

# GRANT AIR SOURCE HEAT PUMP RANGE



Grant **AERONA** Air to Water Heat Pumps with outputs from 6.5kW to 15.5kW



## FEATURES:

- EFFICIENT RENEWABLE TECHNOLOGY WITH HIGH COP'S
- MCS APPROVED PRODUCT RANGE
- BUILT-IN 3kW ELECTRICAL BACKUP (OPTIONAL 6kW)
- INCLUDES A FACTORY FITTED WEATHER COMPENSATOR WITH DUAL TEMPERATURE CONTROL
- HIGH QUALITY EXTERNAL POWDER COATED PAINT FINISH
- READY TO INSTALL WITH SIMPLE PLUMBING AND ELECTRICAL CONNECTIONS
- COMPACT DESIGN WITH COMMON FOOTPRINT ACROSS ALL OUTPUTS



## Grant Profile

### The Company

With an established history of over 30 years designing, manufacturing and supplying a wide range of highly efficient and reliable heating products, Grant has become a firm favourite for many householders and engineers, when choosing a new or replacement heating system. From the award winning Vortex range of oil-fired condensing boilers to the latest solar products and now the innovative range of Aeronair Air Source Heat Pumps, Grant has focused on providing cost effective solutions to the problem of rising energy costs.

### Quality design

Despite the sophisticated technology employed in the development of new products, Grant's design engineers have kept true to the original concept of simplicity in installation and maintenance, which are essential ingredients of today's heating systems.

As with all Grant products, Aeronair Air Source Heat Pumps are manufactured from the highest quality materials and designed not just to meet, but to exceed all relevant performance and environmental standards.

Backed by highly efficient administration and Grant's comprehensive warranty schemes, the Company is also focused on providing an exceptional after-sales service for all of its customers.

### Rest assured

When you order from any of Grant's stockists you can feel secure in the knowledge that you are purchasing the best quality and most reliable product from a long established independent heating specialist. Our policy has always been, and always will be, total commitment to the environment we live in and the customers we serve.

### Technology for the future

The Company has achieved an enviable reputation within the heating industry for its high-efficiency approach to new concepts.

Grant is aware that although most domestic houses will continue to be heated by gas, oil or electricity well into the future, there is a growing awareness that we all need to do more to reduce our dependency on fossil fuels. With this in mind the Company has, over recent years, been involved in the development of a range of renewable heating products.

### A brighter future with green technology

Renewable energy has a key role to play in reducing CO<sub>2</sub> emissions and, in particular, the installation of a Grant air source heat pump is an effective way of reducing a building's carbon footprint, therefore helping the environment.



# Heat Pump Technology

## Contents



### Air Source Heat Pumps (ASHP)

Air Source Heat Pumps use basic thermodynamic principles to convert latent/sensible heat (contained within the ambient air) into heat energy that can be used to provide heating and hot water. In this respect the device can be classified as a renewable energy source because the heat in the ambient air is replenished by the sun.

There are two types of ASHP- 'air to air' and 'air to water'. Air to air heat pumps release the captured energy through an air heat exchanger, which is then forced (by fan) around the dwelling through trunking, or directly into the room. Most commercial buildings use this type of heating medium. Grant Aerona ASHP are the air to water type. Air to water heat pumps release the energy into a water circuit which is then used in a wet heating system (radiators or underfloor).

### The history behind heat pumps

The theory of heat extraction using gas was founded in 1805 by Oliver Evans, with the first domestic fridge appearing around 1880.

Integrating this technology within a building's heating system became apparent in the 1960's. With such a vast amount of history, air source heat pump technology is quite simply a proven and very reliable method of heating the home.

### An increasingly popular method of home heating

Upward spiraling energy costs and advances in heating technology, have positioned air source heat pumps as a very realistic alternative to the conventional fossil-fueled heating system.

