

# Why Vaillant?

because we can unearth the energy.



■ geoTHERM exclusive

■ geoTHERM

Because  **Vaillant** thinks ahead.



# Your future energy supply

starts at home

## 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.

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

**10** year  
guarantee  
on compressor

\*when commissioned by a Vaillant service engineer or approved agent

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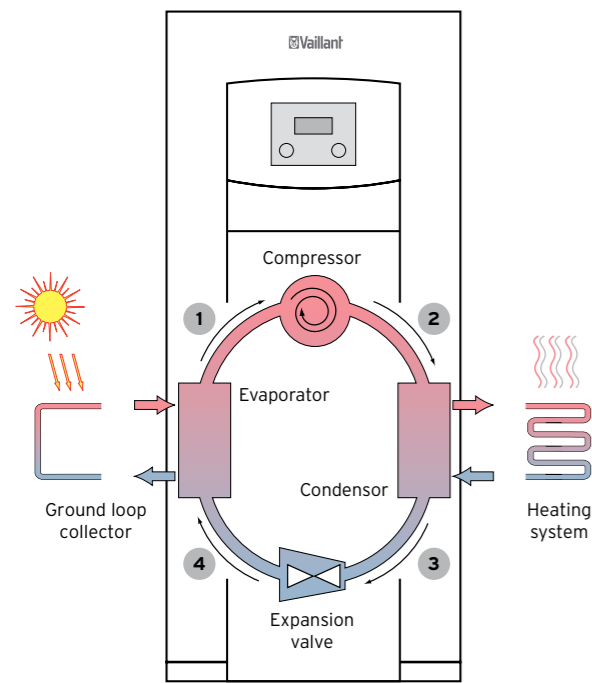
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How the Vaillant

geoTHERM works



The heat pump cycle



geoTHERM exclusive

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 Heat withdrawn from the ground is transferred to the refrigerant.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 1 kW of electrical energy used to operate the compressor provides 4 kW of heat to the property
- Provides space heating and hot water
- Proven, reliable technology which is widely used around the world

Taking energy from the ground

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

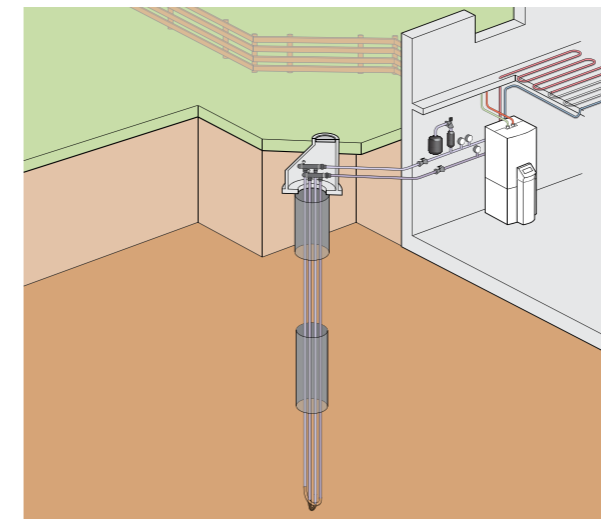
Vertical collector (borehole):

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. Different description between Vertical and horizontal ground loops. A borehole may be as deep as 100m and multiple boreholes may be required.

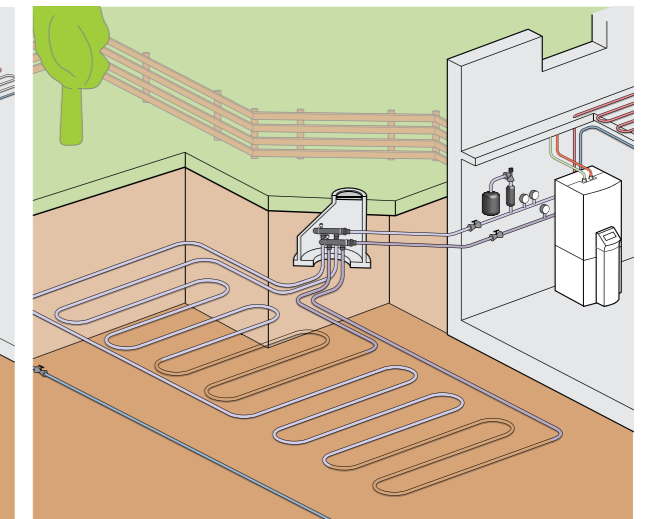
Horizontal collector:

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 heat requirement from the property and 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      | 22-46kW        |          |         |
| 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 system and the ground loop collector 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 generate at temperatures of up to 62°C maximising efficiency and operational performance.

