

Kingspan **HEAT PUMPS**

AEROMAX The Ultimate Air Source Heat Pump Package



Harnessing nature to heat your home



When it comes to creating efficient and cost-effective energy solutions that address today's growing environmental concerns, Kingspan Renewables Ltd leads the way...

Climate change is now a generally accepted fact, which has increased our focus on alternative energy sources that would help to reduce not only carbon emissions (being a significant contribution to global warming), but also energy bills. One of the most efficient and cost-effective renewable energy technologies currently available for domestic and commercial applications are air source heat pumps.

Air source heat pumps collect and utilise thermal energy from outside air to heat the home and provide Domestic Hot Water. The process is simple, effective and entirely renewable – something which is good for both the environment and future generations as well as our pockets.

The range of Aeromax Air Source Heat Pumps ticks all those boxes. They represent another significant offering from Kingspan Renewables Ltd.

As a division of Kingspan Group plc, a major player in the building products sector, Kingspan Renewables Ltd puts significant emphasis on energy conservation and the development of environmentally friendly solutions to generate hot water and home heating.

Aeromax Air Source Heat Pumps reflect an on-going commitment to a zero carbon lifestyle and a brighter future for us all.

The Aeromax range comes from a leading UK Manufacturer and Developer of heat pump technology with an unrivalled international reputation for product design and development. Manufactured to the highest technical and engineering standards, these units offer the highest levels of reliability and quality.

Developed specifically for use in the UK and Irish domestic housing markets, these products have been the subject of major field trials and have to date provided more than 600,000 hours of precise technical operating data relevant to UK and Irish climatic conditions and domestic housing design.

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The Ultimate Air Source Heat Pump Package

To optimise the entire range of benefits that Aeromax Heat Pumps have to offer, we provide the domestic and commercial markets with a complete air source energy package that is custom-made to suit the individual needs of each application. This package is completely unique and includes the highest level of customer support from initial advice, professional planning and design, through to installation, technical and after sales support.

The package incorporates the Aeromax Air Source Heat Pump, which will provide Central Heating (underfloor heating or traditional radiators) and Domestic Hot Water. A buffer vessel can also be supplied as part of the package. This provides the heating energy required during the heat pump defrost cycle and prevents any cooling of the Central Heating circuit or Domestic Hot Water.

A Range Tribune HE Renewable Energy cylinder forms part of the package. Providing mains pressure Domestic Hot Water for powerful showers and fast filling baths, these cylinders have high levels of eco-friendly insulation for added energy efficiency.

The package is suitable for both new and existing properties. In New Build homes Aeromax will supply the home heating and Domestic Hot Water load. When fitting into existing dwellings the present boiler can be retained as additional heating capacity, making Aeromax the Ultimate Air Source Heat Pump Package.

Guarantee

The Aeromax Heat Pump Package is designed for a long operational life. All components of the package carry a guarantee against faulty materials or manufacture:

- 2 years on Aeromax Air Source Heat Pump (1st year for parts and labour, 2nd year for parts only).
- 25-year anti-corrosion guarantee on Range Tribune HE Renewable Energy cylinder.
- 2 years on expansion vessel and other parts associated with the cylinder.

For the guarantee to be valid it is necessary that the system has been correctly installed in line with Installation Manual, Operating Instructions and all the relevant standards, regulations and codes of practice in force at the time.



Saving the Environment

With almost 30% of all UK carbon emissions coming from 24 million dwellings in the UK there are many opportunities to install heat pumps to help reduce these emissions.

Heat pumps utilise the thermal energy, which is freely available everywhere in the UK and this energy is totally renewable and sustainable.

Traditional fossil fuel reserves in the UK such as oil and gas are fast becoming exhausted and current estimates are that these finite deposits could expire totally around 2016.

When fossil fuels are burned to produce energy, carbon dioxide (CO₂) is released into the atmosphere and this, in turn, adds significantly to the global concerns over climate change.

The Aeromax Air Source Heat Pump installed in the home as the sole source of heating and hot water can reduce CO₂ emissions to zero. As there are no emissions from the system, no flues are required and there is no plumbing or local pollution from the installation property. The inconvenience and cost of fuel storage as with oil, LPG and solid fuel is also removed.

Heat pumps are now recognised by the Government's Standard Assessment Procedure (SAP) and show significant carbon savings over other forms of space and water heating.

