

# geoTHERM

## Ground Source Heat Pumps



Vaillant geoTHERM exclusive

Vaillant geoTHERM

# Your future energy supply



## **Renewable Energy**

With global temperatures continuing to rise and as traditional energy resources decline, it's no wonder that domestic energy conservation remains a universally high priority. The development of innovative and effective renewable energy solutions is critical to securing our energy supplies for the future. These solutions are key to improving energy efficiency and reducing environmental impact.

## **Vaillant - the natural choice**

Vaillant are well placed to offer ground source heat pump technology; with over 130 years of experience of developing products that have shaped the heating industry.

# starts at home



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**3** year  
guarantee  
on heat pump\*

**10** year  
guarantee  
on compressor

# How the Vaillant geoTHERM works

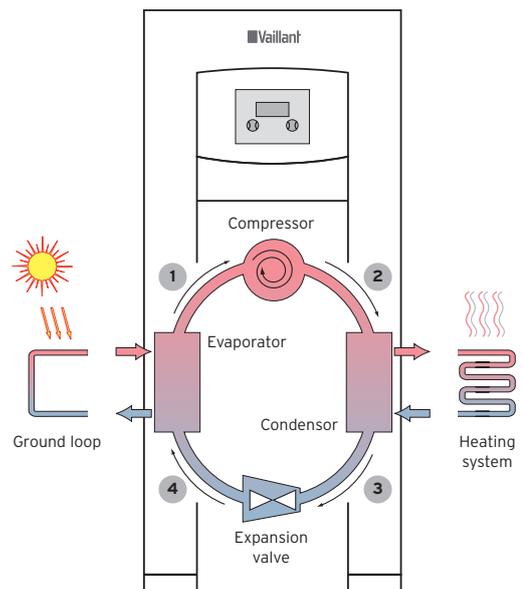
Ground source heat pumps use energy stored in the ground and convert this to heat for space heating or hot water production. Low temperature energy from the earth is passed through a CFC free refrigerant cycle which converts this energy to higher temperatures for use inside the home or workplace.

1. Heat withdrawn from the ground is transferred to the refrigerant. The refrigerant absorbs the heat and changes from a liquid to a gas.
2. The gaseous refrigerant is then passed through a compressor. As the gaseous refrigerant is compressed, its temperature increases further.
3. The heat from the refrigerant is now directly transferred to the heating circuit. The refrigerant is cooled down and returns to a liquid form.
4. In the expansion valve, the refrigerant is then decompressed and cools down further so that it will be able to absorb heat from the ground.

## Benefits of heat pump technology

- Extremely efficient use of energy. Every 1kW of energy used to operate the compressor provides 4kW of useful heat for the property
- Provides space heating and hot water
- Proven, reliable technology which is widely used around the world

## The Heat pump cycle



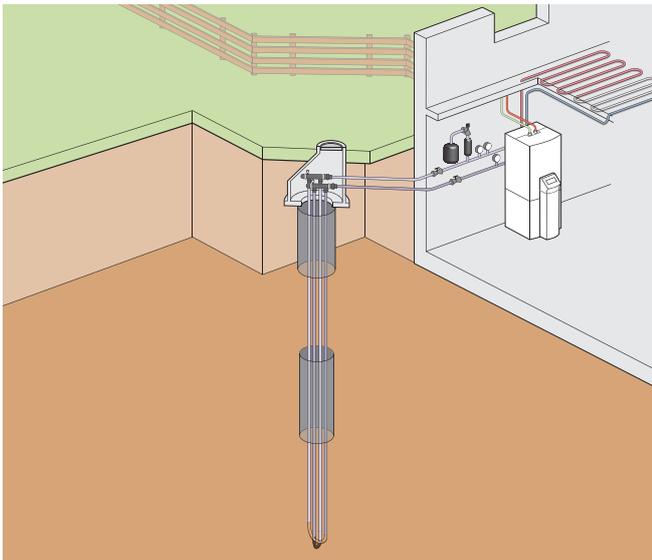
**Taking energy from the ground**

The Vaillant geoTHERM heat pump extracts energy from the ground by using a vertical or horizontal ground loop collector.