#### Multi-stage 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 highperformance 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 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
- 4 kW auxiliary back-up heater for 230V models
- 6 kW auxiliary back-up heater for 400V models
- Intelligent Service communication system provides remote monitoring for added peace of mind
- Free commissioning
- 3 year warranty when commissioned by a Vaillant service engineer\*\*

\*B0W35  $\Delta$ T 5K according to EN 14511

\*\*2 year warranty as standard



Vaillant geoTHERM



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 a weather compensation and energy balancing control unit which incorporates an additional passive cooling function, a 175 litre stainless steel domestic hot water cylinder and a 4 kW auxiliary back-up heater.

### Cooling via the underfloor heating system

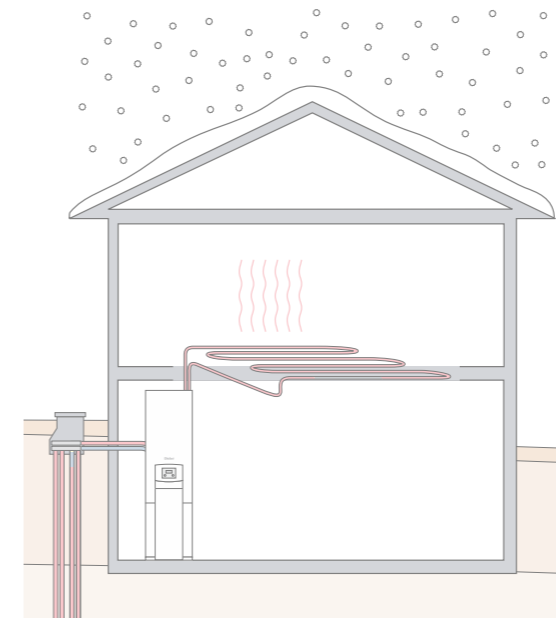
geoTHERM exclusive includes an integrated passive cooling function when used with an underfloor heating system. During the summer months the heat recovery process can be reversed. The excess heat in the living space is withdrawn via the underfloor heating system and then transferred to the ground, by-passing the compressor. 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:

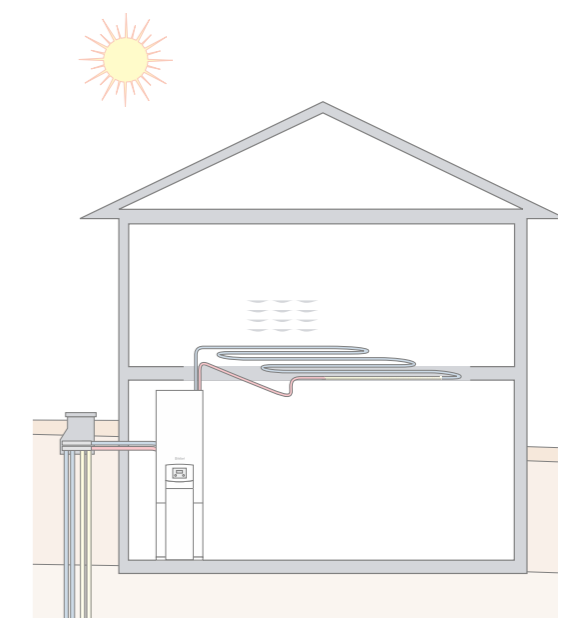
- 6.0/ 8.1/ 10.5 kW\* (230V) output models available
- Maximum flow temperature 62°C
- Integrated 175L stainless steel unvented d.h.w. cylinder
- 4 kW auxiliary back-up heater
- Weather-compensated energy-balance control with graphic display of the environmental yield
- Multi-stage Sound Insulation (MSI) 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
- Free commissioning
- 3 year warranty when commissioned by Vaillant engineer\*\*

\*B0W35  $\Delta T$  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 domestic 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.