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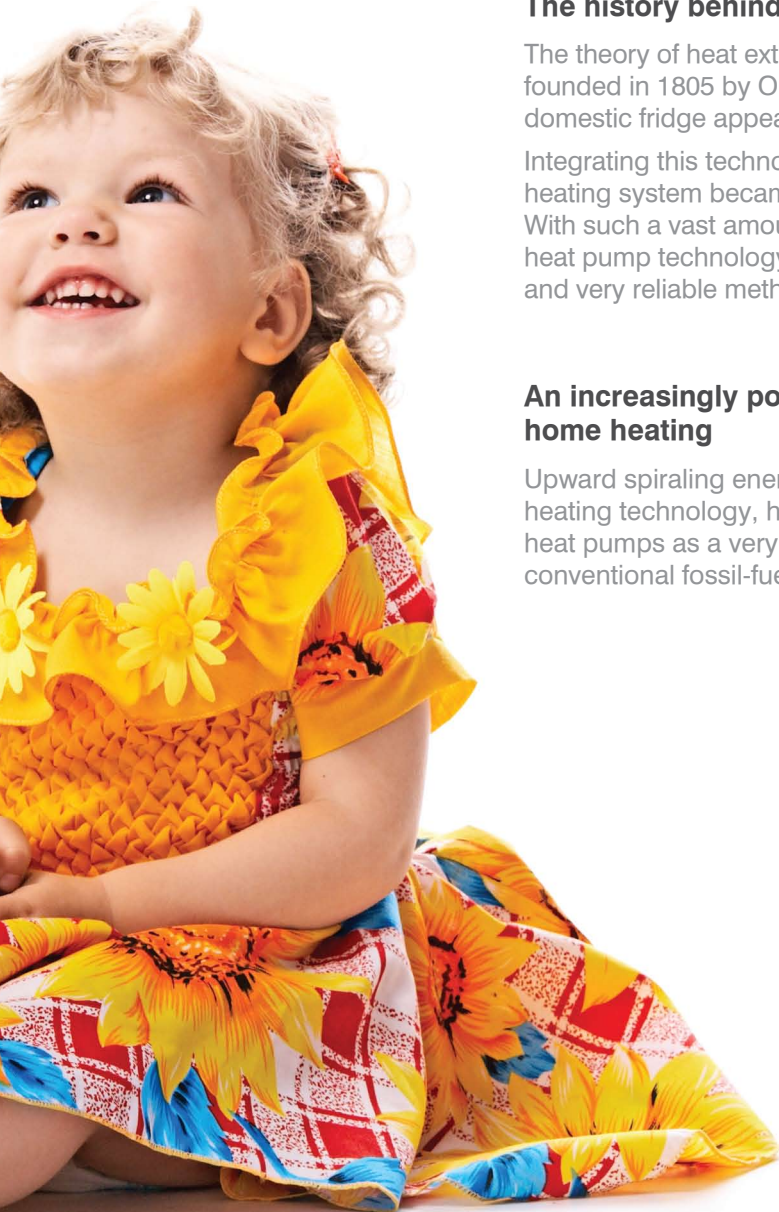
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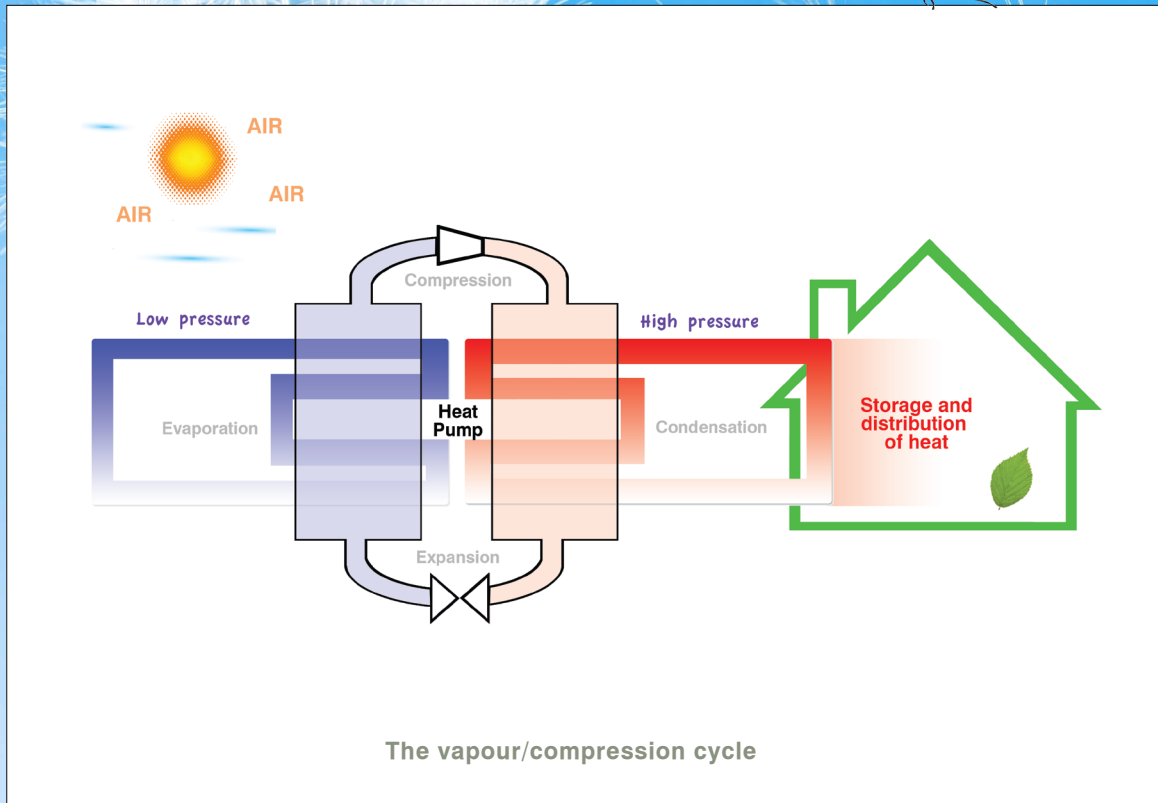


# How an ASHP works

## Air to water technology

Air to water heat pumps employ the dynamics of the vapour/compression cycle used for many years in the basic refrigeration process found within a domestic fridge.