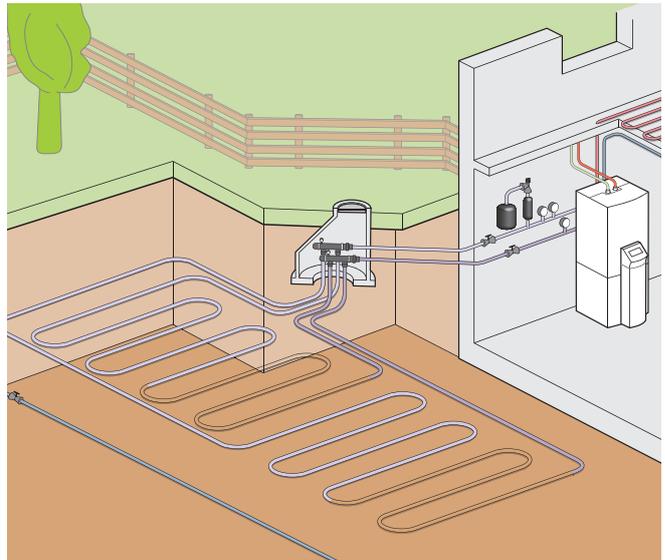
**Vertical collector (borehole):** The space saving ground loop collector is inserted vertically in the ground. Vaillant have developed links with a number of drilling partners and will assist in the search for the right partner for the installation. The depth and quantity of boreholes required depends on the heat required for the property and the type of ground. A borehole may be as deep as 100m and multiple boreholes may be required.

**Horizontal collector:** A series of plastic pipes are laid horizontally in the ground to form a horizontal ground loop collector. The pipes will be buried to a depth of 1.2m and the amount of pipework required depends on the type of ground.

A detailed geological survey will be required to ascertain the size of the ground loop collector for either vertical or horizontal systems.



Vertical collector



Horizontal collector

Heat Pump type	1-family house	2-familyhouse	Multi-Dwelling	Cylinder	Cooling
Heat output	6-8-10 kW	14-17 kW	22-46 kW		
Electrical supply	230V	400V	400V		
geoTHERM exclusive	●			●	●
geoTHERM	●	●	●		●*

\* Optional external accessory required

# Innovation in detail - Vaillant ground source



# heat pump technology

The geoTHERM range of ground source heat pumps provide maximum comfort and efficiency, combined with simple installation, smooth operation and advanced diagnostics which have become synonymous with the Vaillant brand.

**A high-efficiency evaporator** with an injection system significantly boosts the heat transfer process within the ground source heat pump, increasing the efficiency of the system.

#### **Sensor-controlled refrigerant circuit**

Throughout the geoTHERM range the process of heat generation is controlled and monitored by advanced sensors. Continuous pressure measurement in the refrigerant circuit, the heating and the ground loop circuit in combination with an anti-freeze function provides optimal comfort. Using the sensor control the refrigerant circuit can be monitored as required without any special measuring equipment.

#### **Environmentally friendly refrigerant**

Vaillant heat pumps use CFC-free refrigerant R407C which enhances the individual applications of the ground source heat pump. R407C is environment-friendly. The use of refrigerant R407C also allows the ground source heat pump to operate at temperatures of up to 62°C maximising efficiency and operational performance.

#### **Multi-sound insulation (MSI)**

The unique MSI system ensures the ground source heat pump operates extremely quietly. The low noise level of the ground source heat pump is achieved thanks to two elements: the sound-insulated framing module and the vibration-absorbing base plate. In addition, the flexible pipework connection guarantees high performance and quiet operation.