New Build and Refurbishment

Following the Energy White Paper 2003 the UK Government included legislation to update Part L of Building Regulations and improve correlation between building design standards and actual performance.

Planning Legislation

Many Local Authorities are now insisting on the provision of renewable energy as a condition of planning permission for New Build projects.

Aeromax Air Source Heat Pumps are the ideal solution to these requirements.

Government Grant Assistance

To increase access to renewable technologies and encourage people to use alternative sources of energy, grants are often available for the installation of air source heat pumps.

To find out the most up-to-date information about UK grants available at the moment, please visit www.berr.gov.uk.

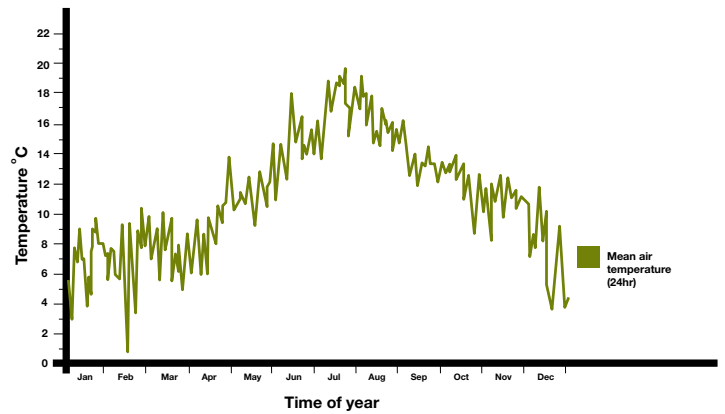
For Irish grants go to www.sei.ie.

UK Climate

In a preliminary report, released recently by the UK Met Office and Climatic Research Unit on behalf of the World Meteorological Organization (WMO), the global mean temperature for 2008 was 14.3 °C, making it the tenth warmest year on a record that dates back to 1850. The warmest year on record was 1998, followed by 2005 and 2003, with other years of this century closely bunched.

The UK has an abundance of renewable energy as shown in the temperature graph which illustrates average daily air temperatures over a full year. With Aeromax Air Source Heat Pumps operating to extremes of temperature as low as -15°C, affordable renewable energy is available throughout the year.

Temperature Annual Fluctuations - South West UK



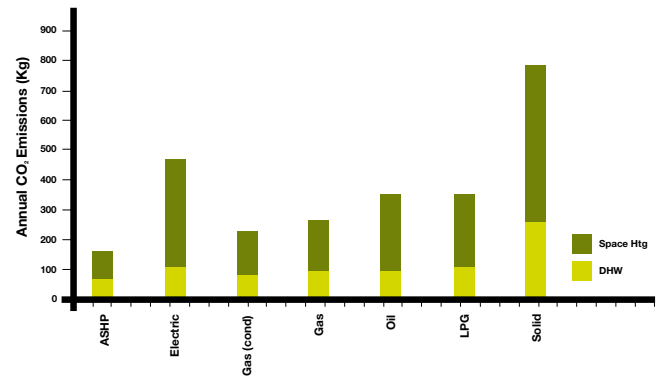
Emissions

Fossil fuel use has a particularly detrimental effect to the environment as when these fuels are burned, carbon dioxide (CO₂) is released into the atmosphere contributing significantly to global warming. Aeromax Air Source Heat Pumps can extract around 75% of usable heating energy from the environment and can generally reduce carbon emissions compared to gas central heating systems by approximately 50%.

These savings are even greater when compared to other fuels as illustrated in the adjacent performance chart.

Typical Emissions Savings

Comparison of average annual CO₂ emissions - new build 60 m². Aeromax 4.5kW heat pumps - space heating and DHW only

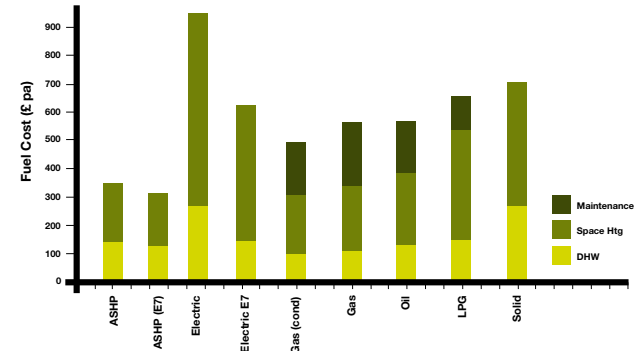


Running Costs

Fossil fuel energy sources are notoriously inefficient and are very costly for the homeowner to maintain. Based on more than 600,000 hours of measured performance data from heat pump installations in UK homes, the chart opposite shows that Aeromax Air Source Heat Pumps can provide 100% of heating and Domestic Hot Water all year round at lower cost than other fuels, radically reducing carbon emissions at the same time.