A low pressure, low boiling point liquid (refrigerant) is exposed to a higher temperature in the coil of the evaporator. The liquid boils off to a gas and in doing so, absorbs energy. The refrigerant gas is then compressed to a higher pressure and temperature before passing through a heat exchanger where it gives its heat energy to water. The heated water is then delivered to a cylinder or heating system. After passing through the heat exchanger the refrigerant condenses back into a liquid before starting the process again.

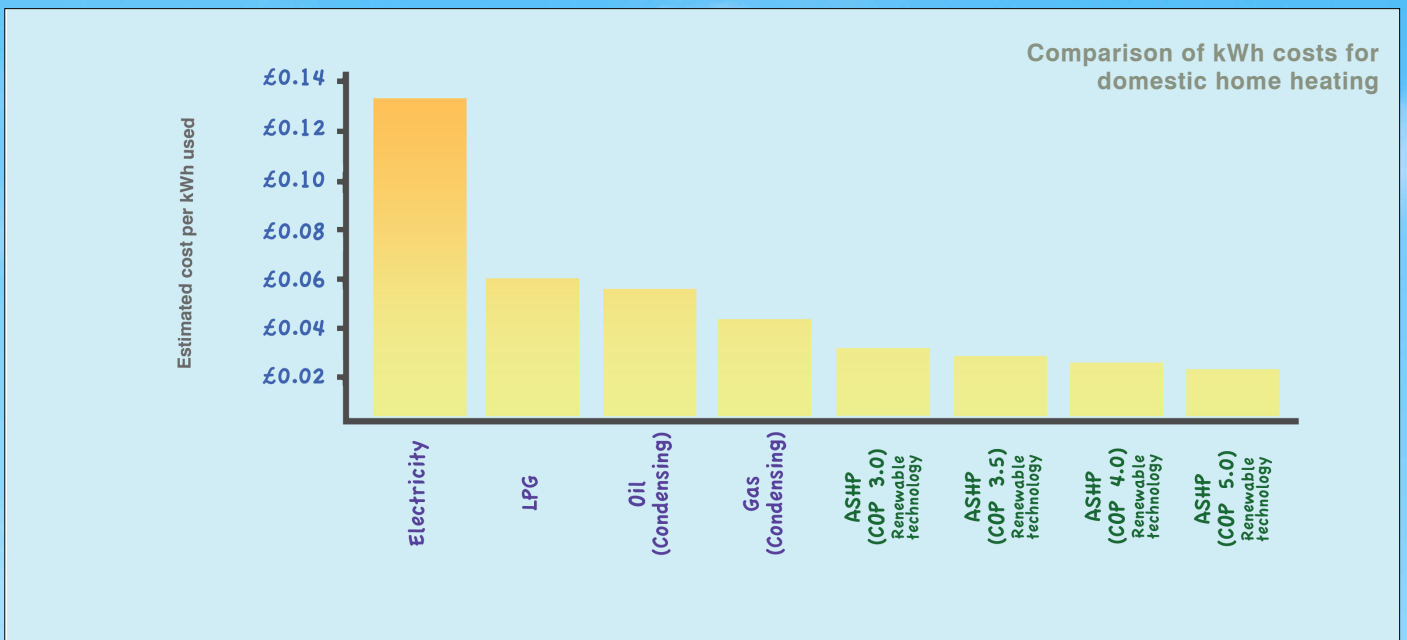
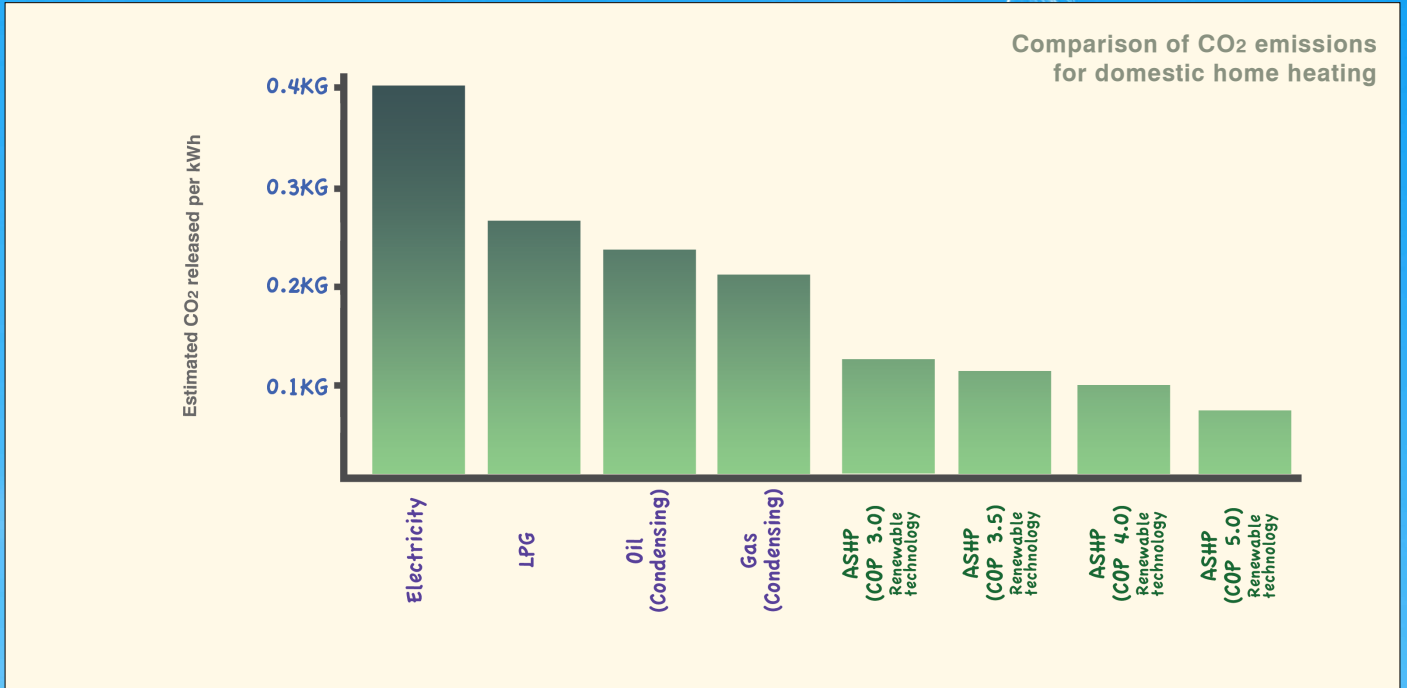