#### **geoTHERM comfort**

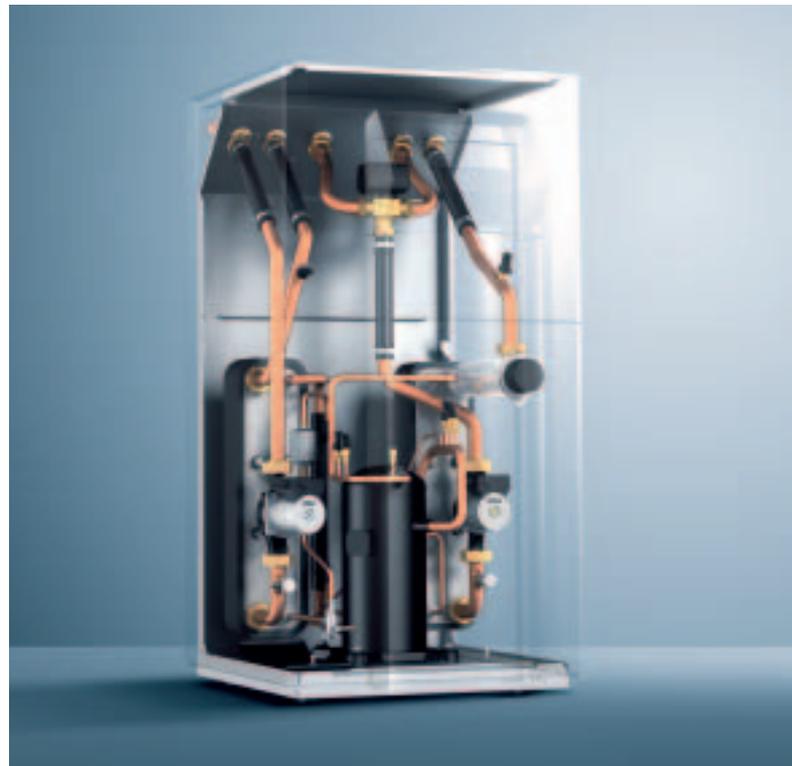
geoTHERM is the ideal solution for heating your home. geoTHERM can be connected to a suitable high performance hot water cylinder for domestic hot water and to an underfloor heating or radiator system for space heating.

#### **Vaillant geoTHERM heat pumps at a glance:**

- 6.0/8.1/10.5 kW\* (230V) output models available
- 13.8/17.3 kW\* (400V) output models available
- maximum flow temperature 62°C
- weather-compensated energy-balance control unit with graphic display of the environmental yield
- Multistage sound insulation (MSI) offers "whisper quiet" operation
- modern and durable heat pump scroll compressor with 10 year warranty
- 4 kW electric backup heater for 230V models
- 6 kW electric backup heater for 400V models
- Intelligent Service communication system provides remote monitoring for added peace of mind
- 3 year warranty when commissioned by a Vaillant service engineer\*\*

\*BOW35  $\Delta T$  5K according to EN 14511

\*\*2 year warranty as standard



Vaillant geoTHERM

# Installation, commissioning,

## **SplitMounting (geoTHERM exclusive)**

The SplitMounting concept for the geoTHERM exclusive has been designed to assist with installations in difficult situations (e.g. steep staircases). The hot water cylinder is designed to be easily separated from the heat pump unit. The heat pump and cylinder can then be transported to the final location as two separate units.

## **Commissioning**

Vaillant engineers will undertake a full commissioning service on all products throughout the geoTHERM range. Any product commissioned by a Vaillant engineer will automatically qualify for an additional 1 year warranty. Details of how to arrange your commissioning visit are provided with each appliance.

