DAIKIN

altherma

Information for installers

Daikin Altherma ground source heat pump

The geothermal power

Why choose

the Daikin Altherma ground source heat pump?

It's simple really – the Daikin Altherma ground source heat pump offers the highest level of all-year-round comfort for home owners, especially in colder climates. It offers them a proven, reliable, renewable energy system that is economical to run and very energy efficient.

As the market leader in heating solutions, Daikin is at the forefront of innovation designed to deliver the greatest efficiency in the most economically attractive manner with the least ecological impact.

- ☑ High seasonal energy efficiency
- ☑ Quick and easy installation including a domestic hot water tank
- ☑ High seasonal energy efficiency
- ☑ New user interface
- ☑ Reliable system

What is a ground source heat pump?

Even in the coldest climates geothermal heat is present in the ground with a fairly constant temperature of 10°C at a depth of 15 metres. This trapped energy is a source of heat. The ground source heat pump at the heart of our system uses this energy to heat the home.

› Using either a vertical probe or a horizontal loop just below the surface, a water/anti-freeze mixture called 'brine' is pumped round a circuit to absorb heat.
› The brine then passes into the heat pump unit, where the heat is transferred to a low-evaporation-point refrigerant.
› This is compressed to produce heating or domestic hot water.

Win-win for you AND the customer

Your customer's new heating system must

› work in low ambient temperatures
› use renewable energy sources with a low environmental impact
› offer low running costs

Your solution, the Daikin Altherma ground source heat pump

› provides heating and domestic hot water from renewable, free geothermal energy
› uses inverter heat pump technologies for higher seasonal efficiency

Your customer benefits from

› optimal comfort plus domestic hot water
› low operating costs due to high efficiencies
› low environmental impact

Your gains include

› a factory-fitted domestic hot water tank
› easy installation
› simple commissioning

1. Heat pump
1 indoor unit
heat pump with integrated domestic hot water tank

2. Ground collector
The geothermal ground collector can be either a vertical probe or a horizontal loop just below the surface. It is connected to the heat pump unit inside the house. This, in turn, is connected to the space heat emitters throughout your home and to the domestic hot water system.

3. Domestic hot water
Hot water at all times for single to multi-family houses, new builds and modernizations

4. Space heating
› Under-floor heating
› Fan coil units
› Heat pump convectors
› Low and high temperature radiators

Making a difference

High seasonal efficiency thanks to use of renewable energy sources

- As the Daikin ground source heat pump uses the heat differential underground, the energy for heating is predominantly free thus reducing the cost dramatically.
- The underground thermal energy is present all year round and cannot be depleted, it is a truly renewable resource the use of which does not damage the environment.

The result?
Reduced heating costs and a reduced impact on the environment.

Seasonal efficiency, smart use of energy

The EU wants to make people aware of what units are consuming and ban non-efficient products from the market. Seasonal efficient units reflect the standardised conditions you can expect over an entire heating and cooling season. From September 2015 onwards, heating systems like heat pumps, combustion, domestic hot water tanks or any kind of combination, will receive an energy label to help you to make the most efficient choice.

System efficiency

* EGSQH10S18A9W

High seasonal efficiency thanks to our inverter heat pump technology

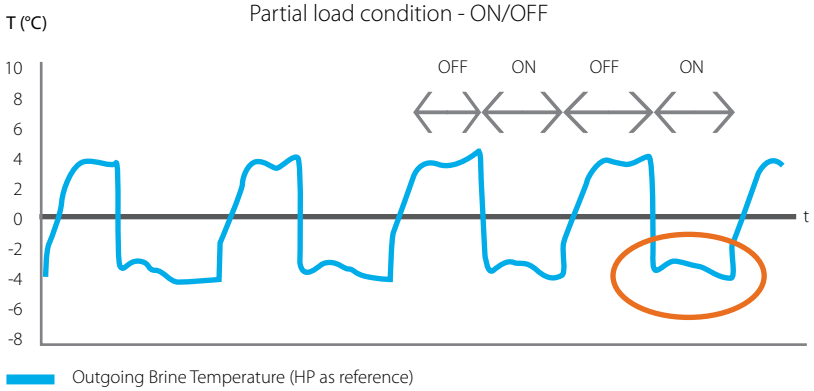
The Daikin inverter heat pump technology has been shown to provide an increase in seasonal efficiency of up to 20% when compared to traditional on/off ground-source heat pumps.