# Green Savings

## Home heating comparison

Compared with other domestic heating methods, a Grant Aerona ASHP can benefit homeowners by creating annual savings on fuel bills, as it can deliver between 3.8kW and 5.8kW (depending on the model, at 7°C air temperature/35°C water temperature) of energy for every 1kW used to run the unit. It also means that homes have a lower dependency on fossil fuels, making them less susceptible to rising fuel costs.

Home heating in the UK additionally accounts for some 30% of CO<sub>2</sub> emissions. Grant Aerona ASHP can help reduce the amount of these harmful gases being released into the atmosphere, therefore lowering the homes carbon footprint.



Note: For more information on individual heat pump efficiencies (COP's) see page 8.

# Grant Aeronas ASHP Range

## Introduction

Grant Aeronas Air Source Heat Pumps include many innovative components, including the integration of a highly efficient weather compensating device with dual temperature control and a 3kW electrical heat backup (there is also a factory fitted option to upgrade the electrical backup to 6kW, by special order). This arrangement allows the unit to perform more efficiently than some other heat pump designs, giving a reliable heat output, using less power, resulting in lower running costs. The design also allows for easy installation, into a new or existing S-plan type system configuration.

The efficient Aeronas air to water heat pumps are available as five MCS Approved 'single phase' units, with outputs ranging from 6.5kW-15.5kW (not including the immersion back up).

## Built in weather compensation control

Grant has taken tried and tested technology and given customers the benefit of incorporating it into every Aeronas ASHP.

As the COP of the heat pump is affected by air temperature and design load, it can sometimes result in poor performance and efficiency. The good news is Grant's factory fitted weather compensating device enables Aeronas heat pumps to accurately monitor both the inside and outside temperature conditions and allows it to precisely control its operation.

Grant has also pre-plumbed and pre-wired an independent heating element into the units which automatically operates and provides a boost in the rare times when the output drops to lower levels.

It is also possible to incorporate and control a secondary heat source with this arrangement e.g. gas, oil-fired, biomass boiler (Bivalent system).



