



THE SUSTAINABLE HOME HEATING SOLUTION

THE ENERGY EFFICIENT HEATING SYSTEM





ALTHERMA BY DAIKIN

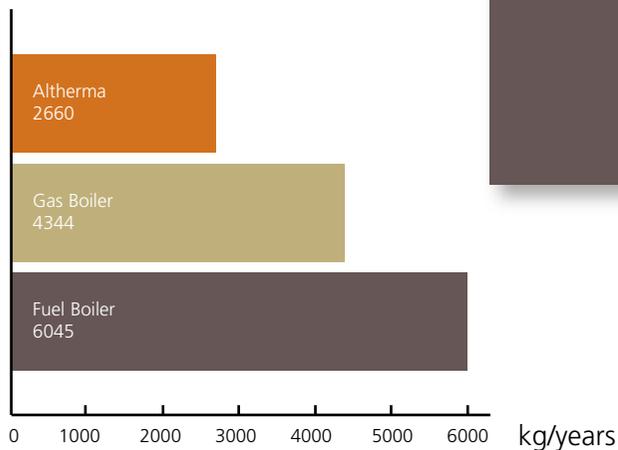
Altherma is a highly flexible, energy efficient home heating system that extracts the heat from the outside air, raises this heat to a higher temperature and then distributes warmth around the home through high quality heating units. At the heart of the system lies an air to water heat pump.

Because of this advanced technology, three quarters of the heat generated by the Altherma system is absolutely free of charge! The Altherma air to water heat pump is today's answer to the current and future problems associated with conventional heating systems, such as, increasing primary energy costs and an unacceptably high environmental impact.

↗ DID YOU KNOW THAT...

Heat pumps are classed as renewable technology, because they extract heat from a renewable source, the air around us!

AVERAGE ANNUAL CO₂ EMISSIONS



Calculations based on data provided by Eurelectric (Union of the electricity industry), 'Eurelec Program - 2001' for EU27

A BRAND BUILT ON QUALITY AND INNOVATION

Daikin has more than 50 years' experience in the production of heat pumps, manufacturing over a million units a year for both residential and commercial applications. The whole system is manufactured entirely 'in house' at Daikin's state of the art factories - This includes the all important highly efficient inverter driven compressor unit. In fact, Daikin produces all of its compressors, some 80% of which are for use in heat pump applications.

Q. So what makes Altherma unique?

A. The fact that it's from Daikin, a company with over 50 years of experience in manufacturing and supplying the highest quality solutions for heating and cooling...

EFFICIENT, **AFFORDABLE** AND FRIENDLY

WITH ENERGY PRICES SOARING

The cost of heating using traditional fossil fuels has increased 100% since early 2006 with costs continuing to rise as fossil fuel supplies become even more scarce. Traditional heating systems like boilers use fossil fuels, making them an expensive and non sustainable option for the environment. Three quarters of the heat generated by the Altherma air source heat pump system is free of charge and maintenance is minimal, offering the perfect solution for home heating and hot water.

NECESSITY IS THE MOTHER OF INVENTION

House building design has taken giant leaps forward to improve energy efficiency. For example: technical advancements in insulation and glazing have meant that the energy saving properties of these products have improved drastically over time. Now we have Altherma, the latest solution to low cost heating for new houses and apartments, or for the refurbishment in older properties. Altherma offers the very latest air source heat pump technology, providing a heating and hot water solution which is proven to be up to 50% more efficient than traditional boiler systems.

PROVEN TECHNOLOGY YOU CAN NO LONGER IGNORE

It is no surprise that people throughout Europe are becoming aware of new heating technology. In less than a decade, practically all properly insulated homes will be heated with heat pump boilers. Daikin is a company that is renowned for quality and superior products, having already installed millions of air source heat pumps across the globe.



66 TO 80% FREE OF CHARGE

A heat pump boiler works much more efficiently and saves more energy than a traditional heating system based on fossil fuels. With Altherma, 1kW of electricity consumption generates 3 to 5kW of free heat. That's an investment that pays.



COP (Coefficient of Performance)

Stands for the ratio of the output heat and the energy used by the heat pump compressor. The Altherma heat pump boiler has a COP of 3 to 5, which means that the pump delivers 3 to 5 times more energy than it uses.



