

# Thermia

## Large capacity Heat pumps





Photo: Tomas Jansohn

# Reliability and low heating costs

A large capacity heat pump from Thermia will effectively lower your heating costs while providing a reliable and sustainable energy solution. It requires very little maintenance and is environmentally sound.

## A wise energy solution

Thermia's large capacity heat pumps utilise the free energy that is stored in the ground, water and air. By fetching and exploiting this free energy you can reduce your heating and hot water costs; in some cases up to 80 per cent. The heat pump is classed as a renewable energy source, which guarantees a sustainable solution for the future.

## Takes care of itself

A large capacity heat pump from Thermia requires minimum care. It just keeps going and in the unlikely event of something going wrong, you find out immediately through a text or email alert. This gives you total control wherever you are in the world.

## Covers all needs

Thermia's large capacity heat pumps can produce heating, tap hot water and comfort cooling for different parts of the building and are available in outputs from 22 kW up to 336 kW (cascade coupling). Thanks to a large number of readymade system solutions and the possibility of customising the plant to the conditions prevailing in your property, you are guaranteed an effective heat pump solution.

## Utilise your existing system

If you already have a well-functioning heating system (for example, gas, oil-fired, electrical or district heating) you can retain it parallel with the heat pump system. The heat pump is simply connected to the existing system and takes care of the entire control. The old heat source can then supplement the heat pump by providing extra heat during the coldest days of the year.

## Quality assured for the long haul

A large capacity heat pump from Thermia is quality assured for the long haul. Thermia has 40 years experience of developing and manufacturing heat pumps that are tried and tested in the hard Nordic climate.



Thermia Robust Eco  
Thermia Solid Eco

Thermia's range of large capacity heat pumps consists of two products that are specially designed to meet a variety of needs: Thermia Solid Eco and Thermia Robust Eco.

## Four different ways to extract energy

### Geothermal heat pump

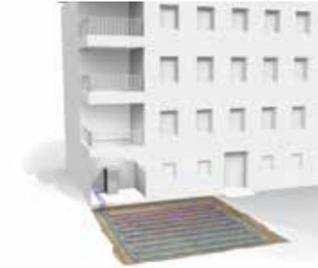


#### Advantages:

- You do not need a large plot of land
- The rock keeps an even temperature all year round
- Little affect on the plot of land

A geothermal pump utilises the solar energy that is stored in the bedrock. Pipes are lowered into a number of drilled holes to a depth of 150–180 metres.

### Ground source heat pump



#### Advantages:

- No drilling needed
- Lower installation cost than geothermal
- The ground loop keeps an even temperature all year round

A ground source heat pump utilises the solar energy that is stored in the ground. Plastic tubing is laid in loops at a depth of one metre. If the bedrock is too deep, or you do not wish to drill on your land for some other reason, you can choose a ground heat pump instead.

### Groundwater heat pump



#### Advantages:

- Lower drilling cost than geothermal
- Even and high temperature = improved efficiency
- Other types of process water can be used

A groundwater heat pump utilises the energy that is stored in the groundwater. The groundwater is pumped up from the bedrock and the energy is extracted by the heat pump before the water is returned to the bedrock.

### Exhaust air heat pump

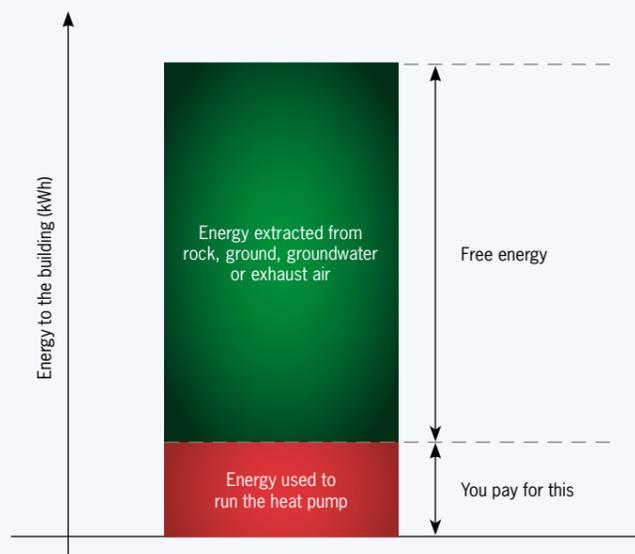


#### Advantages:

- Low investment cost
- Can be combined with other heat sources (rock, ground, etc.) to further increase the efficiency level
- Suitable for places where drilling is forbidden and there is insufficient room for ground source heating

The heat pump recycles the warm exhaust air that is ventilated out of buildings. The system requires a mechanical ventilation system.

## You save this much



The illustration shows the building's total energy consumption of heating and tap hot water. The red field shows the energy used to run the heat pump.

The calculation was made on a building of a 1,000 square metres in an average weather year.



