

GEOflo

21.3kW Ground Source Heat Pump



Working towards
a cleaner future

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The Potterton Commercial GEOflo is a 21.3kW packaged ground source (ground-to-water) heat pump with all major components of the refrigeration cycle contained within a single enclosure suitable for installation within a plant room.

The earth acts as a huge thermal store with the energy supplied by solar rays incident on the surface of the ground. At a depth of around 1 metre to 2 metres the temperature within the ground remains fairly constant at around 10°C to 12°C. Ground source heat pumps harness this energy through the use of a ground loop which extracts this heat to commence and sustain the refrigeration cycle within the heat pump. Through a process of changing the state of the refrigerant, heat is generated which can be used via a plate heat exchanger for space heating.

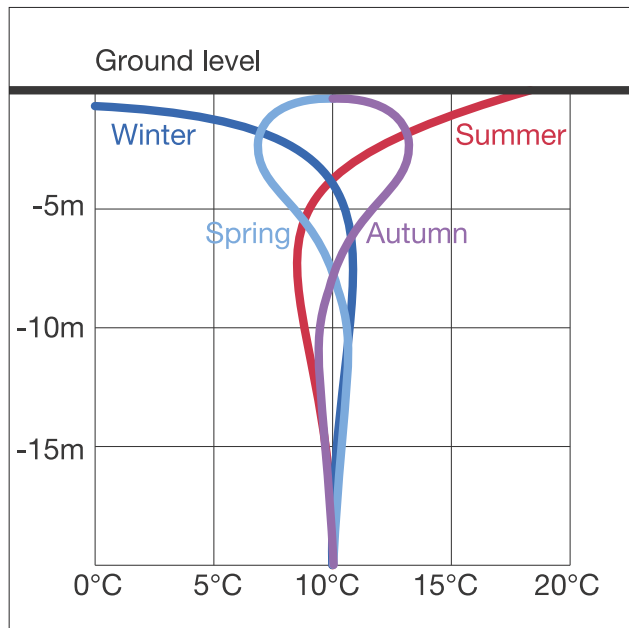
GEOflo is a ground source heat pump with an output of 21.3kW and a 'best in class' coefficient of performance of 4.7 when used with a low temperature heat load such as underfloor heating. GEOflo controls are based on the same platform as the Paramount two and Eurocondense three high efficiency condensing boilers enabling the technologies to operate in harmony and deliver low carbon heating solutions.

Principle of Operation

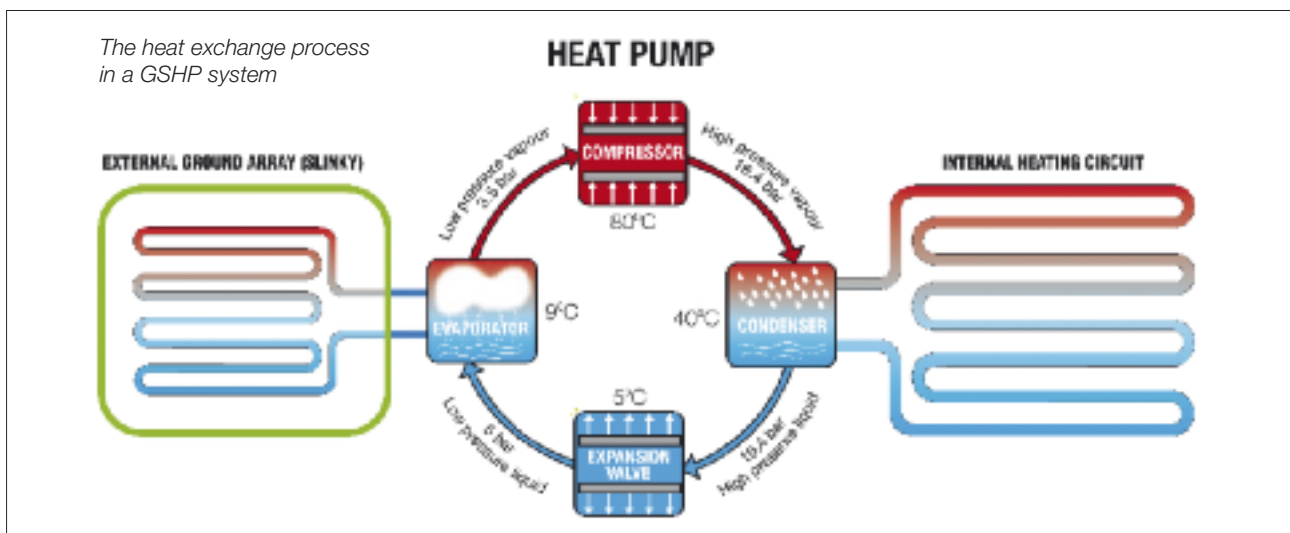
Heat in the ground is generated from incident solar radiation, as well as a continuous flow of heat from the Earth's core. As a result, the ground temperature shows seasonal fluctuations to depths of