### 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
- 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
- Free commissioning
- 3 year warranty when commissioned by a Vaillant service engineer\*\*

\*B0W35  $\Delta T$  5K according to EN 14511

\*\*2 year warranty as standard



geoTHERM VWS 22-46



# Customer service support

## contact details

### 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 collector 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

Vaillant Ltd, Vaillant House, Trident Close, Rochester, Kent ME2 4EZ

Telephone 01634 292300  
E-mail [info@vaillant.co.uk](mailto:info@vaillant.co.uk)

#### Sales

Telephone 01634 292310  
Fax 01634 712804  
E-mail [sales@vaillant.co.uk](mailto:sales@vaillant.co.uk)

#### Contracts, Partnering & Leasing

Telephone 01634 292322  
Fax 01634 292379  
E-mail [contracts@vaillant.co.uk](mailto:contracts@vaillant.co.uk)

#### Technical

Telephone 01634 292392  
Fax 01634 294504  
E-mail [technical@vaillant.co.uk](mailto:technical@vaillant.co.uk)

#### Training

Telephone 01634 292370  
Fax 01634 292354  
E-mail [training@vaillant.co.uk](mailto:training@vaillant.co.uk)

#### After Sales Service

Telephone 0870 850 3073  
Fax 01634 294506  
E-mail [service@vaillant.co.uk](mailto:service@vaillant.co.uk)  
Mon - Fri 8.30am - 5.30pm

#### Website

[www.vaillant.co.uk](http://www.vaillant.co.uk)



Setting the standard for

# customer training



State of the art Vaillant Training Centre in Bristol

As the industry's leading training provider, Vaillant offer comprehensive training courses which can add value to your business.

Every year we train thousands of professionals. We are continually developing and improving our training programmes and facilities to provide a service that matches your requirements.

Every one of Vaillant's training courses is based on practical and detailed hands-on experience, backed up by expert tuition.

The aim of each Vaillant Training Course is to help improve your skills, which in turn can help you to improve your profit. That's why so many choose Vaillant as their training provider.

Who are Vaillant training courses designed for?

- Gas Safe Registered Installers (UK & Isle of Man)
- CORGI Registered Installers (Northern Ireland)
- IPHE Registered Installers
- SNIPEF Registered Installers
- Local Authorities and Housing Associations
- Service Organisations
- Architects and Specifiers
- Merchants and Spare Part Stockists
- Solar DHW installers
- Commercial boiler heating installers

## Current training courses

### ecoTEC High efficiency domestic boiler range

A one-day course covering our latest range of condensing boilers, including installation, operation, servicing and repair.

### Commercial boiler range

A one-day course covering commercial installation, operation, servicing and repair.

### BPEC Unvented domestic hot water

Three courses are available to suit all candidates wanting to take this assessment.

### Unvented domestic hot water initial assessment

A one day BPEC certificated course comprising of a theory training session in the morning followed by assessment in the afternoon.

### Unvented domestic hot water re-assessment

A half day course comprising of a brief update tutorial followed by the BPEC re-assessment examination paper. Please note to be eligible for this assessment all candidates must already hold a certificate of competence for unvented domestic hot water (expired or current), and will be required to present it prior to the assessment.

### Unvented domestic hot water defined scope assessment

A one day defined scope BPEC certificated course for those wanting a better understanding of unvented domestic hot water systems, but not intending to install them. Please note this course does not qualify you to install unvented domestic hot water systems in accordance with part G3 of the Building Regulations.

### Solar product course

A one-day course for heating professionals wanting to get a basic understanding of solar domestic heating systems.

### BPEC Solar DHW course

A two day course for heating professionals looking to gain solar heating BPEC certification.

### BPEC Solar DHW course

A two day defined scope BPEC certificated course for those wanting a better understanding of solar domestic hot water systems, but not intending to install them.

### Air to air appreciation course

A one-day course designed for installers who wish to expand their knowledge of air to air heat pumps.

### Ground Source Heat Pump (GSHP) course

A one day product course looking at the geoTHERM range of ground source heat pumps. The day will cover installation, operation, service and repair.

### BPEC Ground Source Heat Pump (GSHP) course

A two day BPEC certificated course for professionals seeking a GSHP qualification.

### Mechanical Ventilation Heat Recovery (MVHR)

A one day product course looking at the recoVAIR range of mechanical ventilation heat recovery units. The day will cover installation, operation, service and repair.

### FGas Regulations course

Three day training course leading to the Construction Skills assessment on the FGas Regulations.

### Domestic controls training

A one-day course designed to give you the best knowledge and expertise with our range of controls and accessories.

### Certificate in Energy Efficiency for Domestic Heating

A one-day course to help you promote the benefits of high efficiency boilers to your customers.

### BPEC CPA 1 Combustion Analyser Assessment

From 1<sup>st</sup> February 2010, CPA1 will be a pre-requisite for anyone wishing to take ACS elements CEN1 and HTR1. We offer a one day BPEC certificated course for those proficient in the use of a combustion analyser. The day comprises of an update tutorial in the morning followed by assessment in the afternoon. If you would like to receive additional training on flue gas analysis or would just like the opportunity to practice with your own analyser, please contact us for further details.