Typical Running Cost Analysis

Comparison of average annual fuel costs - new build 60 m². Aeromax 4.5kW heat pumps - space heating and DHW only

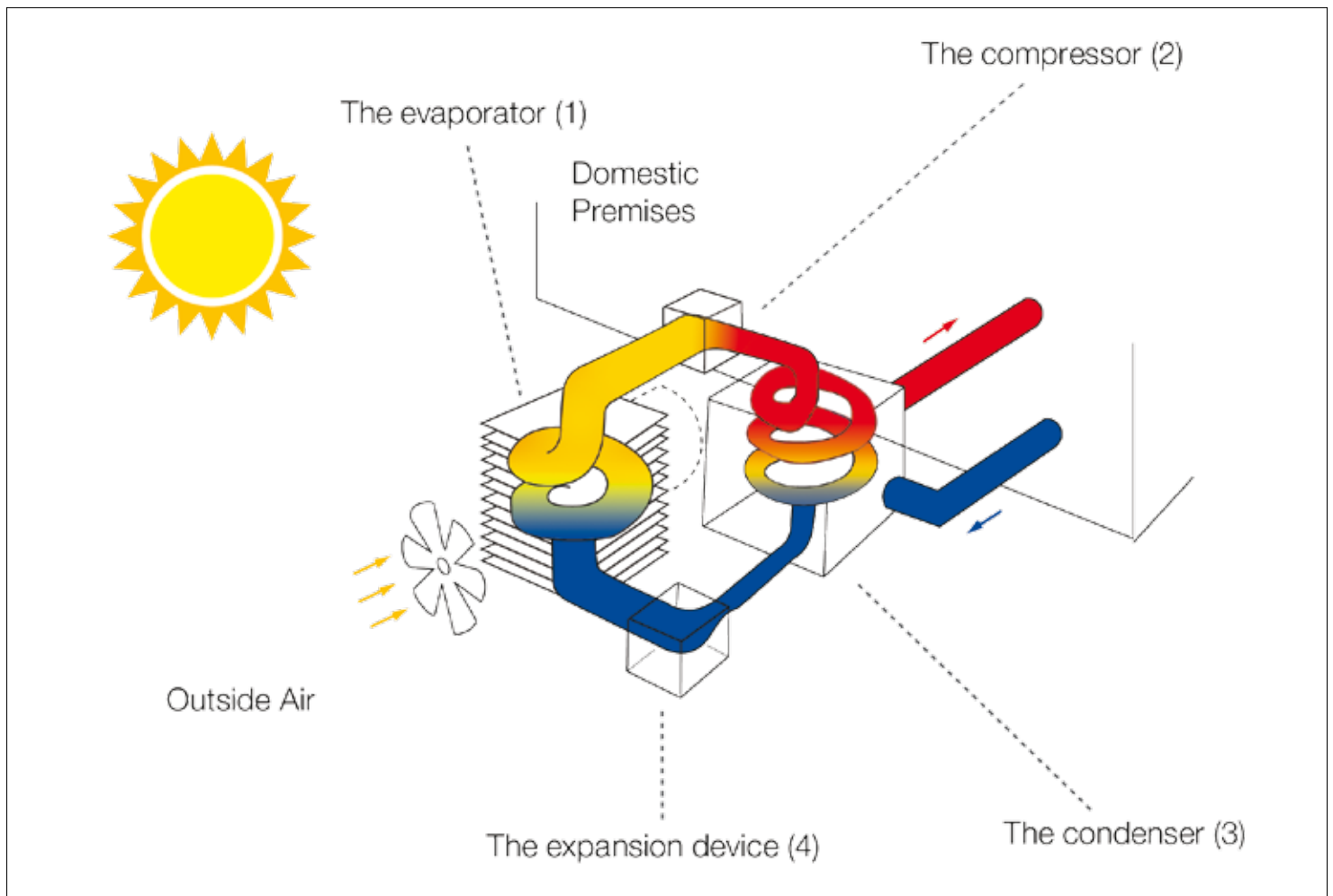


How Much Can You Save?

