

Dartmoor Farmhouse, England

Farmhouse renovation makes use of cascade air source heat pump to meet hot water demand and reduce energy bills.

Key facts

Building

Location	Dartmoor, UK
Construction	Old farmhouse
Heat distribution	Floor heating
Heated area	450 m ²
Level of insulation	

Heat pump and source

Number of heat pumps	2
Installed capacity	14 kW
Operation mode	monoenergetic
Heat source	outside air
Brand and type: Mitsubishi Ecodan	PUHZ Monobloc
Refrigerant	R410A
Sound level	40 dB

Heating system

Heat demand	20 kW
Heating temperature	°C

Domestic hot water

Type of system	Individual
Max. Temperature	65 °C
Circulation system	
Legionella measures	thermal
Storage size	300 litres
Number of storage tanks	1
Storage losses	
Temperature control	

Other information

Electric energy Consumption year	kWh
Investments costs	
PV installation	
Solar thermal	

Experience

Other [cases](#) in UK with the same supplier.



Located on the southern slopes of Dartmoor in the heart of South Devon, the renovation incorporated the existing farmhouse and the conversion of a number of barns to form one dwelling with a floor area of 450m². The original farmhouse was in an off-gas area and, as is typical of this type of property, had no heating system apart from open fires.

The specification of the homeowner was for underfloor heating throughout the majority of the property which incorporated a number of different floor constructions and levels. In the remaining rooms they wanted antique radiators which would be sympathetic to the rustic nature of the original property. With limited space surrounding the property and only a single phase electric supply, a bespoke solution was called for which would meet the requirements of the homeowner while also proving cost effective to run.

A further complication came from the single phase electricity supply and the extensive costs which would need to be met by the homeowner if a 3-phase power supply had to be installed at the property.”

Self-build homeowners in South Devon are enjoying the energy efficient benefits of renewable heat pump technology following the installation of an Ecodan cascade system at their newly renovated farmhouse and barn conversion. The only real alternative would have been oil which would have meant significant install and running costs.

The heat pump unit operates with outside temperatures as low as -20°C and also offers a bivalent function.

Dartmoor Farmhouse, England, Technical details



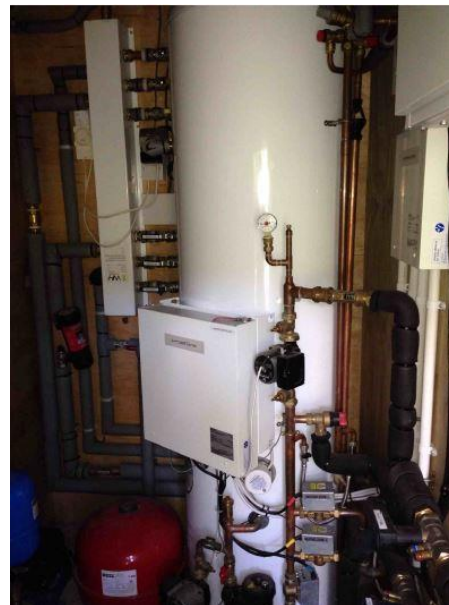
Intelligent, self-learning control system



Description of the technical concept

The limited space made the farmhouse unsuitable for a ground source heat pump but the size of the property meant that the heating demand was significantly greater than one of the typical air source heat pump installations. The installer, Source Energy, therefore specified a cascade system, which rotates the workload between the individual heat pumps to maximise efficiency. Two 14kW Ecodan heat pump units link to a 300 litre Kingspan stainless steel hot water tank, to meet the 20kW heat demand and supply a sufficient volume of hot water to meet the needs of the occupants.

Intelligent, self-learning controls decide which heating system to use at any time to ensure the house is heated in the most economical way possible. The system's controls alternates use of the heat pumps to maximise efficiency and prolong the system's lifespan.



The 300 litre stainless steel hot water tank provides all the heating and hot water the newly renovated home needs.