



Don't just be Warmma, be Warm-ahhhh...



Your heat pump proposal

Thanks for choosing us for your heat pump installation!

A heat pump will give you reliable, even and comfortable heating, will use much less energy than a boiler, and will greatly reduce your carbon footprint.

Please read the enclosed quote carefully. It covers in detail the components we will be installing, describes how the system works, shows how the system will meet the heating requirements of your property, and lists the costs for the work.

We're always happy to help answer questions, so please get in touch if there is anything you aren't sure about.

James Eardley

This proposal is for:

Williams

2 Ynys Arwed Cottages
SA11 4DF

Prepared

9 December 2024

Valid for

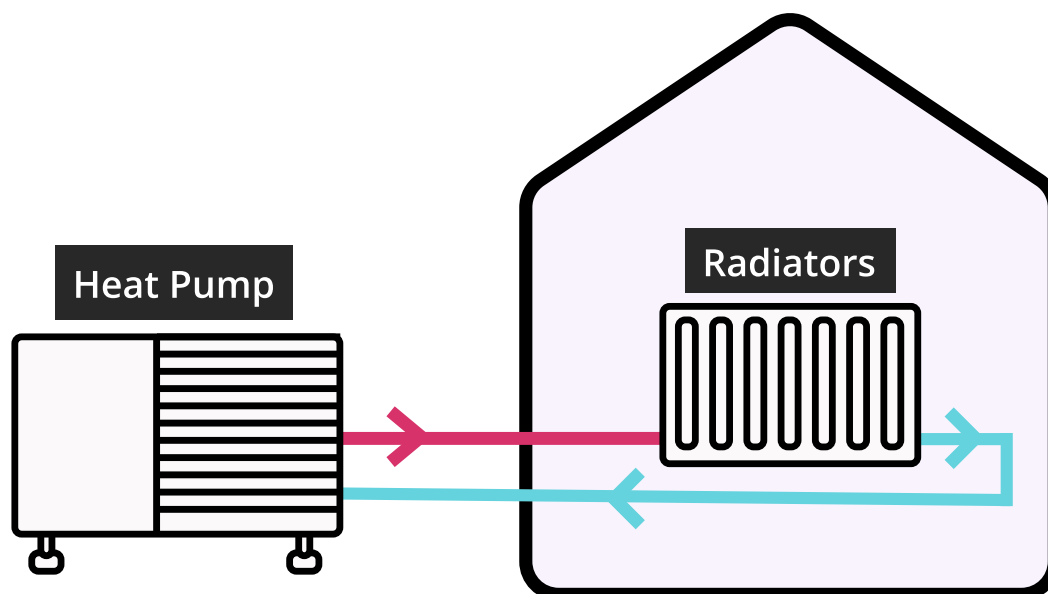
30 days

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Your system

The system we propose includes a heat pump (Samsung 8kw Monobloc Heat Pump), and all the other components necessary to plumb the heat pump into your heating system. We have also specified 9 additional radiators which will help your new system run more efficiently.



Samsung 8kw Monobloc Heat Pump

Samsung heat pumps have a great track record of solid performance in the UK, the Samsung 8kW EHS Monobloc Heat Pump is an affordable, reliable, and efficient monobloc heat pump using R32 as the refrigerant, which helps lower the impact on global warming.

ENA Registration Number: SAMSG/09676/V1 Heating SCOP at 44°C: 3.75

Sound Power Level: 63.0 dB

Nominal Output: 8.00 kW

Proposed flow temperature: 44°C

Actual Output at 44°C*: 6.54 kW

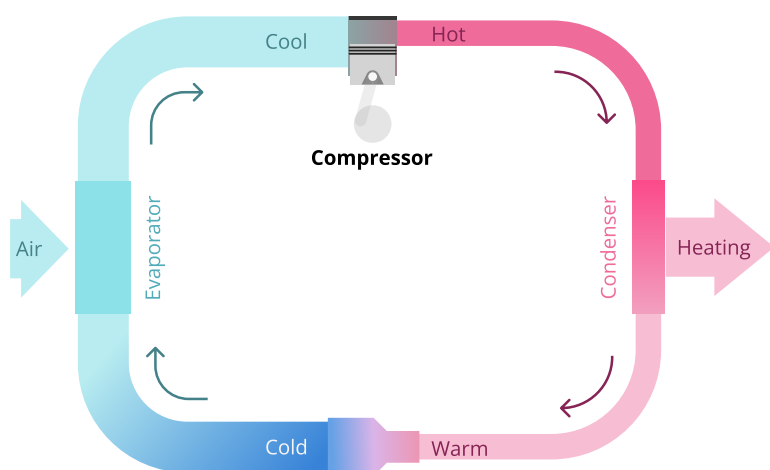
*at outside design temperature of -1.6°C

Heat Pumps Explained

A heat pump uses electricity to move heat from the outside of a building to the inside. It works on the same principle as a fridge.