› The brine, a water/anti-freeze mixture used to transfer heat between the ground and the heat pump, is kept at a higher stable temperature.
› Back-up operation is reduced to a minimum.
› The compressor is highly efficient – even at partial load operation, i.e. when full capacity of the unit is not required.

The result?
Lower running costs and a faster return on investment.

1. Higher brine temperature during partial load conditions boosts efficiency

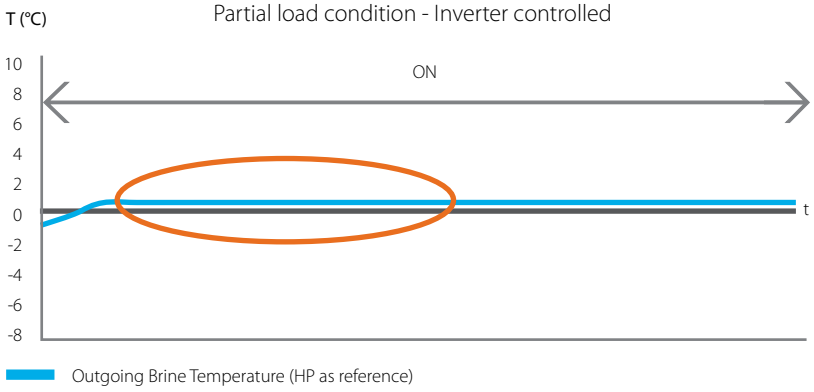
Operation ON/OFF unit
Partial load condition - ON/OFF



Typical application:
- Location: Sweden
- Design temperature: -17°C
- Heat load: 13kW
- Heating-off temperature: 16°C

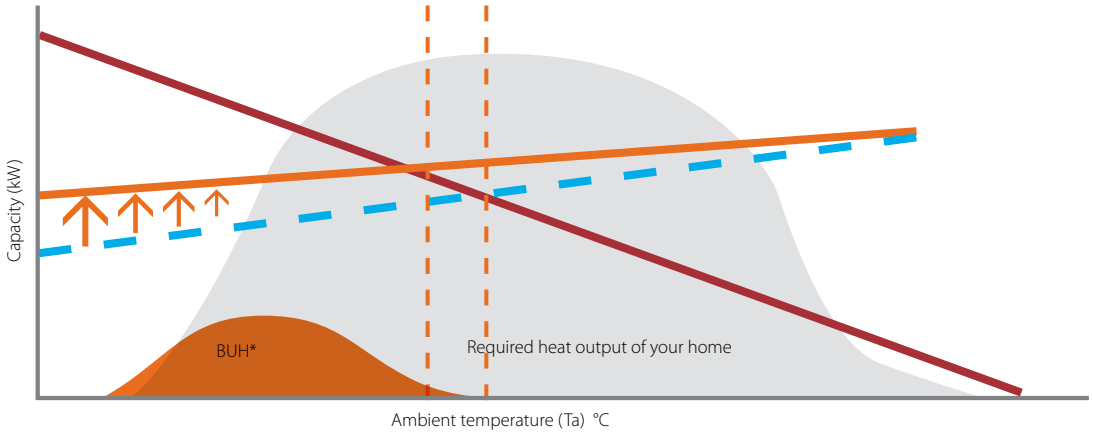
In this typical application, when full capacity is not required, the compressor works in partial load operation. Traditional on/off ground-source heat pumps alternately switch ON and OFF and the brine temperature decreases down to -4°C.

Operation Daikin unit
Partial load condition - Inverter controlled



Daikin's inverter technology produces a stable outgoing brine temperature of around 0°C.
This higher and more constant evaporating temperature leads to greater operating efficiencies.