## **Weather-compensated energy-balance control unit**

A unique energy-balance control is incorporated within the geoTHERM heat pump. The energy-balance control constantly measures outside temperature, temperature required inside the building and the system temperature to ensure the heat pump operates in the most efficient way possible.



geoTHERM exclusive



geoTHERM

# control and service

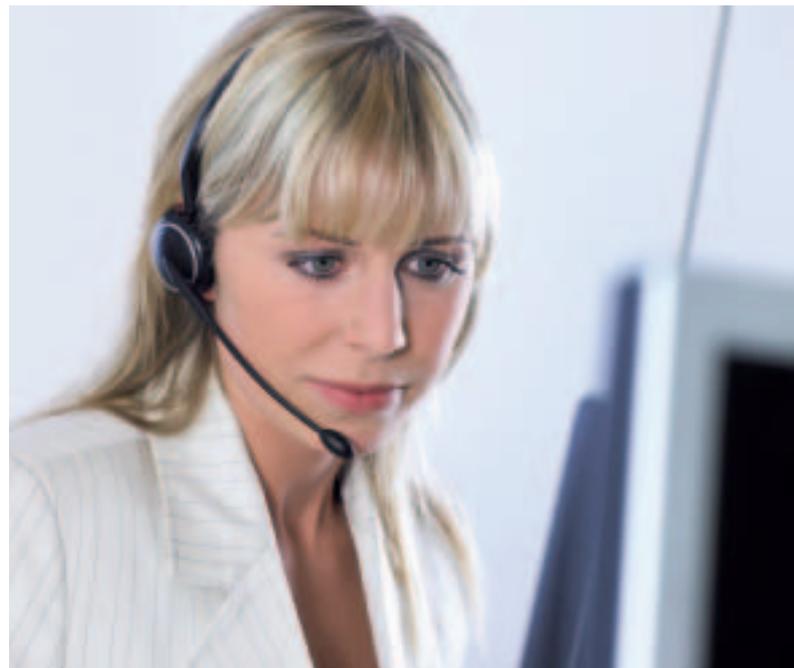
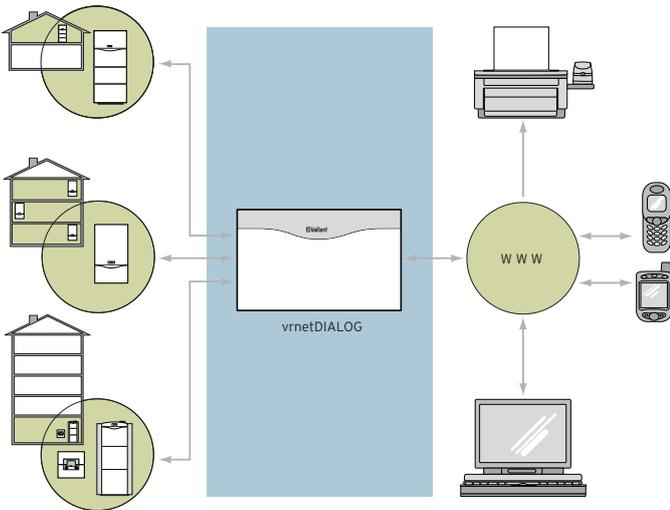
### Intelligent Service\*

All geoTHERM heat pumps benefit from Vaillant's unique Intelligent Service package. Through Vaillant's Intelligent Service Communication system, data is transmitted between the ground source heat pump and a dedicated service team allowing remote monitoring of the system. In the unlikely event of a fault occurring the communications system sends the Vaillant service team a message via email providing details of the fault. Should this occur the service team will automatically contact the home owner to make arrangements for engineers to visit, if the problem cannot be resolved remotely.

The Intelligent Service communication system also allows the heat pump to be monitored remotely and the user advised of changes to the system which could further improve the efficiency.



Intelligent Service communication system



\*GSM module offered as standard. Vaillant reserves the right to offer an alternative when GSM signal is weak.



geoTHERM exclusive

# The perfect climate all year round: geoTHERM exclusive

geoTHERM exclusive offers a complete solution to your home comfort providing heat in the winter, cooling in the summer and domestic hot water throughout the year, all from a single unit.

geoTHERM exclusive is equipped with the weather-compensated energy-balance control unit incorporating an additional passive cooling function, 175 litre stainless steel domestic hot water (d.h.w.) cylinder and a 4 kW electric auxiliary (backup) heater. During the summer months, excess thermal energy from the building can be removed and transferred to the ground via a heat exchanger, cooling the building when used with a specifically designed underfloor heating system.

