RMECO energy
creating a carbon free future

LOGIC CERTIFICATION
APPROVED ASSESSMENT CENTRE

hot water association
DEVELOPING HOT WATER

RMECO energy
creating a carbon free future

Air Source Heat Pump

RM Solar Ltd
4 Valencia Park · Gilcar Way
Wakefield Europort · Castleford
West Yorkshire WF10 5QS
Tel: 01924 22 42 82
Fax: 01924 22 42 83
email: sales@rmsolar.com
www.rmecoenergy.com

Also Available:
Solar Panel Systems
Rain Water Harvesting Systems
Hot Water Storage Solutions

AirSource 6000, Airsource 8000, and AirSource 12000

- Heating optimised
- Nominal 6kW output (BWarm 6000), 8kW output (BWarm 8000) and 12kW output (BWarm 12000)
- Up to 4.0 COP (Coefficient of Performance)
- Low energy costs
- Provides high CO2 emissions savings
- Renewable energy
- Low capital cost
- Easily installed
- Flexible siting
- Operates down to -20°C
- Microprocessor control
- Latest compressor technology
- Incorporates circulating pump

What are Air Source heat pumps?

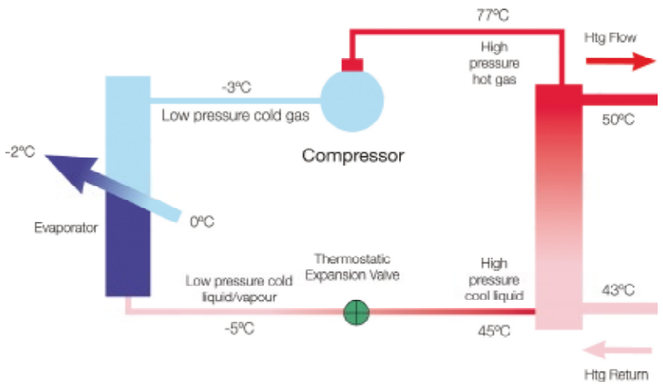
Heat pumps are electrically powered appliances consisting of a compressor and two carefully matched heat exchangers. They are designed to provide space heating through water systems, either radiators or underfloor, by extracting from a free, renewable energy source, the air.

The air will absorb and store heat from the sun, then It is possible to extract considerable heat from ambient temperatures as low as -20°C. Air Source heat pumps have major advantages over its rival the ground source heat pump. Our air system is easily installed to either new build or retro properties as there is no need for any time consuming or expensive excavations. All the compressor requires is siting in a sufficient outside air flow.

Heat pumps are a very cost effective means of providing space heating and pre-heating domestic hot water. The high efficiency of the units means that the output heat energy can be up to four times the electrical input power, something not possible with other methods of heating.

How does an air source heat pump work?

The RM Eco Energy heat pumps use similar technology to that employed in domestic refrigerators or freezers. The ecologically friendly refrigerant, which has a boiling point of about -40°C, evaporates in the evaporator coil and this then extracts heat from the outside air which is blown over the evaporator coil by a fan. Because the gas in the evaporator coil is so cold it will absorb heat from the ambient air at temperatures down to -20°C. The refrigerant gas then passes into the condensing heat exchanger and as the heating circuit water cools the refrigerant it condenses thus passing heat energy into the water which is used to heat the property. Typically the heat passes into the house will be 3 to 4 times the energy used by the compressor and fan, so most of the heat supplied is renewable. Therefore heat pumps are not only a cost reducing and energy saving alternative, but they also reduce your carbon footprint.



Fuel poverty & carbon emissions:

Tackling fuel poverty and reducing carbon emissions are two of the most important concerns for home-owners, tenants and landlords today.

Fuel Poverty is defined as a household who spends more than 10% of its income on heating the home and it is estimated that over 2 million households in the UK are in fuel poverty and struggle to maintain adequate heating for their homes. Carbon emissions are an equally high concern as each year the UK produces 40 million tonnes of carbon, 27 per cent of which is generated within homes in the form of space heating and the delivery of hot water.

The challenge for many organisations is to not simply tackle one aspect but to recognise that a long term strategy and a tailored approach addressing both these issues is needed to create comfortable and eco friendly homes for the future. RM Eco Energy products combat both issues with the use of renewable resources and the most up to date technology. Using completely renewable and sustainable resources as the energy source for the RM Eco Energy products has a number of benefits. Firstly costs are reduced as the Earth's free natural resource of air is used. Additionally, there is the benefit of reducing carbon emissions and making a smaller carbon footprint upon the Earth. Finally, the benefit of these natural resources is their sustainability in the long term. The most up to date technology has enabled RM Eco Energy to achieve the highest energy efficiency levels.

The systems have been designed using the latest compressor technology and microprocessor advances. This combined with the use of renewable energy results in up to 400% energy efficiency. The benefits again address both challenges by delivering reduced heating bills for a home and lower carbon emissions through the use of the most up to date technology.

