Aerona^3

AIR SOURCE HEAT PUMP RANGE

Inverter Driven Technology

What are air source heat pumps?

Air source heat pumps are a sustainable alternative to traditional fossil fuel heating systems and with their green credentials and high efficiency operation, they will play a major role in helping the country achieve its net zero carbon emission targets.

In brief, air source heat pumps utilise the heat energy in the air and convert it into usable energy to heat homes. Grant heat pumps are ‘air to water’ systems (as opposed to ‘air to air’ heat pumps) which means that they capture heat energy from the air and transfer this into ‘wet’ heating systems, such as radiators or underfloor heating.

Grant’s Aerona^3 heat pumps are monobloc units. They use a vapour compression cycle which is the same as that used to extract heat from a domestic fridge. The heat pump draws air in and transfers it over an evaporator where R32 refrigerant is exposed to this air. The liquid refrigerant, which has a low boiling point, boils off to a gas and absorbs the latent heat energy within the air. The gas is then compressed which increases the heat content in the refrigerant before passing through a heat exchanger. Here, the gas condenses back to a liquid while transferring the heat to the water of the heating system. The liquid refrigerant is then re-circulated through the evaporator and the cycle is repeated.

The system water which has been heated up then exits the rear of the heat pump via flow and return pipework and is circulated throughout the rest of the central heating to provide space heating and hot water within the home.

Introducing the Aerona³ R32 range

Consisting of four single phase models – 6kW, 10kW, 13kW and 17kW – the Aerona³ R32 heat pumps provide heating and hot water for properties. Each unit operates at high efficiencies even when the external temperatures are low, making for a cost-effective renewable alternative to traditional off-gas heating methods. Furthermore, the Aerona³ heat pumps have minimal impact on their surroundings being compact in size and quiet in operation with both the 13kW and 17kW models being awarded the Quiet Mark.

QUIET MARK
HPID13R2 & HPID17R32

MCS CERTIFIED

7 year guarantee^

6kW

Model	HPID6R32
ErP Rating* (Heating)	A+++
Height (mm)	675
Width (mm)	898
Depth (mm)	379.4
Weight (Full) (kg)	52.8
SCOP average climate conditions*	4.62
Sound pressure level at 1m (dBA)	54.2

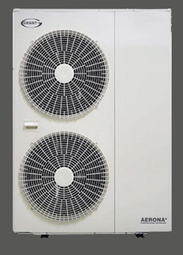
10kW

Model	HPID10R32
ErP Rating* (Heating)	A+++
Height (mm)	882
Width (mm)	874
Depth (mm)	405
Weight (Full) (kg)	71.8
SCOP average climate conditions*	5.22
Sound pressure level at 1m (dBA)	53

13kW

Model	HPID13R32
ErP Rating* (Heating)	A+++
Height (mm)	1418
Width (mm)	1024
Depth (mm)	403
Weight (Full) (kg)	101
SCOP average climate conditions*	5.41
Sound pressure level at 1m (dBA)	49.8

17kW



Model	HPID17R32
ErP Rating* (Heating)	A+++
Height (mm)	1418
Width (mm)	1024
Depth (mm)	403
Weight (Full) (kg)	120
SCOP average climate conditions*	4.54
Sound pressure level at 1m (dBA)	50.6

^ When installed by a G1 accredited installer. T&C's apply
*(BS EN 14825 average climate conditions @ 35° flow)

SCOP & the RHI

The efficiency of an air source heat pump is measured using 'SCOP' which stands for Seasonal Coefficient of Performance. The SCOP value is produced by calculating the overall performance of a heat pump during a particular heating season (warm, average or cold) and then dividing this by the annual energy consumed to run the heat pump.

For example, the Grant Aerona³ R32 6kW model produces 6kW at a SCOP of 4.62 when tested at a low temperature and in average climate conditions. This means, for every kilowatt of energy used to run the heat pump, over 4kW of energy is being given to the heating system in return.