2. Less back-up heater support means lower running costs



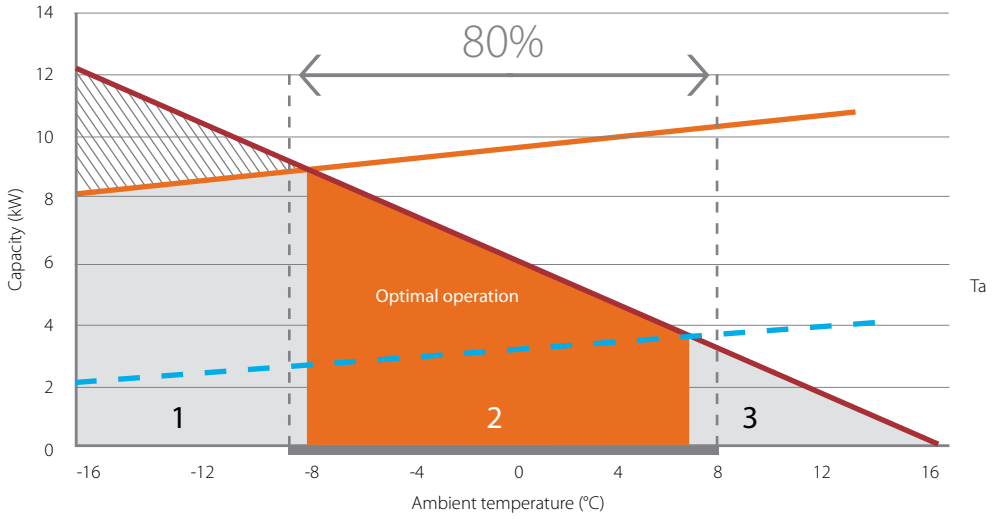
Heat load line
Traditional ON/OFF unit
Daikin unit
BUH* = Back-up heater

Compared to a traditional on/off unit, the requirement for back-up heater support is much lower for the Daikin Altherma ground source heat pump – thanks to the boosting effect of our inverter compressors. This leads to lower running costs.

3. Less on/off operation thanks to a wider modulation range

Typical Nordic climate application with standard heat load

- Location: Sweden
- Design temperature: -17°C
- Heat load: 12kW



Heat load line
Daikin Altherma ground source heat pump - minimum capacity
Daikin Altherma ground source heat pump - maximum capacity

1 **Full load operation** with additional electric assistance (if required): heat load is higher than the maximum heating capacity.
2 **Partial load operation:** heat load is lower than the maximum heating capacity but higher than the minimum heating capacity. The optimal operation zone: the compressor reduces its operating frequency to deliver the exact required capacity with high efficiency.
3 **On/Off operation:** heat load is below the minimum heating capacity. The unit goes into on/off mode to deliver the required capacity.

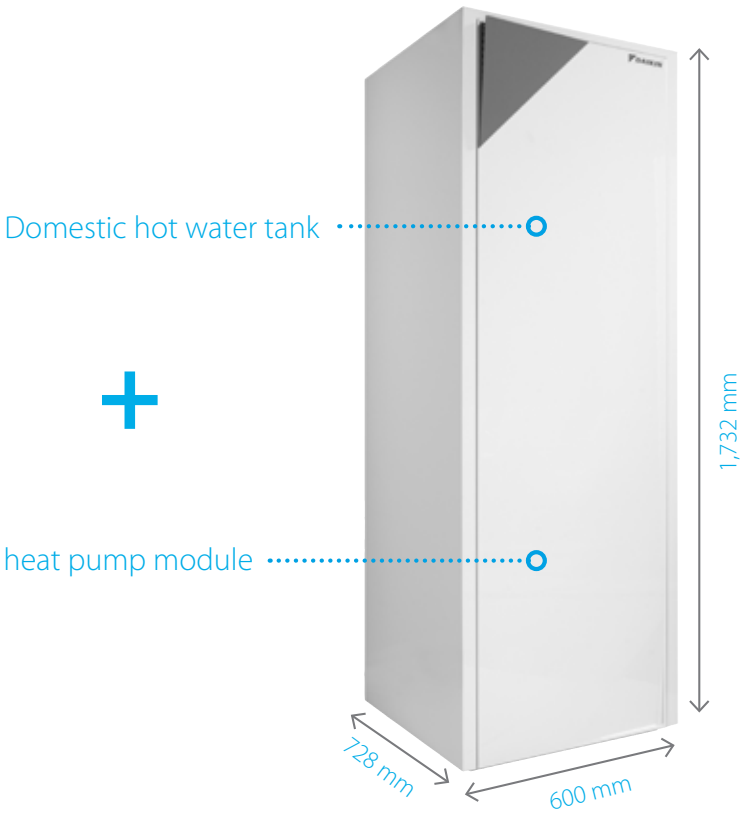
In a Nordic climate, around 80% of the required heat output must be delivered in an ambient temperature range between -9°C and 8°C, indicated by the orange zone. To deliver a high seasonal Coefficiency of Performance (COP), very efficient operation for this ambient range is crucial. As you see, thanks to its wide modulating range, the Daikin Altherma ground source heat pump almost completely covers the relevant temperature range in partial load operation (the optimal operational zone). This is, of course, a major benefit compared to traditional on/off compressors.