An Aeromax Air Source Heat Pump could save around £870 a year on your heating bills and almost 6 tonnes of carbon dioxide (CO₂) a year, however savings will vary depending on the fuel replaced and the local conditions.

Fuel Displaced	£ Saving per Year	CO ₂ saving per year
Gas	300	830kg
Electricity	870	6 tonnes
Oil	580	1.3 tonnes
Solid	280	5 tonnes

How Does the Heat Pump Work?



Aeromax Air Source Heat Pumps provide thermodynamic heating by means of a vapour compression cycle, in addition to operating as an active solar collector. In the same way that a fridge uses refrigerant to extract heat from the inside to keep the food cool, air source heat pump extracts heat from the outside air, and uses it to heat the home (through radiators or an underfloor system) and/or provide Domestic Hot Water.

Every air source heat pump has four main parts:

- the evaporator
- the compressor
- the condenser
- the expansion device

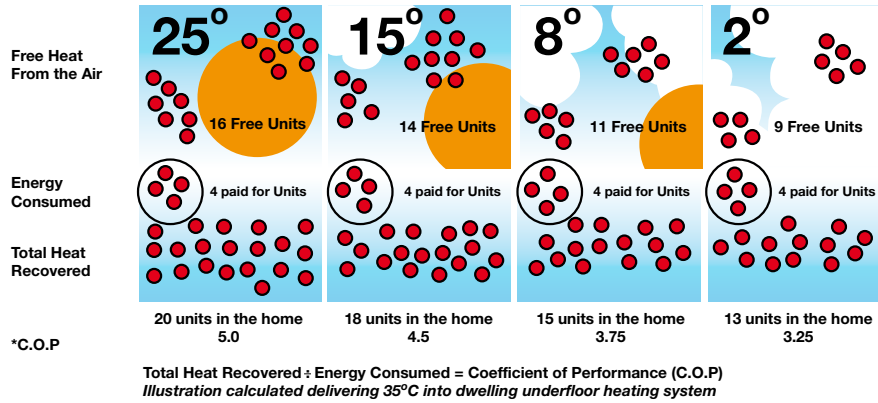
(1) The evaporator collects heat from the outside air, pre-heated by the sun, which is then drawn into the unit by the fan and expelled through the evaporator fins. The evaporator has liquid refrigerant passing through it, which is at a considerably lower temperature than the outside air, therefore the air gives up its heat to the refrigerant, which then vaporises.

(2) This preheated vapour now travels to the compressor where it is compressed and upgraded to a much higher temperature.

(3) The hot vapour now enters the condenser where it is surrounded by water from the heating system. The heat is given up to the cooler water and the now cooler refrigerant returns to its former liquid state but still under high pressure from the compressor.

(4) This high pressure is then released by passing the liquid through the expansion device and from there it returns to the evaporator and the cycle starts again.

Absorbing free energy from atmospheric air

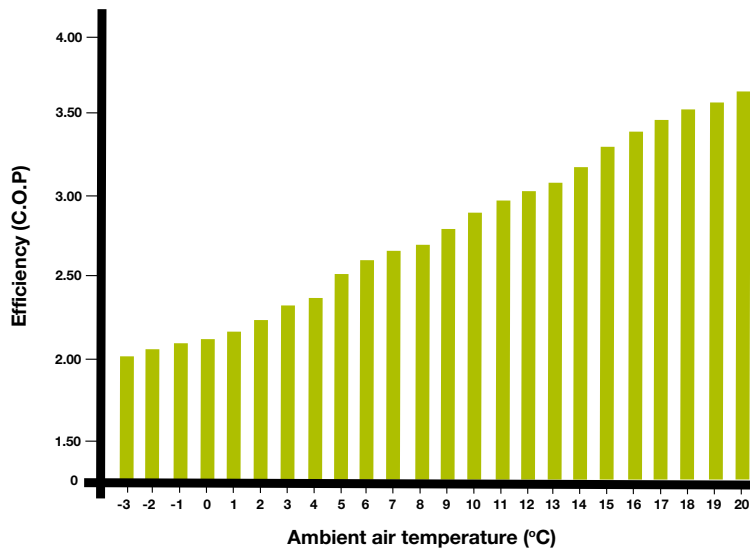


Aeromax Air Source Heat Pumps are one of the most efficient and cost-effective methods of utilising renewable energy source, as free energy, available at all times in the outside air.