CO₂ EMISSIONS

The carbon footprint of a heating system can be calculated by multiplying the energy input by the Green House Gas Conversion Factor

RUNNING COST:

Conditions : Annual heating energy required: 20 000 kWh
Source : Energy prices based on EUROSTAT statistics (first semester 2007).

Fuel Boiler

100%



Gas Boiler

82%



Altherma

Air / Water Heat Pump Boiler

68%



EFFICIENCY (COP):

Source : Results depend on individual design of boilers and different climate conditions.
Efficiency of Altherma measured by an independent accredited laboratory (SP Technical Research Institute of Sweden).

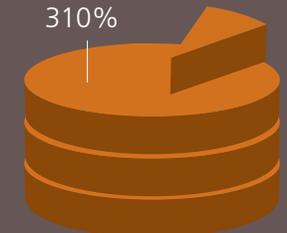
89%



93%



310%



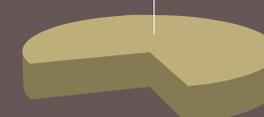
CARBON EMISSIONS (CO₂):

The Green House Gas Conversion Factor is as follows:
Fuel Oil: 0.265
Gas: 0.206
Electricity: 0.430
Source: DEFRA (Department of Environment, Food and Rural Affairs)

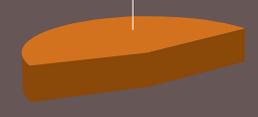
100%



74%



47%



THE SYSTEM AT A GLANCE

A heat pump system consists of an outdoor unit, indoor hydro box (incorporating the control system) and a domestic hot water tank.



OUTDOOR UNIT: SUSTAINABLE ENERGY CONVERTER

The outdoor unit extracts heat from the outside air and raises its temperature to a level high enough to supply heating. This heat is then transferred to the indoor unit through refrigeration pipework (thus, the additional advantage is that the pipes can never freeze). The compact outdoor unit is easily installed as no drilling or excavation work is required.



INDOOR HYDROBOX: HEATING AND HOT WATER SYSTEM

The Hydrobox transfers the heat to the water circulating in the underfloor heating, radiators or fan coil units and also to the domestic hot water tank. If you opt for the combination of heating and cooling, then the indoor unit can also decrease the water temperature to distribute a refreshing coolness.



DOMESTIC HOT WATER TANK: DESIGNED FOR LOW ENERGY CONSUMPTION

As for domestic hot water, Altherma is just as clever. The unique layout and special placement of the system components maximises energy efficiency. The water inside the storage tank is primarily warmed up by thermal energy from the outside air, thanks to the heat pump. The combination of an electric element, in the upper part of the tank, and the heat pump heat exchanger, in the lower part of the tank, ensures the lowest possible energy consumption with rapid water heating. In addition, a built in disinfection function can automatically raise the water temperature to 70°C or higher to prevent the risk of bacteria growth.



ALTHERMA SOLAR ENABLING KIT: INTEGRATING SUSTAINABLE SOLAR HOT WATER HEATING

Altherma has the option to integrate with solar panels to heat the domestic hot water tank. A simple enabling kit connected to the Altherma domestic hot water tank can automatically switch from heat pump to the solar panel when there is sufficient heat available to heat the water tank. This means not only will sustainable free energy come from the air via the Altherma heat pump, but also from the sun via the solar panel.



WHICH HEATING SYSTEM TO USE?



HEAT EMITTERS

There are several different types of system to provide heating in your home and Altherma is compatible with all of them. The selected system can simply be connected to the Altherma unit. Below are examples of some of the most commonly used heating emitters:

UNDERFLOOR HEATING

Underfloor heating is possibly the best solution for new installations.

The main benefits are:

- Maximum comfort due to radiated heat
- Maximum efficiency compared to other heat emitters
- Unobtrusive i.e. no wall space required
- Seasonal COP typically 3.5 to 4.5
- Water flow temperatures typically 35 to 40°C



FAN COILS

These systems are more flexible in that they can provide both heating and cooling if required.