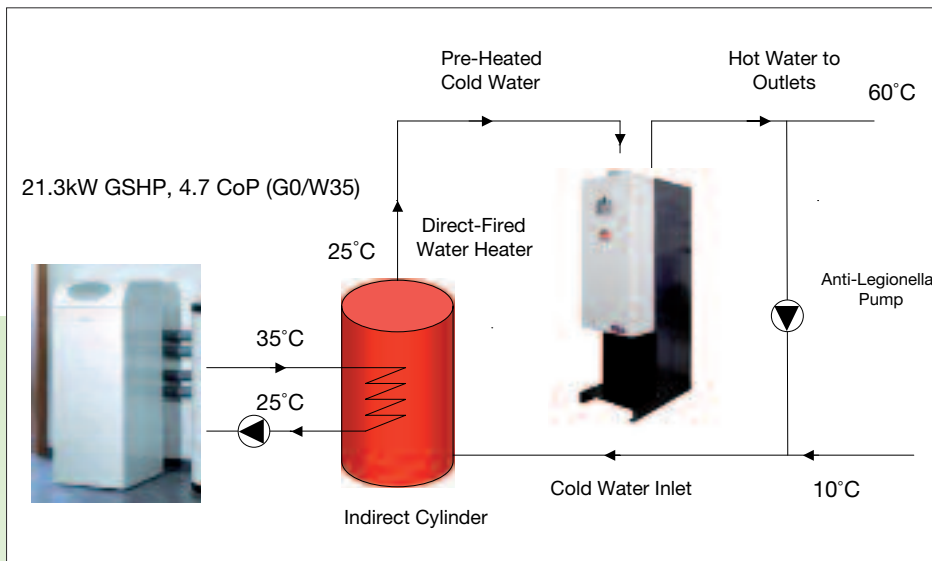
about 15m where the temperature is approximately equal to the mean annual air temperature (8°–11°C in the UK).

Temperatures above this will alter throughout the year as illustrated by the graph below.