### Tailor-made courses

The Vaillant training department creates custom made programmes to suit your company's individual training needs.

### For more information on any Vaillant training course

please contact our Training Department on:

Telephone: 01634 292370 Fax: 01634 292354

Email: [training@vaillant.co.uk](mailto:training@vaillant.co.uk)

[www.vaillant.co.uk/installers/training](http://www.vaillant.co.uk/installers/training)





Installation, commissioning,

control and service

**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 the cylinder can then be transported to the final location as two separate units.



geoTHERM exclusive with Split Mounting concept

**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 year of warranty. Details of how to arrange your commissioning visit are provided with each appliance.

**Weather-compensated energy-balance control**

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.

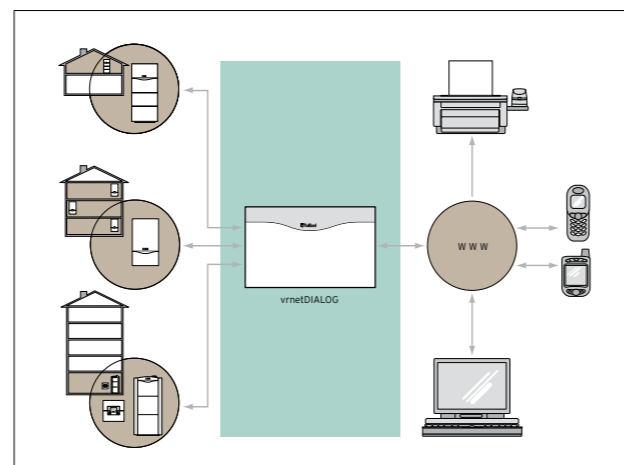


Intelligent Service communication system

**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.



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

geoTHERM

Technical specification

| Ground source heat pumps                         |       |                     |                     |                     |                     |                     |
|--|-------|---------------------|---------------------|---------------------|---------------------|---------------------|
|  |       | geoTHERM 6kW        | geoTHERM 8kW        | geoTHERM 10kW       | geoTHERM 14kW       | geoTHERM 17kW       |
|  | Unit  | VWS 61/2 230V       | VWS 81/2 230V       | VWS 101/2 230V      | 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             | 167/172             | 194/179             |
| <b>Electric connection</b>                       |       |                     |                     |                     |                     |                     |
| Compressor and auxiliary back-up heater          |       | 1/N/PE<br>230V 50Hz | 1/N/PE<br>230V 50Hz | 1/N/PE<br>230V 50Hz | 3/N/PE<br>400V 50Hz | 3/N/PE<br>400V 50Hz |
| Control  |       | 1/N/PE<br>230V 50Hz | 1/N/PE<br>230V 50Hz | 1/N/PE<br>230V 50Hz | 1/N/PE<br>230V 50Hz | 1/N/PE<br>230V 50Hz |
| Slow-blow fuse                                   | A     | 16/20               | 25/25               | 25/25               | 3x25                | 3x25                |
| Inrush current without limiter                   | A     | -                   | -                   | -                   | 64                  | 74                  |
| Inrush current with limiter                      | A     | <45                 | <45                 | <45                 | <25                 | <25                 |
| Electric power consumption<br>- max. at B20W60   | kW    | 2.8                 | 4.0                 | 4.9                 | 6.8                 | 7.7                 |
| Auxiliary back-up heater                         | kW    | 2/4                 | 2/4                 | 2/4                 | 2/4/6               | 2/4/6               |
| System of protection EN 60529                    |       | IP 20               | IP 20               | IP 20               | IP 20               | IP 20               |
| <b>Ground loop collector</b>                     |       |                     |                     |                     |                     |                     |
| Brine type                                       |       | ethylene glycol 30% | ethylene glycol 30% | ethylene glycol 30% | ethylene glycol 30% | 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 ΔT 3K                          | l/h   | 1453                | 1936                | 2530                | 3334                | 3939                |
| Residual pump head ΔT 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                      | 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 ΔT 10K                         | l/h   | 517                 | 697                 | 848                 | 1187                | 1538                |
| Residual pump head ΔT 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<br>(B0W35 ΔT 5K acc. to EN 14511) | kW    | 6.0                 | 8.1                 | 10.5                | 13.8                | 17.3                |
| Electrical power consumption                     | kW    | 1.4                 | 1.9                 | 2.5                 | 3.2                 | 4.1                 |
| COP (Coefficient of Performance)                 |       | 4.2                 | 4.2                 | 4.2                 | 4.3                 | 4.3                 |
| Heating output<br>(B0W55 ΔT 5K acc. to EN14511)  | kW    | 5.5                 | 7.5                 | 9.4                 | 13.6                | 16.1                |
| Electrical power consumption                     | kW    | 2.1                 | 2.8                 | 3.4                 | 4.6                 | 5.6                 |
| COP (Coefficient of Performance)                 |       | 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 230V          | VWS 83/2 230V          | VWS 103/2 230V          |
| Dimensions  |      |                        |                        |                         |
| Height without connections                            | mm   | 1800                   | 1800                   | 1800                    |
| Width   | mm   | 600                    | 600                    | 600                     |
| Depth without/with 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        |
| Compressor and auxiliary back-up heater               |      | 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        |
| Slow-blow fuse  | A    | 16/20                  | 25/25                  | 25/25                   |
| Inrush current without limiter                        | A    | <45                    | <45                    | <45                     |
| Electric power consumption                            |      |                        |                        |                         |