## Thermia Solid Eco

### Optimum performance and low investment cost

**Thermia Solid Eco is the large capacity heat pump for those seeking optimum performance and access to the most important functions. The perfect solution for larger buildings without the need for special applications.**

#### Capacity up to 42 kW

Thermia Solid Eco is available in output sizes 22, 26, 33 and 42 kW.

#### Keeps costs at a minimum

Thermia Solid Eco is the large capacity heat pump for those seeking to keep costs at a minimum without sacrificing performance or function. You get a complete solution to cover basic needs that is perfectly suited to larger buildings, such as schools, churches, manors, business premises, sports halls etc., without the need for advanced extra functions.

#### Controls for maximum output

Thermia Solid Eco can control two separate heating systems in the same building at the same time. The intelligent controls

also make it easy to keep a check on, and control, other parts of the system, such as supplementary heat, tap hot water, cooling and shunt groups. This means that the system can be fine tuned at all times to suit prevailing needs and conditions, giving optimum efficiency and energy saving.

Visit [www.thermia.com](http://www.thermia.com) to download leaflet with technical data.



## Thermia Robust Eco

### Optimum performance and extra features

**Thermia Robust Eco gives the same high performance as Thermia Solid Eco but has more functions due to more advanced controls. Thermia Robust Eco is the natural choice for larger buildings with advanced heating and cooling systems, and extra high demands on functionality.**

#### Capacity up to 336 kW

Thermia Robust Eco is available in output sizes 22, 26, 33 and 42 kW. It is also possible to cascade-connect up to eight machines and get up to 336 kW (8x42 kW). Cascade-connected pumps start one after the other depending on the energy need,

thus ensuring minimum energy consumption regardless of the output.

#### High functionality

Thermia Robust Eco is a large capacity heat pump with many extra features. It has an advanced control system that keeps a check on all the functions, providing you with an assuring overview. Thermia Robust Eco can communicate with other control systems. It can be controlled and monitored via a management system that gathers all the information on, for example, alarms, lifts, ventilation, etc., in the same building.

#### Full control and comfort

It is possible to control up to nine separate heating systems in the building via

a 0-10V signal. This could, for example, be radiators, underfloor heating, fan coil units and the heating of ventilation. With Thermia Robust Eco you can cool certain parts of the building at the same time as other parts are heated. Heating and cooling are produced simultaneously, which can be utilised in several energy saving ways. For example, the cooling effect that occurs when apartments are heated can be put to use to cool a store or warehouse in the same building.

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## Online function

Thermia Solid Eco can be equipped with Thermia Online, a function that allows you to control and monitor the heat pump remotely using a smartphone or computer. You can view current temperatures and set operating parameters

whenever you like. Thermia Online also has a user-friendly calendar function as well as an alarm function, which means you can automatically receive information in the unlikely event that something needs to be fixed.



## Integrated web server

With Thermia Robust Eco you get an integrated web server that enables you to control and monitor the heat pump in real time anywhere in the world. It gives you control over all the settings, such as alarm management, operational data and prevailing temperatures. All these functions facilitate operational optimisation, which could be of great help when

you require support or service. If an error occurs, you or your installation engineer will receive a text or email alert. Online control and monitoring optimises energy efficiency for property owners with buildings in different places.

Thermia Robust Eco can also be equipped with an online function if you have no broadband access.