### Cooling via the underfloor heating system

geoTHERM exclusive includes an integrated passive cooling function when used with an underfloor heating system. During the summer months the heat recovery process can be reversed. The excess heat in the living space is withdrawn via the underfloor heating system and then transferred to the ground. So, instead of withdrawing thermal energy from the ground, as in the

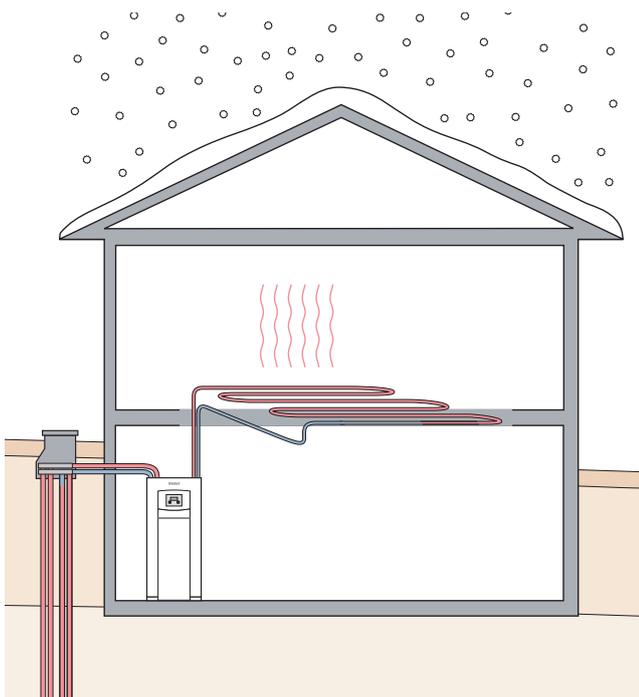
case with heating operation, the heat is withdrawn from the living space and transferred to the ground via the ground loop collector.

### Vaillant geoTHERM exclusive:

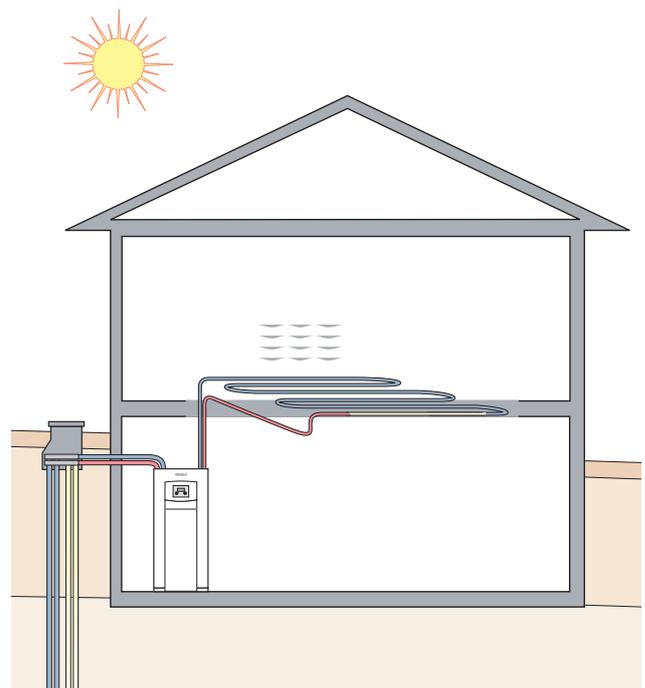
- 6.0/8.1/10.5 kW\* (230V) output models available
- maximum flow temperature 62°C
- integrated 175L stainless steel unvented d.h.w. cylinder
- 4 kW electric backup heater
- weather-compensated energy-balance control unit with graphic display of the environmental yield
- Multi-stage sound insulation (MSI) offers "whisper quiet" operation
- modern and durable heat pump scroll compressor with 10 year warranty
- Intelligent Service communication system provides remote monitoring for added peace of mind
- passive cooling function
- 3 year warranty when commissioned by Vaillant engineer\*\*

