. The renovation reduces energy consumption to the level of a passive house and NIBE's heat pumps play a key role.

Here in Sweden, forty percent of all energy is used by our homes. That figure has to be halved by 2050.

However, eighty percent of the homes we'll be living in then will already have been built. They are being built today - using today's technologies.

Consequently, we need to invest a tremendous amount of money and work into renovating homes across the country to make them energy efficient. A lot has been said about the "Million Programme" apartments. But now the focus is on the 1.5 million single-family homes that also need to be renovated to meet energy efficiency criteria.

IN Skarpnäck, a suburban district of Stockholm, the renZERO concept is being used for the first time on a house undergoing an energy efficiency renovation.

Built in 1945, it is a typical Swedish single-family house. Its current energy consumption is 128 kWh/m^2.

The target is to reduce this by 80 percent to 25 kWh/m^2 - the consumption level of a newly-constructed passive house.

"We had been considering renovating our home for some time. Traditional renovation solutions seemed very complicated, however, and would mean a lot of different contacts. We wanted a simple, turn-key concept that would be kind to our wallet and the environment," says Ola Åkerström, who lives here with his family.

The first stage of the renZERO PROCESS IS renovation of the outer shell using methods that take about half the time it normally takes. The next stage is to fit new windows from Elitfönster and new window frames, developed jointly by Paroc and Elitfönster.
A new FTX ventilation system and a NIBE F1255 ground source heat pump for heating and hot water are then installed.

Even at this early stage, it seems like the 80% energy reduction target will be met.

"Since houses come in all shapes and sizes, there hasn't been a standard solution on the market," explains Richard Carlholmer, NIBE's representative for the project.

"Homeowners have also been hesitant because they've felt that companies push their own products and maintain that they're offering an easy solution. The renZERO concept has been developed by three companies and we each deliver a part to produce a whole.

Once the pilot project has been completed and evaluated, the plan is to roll renZERO out on a broad front.

"Manuals will be written and various sales tools produced."

"It's a huge market and can provide tremendous opportunities to smaller HVAC installers around the country who have not had a chance to become involved in the energy renovation project. My advice is to start establishing partnerships now with building companies that can work with insulation and window replacement. renZERO will be marketed heavily and really is a safe and simple concept for customers.

FACTS ABOUT renZERO:

Energy renovation in progress in the renZERO project:

ROOF: Additional insulation of the roof from the outside using PAROC eXtraTM 360 mm.

FRONTAGE: Additional insulation of external walls using new PAROC renERGIATM panelling. This consists of a 300-millimetre fire resistant and water-proof stone wool lamella glued onto an 18-mm thick board. It takes half the time to add this insulation as it does to add traditional types.

WINDOWS: Windows replaced with ELITE RETRO, with a UV value of 1.1 to 0.9 for best insulation. A newly-developed window frame, by Paroc and Elitfönster, is also fitted.

RENDER AND CELLAR FOUNDATION: Additional insulation using rendered façade lamella PAROC FAL 1, and rendering of the cellar foundation.

HEATING AND VENTILATION: Installation of a new generation of FTX ventilation heat exchangers and a new type of all-in-one ground source heat pump, the NIBE F1255. The heat pump uses up to 15% less energy than previous models and adjusts automatically to changing conditions without the need for any immersion heater.

VENTILATION PIPES: Ventilation pipes are insulated using PAROC Hvac AirCoat and extra insulation is added to water pipes using PAROC Hvac Section AluCoat.

"We've been living in the house while the renovation was on-going"

OLA AND ERIKA ÅKERSTRÖM LIVE in renZERO's pilot house in the suburbs of Stockholm. Built in the 1940s by Ola's grandfather, the house has been extended and renovated over the years.

"I believe this is an effective option for meeting future targets," says Ola.

"As an individual homeowner, you simply don't have the time, knowledge or financial means to assess what needs doing to save energy. Let alone actually pulling it all together to get the job done. Here we have a package designed, assembled and endorsed by professionals from the various fields."

The renovation work has hardly affected everyday life for Ola and Erika who have been able to remain in their home throughout, except for when the windows were being replaced and the ventilation pipes were installed in the attic.

"Everything has gone extremely smoothly. Especially the heat pump installation."

"It took an entire morning to remove the old one. But the new one, which can be disassembled into sections, took hardly any time at all to carry down. I don't know anything about plumbing, but it only took 10 minutes to assemble it! It then took me another 10 minutes to connect it to NIBE Uplink via the Internet."

"It's so quiet that we can't even hear it operating!"

