

Unrivalled in geothermal energy extraction and use

Series DS 5050 T heat pumps

25 to 50 kW

Up to 200 kW in cascade

Lower your total heating costs

- + No space needed for oil tank
- + No chimney
- + No costs for service or emissions measurement
- + No danger due to gas connection
- + Maintenance-free operation

With WATERKOTTE, you get everything from one source

- + Heat source from our subsidiary "TERAMEX Erdwärme"
- + Heat pump technology and automation from WATERKOTTE
- + Implementation by WATERKOTTE system partners
- + Heat pump heating was developed by Waterkotte in 1970 and represents a revolution in heating technology following 1.5 million years of fire heating

Take advantage of our years of experience!



The DS 5050 T series is part of the new generation of heat pump technology.

WATERKOTTE brings you heating at its best: geothermal heat pump heating

More economical than ever

...Klemens Oskar Waterkotte pioneered this idea in 1969 at his new house, where the first Waterkotte geothermal heat pump heating system began operation early in 1970.

It was a success from the very beginning

...more economical than oil heating, which was the most economical form of heating at the time, with a price of under 9 cents per litre.

The secret of its success

...lay and lies in the heat source and the integrated system technology, which was properly implemented and optimised from the very beginning.

The optimum heat source

...is the soil, with a temperature closest to living space temperature.

+ Heat source, geothermal temperature + 12 °C

+ Heat use, room temperature + 22 °C

The small difference in temperature of only 10 °C creates the optimum conditions for heat pump heating. The smaller the difference, the higher the efficiency and the capacity of the heat pump.

What is a heat pump?

In the Palaeolithic era, man learned how to work with fire and use it for heating. Since then, the fireplace is just about the only thing that has changed. For 1.5 million years, fire, without any significant improvements, was the only answer. That is, until Klemens Oskar Waterkotte revolutionised the world of heating technology in 1970. His technological development made it possible to generate heat without fire by extracting and using renewable geothermal energy. In doing this, he used the idea of the refrigerator, patented by Carl von Linde around 1876. The heat pump only differs from the refrigerating machine in its name and use.

+ "Refrigerating machine" – The cold side is used

+ "Heat pump" – The warm side is used

The geothermal heat pump heating system offers the solution

The heat pump alone cannot generate heat. It needs a heat pump heating system in order to heat.

What does a heat pump heating system consist of?

It consists primarily of

+ the heat source system,

+ the heat pump heating control system and

+ the heat distribution system.

What did Waterkotte achieve?

+ He developed heat source technology and sized it correctly

+ He developed and sized the highly-efficient floor heating system implemented using plastic pipes densely laid in a concrete screed.

+ Using the heat pump, he developed the first effective heat pump heating system.

What determines the quality of the heat pump heating system?

Efficiency and consumption are determined based on the quality of the technical condition of the whole system as well as the characteristic temperature behaviour of the heat source and the heat sink over an entire heating period. Because of this, it does not make much sense to measure the efficiency of a heat pump and compare it.

Is there a way to measure and compare the quality of the system?

Yes, by measuring and comparing the annual energy efficiency in a neutral field test over an entire heating period. This is the only objective means of comparison.

WATERKOTTE has always emerged from these tests unrivalled, with a measured annual energy efficiency of 4.5.

How can the efficiency of the heat pump heating system be compared?

Information provided by inspection results is limited to the heat pump; this is the same as evaluating a car based on its motor alone. This information is worthless, as is the measured data in Stiftung Warentest (Germany's leading consumer safety group).

In comparison with a car

+ The heat pump corresponds to the motor.

+ The complete heat pump heating system corresponds to the car and the energy efficiency data for the system, provided by a field test over the course of a heating period, corresponds to the data regarding consumption values for real travel operation under real conditions.

Can the energy efficiency be guaranteed?

Yes, by using WATERKOTTE technology and TERAMEX geothermal loops delivered and installed by certified WATERKOTTE partner installers, the amount of geothermal heat gained is guaranteed at over 75% for a period of 10 years.

ing, the one and only renewable solution for today and in the future.

How do you obtain geothermal heat?

There are three basic methods:

- + Ground water transportation, heat dissipation and reintroduction (intermediate heat exchanger necessary)
- + Surface collector, placed at an appropriate depth (not suitable for natural cooling)
- + TERAMEX geothermal loops (the optimum solution, guaranteed energy efficiency, natural cooling possible)

How do you evaluate heat pump heating systems?

Only neutrally measured annual energy efficiency ratings are reliable values. Measured data from a testing laboratory or Stiftung Warentest (Germany's leading consumer safety group) are worthless. The annual energy efficiency rates of WATERKOTTE heat pumps and TERAMEX geothermal loops place them alone at the top with guaranteed results.

Can outdoor air be used as a heat source?