\*BOW35  $\Delta T$  5K according to EN 14511

\*\*2 year warranty as standard



geoTHERM exclusive with underfloor heating



geoTHERM exclusive with passive underfloor cooling



# A geoTHERM heat pump for every application

## High output applications

Heat pump technology can be used in residential and light commercial applications. The geoTHERM and geoTHERM exclusive products are complemented by a range of large output heat pumps designed for larger homes or commercial buildings which operate on a 3 phase electricity supply.

## geoTHERM flexibility

Incorporating many of the features found on the Vaillant geoTHERM heat pumps, the larger output products are supplied without a heating circulation pump allowing the installer the flexibility to design the system to suit a larger output or cascade application.

## Larger output geoTHERM heat pumps

The geoTHERM range includes a range of larger heat pumps for larger domestic properties and light commercial requirements.

- 21.6/29.9/38.3/45.9 (400V) output models available
- ability to cascade units for larger system requirements
- maximum flow temperature 62°C
- weather-compensated energy-balance control unit with graphic display of the environmental yield
- Multistage sound insulation (MSI) offers "whisper quiet" operation
- modern and durable heat pump scroll compressor with 10 year warranty
- Intelligent Service communication system provides remote monitoring for added peace of mind
- 3 year warranty when commissioned by a Vaillant service engineer\*\*

\*BOW35  $\Delta T$  5K according to EN 14511

\*\*2 year warranty as standard

## Technical specification

Ground source heat pumps						
		geoTHERM 6kW	geoTHERM 8kW	geoTHERM 10kW	geoTHERM 14kW	geoTHERM 17kW
	Unit	VWS 61/2	VWS 81/2	VWS 101/2	VWS 141/2	VWS 171/2
<b>Dimensions</b>						
Height without connections	mm	1200	1200	1200	1200	1200
Width	mm	600	600	600	600	600
Depth without/with column	mm	650/840	650/840	650/840	650/840	650/840
Weight with/without packaging	kg	156/141	163/148	167/152	187/172	194/179
<b>Electric connection</b>						
Compressor and auxiliary heater		1/N/PE 230V 50Hz	1/N/PE 230V 50Hz	1/N/PE 230V 50Hz	3/N/PE 400V 50Hz	3/N/PE 400V 50Hz
Control circuit		1/N/PE 230V 50Hz				
Slow-blow fuse	A	16/20	25/25	25/25	3x25	2x25
Starting current without limiter	A	-	-	-	64	74
Starting current with limiter	A	<45	<45	<45	<25	<25
<b>Electric power consumption</b>						
- max. at B20W60	kW	2.8	4.0	4.9	6.8	7.7
- Auxiliary heating (backup heater)	kW	2/4	2/4	2/4	2/4/6	2/4/6
System of protection EN 60529		IP 20				
<b>Heat source circuit/ground loop circuit</b>						
Brine type		ethylene glycol 30%				
Max. operating pressure	bar	3	3	3	3	3
Min. inlet temperature	°C	-10	-10	-10	-10	-10
Max. inlet temperature	°C	20	20	20	20	20
Rated volume flow $\Delta T$ 3K	l/h	1453	1936	2530	3334	3939
Residual pump head $\Delta T$ 3K	mbar	381	332	263	252	277
Electric power consumption of the pump	W	132	132	132	205	210
<b>Heating circuit</b>						
Max. operating pressure	bar	3	3	3	3	3
Min. flow temperature	°C	25	25	25	25	25
Max. flow temperature	°C	62	62	62	62	62
Rated volume flow $\Delta T$ 10K	l/h	517	697	848	1187	1538
Residual pump head $\Delta T$ 10K	mbar	486	468	450	551	603
Electric power consumption of the pump	W	93	93	93	132	205
<b>Refrigerant circuit</b>						
Refrigerant type		R407C	R407C	R407C	R407C	R407C
Quantity	kg	1.9	2.2	2.05	2.9	3.05
Admissible operating over pressure	bar	29	29	29	29	29
Compressor type/oil		Scroll/Ester	Scroll/Ester	Scroll/Ester	Scroll/Ester	Scroll/Ester
Inside acoustic power	dB(A)	49	51	53	52	53
<b>Performance data</b>						
Heating output (BOW35 $\Delta T$ 5K acc. to EN 14511)	kW	6.0	8.1	10.5	13.8	17.3
Connected (power) consumption	kW	1.4	1.9	2.5	3.2	4.1
COP		4.2	4.2	4.2	4.3	4.3
Heating output (BOW55 $\Delta T$ 5K acc. to EN )	kW	5.5	7.5	9.4	13.6	16.1
Connected (power) consumption	kW	2.1	2.8	3.4	4.6	5.6
COP		2.6	2.7	2.8	2.9	2.9