In summary, the higher the SCOP, the more efficient the heat pump. The Aerona³ R32 range is Grant's most efficient generation of air source heat pumps with excellent SCOPs across all four models. While the SCOP values can reduce slightly when the outdoor air temperature gets colder, homeowners who choose a Grant Aerona³ heat pump can be assured that their heating system is working as efficiently as it can all year round.

A heat pump with a high SCOP value can not only help lower household energy and heating bills but it can also equate to other financial rewards through the Government's Domestic Renewable Heat Incentive. Through the RHI, households who install eligible renewable heating systems (such as a Grant air source heat pump) can receive quarterly payments for seven years as long as they adhere to the Scheme's rules.

RHI payments, which aim to encourage homeowners to install greener, more sustainable heating technologies, are calculated based upon the heat demand of the property, the amount of energy consumed by the heat pump and multiplying the renewable proportion of the heat demand by the RHI tariff.

The diagram below provides an example of two RHI calculations and it shows how a heat pump with a higher SCOP value can deliver greater financial rewards through the RHI Scheme.

- Example RHI calculation

	Grant Aerona³ 13kW model	Other brand 12kW model
Head demand	15,000kW	15,000kW
RHI Tariff	£0.1071	£0.1071
SCOP	5.4	3.81
Annual energy consumption of heat pump		
	15000/5.4 = 2777.77kW	15000/3.81 = 3937kW
Renewable proportion of heat demand		
	15000 - 27777.7 = 12222.23kW	15000 - 3937 = 11063kW
Estimated annual RHI payment		
	12222.23 x £0.1071 = £1309	11063 x £0.1071 = £1184.85
Total estimated RHI payments over 7 years		
	£9163.00	**£8293.95**

Get up to an extra 10% when using Aerona³

Noise Levels

It is a common belief that air source heat pumps can be noisy when running. While the fans in a heat pump do make a sound as they rotate, Grant's air source heat pumps have been specifically designed to be quiet in operation to ensure there is little impact to the household and neighbouring properties.

The diagram on the right shows the sound levels of Grant's Aerona³ heat pumps compared with other common household appliances and noises. An average fridge freezer, which is considered quiet, has a sound level of 40dB or less. Meanwhile, when two people are having a conversation, they create approximately 60dB of noise. The level of sound that Grant heat pumps generate sits in between these two average values. Grant Aerona³ heat pumps are also considerably quieter than the average washing machine (at 65dB), household hoover (at 72.5dB) and lawn mower (at 80dB).

The low operating sound levels enable Aerona³ models to easily integrate into outdoor environments, including those where noise restrictions may be in place. Their quiet operation has been acknowledged by Quiet Mark, an international award programme that validates and awards low-noise, high performance technologies. Both the 13kW and 17kW Aerona³ heat pumps have been awarded the Quiet Mark, recognising these products for their excellent performances and identifying them as being amongst the quietest models within their given category.

NOTE

Please note, the decibel levels listed in this diagram for common noise sources are typical values but they will vary. The values given for the air source heat pump sound pressure level is measured at an external distance of 1m. Anti-vibration mounts/feet and flexible hose connections should be used to reduce any vibration on the building structure and heating system.

Location, Location, Location

Choosing the right place to locate your air source heat pump is an important decision because the incorrect siting of a heat pump can impact its performance. There are several factors to consider and it is always worth discussing these with your installing engineer.

Ideally, homeowners should avoid locating their heat pump on the North side of their property, unless there is no other alternative, because this will be the colder side. A South facing side of a building is best for a heat pump but when this is not possible, a South East or South West position is the next best alternative followed by an East or West facing side. It is also important to choose a position that is protected from the wind and other adverse weather conditions.

An air source heat pump needs adequate clearances on all sides so that the unit can be easily accessed for operation, servicing and maintenance purposes. For a Grant Aerona³ heat pump, the minimum clearances are: 300mm above and to the rear, 100mm to the left side, and 600mm to the right side and around the front.