The efficiency of heat pumps is measured by a Coefficient of Performance (C.O.P), which is simply the ratio of heat output to energy input, both being expressed in kW. C.O.P's for air source

systems generally range between 2 and 4 (dependent on ambient air temperatures). This means that for every 1kW of electricity used by the heat pump, 1-3kW of free heat are collected from the air, delivering in total 2-4 kW of energy to heat water, which makes a heat pump an efficient way of providing space heating and Domestic Hot Water.

Typical Coefficient of Performance for Aeromax Air Source Heat Pumps



Designed for external use in UK and Irish climates, Aeromax Air Source Heat Pumps operate at optimum performance all year round – no matter what the outside air temperature is.

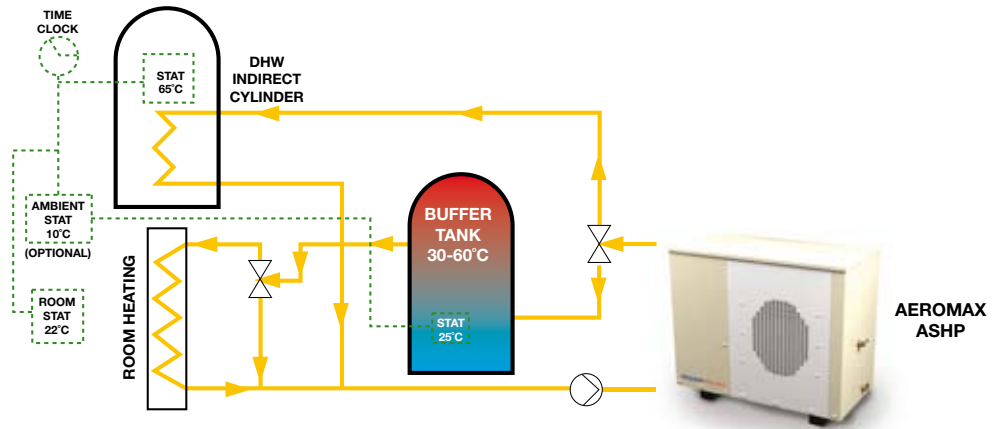
Aeromax has the ability to extract useful heat from the outside air at temperatures as low as -15°C and can generate hot water up to 65°C.

Aeromax Heat Pump efficiency (C.O.P) against different ambient temperature, using average flow temperature of 50°C, is shown in the chart above.

Heating Systems

Aeromax Air Source Heat pump can be incorporated into monovalent or bivalent heating systems in both new buildings and existing properties.

Monovalent Heating Systems

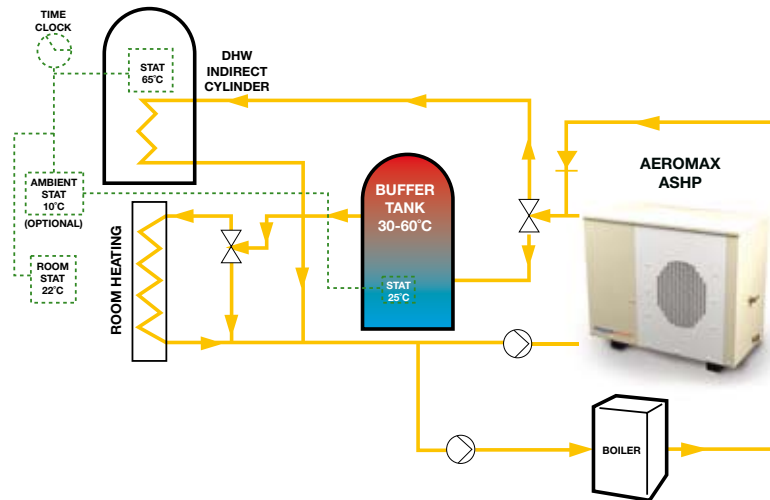


Ideal for new build, very well insulated properties or retrofitting into highly insulated existing dwellings with low temperature space heating requirements.

In this type of application the range of Aeromax Air Source Heat Pumps can be sized to provide 100% of the heating requirement on the coldest day of the year and the entire annual Domestic Hot Water requirement.

Fitted with a buffer tank, Aeromax can efficiently charge required volumes of water to service the dwelling heating and hot water loads and activate defrost cycles as rapidly as 4 minutes per hour when necessary.