Ground source heat pumps				
		geoTHERM exclusive 6kW	geoTHERM exclusive 8kW	geoTHERM exclusive 10kW
	Unit	VWS 63/2	VWS 83/2	VWS 103/2
<b>Dimensions</b>				
Height without connections	mm	1800	1800	1800
Width	mm	600	600	600
Depth without/with control column	mm	650/840	650/840	650/840
Weight with/without packaging	kg	231/216	239/224	242/227
Electric connection		1/N/PE 230V 50Hz	1/N/PE 230V 50Hz	1/N/PE 230V 50Hz
Slow-blow fuse	A	16/20	25/25	25/25
Starting current with limiter	A	<45	<45	<45
Electric power consumption				
- max. at B20W60	kW	2.8	4.0	4.9
- Auxiliary heating (backup heater)	kW	2/4	2/4	2/4
System of protection EN 60529		IP 20	IP 20	IP20
<b>Integrated d.h.w. cylinder</b>				
Capacity	l	175	175	175
Max. operating pressure	bar	10	10	10
Max. temperature with heat pump	°C	55	55	55
Max. temperature with heat pump and auxiliary heater	°C	75	75	75
<b>Heat source circuit/ground loop circuit</b>				
Brine type		ethylene glycol 30%	ethylene glycol 30%	ethylene glycol 30%
Max. operating pressure	bar	3	3	3
Min. inlet temperature	°C	-10	-10	-10
Max. inlet temperature	°C	20	20	20
Rated volume flow $\Delta T$ 3K	l/h	1453	1936	2530
Residual pump head $\Delta T$ 3K	mbar	335	277	216
Electric power consumption of the pump	W	132	132	195
<b>Heating circuit</b>				
Max. operating pressure	bar	3	3	3
Min. flow temperature	°C	25	25	25
Max. flow temperature	°C	62	62	62
Rated volume flow $\Delta T$ 10K	l/h	517	697	848
Residual pump head $\Delta T$ 10K	mbar	490	460	580
Electric power consumption of the pump	W	93	93	132
<b>Refrigerant circuit</b>				
Refrigerant type		R407C	R407C	R407C
Quantity	kg	1.9	2.2	2.05
Admissible operating over pressure	bar	29	29	29
Compressor type/oil		Scroll/Ester	Scroll/Ester	Scroll/Ester
Output passive cooling	kW	3.8	5.0	6.2
Inside acoustic power	dBA	48	49	50
<b>Performance data</b>				
Heating output (BOW35 $\Delta T$ 5K acc. to EN 14511)	kW	6.0	8.1	10.5
Connected (power) consumption	kW	1.4	1.9	2.5
COP		4.2	4.2	4.2
Heating output (BOW55 $\Delta T$ 5K acc. to EN 14511)	kW	5.5	7.5	9.4
Connected (power) consumption	kW	2.1	2.8	3.4
COP		2.6	2.7	2.8