Fuel efficiency is the aim for the future, yet for many it is a reality today thanks to RM Eco Energy's renewable heating product range. The success of the RM Eco Energy products is their use of renewable energy whilst at the same time using the latest compressor and microprocessor technology. RM Eco Energy systems are easily installed and are fully accessible, eliminate the need for landlord certificates, have a long life of up to 20 years, deliver reduced fuel costs, reduce CO2 emissions and use the natural renewable and sustainable resources from our surroundings.

The AirSource advantage:

- Plug and play product
- Complete with water circulation pump
- Sophisticated micropressor control with weather compensated output
- Low water pressure protection and flow
- Optional wall brackets and anti-vibration mounts
- Optional wall or floor mounted enclosure

Why use Air Source heat pumps?

Whilst heat pumps are relatively new in the UK they have provided a solution to energy problems for many years in Europe and the USA in areas where gas and oil is not readily available. More recently heat pumps have become a viable alternative to domestic heating systems in the UK as they offer solutions to the growing demand for energy efficiency and reduced carbon emissions.

The benefits of RM Eco Energy heat pumps are low capital costs, easy installation and a long life of up to 20 years. RM Eco Energy heat pumps are normally installed outside a property, with little requirement for ongoing maintenance and operating down to -20°C. Once installed the units achieve high efficiencies up to 400% and low running costs throughout the year. The use of free renewable energy from the air also reduces carbon emissions by up to 70%.

The best results and paybacks are achieved when properties are off gas and use either electric or oil for their heating. Gas is less attractive on today's price, but as everyone is aware the gas price long term is unstable and will only go one way, up!

AirSource product training:

Training is available to any competent installer (please call 01924 22 42 82 for details). Due to the nature of this product we do not recommend any one installing a unit without having first completed the installation course.

If installation is carried out before being trained it may affect the product warranties and guarantees.

The next move:

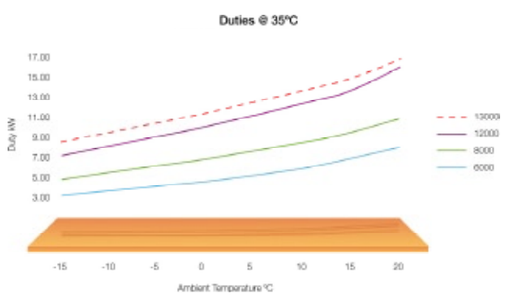
If you are interested in taking your enquiry to the next stage please contact us on 01924 22 42 82 and we can either arrange a site survey or we can send you out the appropriate site survey forms for self completion.

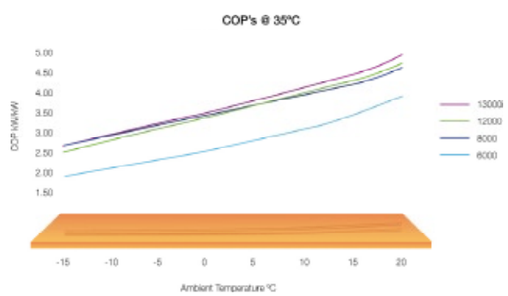
From the information that we receive back we can asses the feasibility of an installation, decide upon which kit would be necessary, and arrange for a costing via one of our stockists. The nominated surveyor will also be able to provide you with a detailed quotation for installation of the AirSource product.

Technical Specification:

SPECIFICATION	AirSource 6000	AirSource 8000	AirSource 12000
Height (inc. feet)	681mm	780mm	780mm
Width	1020mm	1274mm	1369mm
Depth	312mm	340mm	374mm
Weight	87kg	110kg	175kg
Heating Output*	6kW	8kW	12kW
COP**	up to 4.0		
Power Supply	230V / 1ph / 50Hz or 400V / 3ph / 50Hz		
Water Connector Size	22mm		
Min. Ambient Temp.	-20°C		
Max. Ambient Temp.	45°C		

*Based on 7°C ambient, 50°C supply water temperature. **At 35°C supply water temperature.





Frequently asked questions

What are the benefits of Air Source Heat Pumps (ASHP) over Ground Source Heat Pumps (GSHP)?
There are a number of benefits when using an ASHP. Capital cost is lower as the ASHP's are normally self-contained units without additional heat transfer requirements such as ground pipe work. This also means that installation costs are lower as the ASHP simply needs siting in an appropriate position and connecting to the mains supply electricity and building wet system; whereas a GSHP will require significant ground works, either bore holes or deep furrows. This type of work is not always possible on existing buildings due to limited access and is always costly. New technology has enabled ASHP's to achieve similar seasonal efficiencies to those traditionally associated with GSHP's

What refrigerant is used in RM Eco Energy heat pumps?
We use R407C in all our products. This is an approved refrigerant with zero Ozone depleting potential and a low global warming potential.

What is the best type of system to connect a heat pump to?
For optimum efficiency an underfloor system provides the best results, as it requires a lower flow temperature and the heat pump can be programmed to provide the water at the required temperature with no need for a mixing valve. Any system will benefit from using a thermal store rather than a direct feed which will allow the heat pump to raise the water to the correct operating temperature more quickly as there is no direct heat loss from the thermal store during the start up period.

What is the lower limit operating temperature?
-20°C is defined as the lower operating limit but the heat pump will not switch off at this temperature. If the heat pump is expected to operate below -5°C for long periods of time then a boost heater should be fitted to act as a backup. At -20°C the maximum supply water temperature will be 45°C.