Remotely operated HEAT PUMPS

Bäckabro nursery school in the village of Vittsjö is heated by NIBE heat pumps that are controlled via MODBUS from the town of Hässleholm, more than 20 kilometres away.

The NIBE Uplink web interface enables remote management and control of virtually all new NIBE heat pumps. Property managers/owners or installers can simply log in and check their heat pumps. It has in fact been possible for some time now to connect many of NIBE's heat pumps to large building systems using Modbus.

Many large property owners have complex management and control systems. In most cases, equipment is connected via the Modbus protocol. In simple terms, Modbus is about connecting equipment, sensors and computers on shared networks with more or less automated operation.

"Modbus basically enables communication between all devices. It's then up to each device what it can do with the incoming data," says Andreas Johannesson, who works with Modbus-related issues at NIBE. Andreas helps installers to connect their NIBE products correctly with Modbus systems.

Many property owners have a DDC (Direct Digital Control) system in their buildings. DDC technology makes it possible to control and monitor all connected equipment, such as wind gauges, alarms, door locks, heat pumps, ventilation, pumps and lighting. Different DDC systems are then connected together so that all the properties can be controlled remotely.

"A simple example is when thermometers and wind gauges provide information that prompts the heat pump to increase its power output. Or a certain type of fire alarm commands all doors to unlock."

Virtually all larger NIBE heat pumps can now be connected to Modbus networks using NIBE Modbus 40.

In all, about 100 parameters can be viewed and 20 of them can be selected for immediate access in the system.

Anders Svensson, Operations Manager at Hässleholm Local Authority, says "We monitor and control our entire property holding via a Siemens Modbus system". Hässleholm Local Authority has a lot of NIBE heat pumps of various types and sizes in many of its facilities in the local area and all of them can be controlled centrally.

"We have a graphics system that allows us to view a wide range of performance metrics and where a large number of actions are automatically initiated. For heat pumps, it's very much about gathering data on energy consumption, the coefficient of performance (COP) over 24 hours and other such information. This data is then used in the overall energy performance statistics in different ways. It might be an analysis of all energy used in one particular property, whether for heating or something else. Or it might be a comparison of the energy consumption of different heating methods under the same external conditions."

"We also have automatic alarm systems that send text message alerts with different priority levels to the property managers."

You can find much more information about Modbus on nibe.se. Modbus training is included in NIBE's advanced Commercial Heat Pump courses. ❑

Don't miss our manufacturer meetings!

WHETHER YOU HAVE time to visit trade fairs like Nordbygg or not, if you're a building services engineer we recommend you go along to our manufacturer meetings, where you get first-hand information about the latest products and technologies from NIBE, IFO, Mora/FM Mattsson, Purus, Siemens, Flygt and Uponor.

Book in one of this year's meetings at **www.fabrikantgruppen.se**

LOCATION	DATE
Kalmar	24 April
Sundsvall	7 May
Östersund	8 May
Malmö	21 May
Helsingborg	22 May
Gothenburg	2 October
Örebro	15 October
Norrköping	16 October
Uppsala	6 November
Stockholm	20 November

Training courses in spring 2014

www.nibe.se/Partners/NIBE-Training/

Heat pumps – BASIC	4 Feb and 13 March
Ground source heat pumps – TECHNOLOGY	26 Feb and 16 April
Ground source heat pumps - SERVICE	12 Feb and 8 May
Air/water heat pumps - TECHNOLOGY	17 March and 2 May
Air/water heat pumps - SERVICE	28 Jan and 16 May
Exhaust air heat pumps – TECHNOLOGY	20 March and 7 May
Exhaust air heat pumps – SERVICE	21 March and 9 May
Commercial heat pumps – BASIC	14 Feb and 8 April
Commercial heat pumps – TECHNOLOGY	29 Jan and 23 April
Commercial heat pumps – SERVICE	21 Feb and 11 June
Commercial heat pumps – DIMENSIONING	27 Jan and 16 June
Heat pumps AP AW-BW – BASIC	19 May
Ground source heat pumps AP BW – TECHNOLOGY	4 June
Ground source heat pumps AP AW – TECHNOLOGY	2 June
Heat pump refrigerant technology	18 Feb and 14 April
Refrigerant certification(5 days)	24-28 March and 23-27 June
EU Certification (2 days)	5-6 March

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FIVE THINGS TO THINK ABOUT WHEN DOING A MODBUS INSTALLATION

1. **Activate MODBUS** in the system under System Settings Menu 5.2.4.
2. **Connect** the DDC to the X2 terminal block on MODBUS 40 (A = +, B = -).
3. **Read** the data in the holding register "03" in the DDC.
4. **You will find the parameters** that you want to read via MODBUS in the NIBE MODBUS Manager program (nibe.se/Modbus).
5. **Always download** the latest software when installing the system.