A heat pump also requires sufficient clearances so that the air flow to and from the unit is free and uninterrupted, and the inlet and outlet grills must always be kept unobstructed otherwise the heat pump will not be able to operate properly.

Heat pumps require a level, flat base to be installed upon so they should not be installed on loose, uneven surfaces such as grass, soil, gravel or shingle. The base should be capable of taking the weight of the heat pump as well as minimising the transmission of noise and vibration. Examples of suitable bases for a Grant heat pump include a 150mm thick concrete base or paving slabs on compacted hard core.

If a heat pump is being installed within the vicinity of the sea, it will need to be treated with a suitable anti-corrosion treatment to protect the unit and core components from the sea air. Grant heat pumps can be supplied pre-treated with an anti-corrosive treatment called Blygold. The Blygold coating, which is applied to the evaporator within the heat pump, provides protection against the salt within the sea air, helping to preserve the lifespan and performance of the heat pump within a coastal region.

Preparing your home

For a heat pump to operate effectively, the property it is heating needs to be energy efficient and well insulated. Working at lower temperatures (compared to conventional heating systems such as oil and gas boilers), air source heat pumps require a property to be sufficiently insulated so that any heat loss through the walls, roof and floors is minimised. By reducing the amount of heat loss from the property, the heat pump can work at its highest efficiencies to meet the heating demand of the home and delivering comfort throughout.

Preparation is key with air source heat pumps. There are several energy-efficiency measures which homeowners can do to get their homes heat pump ready including loft insulation, wall insulation and double or triple glazing windows. To read more about the steps you can take to prepare your home for a Grant heat pump, please read our Blog here: www.grantuk.com/about/blog/getting-your-home-heat-pump-ready

Do's & Don'ts

When fitting a heat pump, there are some clear do's and don'ts which homeowners and their installers should follow. Adhering to the do's and avoiding the don'ts will help ensure that a heat pump installation is successful in delivering years of reliable, sustainable and efficient home heating.

Do

Consider the property's insulation levels
As mentioned in the previous section, heat pumps can achieve optimum efficiency when the property is well insulated

Find the best location to site the heat pump
Location is key so positioning a heat pump in the right place will help the unit achieve its maximum performance (please refer to p.8 for more details)

Design the system correctly
Working with the installer to properly design a heat pump system is crucial as this planning can ensure that the correct heat pump model is sized and selected to meet the heat demand of the property most efficiently

Assess the radiator sizes
Correctly sizing the heat emitters, whether they be radiators or an underfloor heating system, is very important as there needs to be sufficient surface area to effectively transfer the heat from the low temperature system into the property (sizing the heat emitters is a key step in the system design)

Ensure the system is installed and commissioned correctly
The installer must fit the heat pump and commission the system in full accordance with the installation instructions

Receive a complete handover from the installer
Once the system has been commissioned and ready to operate, installers should provide homeowners with a detailed handover so that they understand how the system works

Service the heat pump annually
Heat pumps require minimum involvement from homeowners but regular servicing of the heat pump each year will help maintain the system and ensure it is working at its most efficient

Do not

Connect a heat pump to an old hot water cylinder
Unless the existing cylinder is heat pump ready, a new cylinder (which has the necessary insulation and larger internal coil) should be installed as part of the heat pump installation

Restrict the air circulation around the heat pump
If the air flow is obstructed in any way, this can limit the output of the heat pump and reduce the performance of the heating system

Turn off the heat pump
Heat pumps work most efficiently when they are not turned on and off throughout the day. Instead, it is more cost effective to use setback controls to adjust the heat pump's continuous operation according to the heating demand

Expect the radiators to be too hot to the touch
As heat pumps work at lower temperatures, the radiators or other types of heat emitters will not be as hot as those connected to a high temperature heating system

Leave doors and windows open unnecessarily
Any actions which allow heat to escape the property will lower the room temperatures to below the desired warmth that the system is asked to achieve

Touch the heat pump controls
Homeowners should not tamper with the heat pump controller settings as these will be set by the installer to ensure that the system operates correctly. To manage room temperatures, homeowners should use room thermostats, TRVs and other control systems.