## Sealed system kits

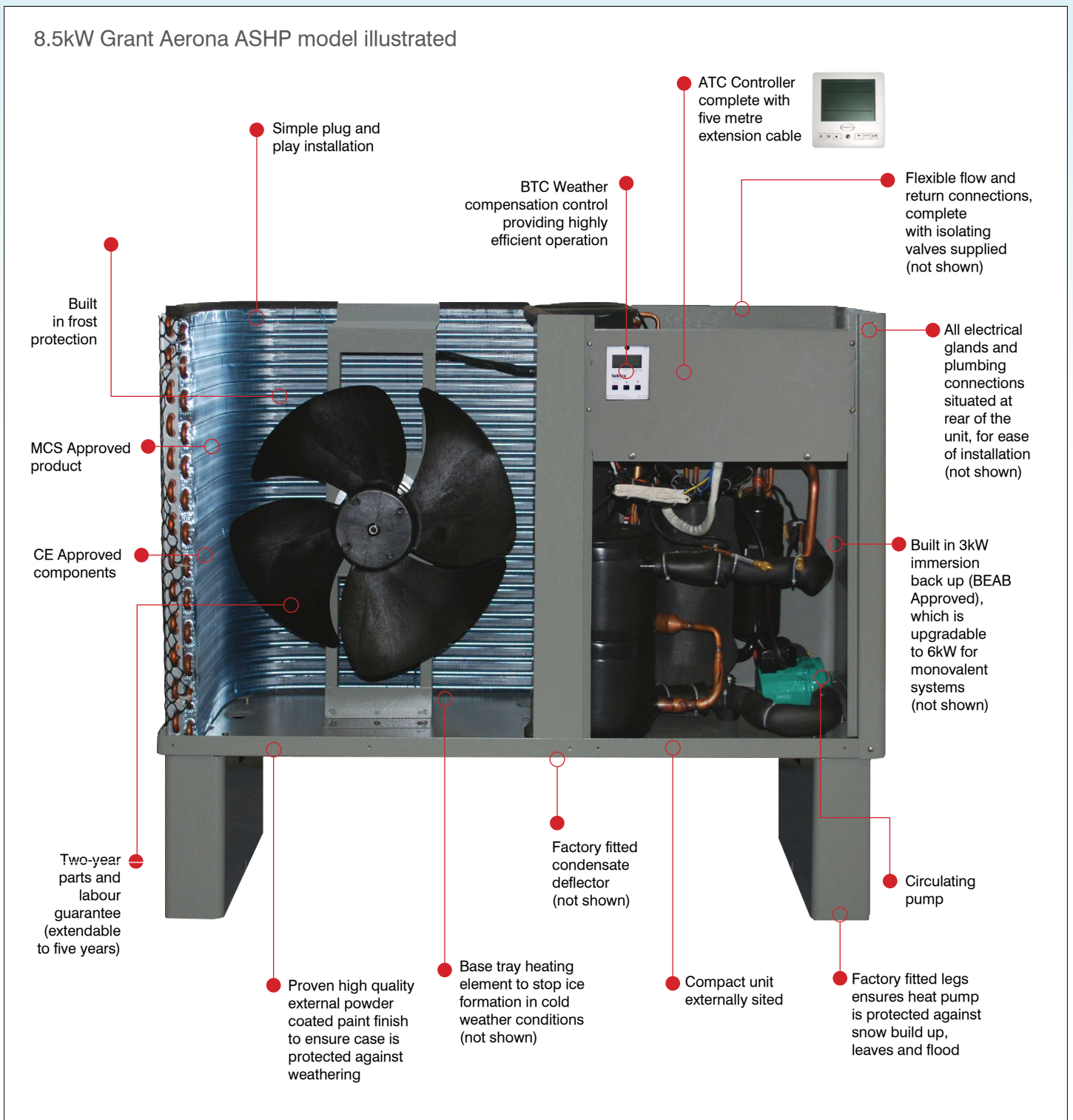
Sealed system kits to suit all ASHP models are available. The kits come in two sizes for standard systems and one larger size for use with the ThermaWave Thermal Store.

For further information, see the Grant Product Price List.



# Key Features

8.5kW Grant Aerona ASHP model illustrated



## External design

The Grant Aerona ASHP is very compact, sited externally, and requires no additional storage space for fuel, therefore leaving more valuable room inside the home.

The units come complete with a galvanised steel casing featuring a proven high quality external powder coated paint finish, which protects the internal components and case from weathering.