What controls will the heat pump work with?
The heat pump is fitted with a controller that is pre-programmed with all of the operating set points and alarms and simply requires an input from an external clock/thermostat. Any standard type of central heating controller will work with the heat pump but the best solution is to use a controller with a number of on/off options for each day to take advantage of any special off peak tariffs available.

What are the primary maintenance requirements?
The heat pump should be serviced once a year by a qualified technician and the following items checked:

- The unit structure for signs of corrosion or damage
- Panels are securely fastened and vibration free
- All electrical connections are secure and that there is no damage to any of the wiring
- All water connections are tight and the system water pressure is correct
- Pipe insulation has not deteriorated or come loose
- The air path to and from the unit is clear
- Condensate drain pan and pipe are clean and clear

The unit should be switched on, and the following checked:

- The controls are working correctly
- The water pump is free and operating correctly
- The unit fan is operating
- The unit raises the water to the correct operating temperature

What are the siting requirements of the unit?
Sufficient space is required for airflow into the machine and adequate clearance is needed at the front of the heat pump to prevent cold air re-circulation. Access is also needed for service and maintenance. If possible the unit should be sheltered from high winds to improve efficiency by reducing the fan power requirement. Units are best placed in a south facing aspect to gain maximum benefit from solar gains.

Can radiator and underfloor systems be combined?
Yes, but if used in this way the heat pump return water should be set to suit the radiator system and a mixing valve used to reduce the underfloor supply to the design temperature. On all retro installs it may be necessary to resize certain radiators as all heat pump systems generally need larger than normal output surface areas.

How long does it take for radiators to get up to temperature?
This will depend upon a number of factors. A heat pump will raise the water passing through it by between 5°C and 10°C depending upon the water flow rate. Getting the radiators up to temperature will depend upon a combination of the rate of temperature rise across the heat pump, the amount of water in the system and temperature of the standing water in the system when the unit switches on. As a rule of thumb the heat pump will raise the water temperature at a rate of 1°C per minute therefore the time taken to achieve the maximum operating temperature will be the difference between the standing temperature and the required operating temperature in minutes.

What is the maximum number of radiators per heat pump system?
The number of radiators is less significant than the total capacity of all the radiators added together. This should not exceed the expected heat pump output at the design condition; i.e. if the heat pump output is 6kW at the design outdoor condition then the radiator capacity should be 6kW based upon the water supply temperature of 50°C

How often should the water temperature be boosted to raise it to its operating temperature?
In most conditions the heat pump will start and raise the water temperature as expected. In periods of very cold weather where there is going to be significant reduction in the system standing water temperature to below 15°C then a boost heater should be fitted in the return water side to help the heat pump start up and to prevent it from going straight into de-frost. This will work automatically when required.

Can the heat pump raise the water temperature to 65°C
No, the standard heat pump will raise the supply water temperature to 50°C as set by the controller. If applying the AirSource Xtra Range heat pump, water temperatures of 60°C+ will be possible but the higher the water temperature the lower the overall unit efficiency. (Please contact us for more details of our Xtra range).

How should Domestic Hot Water be heated?
The heat pump should be used to pre-heat the water before additional heating is added to raise the water to the desired temperature. If connected in parallel with a solar heating system the heat pump should be set to operate if the solar cannot provide adequate heating. DHW systems should be designed to comply with current regulations.

How often does the heat pump go into de-frost and what is the effect?
Heat pumps de-frost on demand and the frequency is relative to the operating conditions. It is reasonable to expect a heat pump to defrost once an hour when indoor temperatures are low, but not for it to de-frost once above 5°C. The unit controls prevent de-frost initiating more frequently than every 45 minutes, and limits the maximum length of any de-frost to 10 minutes. An average de-frost will last for about 3-4 minutes and during this time the system water temperature will be reduced by a few degrees.

Can the units be hidden behind fences, bushes, etc.?
Units may be installed behind barriers or even inside enclosures, garages or sheds. The important consideration is ensuring that adequate airflow is available and that the discharge air cannot be re-circulating back onto the inlet as this will result in a continual lowering of the air temperature reducing the efficiency of the unit.

How does the heat pump compare with other heating appliances?
Sound levels inside the house are generally lower than those that would be expected from a gas or oil boiler with a fan assisted flue and will not cause a nuisance provided the installation guidelines have been followed correctly. Noise levels outside may be 2-3dB higher than those expected from a condensing boiler flue and this should be considered when selecting the position of the heat pump.

Can the heat pump cool as well as heat?
Yes, however if cooling is required an alternative range of units is available to provide both heating and cooling. Cooling may be used with underfloor heating or with fan coil units, but is not recommended with radiators as even though the minimum water temperature can be controlled, on certain days, depending upon conditions, the radiators could sweat and cause water damage to carpets or flooring.

Will the heat pump switch between heating and cooling automatically?
No, this has to be done manually on the controller to prevent cycling between the two demands

What is the minimum water content in the system?
15 Litres. A normal system will contain much more than this and the lower the water volume the more the unit will cycle on and off.