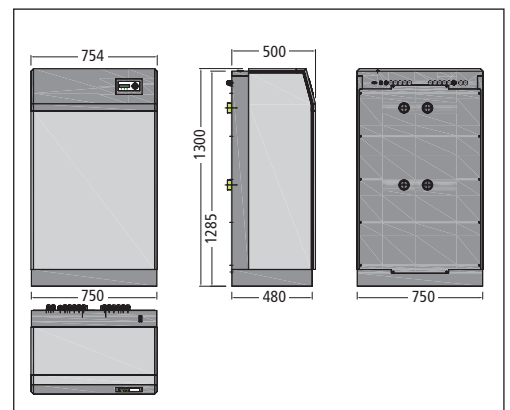
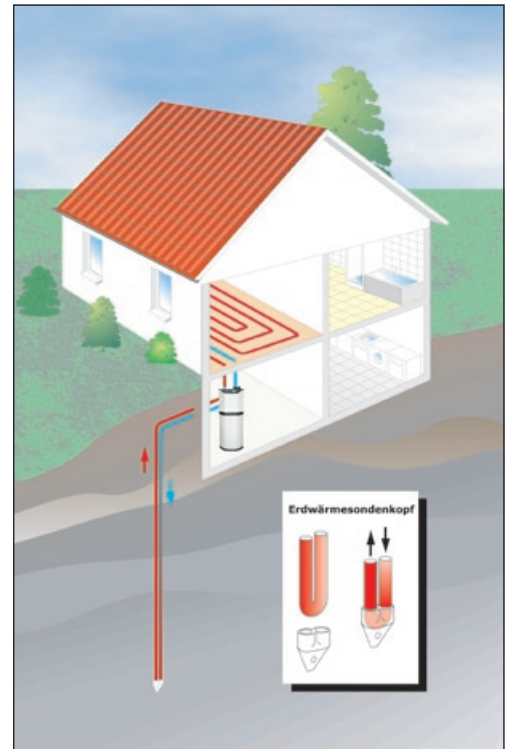
Yes! Air can be used as a heat source but it lacks heat capacity and the ability to absorb solar radiation. Outdoor air is heated only through contact with the earth's surface by direct transmission of geothermal heat, just like a floor heating system. The farther you get from the surface, the colder it gets: while the temperature may be 1 °C at 150 m, there is continuous snow at 4,000 m and at flight altitude (11,000 m), the temperature is -55 °C, even in the summer. From an ecological perspective alone, air heat pumps emit more CO₂ than gas heating systems and require twice the electricity of a WATERKOTTE geothermal heat pump with geothermal energy supplied by TERAMEX. This said they

The new solution for large buildings is DS 5050 T.

This series was developed especially for use in large residential buildings where space is limited and low noise emission combined with high efficiency is required. The standard design includes two compressors with the same capacity (tandem switching). This improves efficiency by matching output to load.

This design has even more advantages:

- + When combined with the Electronic Motor Power Management Module (EMPM), the starting current can be limited to 30 A.
- + The vacuum is maintained and provides top-quality insulation throughout the entire service life of the system.
- + You have the special option of using cascade switching on up to four units.
- + Most of the time, only one compressor is running; this dramatically improves your annual energy efficiency.
- + Alternate switching at every restart ensures long service life.



Another advantage is the heat pump's small size with respect to its capacity.

Technical description

- + The electrical control board is located at the top of the heat pump and positioned horizontally to allow for easier fitting for the cable glands, which are located at the top back of the heat pump.
- + The Electrical Motor Power Management Module, EMPM, prevents activation in the case of phase cut-out or incorrect phase position and ensures a soft start at max. 30 A and a soft drive stop when the heat pump is switched off (compressor stop without impact).
- + The built-in electronic expansion valve provides optimal operating conditions for all load ranges.

Automation

The unit is equipped with the improved WPCU central control unit which, for the first time, allows for network coupling using a plug-in module (access to building control technology).

Performance table DS 5050.3 T with R407C

Nominal value		5030.3 T	5037.3 T	5044.3 T	5050.3 T
Power cons./output W10/W35	kW*	5,1/30,0	6,5/37,0	7,4/44,1	8,4/49,8
Performance rate		5,8	5,7	5,9	5,9
Ground water flow (W10/W35)	m ³ /h (Δt=4K)	5,3	6,5	7,8	8,9
Pressure loss in evaporator	mWS	1,3	1,6	1,7	1,8
Heating water flow (W10/W35)	m ³ /h (Δt=4K)	5,2	6,4	7,6	8,6
Pressure loss in condenser	mWS	1,0	1,1	1,3	1,3
Power cons./output B0/W35**	kW*	5,1/22,0	6,2/26,5	7,2/32,2	8,0/36,0
Performance rate		4,3	4,3	4,4	4,5
Water-glycol flow rate (B0/W35)	m ³ /h (Δt=4K)	4,1	5,0	6,1	6,9
Pressure loss in evaporator	mWS	1,0	1,1	1,2	1,3
Heating water flow (B0/W35)	m ³ /h (Δt=5K)	3,8	4,6	5,5	6,2
Pressure loss in condenser	mWS	0,5	0,6	0,7	0,7
Power cons./output B5/W30**	kW*	4,8/26,3	5,7/32,2	6,5/38,6	7,3/43,3
Usage limit		F-5/W50, W5/W55			
Compressor		Tandem-Vollhermetic-Scroll			
Electrical data 3x400 V, 50 Hz					
Starting current with soft start	A	34	36	41	45
Max. operating current	A	20	22	26	30
Main fuse provided by customer	A	25	25	32	32
Control fuse provided by customer	A	10	10	10	10
Dimensions, weights, connections					
Number of scroll compressors		2	2	2	2
Volume compr. oil fill	Liter	2,72	3,37	3,2	3,4
R407C coolant fill mass	kg	--	--	--	--
Unit weight	kg	220	246	263	269
Connections: Heat source / use		R2" a			
Dimensions W x H x D	mm	750 x 1300 x 500			

* Tolerances stated in EN 12900 apply for the performance data listed above.

** F0: Fluid (70% water + 30% ethylene glycol)

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