# Performance data



## Technical specifications

Model	HPAW65	HPAW85	HPAW110	HPAW130	HPAW155
Output	6.5kW	8.5kW	11.0kW	13.0kW	15.5kW
Height	920mm	1165mm	1165mm	1165mm	1470mm
Width	1120mm	1120mm	1120mm	1120mm	1120mm
Depth	430mm	430mm	430mm	430mm	430mm
Weight: Empty Full	94kg 111kg	115kg 134kg	138kg 156kg	152kg 170kg	172kg 191kg
Water Proof Level	IPX4	IPX4	IPX4	IPX4	IPX4
Noise (at a distance of 1m)	52dB(A)	52dB(A)	52dB(A)	52dB(A)	58dB(A)
Refrigerant	R407c	R407c	R407c	R407c	R407c
Operating Voltage	230v (1 phase)	230v (1 phase)	230v (1 phase)	230v (1 phase)	230v (1 phase)
Flow/Return Tappings	3/4" BSPF	3/4" BSPF	1" BSPF	1" BSPF	1" BSPF
Integrated Heating Element	3kW	3kW	3kW	3kW	3kW
Operating Temperatures (Air)	-15°C to 40°C	-15°C to 40°C	-15°C to 40°C	-15°C to 40°C	-15°C to 40°C
Operating Temperatures (Water)	25°C to 60°C	25°C to 60°C	25°C to 60°C	25°C to 60°C	25°C to 60°C
Compressor	Rotary	Rotary	Rotary	Rotary	Rotary
Base Tray Trace Element	Yes	Yes	Yes	Yes	Yes
COP @ Air 7°C/Water 35°C *	4.1	3.9	4.3	4.8	5.8

## About 'Coefficient of Performance' (COP)

COP is a ratio indicating the amount of energy required to run the heat pump, compared with the amount of energy being produced by the heat pump, to heat the water.

Standard testing, carried out to EN14511 establishes a benchmark COP at a particular ambient and circuit water temperature. This is 7°C for ambient air and 35°C for water flow temperature. For example, the Grant Aerona 13.0kW ASHP model produces a COP of 4.8, when tested to this level. This means for every kilowatt (kW) of energy used to run the Aerona, 4.8kW of energy is being given to the heating system in return.

It is important to note that as the temperature outside gets colder, the COP of an air source heat pump reduces proportionately, due to there being less heat energy available within the air.

\* See approvals rear page.





# Sizing an ASHP

## Before you start

Selecting the correct size of heat pump for your property is very important. There are a few checks which need to be carried out to ensure you get the optimum performance from a Grant Aerona Air Source Heat Pump, such as:

- Has a correct heat loss calculation been carried out for the building?
- Is the ASHP the only method of heating the building, or is there a secondary heat source?
- Have any radiators specified for the system been increased in size in line with the lower flow temperature produced by an ASHP?\*
- Are the building's walls insulated?
- Is there a minimum of 270mm of loft insulation?
- If applicable, are the building's existing heating controls being upgraded?
- Is the ASHP sized to provide domestic hot water as well as space heating?

\*Details on calculating radiator sizes can be found in the Grant Aerona ASHP installation manual.

## Calculating the ASHP output required

The chart opposite shows the approximate % increase/decrease in the output of an air source heat pump, dependent upon air and water flow temperatures. This is provided as a guide only, as numerous other factors need to be taken into consideration when designing a system, but should assist when selecting an ASHP.

As highlighted, a typical air source heat pump tested to the Industry Standard EN14511 achieves **100%** of its output at an air temperature of 7°C and a water flow temperature of 35°C.

The same heat pump operating in 1°C air temperature and 35°C water flow temperature, could see a reduction in output of up to **14%**.

Again, if you took the same heat pump operating in 11°C air temperature and 35°C water flow temperature, an increase in the output of up to **13%** is possible.

## Factory fitted back up

Grant Aerona ASHP have a factory fitted 3kW immersion back up, which should not be included in the sizing calculation. This feature is designed to operate only when demand upon the ASHP exceeds its stated output e.g. extreme cold weather for long periods. In most cases, providing the ASHP was sized correctly for the system, this additional feature will more than compensate for any short term reduction in the unit's heating capacity.

### ASHP OUTPUT CHART

AIR TEMP	%	%	%	%	%	%
21°C	212	193	181	167	150	129
19°C	186	169	159	146	132	113
17°C	164	149	140	129	116	100
15°C	145	132	124	114	103	88
13°C	132	120	113	104	93	80
11°C	124	113	106	98	88	76
9°C	118	107	101	93	83	72
7°C	110	100	94	86	78	67
5°C	105	95	89	82	74	64
3°C	100	91	86	79	71	61
1°C	95	86	81	74	67	58
-1°C	91	83	78	72	65	56
-3°C	88	80	75	69	62	54
-5°C	85	77	72	67	60	52
-7°C	80	73	69	63	57	49
-9°C	77	70	66	61	54	47

30°C 35°C 40°C 45°C 50°C 55°C

WATER TEMP

#### NOTES:

Figures indicate % of unit output (100% at 7°C air/35°C water).

No immersion element value is included.

This chart is provided for guidance only and should not replace a full system heat loss calculation.