Ground source heat pumps					
		geoTHERM 22kW	geoTHERM 30kW	geoTHERM 38kW	geoTHERM 46kW
	Unit	VWS 220/2	VWS 300/2	VWS 380/2	VWS 460/2
<b>Dimensions</b>					
Height without connections	mm	1200	1200	1200	1200
Width	mm	760	760	760	760
Depth without/with control column	mm	900/1100	900/1100	900/1100	900/1100
Weight with/without packaging	kg	356/326	370/340	394/364	417/387
<b>Electric connection</b>					
Compressor and auxiliary heater		3/N/PE 400V 50Hz	3/N/PE 400V 50Hz	3/N/PE 400V 50Hz	3/N/PE 400V 50Hz
Control circuit		1/N/PE 230V 50Hz	1/N/PE 230V 50Hz	1/N/PE 230V 50Hz	1/N/PE 230V 50Hz
Slow-blow fuse	A	3x20	3x25	3x32	3x40
Starting current with limiter	A	44	65	85	110
Electric power consumption - max. at B20W60	kW	10.0	12.0	16.0	18.0
System of protection EN 60529		IP 20	IP 20	IP 20	IP 20
<b>Heat source circuit/ground loop circuit</b>					
Brine type		ethylene glycol 30%	ethylene glycol 30%	ethylene glycol 30%	ethylene glycol 30%
Max. operating pressure	bar	3	3	3	3
Min. inlet temperature	°C	-10	-10	-10	-10
Max. inlet temperature	°C	20	20	20	20
Rated volume flow $\Delta T$ 3K	l/h	4858	6660	8640	9840
Residual pump head $\Delta T$ 3K	mbar	324	275	431	379
Electric power consumption of the pump	W	390	390	585	585
<b>Heating circuit</b>					
Max. operating pressure	bar	3	3	3	3
Min. flow temperature	°C	25	25	25	25
Max. flow temperature	°C	62	62	62	62
Rated volume flow $\Delta T$ 10K	l/h	1902	2580	3336	3900
Pressure lost $\Delta T$ 10K	mbar	23	25	40	53
Electric power consumption of the pump	W	-	-	-	-
<b>Refrigerant circuit</b>					
Refrigerant type		R407C	R407C	R407C	R407C
Quantity	kg	4.1	5.99	6.7	8.6
Admissable operating over pressure	bar	29	29	29	29
Compressor type/oil		Scroll/Ester	Scroll/Ester	Scroll/Ester	Scroll/Ester
Inside acoustic power	dBA	63	63	63	65
<b>Performance data</b>					
Heating output (BOW35 $\Delta T$ 5K acc. to EN 14511)	kW	21.6	29.9	38.3	45.9
Connected (power) consumption	kW	5.1	6.8	8.8	10.6
COP		4.3	4.4	4.4	4.4
Heating output (BOW55 $\Delta T$ 5K acc. to EN 14511)	kW	20.3	27.3	36.2	42.5
Connected (power) consumption	kW	6.9	9.3	11.8	14.1
COP	kW	3.0	2.9	3.1	3.0

# Vaillant geoTHERM

## technical and design support

### Working in partnership

The after sales service and support behind every Vaillant product is part of the quality package that has helped us build a unique reputation within the industry.

Vaillant work in partnership with a network of professional installers. Vaillant support their installer partners with a range of ancillary services to ensure all aspects of your heat pump installation are completed to your expectations. These services include:

- Site surveys
- Ground source heat pump sizing
- Ground loop sizing
- Heating system design
- Commissioning

Vaillant have also partnered with a number of specialist service suppliers to support the installation of your heat pump:

- Drilling companies
- Ground workers
- Under floor heating suppliers

### Vaillant technical support team

Our dedicated team is on-hand to offer technical support. We are here to help with product familiarisation and to tackle any other issues that arise in relation to our geoTHERM products.

### High quality training

Please contact our training team to register your interest in attending a Vaillant ground source heat pump training course.

### Contact details

#### Head Office,

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