It is worth noting that not all properties are suitable for a heat pump. If a home does not have sufficient insulation, a heat pump should not be installed unless the necessary energy-efficiency measures are fitted first.

Your questions, answered.

What heat emitters work with heat pumps?
Heat emitters with larger surface areas are the best partners for an air source heat pump operating at lower temperatures. A larger surface area allows the heat from the system to be effectively transferred evenly into the property's occupied spaces. Grant's Uflex underfloor heating ranges as well as their Afinia aluminium radiators are both ideal heat emitters to install with a heat pump.

Do I need planning permission?
The installation of an air source heat pump on domestic premises is considered to be permitted development and should not require any planning permission providing that all conditions are met. It is recommended to check with your Local Authority Planning Department prior to any work commencing because in some cases, planning permission may be required.

Why is it important to size a heat pump correctly?
Air source heat pumps must be correctly sized to ensure that it can provide the required amount of heat output at the design conditions – typically when the outside temperature is at -3°C. To do this an installer must first accurately determine the heat loss from the property and then, using this information, correctly select the required size of heat pump based on the design outside air temperature. Grant can assist with sizing the ASHP and the heat loss of the building.

Will my fuel and electricity costs go up with a heat pump?
Air source heat pumps do use electricity so you will likely see a small increase in your electricity usage and costs. However, you will not have any fuel costs so, by not needing to pay for gas, oil, LPG or another fuel, you will make savings here.

How often should a Grant heat pump be serviced?
Grant heat pumps should be serviced annually in order to comply with the product guarantee Terms & Conditions.

For more FAQ's, tips, advice and much more please visit our knowledge hub at **www.grantuk.com/knowledge-hub**

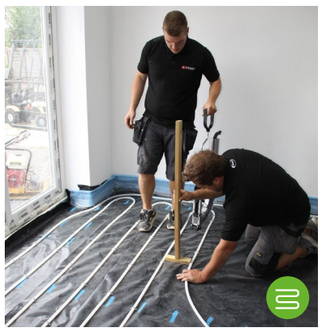
Case Study

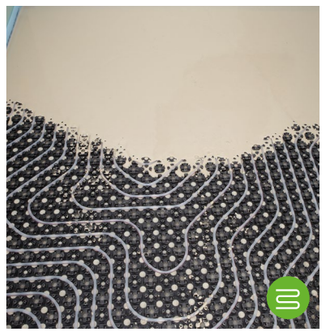
Project Overview

This four-bedroom semi-detached property in Wiltshire underwent a complete heating system upgrade as part of a wider renovation project. In addition to building a large extension off the side of the property, this home's heating system was also updated, swapping from a gas boiler to a renewable system with the installation of a Grant Aerona³ air source heat pump.

Products Installed

- Aerona³ 13kW R32 Air Source Heat Pump
- MonoWave High Performance 300ltr Cylinder
- Uflex Underfloor Heating System (throughout the downstairs of the new extension)
- Uflex MINI Underfloor Heating System (throughout the downstairs of the original property)
- Afinia Aluminium Radiators (throughout upstairs of the entire property)