Bivalent and Integrated Heating Systems



Aeromax Air Source Heat Pumps are designed to allow straightforward integration with other traditional forms of fossil fuel heat sources such as gas and oil fired boilers. Ideally suited for retrofitting into existing properties where end users have a desire to switch to renewable energy technologies and reduce their fuel bills whilst retaining their existing boiler as additional heating capacity.

In this type of application Aeromax can be sized to provide a variable proportion of the annual heating requirement (say 80%) with the existing boiler integrated to deliver the balance on the coldest days.

A bivalent system integrating an Aeromax Air Source Heat Pump (as the primary source of heating) with a traditional gas or oil boiler offers an ideal solution where lower energy consumption and considerable carbon emissions savings can be achieved.

This type of system design and application provides the end user with an ability to balance the initial capital cost of installation with the benefit of reduced running costs, significantly reducing capital payback periods against retrofitting Ground Source Heat Pump monovalent systems.

Aeromax Air Source Heat Pump – Product Features



- Aeromax Air Source Heat Pumps are available in 3 outputs: 4.5kW, 9.0kW and 12.0kW to suit individual requirements.
- Designed specifically for use in UK housing applications in North European climates (operational to -15°C).
- Provide Domestic Hot Water at 65°C without any supplementary electrical resistance heating back up (no immersion heaters or flow boilers) and therefore eliminate the need for storage of external fuel (oil or solid fuels).
- Highly efficient - when heating Domestic Hot Water to 65°C the heat pump is around 225% efficient (electric immersion heaters and gas boilers are around 100% and 85% efficient respectively).
- Typical comfort space heating is delivered between 35°C and 55°C.
- Designed to work efficiently with radiators or underfloor heating systems at around 400% efficiency.
- Twin compressors in larger models optimise efficiency at all operating conditions.
- Dual temperature operation for maximum operating efficiency.
- System controls typically managed by a standard Central Heating and Domestic Hot Water programmer together with a room thermostat for thermal comfort.
- Units are small, compact and easy to install.
- No need for disruptive and expensive ground collector installations as with ground source systems.
- Electrical installation requires a single-phase 230/240V mains supply, with all units designed to operate with very low starting currents.
- Plumbing installation is effortless with simple flow and return connections to both internal and external water circuits.
- Operate with very low sound levels between 54 and 59dB(A).
- Virtually maintenance free with a long lifespan: no expensive annual service requirements.
- Reverse cycle defrost (4 minutes per hour) protects unit from low temperatures and prolongs its life.
- Offered as complete package solution from initial advice and design, to training, technical and after sales support.
- Environmentally and pocket friendly – help reduce dioxide carbon (CO₂) emissions as well as energy bills.
- Can be coupled with high efficiency Range Tribune HE Renewable Energy cylinder to maximise benefits.

Technical Specifications

MODEL	UNITS	Aeromax ASHP 45/80	Aeromax ASHP 90/160	Aeromax ASHP 120/215
@ Air On 0°C, 90% RH*				
Output To Water (@ 55°C)#	kW	2.97	6.00	8.20
Electrical Input	kW	1.54	3.12	4.26
Output To Water (@ 35°C)#	kW	3.39	7.00	9.50
Electrical Input	kW	1.11	2.31	3.14
@ Air On 7°C, 87% RH* (To EN 14511-2-2007)				
Output To Water (@ 35°C)#	kW	4.40	8.96	12.20
Electrical Input	kW	1.20	2.47	3.35
@ Air On 20°C, 60% RH*				
Output To Water (@ 55°C)#	kW	6.10	12.20	16.60
Electrical Input	kW	1.78	3.57	4.85
Output To Water (@ 35°C)#	kW	6.30	12.60	17.20
Electrical Input	kW	1.37	2.75	3.75
ELECTRICAL DATA				
Electrical Supply Spec' 1 Phase	V/ph/Hz	230/240V / ~1N / 50Hz		
Minimum Supply Capacity 1 Phase	amps	13	25	32
Maximum Supply Fuse 1 Phase	amps	15	32	40
Max Starting Current S/Start (LRA) 1ph	amps	N/A	N/A	N/A
Soft Start Amps 1ph N	amps	19	35	31
AIR DATA				
Air Flow (Anem' @ air on grille. Wet evap')	m ³ /hr	2700	3000	4400
Fan External Resistance STD	mm WG	0	0	0
Fan External Resistance "F"	mm WG	6	6	6
WATER DATA				
Water Flow +/- 20%	l/min	7.5	15	20
Pressure Drop (water)	m hd	1.1	0.7	0.2
Water Connections	inches	¾" BSPM	¾" BSPM	1" BSPM
Condensate Water Connections	mm	¾" BSPM	¾" BSPM	¾" BSPM
Typical Buffer Tank Sizes	litres	50	100	150
GENERAL DATA				
Gas Charge (R134a)	kg	3.4	5.5	8.5
Sound Pressure Level @ 3m	dB (A)	56	58	58
DIMENSION DATA				
Width (unpacked)	mm	1107	1107	1582
Depth (unpacked)	mm	505	555	607
Height (unpacked)	mm	955	955	955
Weight (unpacked)	kg	150	213	264