The main benefits are:

- Able to heat and cool
- Cased or concealed units
- Individual control
- Ease of installation
- Water flow temperatures typically 35°C heating 7°C for cooling option
- Seasonal COP heating typically 3.5 to 4.5

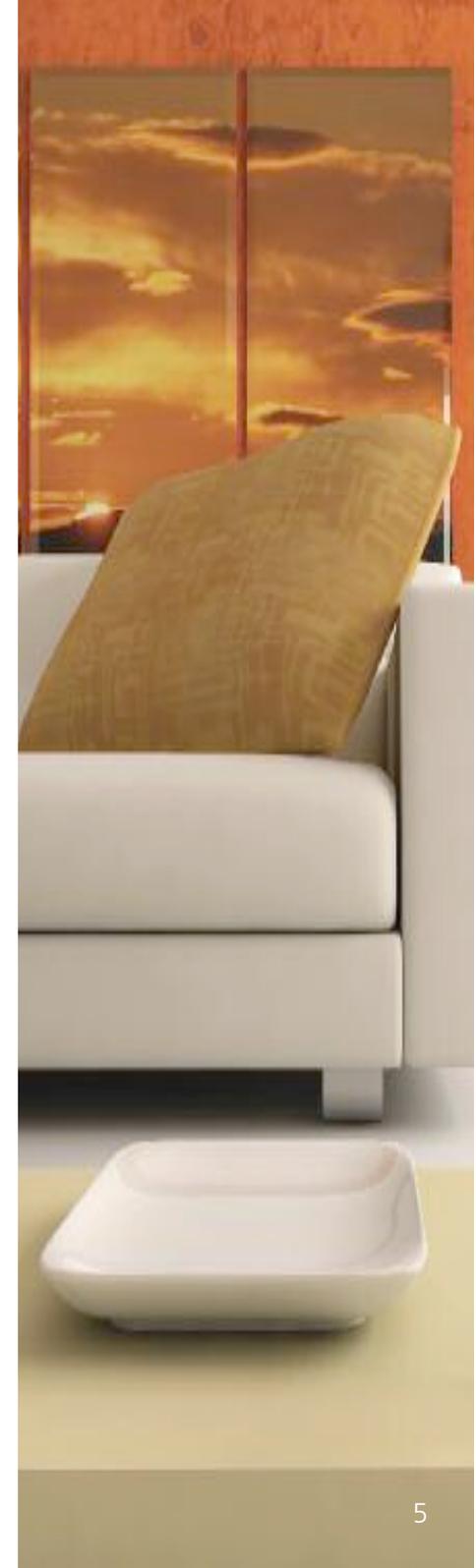


RADIATORS

A traditionally used system as costs are relatively inexpensive compared to other systems.

The main benefits are:

- Traditional heating solution
- Low capital cost
- Ease of installation
- Water temp typically 50°C with heat pumps (radiators must be sized accordingly)
- Seasonal COP with weather compensation typically 2.5 to 3.5



BASICS OF HEAT PUMP TECHNOLOGY

↗ DID YOU KNOW THAT...

In nature, thermal energy travels from a higher to a lower level, from warm objects to colder ones. Simple: place a cup of coffee on your terrace table and it will cool down until it reaches the temperature of the surrounding air.

A heat pump does the opposite. It is a system that “pumps” thermal energy from a lower to a higher level. The same happens with water. Water naturally runs from higher to lower places, but it can be pumped in the opposite direction.

1/ WHAT'S THE MAGIC BEHIND HEAT PUMPS?

It all starts with the sun. The sun warms up our atmosphere and the outer layer of the earth's crust. In one year the energy sent to the earth by the sun is 50 times higher than the total consumption of energy on our planet. This makes the sun a vast and a sustainable source of energy.

On sunny days you can feel the thermal energy from the sun on your skin. But actually, there is always lots of thermal energy in the air, even on cold winter days or even at night. Heat pumps take thermal energy from the atmosphere, or from the water (rivers, lakes,...) or from the ground. With Altherma, energy is extracted from the outside air which is cheaper and easier than the other alternatives.

2/ WHY DO HEAT PUMPS CONTRIBUTE TO LOW CO₂ EMISSIONS?