| - max. at B20W60                                      | kW   | 2.8                    | 4.0                    | 4.9                     |
| - Auxiliary back-up heater                            | kW   | 2/4                    | 2/4                    | 2/4                     |
| System of protection EN 60529                         | IP   | 20                     | 20                     | 20                      |
| Integrated hot water cylinder                         |      |                        |                        |                         |
| 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         | °C   | 75                     | 75                     | 75                      |
| Ground loop collector                                 |      |                        |                        |                         |
| 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                    | 132                     |
| Heating circuit                                       |      |                        |                        |                         |
| 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                     |
| Refrigerant circuit                                   |      |                        |                        |                         |
| 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                      |
| Performance data                                      |      |                        |                        |                         |
| Heating output (BOW35 $\Delta T$ 5K acc. to EN 14511) | kW   | 6.0                    | 8.1                    | 10.5                    |
| Electrical power consumption                          | kW   | 1.4                    | 1.9                    | 2.5                     |
| COP (Coefficient of Performance)                      |      | 4.2                    | 4.2                    | 4.2                     |
| Heating output (BOW55 $\Delta T$ 5K acc. to EN 14511) | kW   | 5.5                    | 7.5                    | 9.4                     |
| Electrical power consumption                          | kW   | 2.1                    | 2.8                    | 3.4                     |
| COP (Coefficient of Performance)                      |      | 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           |
| Dimensions  |      |                     |                     |                     |                     |
| Height without connections                            | mm   | 1200                | 1200                | 1200                | 1200                |
| Width   | mm   | 760                 | 760                 | 760                 | 760                 |
| Depth without/with column                             | mm   | 900/1100            | 900/1100            | 900/1100            | 900/1100            |
| Weight with/without packaging                         | kg   | 356/326             | 370/340             | 394/364             | 417/387             |
| Electric connection                                   |      |                     |                     |                     |                     |
| Compressor and auxiliary back-up 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                |
| Inrush current with limiter                           | A    | 44                  | 65                  | 85                  | 110                 |
| Electric power consumption                            |      |                     |                     |                     |                     |
| - max. at B20W60                                      | kW   | 10.0 1              | 12.0                | 16.0                | 18.0                |
| System of protection EN 60529                         | IP   | 20                  | 20                  | 20                  | 20                  |
| Ground loop collector                                 |      |                     |                     |                     |                     |
| 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                 |
| Heating circuit                                       |      |                     |                     |                     |                     |
| 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                |
| Residual pump head $\Delta T$ 10K                     | mbar | 23                  | 25                  | 40                  | 53                  |
| Electric power consumption of the pump                | W    | -                   | -                   | -                   | -                   |
| Refrigerant circuit                                   |      |                     |                     |                     |                     |
| Refrigerant type                                      |      | R407C               | R407C               | R407C               | R407C               |
| Quantity  | kg   | 4.1                 | 5.99                | 6.7                 | 8.6                 |
| Admissible 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                  |
| Performance data                                      |      |                     |                     |                     |                     |
| Heating output (BOW35 $\Delta T$ 5K acc. to EN 14511) | kW   | 21.6                | 29.9                | 38.3                | 45.9                |
| Electrical power consumption                          | kW   | 5.1                 | 6.8                 | 8.8                 | 10.6                |
| COP (Coefficient of Performance)                      |      | 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                |
| Electrical power consumption                          | kW   | 6.9                 | 9.3                 | 11.8                | 14.1                |
| COP (Coefficient of Performance)                      |      | 3.0                 | 2.9                 | 3.1                 | 3.0                 |



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