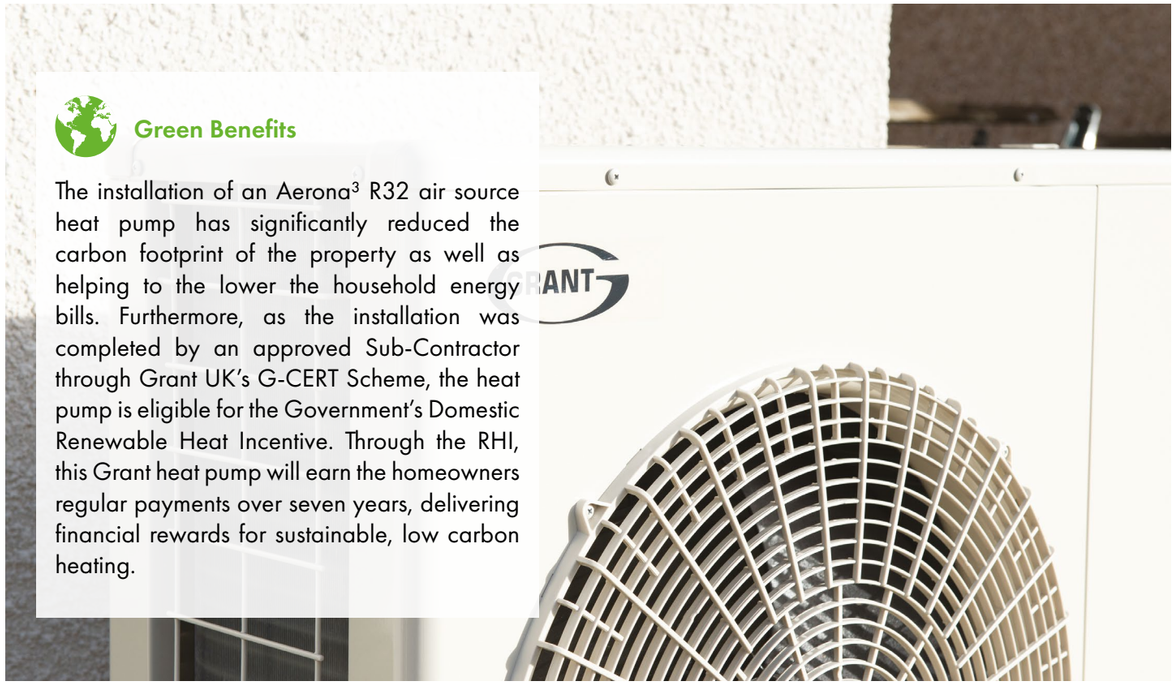
Why renewables

Having lived in the property for five years, the owners wanted the renovation project to not only deliver their forever home but to enable them as a family to live as sustainably as they could. To achieve this, they needed to improve the efficiency of their heating and change the heat source to a greener alternative. This was the reason why a Grant whole house renewable heating system was selected and installed.

> The renovation project gave us the opportunity to completely transform our heating system, moving away from a fossil fuel and going green with a new heat pump. Our heating and hot water demand is now being efficiently fulfilled by an air source heat pump which is working effectively alongside the complementary technologies also supplied from Grant UK. Today, we have complete peace of mind that our renewable heating system is reliable and environmentally friendly and will be for many years to come.
>
> The Homeowner

Green Benefits

The installation of an Aerona³ R32 air source heat pump has significantly reduced the carbon footprint of the property as well as helping to the lower the household energy bills. Furthermore, as the installation was completed by an approved Sub-Contractor through Grant UK's G-CERT Scheme, the heat pump is eligible for the Government's Domestic Renewable Heat Incentive. Through the RHI, this Grant heat pump will earn the homeowners regular payments over seven years, delivering financial rewards for sustainable, low carbon heating.



Rise to the challenge

We are all living in an era where sustainability and the future of our planet are increasingly important and prominent factors in our day to day lives. From reducing waste and recycling more materials through to larger measures which reduce greenhouse gas emissions, there are lots of different ways for human activities to be less harmful on the environment.

The Government has set a target to achieve Net Zero carbon emissions by 2050 and to achieve this goal, home heating systems up and down the country need to be made more efficient and de-carbonised. Air source heat pumps are one of the answers which can help homes to no longer be solely reliant on fossil fuels for heating. A Grant heat pump, for example, can provide homeowners with a sustainable, efficient and cost-effective solution to heat their homes with renewable energy, helping them to significantly reduce their carbon footprint and enjoy the wider benefits of a cleaner heat source.

Start your journey to Net Zero and embrace renewable energy within your home by installing a Grant air source heat pump. Together, if we all rise to the challenge, we can make our lives more sustainable and create a greener future for the next generation.


On the journey to a greener future, we are with you every step of the way.
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Grant Engineering (UK) Ltd
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