Heat pump emissions are considerably lower than those of conventional heating systems. Because heat pumps consume much less energy than the traditional boiler system, CO₂ emissions are reduced. For every kilowatt of energy needed to run the heat pump, 3 to 5 kilowatts of energy is produced for the heating and hot water system.

3/ WHY HAVE PEOPLE HESITATED TO USE HEAT PUMPS UP TO NOW?

In spite of these undeniable benefits, heat pumps have not been people's choice for their heating and hot water installation. The reason for this is that fossil fuels have been relatively inexpensive and the cost of heat pump technology relatively expensive compared to traditional heating systems. This has changed. The cost of fossil fuels is escalating at an alarming rate which means the Altherma system is now not only affordable, but also competitive compared to traditional systems.

HOW HEAT PUMPS WORK

Heat pumps work on a well established principle known as vapour compression or refrigerant cycle. They work in much the same way as the common refrigerator, a technology already embedded in every household, but in reverse.

The heat pump consists of four main components: the compressor, expansion valve, and two heat exchangers,

one to absorb heat from the heat source and one to reject the heat.

Quite simply, heat pumps are a mover of heat, they absorb heat from one place and move it via a heat transfer medium or refrigerant to be used somewhere else.

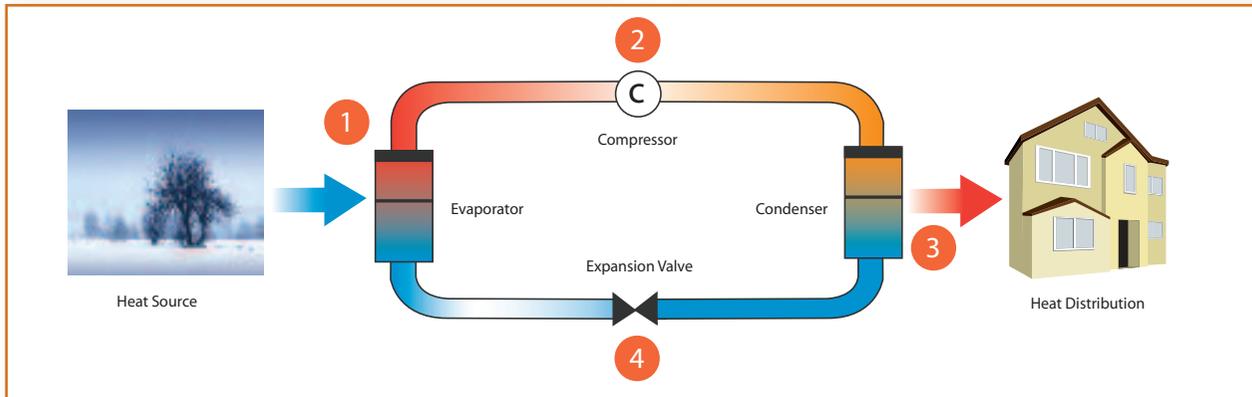
The cycle can be explained in a four stage process:

1 STAGE ONE

The heat transfer medium (the refrigerant) is colder than the heat source (the outside air). As the outside air passes across the first heat exchanger (the evaporator) the liquid refrigerant absorbs the heat and evaporates.

2 STAGE TWO

The vapour then passes to the compressor and is compressed. When compressed the pressure is increased and the temperature of the vapour rises, effectively concentrating the heat.