In a heat pump, a compressor is used to pressurise a refrigerant, making it hotter - in the same way that a bicycle pump generates heat when it compresses air. The hot refrigerant is passed through a heat exchanger that draws off the heat for use in your house.

The refrigerant (now much cooler) is then passed through an evaporator nozzle, which allows it to expand. As the pressure decreases the refrigerant cools even further - in the same way that aerosols get cold when compressed air is released from a can.



The beauty of heat pumps is that a relatively small electrically-driven compressor can move large amounts of heat. The ratio between the electrical energy input and the heat output is the coefficient of performance (CoP). This will vary over the course of a year: the heat pump will be more efficient in the summer when the difference between the inside and outside temperatures is less.

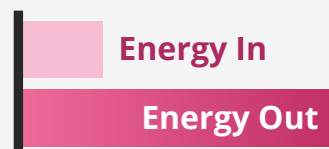
However, even in the winter the heat pump will use far less energy than a direct electrical heater or a gas boiler to produce a given amount of heat.

How efficient will my system be?

375%

From our model of your property, we expect your system to have a Seasonal Coefficient of Performance (SCoP) of 3.75.

That means for every kWh of electrical energy you put into the heat pump, you will on average get 3.75 kWh of heat.



Will I notice a difference?



Boilers typically run for short periods at very hot temperatures, and cycle rapidly on and off.

Heat pumps work more efficiently if they run at lower temperatures for longer periods, so your radiators will feel cooler than they used to but will be on for more of the time. We have based our calculations on a radiator temperature of 41.5 degrees.

You don't need to worry though - we've carefully sized your system so that you should always have enough heat to keep your house warm.

People who have heat pumps usually say they really like the more even heat that a heat pump system gives you compared to a gas boiler.

Inputs

Property Details

Year built	Pre 2000
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Design Data

Outside Design Temp – ODT	-1.6°C
Degree Days (DD)	2161
Mean air temp – MAT	9.9°C
Altitude	24m

Building Requirements

Space Heating load	6223W
Total area of building	79.79m²
Average Watts per metre square heat loss	78W/m²

Heating check

We have checked that every room in your property will still be warm enough after the installation of the heat pump.

We've surveyed every room to work out the total expected heat loss through the ventilation, roof, walls, floors, windows and doors, at the specified room temperature. We've then compared this with the heat that the heat emitters will produce to ensure that every room will be warm enough. Radiators that will be removed are displayed with a lighter shade.

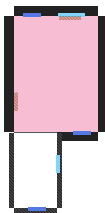
The output power of each radiator is calculated using:

The proposed flow temperature	44°C
The dT	5°C
The mean water temperature	41.5°C

Ground floor

Lounge

Area: 30.55 m² Heat loss: 99 W/m² Design Temp: 21°C Air changes: 1.5/hr



✓	Sufficient heating	3062 W / 3036 W
🔌	K2 W1000 x H600 mm	Removed 528 W
🔌	K2 W1200 x H600 mm	Removed 634 W
🔌	K2 W2000 x H600 mm	New 1056 W
🔌	K2 W1800 x H600 mm	New 950 W
🔌	K2 W2000 x H600 mm	New 1056 W

Assumptions

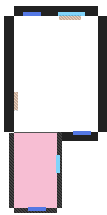
We have assumed an outside design temp of -1.6°C. This is based on tables of typical minimum winter temperatures in the UK.

We have used different design temperatures for different types of room. Bathrooms are typically kept warmer than living spaces such as lounges, kitchens and bedrooms for example, while utility spaces can be kept at a lower temperature. Kitchens and bathrooms also have more ventilation than other rooms, so we have allow for more heat loss through air exchange to these rooms.

Most heat loss from a property is through the building fabric however. We have provided a floorplan with a list of the materials we have used for the model along with a measure (U-value) of their insulating properties.

Kitchen

Area: 10.08 m² Heat loss: 74 W/m² Design Temp: 18°C Air changes: 2/hr

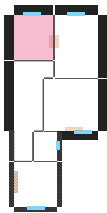


✓ Sufficient heating			761 W / 742 W
	K2	New	
	W1200 x H600 mm	761 W	

First floor

Bedroom

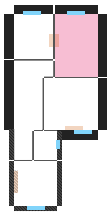
Area: 5.50 m² Heat loss: 75 W/m² Design Temp: 18°C Air changes: 1/hr



✓ Sufficient heating			444 W / 415 W
	K1	Removed	
	W700 x H600 mm	259 W	
	K2	New	
	W700 x H600 mm	444 W	

Bedroom

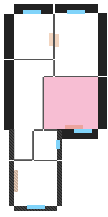
Area: 8.40 m² Heat loss: 61 W/m² Design Temp: 18°C Air changes: 1/hr