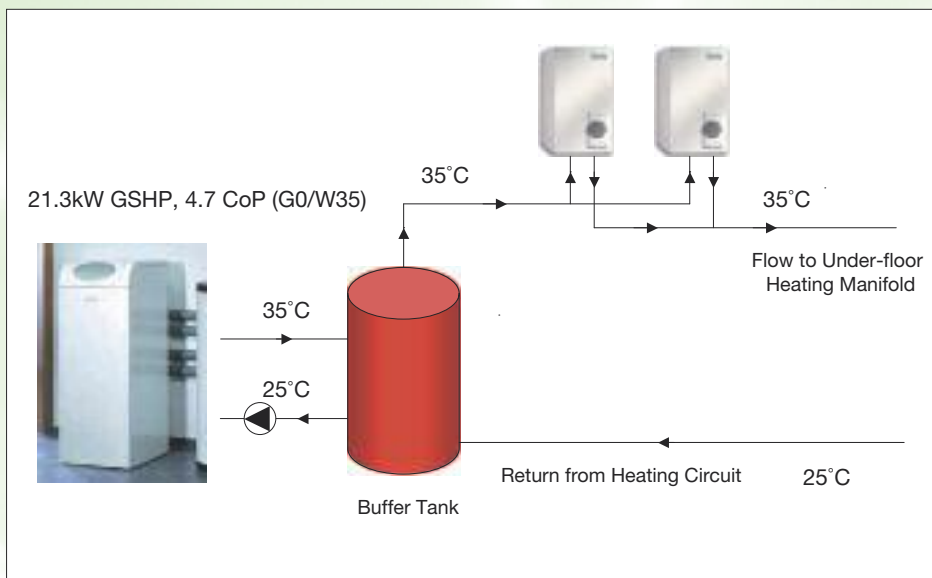


Approximate UK annual ground temperatures





Cold Water Pre-Heat Applications



Space Heating (Under-Floor) Applications

Operation period	1,800h per year	2,400h per year
<i>Soil type</i>		
Dry, non-cohesive	10 W/m ²	8 W/m ²
Moist cohesive soil	20 to 30 W/m ²	16 – 24 W/m ²
Water saturated sand or gravel	40 W/m ²	32 W/m ²

Practical heat pump extraction rates per m² ground

Operation period	1,800h	2,400h
<i>Ground type</i>		
Poor underground and dry sediment	25 W/m	20 W/m
Normal underground and water-saturated sediment	60 W/m	50 W/m
Consolidated rock	84 W/m	70 W/m

Practical heat pump extraction rates per metre run of vertical borehole (see EN 15450:2007 for full details).

- 4.7 Coefficient of Performance
- Ultra low noise level of 48 dB(A) at 1 metre
- Compact, small footprint design
- Cascade multi-unit installation configurations

GEOflo Technical Details

	Units	
Heat Output	kW	21.3
Coefficient of Performance (COP)	–	4.7
Basis for COP	–	0°C source temp, 35°C load temp
Electrical Power Input	kW	4.6
Electrical Supply	–	415V, 3 phase, 50Hz
Refrigerant	–	R410A
Heat Transfer Medium	–	70% water, 30% ethylene glycol
Minimum Heat Source Temperature	°C	- 6
Maximum Heat Source Temperature	°C	+ 20
Maximum Heat Load Temperature	°C	+ 60
Noise Level (Sound Pressure)	dB(A)	48 measured at 1 metre
Dimensions (H x W x D)	mm	1380 x 530 x 700
Footprint (W x D) with access	mm	1430 x 900
Weight	kg	230

GEOflo Solution Options

- 21.3kW ground source (ground-to-water, closed loop) heat pump
- 450 litre unvented, duplex stainless steel, indirect, single coil pre-heat cylinder (for hot water applications) complete with cold feed kit including expansion vessel
- 450 litre buffer tank for space heating applications

Features & Benefits

- Compact with small footprint
- High CoP of 4.7 (G0°C, W35°C)
- R410A is as the refrigerant within a pre-charged sealed circuit
- Anti-vibration mountings included
- Same Siemens controls platform as the Potterton Commercial boilers for harmonised operation
- Building Energy Management System interface
- Multi-unit installations possible with up to six heat pumps operating in cascade

Application Support

- Review of project hydraulic schematic
- Telephonic and on-site installation and application support including pre-commissioning visit where applicable
- Commissioning and controls set-up of GEOflo system including primary heating appliances when supplied. Excludes testing of the ground loop.

PART OF BDR THERMEA

Baxi Commercial Division
Wood Lane, Erdington,
Birmingham B24 9QP

Sales:

0845 070 1056

Technical:

0845 070 1057

Email: potterton.commercial@baxicommercialdivision.com
www.pottertoncommercial.co.uk



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heating specialists