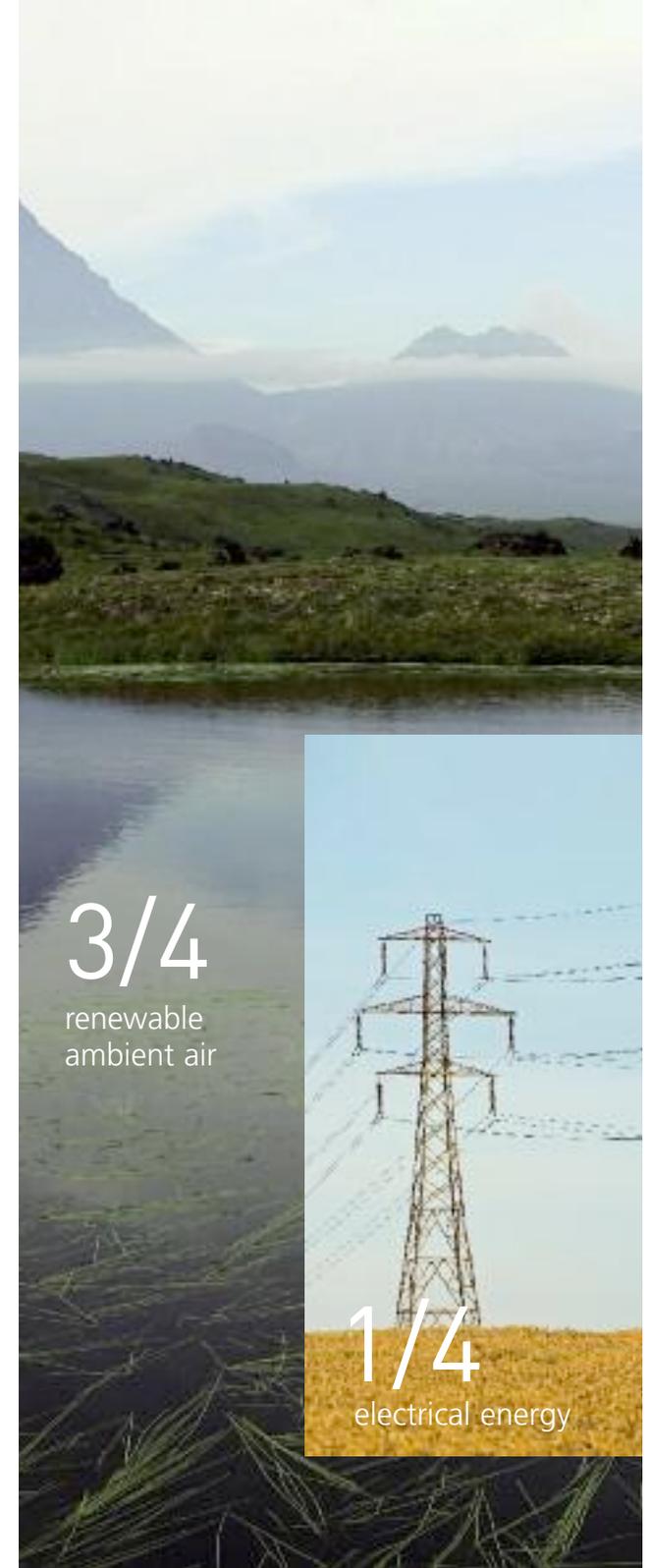


4 STAGE FOUR

The liquid refrigerant then passes through an expansion valve, reducing its pressure and temperature, ready to start the whole cycle once again.

3 STAGE THREE

The hot vapour passes to the second heat exchanger (the condenser) where the heat is rejected and the vapour condenses back into a liquid. In the case of Altherma the rejected heat is passed into the water of the central heating and hot water system ready for use in the home.



ALTHERMA ADVANTAGES

CHOOSING ALTHERMA ... NOTHING BUT BENEFITS!

LESS ENERGY, PLEASANT WARMTH IN THE HOME

Altherma operates up to 5 times more efficiently than a traditional heating system based on fossil fuels or electricity. By making use of the heat in the outside air, you use much less energy while still enjoying a stable and pleasant level of comfort. Also, maintenance requirements are minimal ensuring low running costs. Thanks to the inverter technology and in-built weather compensation control Altherma uses; energy savings are even greater than most other heat pump systems.

MINIMAL INSTALLATION COST

Altherma takes heat from the air. No digging or excavation works are required as is the case with ground source heat pumps. Both the outdoor and indoor units are compact and the external unit can be located easily outside any building, including apartments. Without flames or fumes, there is no need for a chimney or constant ventilation in the room where the Altherma indoor unit is installed.

FLEXIBLE CONFIGURATIONS

Altherma can be configured for use in both new and refurbishment applications, and connects to standard low temperature radiators, under floor heating or fan coil units. This means that whichever heating system you may already have, there is no need to change your existing heat emitters.