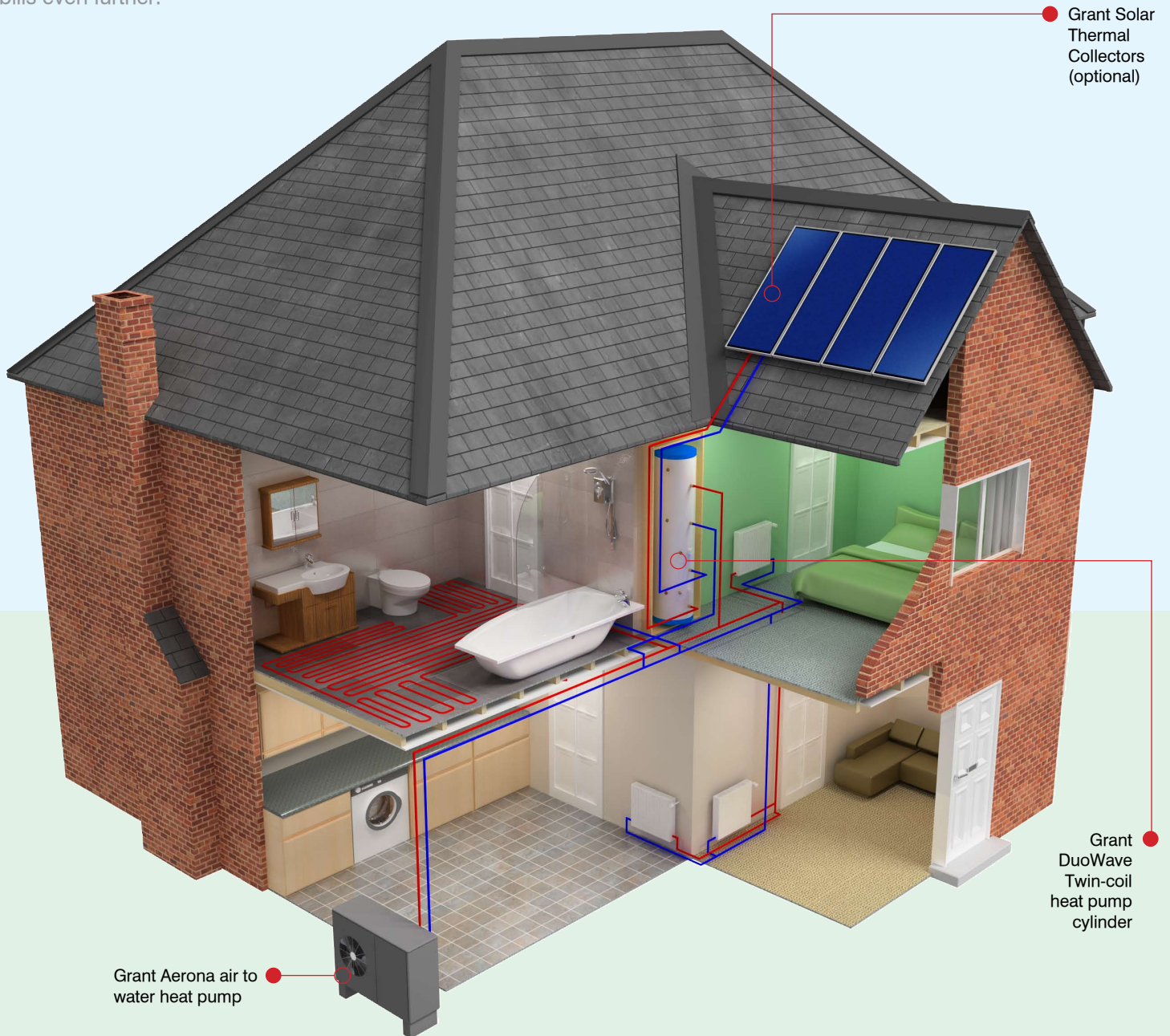


# Grant Aerona in the home

## Typical system layout

The house below shows a Grant Aerona air to water heat pump incorporated into a standard heating system, comprising heat pump, cylinder, underfloor heating and radiator circuit.

Grant Solar Thermal is also a good match for air source heat pumps and when combined using one of Grant's high efficiency heat pump cylinders, can reduce home heating bills even further.



# Grant Heat Pump Cylinder Range

*Duplex stainless steel unvented indirect, mains pressure cylinders for either Grant Aerona Air Source Heat Pumps or combining ASHP with solar thermal systems.*



## Heat Pump cylinders

Grant have introduced a range of stainless steel cylinders specifically matched to the Aerona ASHP, which incorporate a larger primary coil for quicker heat transference.

The new cylinders are available in seven indirect single coil versions, ranging from 125-400 litres and five indirect twin coil versions ranging from 170-400 litres.