✓ Sufficient heating			571 W / 516 W
	K1	Removed	
	W700 x H600 mm	259 W	
	K2	New	
	W900 x H600 mm	571 W	

Bedroom

Area: 8.70 m² Heat loss: 56 W/m² Design Temp: 18°C Air changes: 1/hr



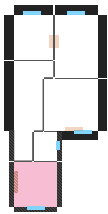
✓ Sufficient heating 507 W / 485 W

🔌 K1 Removed
W1000 x H600 mm 370 W

🔌 K2 New
W800 x H600 mm 507 W

Bath

Area: 6.00 m² Heat loss: 122 W/m² Design Temp: 22°C Air changes: 3/hr



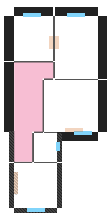
✓ Overridden: shortfall made up elsewhere 691 W / 729 W

🔌 K2 Removed
W1200 x H600 mm 592 W

🔌 K2 New
W1400 x H600 mm 691 W

Internal

Area: 8.50 m² Heat loss: 22 W/m² Design Temp: 18°C Air changes: 0/hr

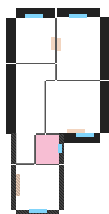


✓ Sufficient heating 222 W / 184 W

🔌 K1 New
W600 x H600 mm 222 W

Cloak/WC

Area: 2.06 m² Heat loss: 56 W/m² Design Temp: 18°C Air changes: 2/hr



✓ Overridden: shortfall covered elsewhere.

0 W / 116 W

Why do I need new radiators?



Heat pumps work more efficiently at low flow temperatures - but at low temperatures small radiators may not have enough surface area to adequately heat a room.

With new, larger radiators you will use less energy to heat your property than if you used existing smaller radiators but had to run your heat pump at a higher temperature.

Heat Pump Check

Your heat pump: Samsung 8kw Monobloc Heat Pump

Total heat loss	6223 W
Area of building	79.79 m ²
Average heat loss	78 W/m ²
Output power of Samsung 8kw Monobloc Heat Pump at the ODT and proposed flow temperature	6535 W



Heat pump meets demand

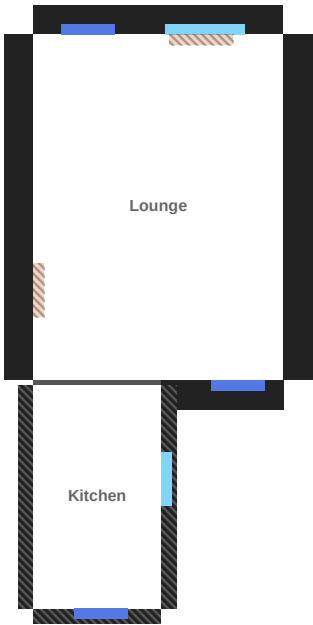


At the ODT -1.6 and proposed flow temperature 44°C, the total heat loss is less than the output power of the heat pump.

Materials

The list of materials surveyed in the building. Radiators that will be removed are displayed with a lighter shade. Floors, intermediate floors, roofs, roof glazing and dormers are not shown in the drawings but are displayed in the material list.

Ground floor



Window

PVC Double Glazed
U-value: 2.8

Door

PVC-U door double glazed
U-value: 2.8

Radiator

K2 - two panels, two fins

K1 - one panel, one fins

External Wall

main
U-value: 2.16
Thickness: 550 mm

Render 19mm, brick 102mm, 50mm
mineral wool slab, brick 102mm, 12.5mm
plasterboard on dabs
U-value: 0.51
Thickness: 286 mm

Internal Wall

Plasterboard 12.5mm, studding 75mm,
plasterboard 12.5mm
U-value: 1.72
Thickness: 100 mm

Floor

Solid floor with 0mm of insulation

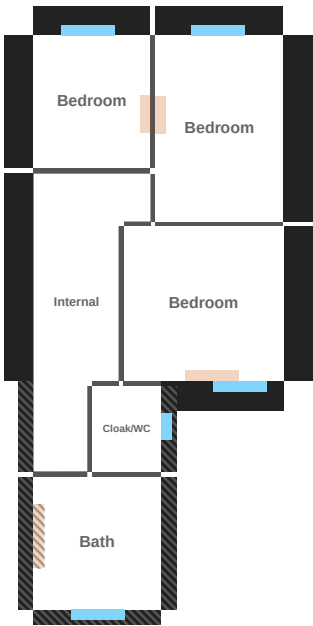
Intermediate Floor

Intermediate floors, boarding 19mm,
airspace between joists, 9.5mm
plasterboard
U-value: (up) 1.73, (down) 1.41

Roof

Pitched roof - Slates or tiles, sarking felt,
ventilated air space, 300mm insulation
between joists, 9.5 mm plasterboard
U-value: 0.12

First floor





Chippings, 3 layers of felt, boarding, air
space, 100mm insulation, 9.5 mm
plasterboard

U-value: 0.32