Notes: (1) Weight and Dimensions Nett. (2) Allow 500mm clearance to service panels. (3) Minimum air temperature -15°C. (4) Water to have correct balance, see technical manual for details. (5) We reserve the right to change or modify models without prior notice. (6) Performance is instantaneous (no allowance for defrosts). (7) * = Outdoor Heat Exchanger, Inlet Temperature. (8) # = Indoor Heat Exchanger, Outlet Temperature.

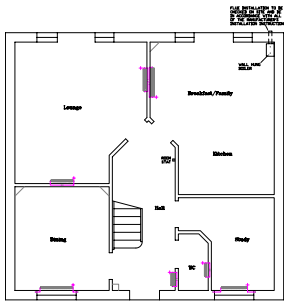
Technical support is available on 01482 865401 (Coates Design Partnership)

Custom Designed for Maximum Operating Efficiency

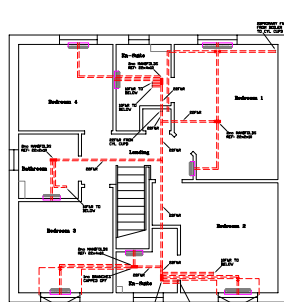


Professional design, planning and sizing is an important and inseparable factor when installing heat pumps into new properties or into existing dwellings, where the Central Heating and Domestic Hot Water systems, already installed, are to work with the Aeromax Air Source Heat Pump. That is why we don't confine our offer to simply selling the heat pump, but provide a complete service package, from initial advice and design, to training and technical support, making installation straightforward and stress-free.

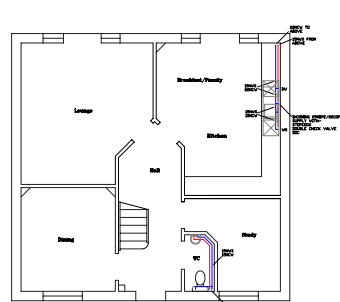
All designs and drawings are carried out by Coates Environmental & Renewable Design Partnership, one of the UK's leading consultancy practices and now part of Kingspan Group plc. Drawings and Schemes are produced using the latest AutoCAD technology by experienced design engineers. Drawings include:



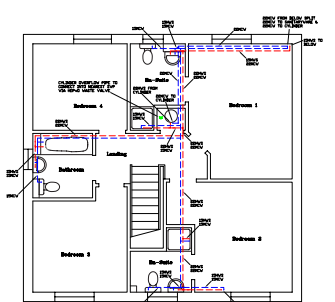
Ground Floor



First Floor



Ground Floor



First Floor

Typical Heating System Layout

- All heating, hot and cold water layouts.
- Position of radiators.
- Heat pump installation schematics.
- Supervision.
- Project management.

Typical Hot & Cold Water Layout

- Layout plans of property.
- Position of Heat pump.
- Position of buffer tank.
- Cylinder and pump/controller positions.
- Position of boiler (optional).
- Pipe routes and sizes.
- Specification.

Range Tribune HE Renewable Energy Unvented Cylinders – the Perfect Partner for Aeromax Air Source Heat Pumps



To maximise benefits of using the Aeromax Air Source Heat Pump we strongly recommend the use of a Range Tribune HE Renewable Energy unvented cylinder.

Tribune HE Renewable Energy cylinders have been designed specifically for use with alternative energy sources and are based on the highly successful Range Tribune HE unvented units. Featuring a purpose-designed coil, which allows maximum heat transfer from the heat pump into the stored water, they are an efficient and environmentally friendly way of providing Domestic Hot Water.