COMPLETE COMFORT FOR YOUR FAMILY

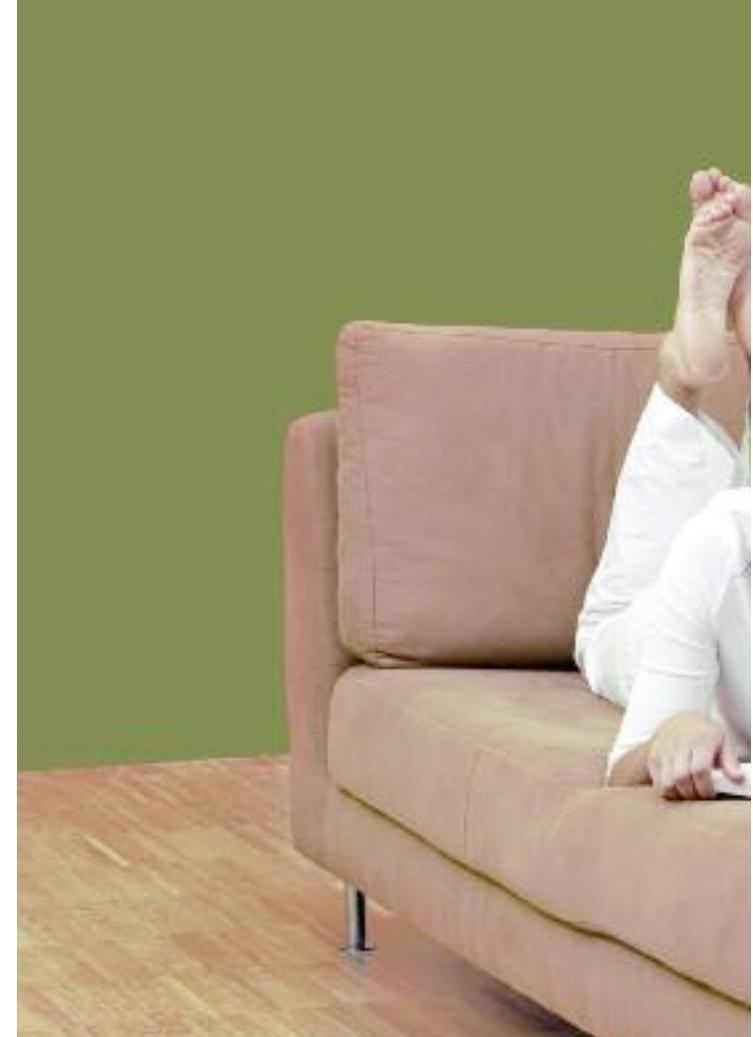
Altherma satisfies all your heating and domestic hot water requirements right through the year even on the coldest days. Solar heating panels can be connected to the Altherma system as an option if required. With a fully integrated control system, Altherma will provide consistent comfort with optimum efficiency...and for those long hot summer days Altherma even comes with a cooling option.

ABSOLUTELY SAFE

Altherma works without oil, gas or other hazardous substances – reducing potential risk that comes with these types of systems. Moreover, you don't need a gas connection, flues, extra ventilation or a fuel tank. There is no risk of intoxication, smell or pollution from leaking tanks.

RENEWABLE, INEXHAUSTIBLE ENERGY WITH SOLAR PANELS

Altherma has an option to be connected to, and to work in conjunction with solar panels. The integrated control system will maximise the renewable heat available, be it from the air, via the heat pump, or direct sunlight from the solar panel – An integrated solution to last another 5 million years... or as long as we have a sun in the sky.



DID YOU KNOW THAT ...

Altherma has an automatic control system that adjusts the system's operation to varying ambient conditions. So you always enjoy optimal comfort and efficiency.



WE ARE BECOMING INCREASINGLY ENVIRONMENTALLY MINDED

Traditional heating systems that rely heavily on fossil fuels are increasingly coming under scrutiny due to the battle against CO₂ emissions. Stricter European standards regarding heating economy are becoming more relevant. Three quarters of the heat generated by the Altherma system is from a renewable source (the air), so this modern technology will satisfy the needs to reduce CO₂ emissions. Even though the heat pump needs some electrical energy to run, Altherma emits far less CO₂ than fossil fuel boilers – This means that you can personally contribute to a better environment by using Altherma.