Quick and easy installation including a domestic hot water tank

› The domestic hot water tank is factory-fitted, reducing the installation time.
› Pipework connections on top of the unit make it very easy to connect.
› The unit's lower overall weight facilitates transport and installation.

Compact indoor unit with pleasing design

› Very compact footprint: full integration of heat pump module and domestic hot water tank in a 728mm x 600mm form – similar to a normal household appliance.
› High quality design helps the unit blend in with other household units.
› Less than 1800mm high, it fits neatly in any standard room
› Only 10mm of side clearance is required, and all pipework connections are on top of the heat pump unit.
› Unit is equipped with integrated expansion vessels for both the brine loop and the heating circuit, so no additional space is required.



Easy user interface

› Quick commissioning: all installation settings can be programmed on a laptop and simply uploaded to the controller during commissioning. This reduces on-site time and allows you to reuse settings on similar installations.
› User-friendly, room thermostat functionality: your customer can control the water temperature referencing the actual room temperature, resulting in a more stable room temperature and higher comfort levels.
› Energy management functionality: the controller displays both the output and input energy of the unit, allowing users to manage their energy consumption more accurately.
› Easy servicing: the controller records the time, date and nature of the last 20 error occurrences, enabling quicker diagnostics and maintenance.

Reliable system

Reliability is a prerequisite for any new heating system and Daikin is the market-leader in terms of reliability thanks to the close attention paid to design, production and testing as well as aftersales support. To this end, every component is carefully selected and rigorously tested to verify its contribution to product quality and reliability.

Daikin Altherma ground source heat pump

Indoor Unit				EGSQH	10S18A9W
Heating capacity	Min.			kW	3.11[1] / 2.47[2]
	Nom.			kW	10.20[1] / 9.29[2]
	Max.			kW	13.00[1] / 11.90[2]
Power input	Nom.			kW	2.34[1] / 2.82[2]
COP					4.35[1] / 3.29[2]
Casing	Colour				White
	Material				Precoated sheet metal
Dimensions	Unit	Height/Width/Depth		mm	1,732/600/728
Weight	Unit			kg	210
Tank	Water volume			l	180
	Insulation	Heat loss		kWh/24h	1.4
	Corrosion protection				Anode
Operation range	Domestic hot water	Water side	Max (booster heater)		-
Refrigerant	Type				R-410A
	Charge			kg	1.8
				TCO_2eq	3.8
	Control				Electronic expansion valve
	GWP				2,087.5
Sound power level	Nom.			dBA	46
Sound pressure level	Nom.			dBA	32
Power supply	Name/Phase/Frequency/Voltage			Hz/V	9W/3~/50/400
Current	Recommended fuses			A	25
Domestic hot water heating	General	Declared load profile			L
	Average climate	ηwh (water heating efficiency)		%	93
		Water heating energy efficiency class			A
Space heating	Average climate water outlet 55°C	General	ηs (Seasonal space heating efficiency)	%	146
			Seasonal space heating eff. class		A++
	Average climate water outlet 35°C	General	ηs (Seasonal space heating efficiency)	%	146
			Seasonal space heating eff. class		A++

(1) EWB/LWB 0°C/-3°C - LWC 35°C (DT=5°C) (2) EWB/LWB 0°C/-3°C - LWC 45°C (DT=5°C) * Contains fluorinated greenhouse gases

Trust Daikin

Daikin may not be a household name. After all, we don't make cars, TVs, fridges or washing machines. But we do make world-class heat pumps. In fact, more than 275,000 Daikin Altherma heat pumps have been fitted across Europe since its initial launch in 2006. Because we focus on doing only what we're best at: creating the most efficient heating, ventilation and air conditioning solutions, renowned for design excellence, quality and reliability. So your customers can depend on Daikin for the ultimate in comfort, leaving you free to focus on other essentials – like winning new work and growing your business.

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