Fed directly from the mains water supply, Range Tribune HE Renewable Energy cylinders offer the benefit of mains pressure hot water – powerful showers and fast filling baths. The high level of environmentally friendly insulation ensures exceptionally low heat loss from the stored water.

The Tribune HE cylinders are extremely flexible in terms of siting and supply powerful mains pressure hot water to multiple points around the house.

The cylinders are manufactured from high grade 'Duplex' Stainless steel and come with a 25-year fully transferable anti-corrosion guarantee on the inner container.

Tribune HE Renewable Energy cylinders are available in a range of sizes from 180 to 300 litres in Indirect versions. They are designed to

accept heat input from a renewable heat source. Where renewable energy input does not fully meet the desired temperature, Indirect units use input from the householders' traditional heat source of gas, oil or electric boiler to meet the additional loads.

Every Range Tribune HE cylinder carries a fully transferable, 25-year guarantee against faulty materials or manufacture provided that:

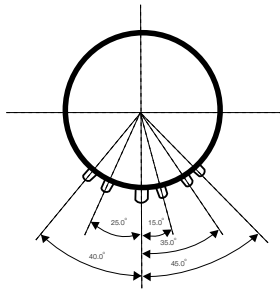
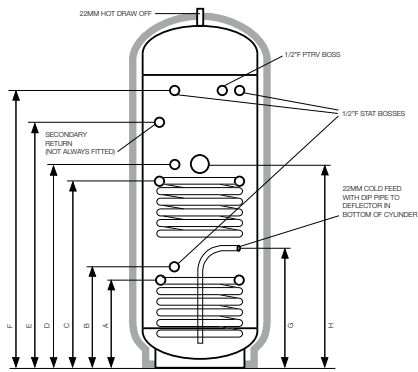
- It has been correctly installed as per the Installation Instructions and all the relevant standards, regulations and codes of practice in force at the time
- It has not been modified in any way, other than by Range
- It has not been misused, tampered with or subjected to neglect
- The system is fed from the public mains water supply
- It has only been used for the storage of potable water
- It has not been subjected to frost damage
- The unit has been serviced annually and the Benchmark Log Book has been filled in after each annual service.

The guarantee period starts from the date of purchase and no registration is required. Invoices for servicing may be requested to prove that the unit has been serviced annually. All the components fitted to or supplied with the cylinder carry a 2-year guarantee.

The Guarantee does not cover the effects of scale build up, any labour charges associated with replacing the unit or its parts and any consequential losses caused by the failure or malfunction of the unit.

Technical Specifications

INDIRECT



CODE	CAPACITY	HEIGHT	DIAMETER	A	B	C	D	E	F	G	H	WEIGHT (Kg-EMPTY)	WEIGHT (Kg-FULL)
TT180	180 L	1281	550	290	345	674	729	N/F	1080	390	725	50	230
TT210	210 L	1469	550	365	420	779	834	1150	1268	465	830	55	265
TT250	250 L	1719	550	365	420	950	1005	1400	1518	465	1000	60	310
TT300	300 L	2032	550	365	420	979	1034	1600	1832	465	1030	65	365

Water Capacities

Model	Lower Coil Volume (litres)	Upper Coil Volume (litres)	Total Capacity (litres)
TT180	55	125	180
TT210	65	145	210
TT250	90	160	250
TT300	100	200	300

Coil Specification

Model	Lower Coil		Upper Coil	
	Surface Area (m ²)	Fluid Content (litres)	Surface Area (m ²)	Fluid Content (litres)
TT180	0.670	3.687	0.670	3.687
TT210	0.878	4.826	0.767	4.220
TT250	0.878	4.826	0.767	4.220
TT300	0.878	4.826	0.878	4.826

Foam Insulation and Heat Loss

All stainless unvented HE products utilise the latest foam injection which provides significant improvements in standing heat loss values.

Model	Standing Loss kWh/24hrs
TT180	1.60
TT210	1.85
TT250	2.10
TT300	2.31

In addition our insulation process offers benefits to the 'green' specifier.

Ozone Depletion Potential (ODP) ZERO

Global Warming Potential (GWP) ONE

Buffer Tanks

For the Ultimate Aeromax Air Source Heat Pump Package, Kingspan Renewables Ltd also offer appropriate buffer tanks to integrate into the system if required.



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