Grant Heat Pump cylinders feature compression fittings which are conveniently located to make installation quicker and easier.

## Domestic Hot Water (DHW) Boost Kit

Whilst it is possible to raise the DHW to 60°C with an Aerona Air Source Heat Pump, it can be more efficient to set the hot water temperature between 45°C and 50°C and utilise Grant's Domestic Hot Water Boost Kit to take the cylinder up to the desired higher temperature. This unit comprises an enclosure with 20A rated contactor, an override switch and relay, which works with the immersion element fitted in all Grant cylinders.

### Grant MonoWave Heat Pump Cylinders Unvented Indirect Single Coil Duplex Stainless Steel

Model	Capacity (ltrs)	Pressure Regulator (bar)	Immersion fitted (kW)	Expansion Vessel (ltrs)	Coil Rating Primary (kW)	Standing Heat Loss (kW/24hrs)	Dimensions Height (mm)	Diameter (mm)	Weight Empty (kg)	Full (kg)
HPMONO/IND125	125	3	3	12	24.0	1.70	800	580	30	155
HPMONO/IND150	150	3	3	12	27.8	1.92	890	580	32	182
HPMONO/IND170	170	3	3	19	27.8	2.04	1075	580	45	215
HPMONO/IND200	200	3	3	19	47.0	2.45	1230	580	49	249
HPMONO/IND250	250	3	3	24	47.0	2.69	1480	580	59	309
HPMONO/IND300	300	3	3	24	56.6	2.71	1745	580	68	368
HPMONO/IND400	400	3	3	35	56.6	2.94	2110	580	76	476

### Grant DuoWave Heat Pump Cylinders Unvented Indirect Solar Twin Coil Duplex Stainless Steel

Model	Capacity (ltrs)	Pressure Regulator (bar)	Immersion fitted (kW)	Expansion Vessel (ltrs)	Coil Rating Primary (kW)	Solar (kW)	Standing Heat Loss (kW/24hrs)	Dimensions Height (mm)	Diameter (mm)	Weight Empty (kg)	Full (kg)
HPDUO/IND170	170	3	3	19	32	8.5	2.04	1075	580	57	227
HPDUO/IND200	200	3	3	19	47	10	2.45	1230	580	61	261
HPDUO/IND250	250	3	3	24	47	16	2.69	1480	580	71	321
HPDUO/IND300	300	3	3	24	55.6	16	2.71	1745	580	80	380
HPDUO/IND400	400	3	3	35	55.6	23	2.94	2110	580	100	500

Note: Grant MonoWave and DuoWave Heat Pump Cylinders include a factory-fitted temperature and pressure relief valve, set to operate at 7 bar and 90°C.

# General Information

## Installation and maintenance

The installation of a Grant Aerona Air Source Heat Pump should be carried out by a Grant Approved Heat Pump Installer. More information on this scheme is available from the Grant UK website.

Servicing should be carried out annually by a qualified heating engineer. During servicing it is important for the engineer to ensure that the evaporator matrix is clear of debris as any build up could significantly affect the performance of the heat pump.

## Guarantees

Grant Aerona Air Source Heat Pumps are guaranteed for two years from the date of purchase (excluding consumable items), subject to being serviced annually and installed in accordance with the manufacturer's instructions. This warranty can also be extended to five years for an additional fee. See the Aerona Installation manual for further details.

On completion of the installation all Grant Aerona Air Source Heat Pumps must be commissioned and the guarantee registration form returned to Grant UK.

## Approvals

Grant Aerona ASHP are manufactured using CE approved components and include a BEAB certified 3kW Immersion element. To ensure performance standards, the units have been tested and approved in a UK test house to EN14511.

All Heat Pump cylinders are manufactured in accordance with BS EN 12897 the specification for unvented hot water storage vessels. They all comply with Building Regulations G3 and Water Regulations. Cylinder performance complies with the requirements BS6700, BS1566 and BS7206 and meets the NHBC criteria.

## After sales service

For peace of mind, all Grant Aerona Air Source Heat Pumps are backed by Grant's comprehensive service operation and in the unlikely event of a problem occurring, your installer should telephone our Customer Service Department on: **01380 736920**

## Website

For information about other Grant products or to download brochures please visit the website at: **www.grantuk.com**

Our popular online site is regularly updated with the latest news and product developments.

## Grant Guide to ASHP

A guide to make the householder, installer, specifier and merchants life easier when choosing an air source heat pump, is now available.

The comprehensive brochure, answers some of the most commonly asked questions regarding air to water heat pumps and also touches on Grant's new Aerona ASHP technology.

To obtain a free copy, just call the Grant Sales office on: **01380 736920** or alternatively it can be downloaded from the website.



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