DID YOU KNOW THAT ...

The Altherma system can be perfectly combined with solar collectors to produce hot water. The sun provides 30 to 70% of the energy required for our hot water needs. Altherma, your total solution, thinks of the future.

- ✓ 30 – 50% reduction in CO₂ emissions
- ✓ Low running costs
- ✓ Low maintenance
- ✓ Low noise – unobtrusive and quiet
- ✓ Easy to install, no groundwork i.e. trenches or boreholes
- ✓ No gas supply required
- ✓ Ideal for properties not on the gas grid
- ✓ No flues or ventilation required
- ✓ No fuel storage tanks required
- ✓ Comparable installation costs to gas fired boilers
- ✓ Suitable for both apartments & houses
- ✓ Single phase power supply with low starting current
- ✓ Flexible, can be connected to underfloor heating, low temperature radiators or fan coils
- ✓ Weather compensation built in as standard
- ✓ Meets & exceeds CO₂ reduction targets required by building regulations
- ✓ Helps achieve 3 stars rating in the code for sustainable homes

CONFIDENCE FOR YOU

COMPLETE SATISFACTION

Altherma is today's answer to the concerns of escalating fossil fuel costs and high CO₂ emissions associated with conventional heating systems. The system provides all year round space heating and hot water constantly controlled to optimise efficiency. The control system offers inbuilt functionality including boost function for rapid recovery, back up heater for extreme circumstances and an option for integrating solar panels. Altherma is a renewable energy solution that can reduce CO₂ emissions by up to 50% because it uses up to 5 times less energy than the conventional oil, gas or electric fired home heating systems.

DAIKIN...A BRAND YOU CAN TRUST

Altherma is a tried and tested system with thousands of units installed around the world. Daikin has a reputation for the highest quality products which are both reliable and robust. The use of Daikin's inverter technology and the built in weather compensation function, ensures consistently comfortable room temperature at all times with the lowest possible energy consumption. Even in extreme conditions (temperatures down to -20°C) Altherma will give exceptional performance all year round.

Expectations of homeowners are changing...

An increased expectation and even demand for products that are 'low CO₂' and 'energy efficient' is now becoming a driving factor when choosing a home heating and hot water system...

...The Altherma system easily satisfies and even exceeds these homeowner demands.





INDOOR UNIT			EKHBH008AA***	EKHBX008AA***	EKHBH016AB***	EKHBX016AB***
Function			Heating only	Reversible	Heating only	Reversible
Dimensions			922x502x361		922x502x361	
Leaving water temperature range	heating	°C	15~50		15~55	
	cooling	°C	-	5~22	-	5~22
Drain valve			Yes			
Material			Epoxy polyester painted galvanised steel			
Colour			RAL 9010 (neutral white)			
FACTORY MOUNTED HEATER			POWER SUPPLY		CAPACITY STEPS	
EKHBH(X)008AA3V3 / EKHBH(X)016AB3V3			1 ~ /230V		1	
EKHBH(X)008AA6V3 / EKHBH(X)016AB6V3			1 ~ /230V		2	
EKHBH(X)008AA9WN / EKHBH(X)016AB9WN			3 ~ /400V		2	

OUTDOOR UNIT			ERHQ006AD	ERHQ007AD	ERHQ008AD	ERHQ011AA	ERHQ014AA	ERHQ016AA
Dimensions			735x825x300			1170x900x320		
Nominal Capacity	heating	kW	5.75	6.84	8.43	11.2	14.0	16.0
	cooling	kW	5.12	5.86	6.08	10.0	12.5	13.1
Nominal input	heating	kW	1.26	1.58	2.08	2.46	3.17	3.83
	cooling	kW	2.16	2.59	2.75	3.60	5.29	5.95
COP			4.56	4.33	4.05	4.55	4.42	4.18
EER			2.37	2.26	2.21	2.78	2.36	2.20
Operation range	heating	°C	-20 ~ 25			-20 ~ 35		
	cooling	°C	10 ~ 43			10 ~ 46		
	hot water	°C	-20 ~ 43			-20 ~ 43		
Sound pressure level	heating	dBA	48	48	49	49	51	53
	cooling	dBA	48	48	50	50	52	54
Weight			56			103		
Refrigerant charge			R-410A			kg		
Power supply			1 ~ /230V/50Hz			1 ~ /230V/50Hz		
Recommended fuses			A			20		