NIBE

www.nibe.se

New faces at NIBE

MAGNUS IN ÖSTERLED

MAGNUS LINDBERG FROM KUMLA is our new Manager for the East Region. Magnus has extensive experience of all types of heating installations, acquired whilst working at Mullhyttans Rör, including practical installation work and planning and design.

"I started off as a pipe fitter and have been working as a site manager for a number of years now," says Magnus.

"I think I've installed every make of heat pump there is!"

"It won't be easy stepping into Ola Bredell's shoes, but I intend to give as much help to all the installers out there as Ola gave to me."

You can contact Magnus on +46 (0)433 – 27 34 91.

HENRIK HELPS WITH HEAT PUMP PROJECTS

HENRIK NILSSON will be stepping into his role as an Internal Sales Executive for commercial heat pumps in the New Year. Henrik has worked as a refrigeration engineer in the heat pump sector for many years and has established a wide network of contacts, including installers. His work will involve assisting with various issues relating to installations in commercial properties.

THERE'S SO MUCH HEAT OUT THERE…

– Just waiting to be collected

Some 30 years ago the Swedish company NIBE started to manufacture ground source heat pumps. What was then seen as a novelty is today the primary source of heating in new houses in large parts of Scandinavia. Heat pumps has also played a major part in Sweden reducing its dependency of fossil fuels for heating by close to 80%.
And as someone said – if it can heat a house in Scandinavia, it can heat a house anywhere!

TODAY NIBE IS A MAJOR player in the heating industry with an annual turnover of some € 900 million and more than 6,000 employees on three continents.

A large part of this is the result of the success of ground source heat pumps. With the aid of a ground source heat pump, solar energy stored in the ground can be collected and used to heat homes and commercial buildings.

Warmth builds up underground from the first days of spring when the surface of the earth starts to thaw, to high summer, when the rays of the midday sun penetrate deep down into the ground. By the time the autumn leaves are falling, there's enough energy stored in the ground to heat up any house throughout the coldest winter. A heat pump collects and upgrades this naturally occurring warmth.

Even a wet and cool summer can still provide enough energy to maintain a comfortable indoor temperature in the coming winter.

If at any point it gets too hot inside the house, the same system can be used for cooling.

Drawing on the lower temperature underground (between 4 and 12 C°) passive cooling also exploits nature's own resources – simply for cooling instead of heating.

It's amazing, but true.

THREE KINDS OF HEAT PUMPS

Heat pumps is a word with many different meanings. Today NIBE produces three kinds of heat pumps.

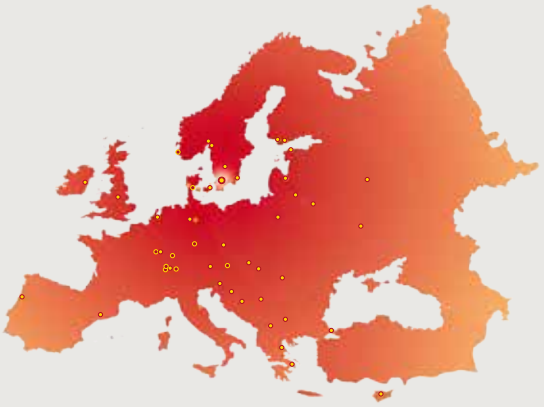
Exhaust air heat pumps
An exhaust air heat pump ventilates the building and recovers the energy in the warm air, reusing it to warm up your sanitary water and fuel a central heating system. Ideal for heating domestic premises and tap water.

Ground source heat pumps.
Drawing heat from surface soil, bedrock or the water in a nearby lake, this is a great option for heating houses, multiple-unit properties and other larger buildings. Available with or without an integrated water heater.

Air/water heat pumps
These pumps extract heat from the ambient outside air. In contrast to simpler types of air-to-air heat pumps, they are connected to the building's heating system and are able to produce both heat and hot water.

HEAT PUMPS MEAN RENEWABLE ENERGY!

The 20/20/20 European directive imposes compulsory targets on the EU's 27 member states, specifying that 20% of energy consumption must be met by renewable sources by 2020. Since ground source heat pumps are now classified as a renewable energy source their installation will help member states reach this ambitious target. And in many cases, local or regional authorities are offering home owners subsidies to switch their existing.



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