# Overview – product properties

Properties and functions	Advantages	Solid Eco	Robust Eco
Classed as hermetically sealed	No yearly inspection required	●	●
High annual energy efficiency level.	Low operational cost all year round, good for the environment.	●	●
Quality components and intelligent design.	Optimum reliability and long service life.	●	●
Intelligent controls keep a check on all the system functions, such as supplementary heat, domestic hot water, shunt groups, cooling, legionnaires control, etc.	Optimum energy saving and comfort. User-friendly, logical navigation in the control menu.	●	●
Cascade function with sequential alternated operation. Possibility of parallel-connecting up to eight heat pumps (master/slave function).	The output of the plant is adapted sequentially (pump for pump) based on the prevailing needs of the building. Can achieve a capacity of 336 kW. You do not pay for more output than you need at any time. Alternated operation distributes the operational time between the heat pumps in the system, thus extending the service life of the entire plant and minimising the risk of breakdown. Easy to use, all operations are carried out via a control unit.		●
The possibility to control up to nine different heating systems via a 0-10 V signal (zoning via eight sub-shunt groups). (Accessory).	Gives you the opportunity for individual temperatures and heating systems in different parts of the building (e.g. radiators, underfloor heating, fan coil units and the heating of ventilation).		●
The possibility to control two different heating systems (zoning via a sub-shunt group). (Accessory).	Gives you the opportunity for different temperatures to two different heating systems in the same building (e.g. radiators, underfloor heating, fan coil units and the heating of ventilation).	●	●
The control of external heat source (supplementary heat) via a 0-10 V signal.	Offers the possibility of using existing heat source for supplementary heat. The controls ensure that the supplementary heat is adapted to the requirement, which minimises energy consumption and further lowers the operational cost.		●
The external heat source (supplementary heat) is activated by the on/off function.	Offers the possibility of using existing heat source for supplementary heat during the coldest days of the year.	●	●
Tap hot water is heated by an extra heat exchanger, separate from the hot water tank (Water Charging System). (Accessory).	Ensures an even water temperature in the system even at large amounts of water usage. Offers increased comfort in buildings where large volumes are tapped in a short time.		●
Can produce cooling. (Accessory).	No extra investment cost for a separate cooling unit. By utilising the free cooling (from the drill hole) the building can be cooled significantly cheaper than by using traditional air conditioning. If a large cooling capacity is required, the compressor can be used to produce extra cooling.	●	●
Can produce heating and cooling simultaneously.	Offers the possibility to cool certain parts of the building at the same time as other parts are heated.		●
Can communicate with other control systems via Modbus (standard) or OPC client (accessory).	Possibility to control and monitor the heat pump via a management control system (along with others parts of the building such as ventilation, lifts, etc.).		●
Built-in web server enables the heat pump to be controlled and monitored online. Simply connect a network cable.	Offers the possibility to remote-control the heat pump. All communication is in real time. Simplifies operational optimisation and is a help if you should require support or service. The alarm function informs you if something should go wrong.		●
The online function enables the heat pump to be controlled and monitored online and via wireless communication. (Accessory).	Offers the possibility to remote-control the heat pump. Simplifies operational optimisation and is a help if you should require support or service. The alarm function informs you if something should go wrong.	●	●
Tap Water Control (TWC). The two-temperature sensor in the regulating system ensures that the temperature of the water circulation is always over a set degree, and that the tap hot water flow is always at least 65°C. (Accessory).	Gives temperature-controlled hot water circulation, which could be important for some installations.		●
A hot gas heat exchanger utilises the system's highest temperature for extra effective hot water production.	Gives 13% cheaper production of hot water than traditional systems. Gives a cost-effective guard against legionnaires' disease and compensates for circulation losses in the hot water system.*	●	●
Top-up function utilises the current production of heating to make tap hot water. Reduces the number of starts and stops of the compressor.	Extended service life of the compressor.		●
Compact design.	Easy to place and takes very little space. No more than a fridge.	●	●

\* Based on a comparative study of the risk of legionnaire's disease through a hot gas system compared to a traditional system with an electric heater, conducted by Danfoss R&D Center in November 2009.

## Reference cases



### Modern times, modern heating solutions

It all began with cast-iron stoves, and ended up with a heat pump from Thermia. The church in Sipoo, Finland, has seen many heating solutions over the years.

In 1997 heat pumps entered the picture, largely due to environmental considerations. The fact that 75 per cent of geothermal energy is pure solar energy stored in the rock was a major factor in choosing between the various options.

The church was also aware that underfloor heating and heat pumps work very well together, which is why work began to lay underfloor pipes in the entire church. This would provide consistent, comfortable heating in the whole building, wherever parishioners were sitting. Beautiful concrete mosaic flooring with good heat conductivity was laid on top of the heating pipes.

Based on an average consumption of 38 m<sup>3</sup> of oil a year, the church's output requirements in the severe cold was put at 208 kW, and the energy requirement at 344,000 kWh a year. The solution was two Thermia Robust heat pumps.

The energy for the heat pumps is drawn from eight bore holes in the rock outside the church, 180 m deep and 140 mm in diameter.



### Strömstadsbyggen has around 240 heat pumps in operation

The public utility Strömstadsbyggen in Sweden has chosen their path for heating their buildings. Heat pumps from Thermia are the key.

"Heat pump technology is absolutely the right strategy for us, from both an environmental and economic point of view", says Sven-Erik Adolfsson, MD of Strömstadsbyggen.

At present Strömstadsbyggen has around 240 heat pumps in operation. All new builds have heat pumps installed and there is a program to replace electrical and oil fired boilers with heat pump technology in older buildings.

"Thanks to heat pump technology we have one of the lowest heating costs per square meter in Sweden. We know that many people are watching developments with a keen interest and I would be glad to see more people following us", says Sven-Erik.

#### Unbeatable technology

Strömstadsbyggen means that heat pumps are unbeatable from an environmental point of view. When in operation they require minimal supervision and have a low impact on the environment.

In addition no fuel deliveries are required, which is an environmental benefit in itself.

"It is a combination of the efficient and reliable technology and the good collaboration with Thermia and its local dealer that has led us to invest so heavily in heat pumps", says Sven-Erik Adolfsson.



Sven-Erik Adolfsson, MD of Strömstadsbyggen

### Effective solution for both heating and cooling

A commercial heat pump installation in Spain. Seven Thermia Robust units connected together to produce heating and cooling.





**HEAT PUMPS**

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