Nominal Capacity and Power input based on the following conditions:
Heating: Ambient 7°CDB/6°CWB / Leaving Water Temp. 35°C (DT 5°C) **Cooling:** Ambient 35°C / Leaving Water Temp. 7°C (DT 5°C)

DOMESTIC HOT WATER TANK			EKHWS150B3V3	EKHWS200B3V3	EKHWS300B3V3	EKHWSU150B3V3	EKHWSU200B3V3	EKHWSU300B3V3
Suitable for			Open Vent System			Unvented system (EKUHWB kit also required)		
Water volume	1		150	200	300	150	200	300
Max water temperature	°C		85			85		
Booster heater capacity	kW		3			3		
Power supply	ph/V/Hz		1/230/50			1/230/50		
Height	mm		900	1150	1600	1015	1265	1715
Diameter	mm		580			580		
Empty weight	kg		37	45	59	38	46	60
Colour			Neutral White			Neutral White		
Material inside tank			Stainless Steel (DIN 1.452 1)			Stainless Steel (DIN 1.452 1)		
Material outside casing			Epoxy-Coated Mild Steel			Epoxy-Coated Mild Steel		
Piping connections (Diameter water inlet H/E)	inch		3/4" FBSP					
Water outlet H/E	inch		3/4" FBSP					
Cold water in	inch		3/4" FBSP					
Hot water out	inch		3/4"					



SOLAR ENABLING KIT			EKSOLHWAV1
Dimensions		HxWxD	770x305x270
		mm	
		Pressure drop	kPA
		21.5	
Heat exchanger	max. inlet temp.		°C
	110		
		capacity	W/
		1,400	
Ambient temperature	max.		°C
	35		
		min	°C
		1	
Power supply			1 - /220-240V/50Hz
Power supply intake			Indoor unit

OPTIONS - OUTDOOR UNIT		Hydro Box Heating Only EKHBH008 EKHBH016	Hydro Box Reversible EKHBH008 EKHBH016	Outdoor Unit ERHQ006-016
EKHB8DP	Drain pan Kit for cooling operation below 18°C	n/a	•	n/a
EKRP1HB	Option PCB for solar connection and remote alarm reporting	•	•	n/a
EKBPHT16	Drain pan heater tape	n/a	n/a	•

ACCESSORY KIT FOR UNVENTED SYSTEMS - DOMESTIC HOT WATER TANK		Domestic Hot Water Tank EKHWSU-B3V3	Domestic Hot Water Tank EKHWS-B3V3
EKUHWB	Includes: Combined Pressure Reducing Valve, Non Return Valve, Strainer, Expansions Relief Valve, Expansion Vessel, Tundish	•	n/a
EKUHW2WB	Separate 2 way valve (To use with EKUHWB for installations with Solar Kit)	•	n/a



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Daikin's unique position as a manufacturer of heat pumps equipment, compressors and refrigerants has led to its close involvement in environmental issues. For several years Daikin has had the intention to become a leader in the provision of products that have limited impact on the environment. This challenge demands the eco design and development of a wide range of products and an energy management system, resulting in energy conservation and a reduction of waste.



Daikin Europe N.V. is approved by LRQA for its Quality Management System in accordance with the ISO9001 standard ISO9001 pertains to quality assurance regarding design, development, manufacturing as well as to services related to product.



ISO14001 assures an effective environmental management system in order to help protect human health and the environment from the potential impact of our activities, products and services and to assist in maintaining and improving the quality of the environment.



Daikin units comply with the European regulations that guarantee the safety of the product.



Daikin Europe N.V. participates in the Eurovent Certification Programme for Air Conditioners (AC), Liquid Chilling Packages (LCP) and Fan Coil Units (FC): the certified data of certified models are listed in the Eurovent Directory. Multi units are Eurovent certified for combinations up 2 indoors units.

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