Energy for life

The Terra Heat Pump

Heating and cooling for life

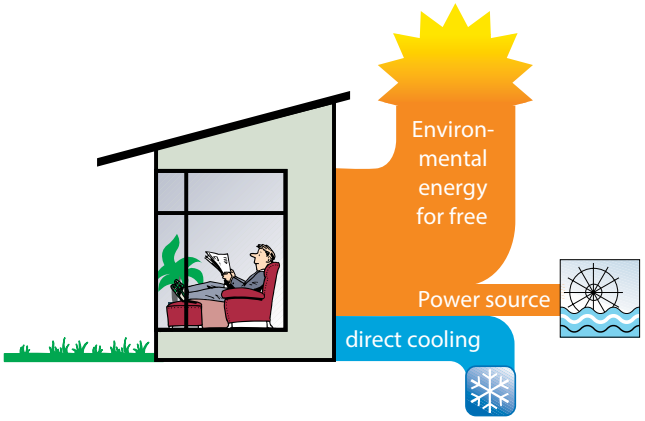
kyasol
Green Building Solutions

The **Concept**

Modern, independent & inexpensive heating and cooling

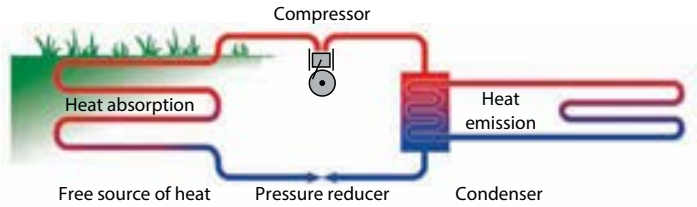
Life never stands still and this is how the Terra heat pump operates. It uses a renewable source of energy which costs nothing, is always available and does not use up natural resources or produce any waste products.
Heating and cooling for life.

The same principle is used for cooling



TERRA
heat pump by

IDM ENERGIE SYSTEME



The heat pump consists of a few simple components:
A compressor, a source of heat, a condenser and a pressure reducer. The refrigerant circulating in the closed circuit uses free heat from the ground which is transferred by the condenser to the heating and hot water system at a higher temperature.

The Terra heat pump from IDM uses energy from the environment which costs nothing and delivers heating and hot water. During hot weather the same principle is applied to povide a cooling system, giving a comfortable temperature all year round.

GEPRÜFTE QUALITÄT
INTERNATIONALES GÜTESIEGEL

The IDM heat pump has received international awards for efficiency and innovation.

Live life to **the Full**

Keep an eye on the future - using energy from the environment costs nothing

Cosiness and Comfort
- Heating at the touch of a button
  (no purchase of oil, wood or gas)
- Silent operation
- Risk free
  (no danger of fire, no oil storage necessary)
- Extremely reliable
  (no burner to go wrong)
- Low temperature heating provides a pleasant room temperature
- Can also be used for cooling

Energy saving
- Approximately 65-75% of the energy needed for heating can be provided free of charge from the soil, the air or from ground water (using diffeent methods of extraction).
  The remaining energy is required for the electrical power to drive the compressor.

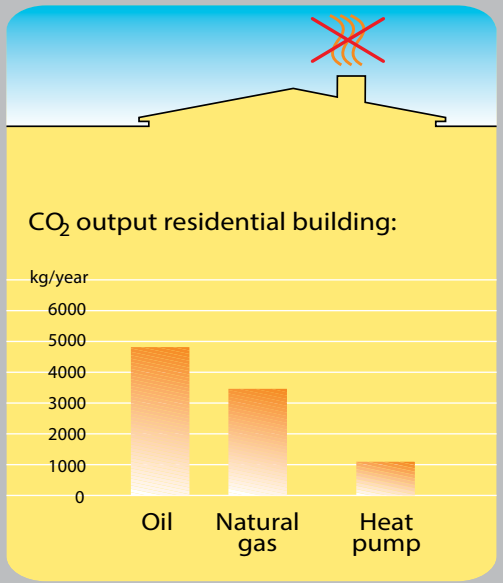
Low initial costs
- No chimney
- No gas connection
- No fire door

- The value of the property is enhanced because it has its own source of energy
- Additional financial incentives may be available
  (depending on the local area)

Low running costs
- No storage of heating materials
  (wood, gas or oil)
- Special electricity tariff for heat pumps
  (depending on the local area)
- Low service costs
  (no oil nozzle changing, no dirty oil burner)
- No chimney sweeping

Environment friendly
- No smoke
- No soot
- No dust
- No oil fumes

$C0_2$ Reduction



The Terra heat pump from IDM heats & cools
That means a pleasant room temperature throughout the year

The **Earth**

Means security warmth and home for all of us

Installing the pipes and brine circulation

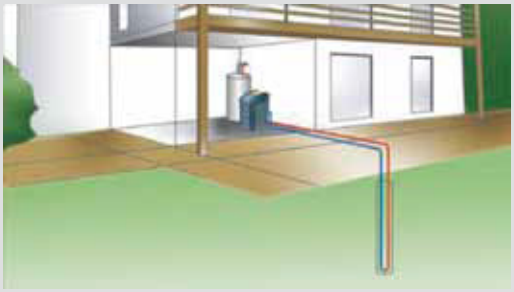
Several hundred meters of plastic pipes are laid into the ground at a depth of approximately one to one and a half meters. Cold brine is pumped through them to extract free heat from the soil.

The plastic pipes are guarenteed for 50 years.

The reverse procedure is used to provide cooling.

For a heating performance of 10kW, between 500 & 600m of pipe have to be laid in an area between 250 & 480m² (depending on the ground conditions)

Deep bore brine circulation



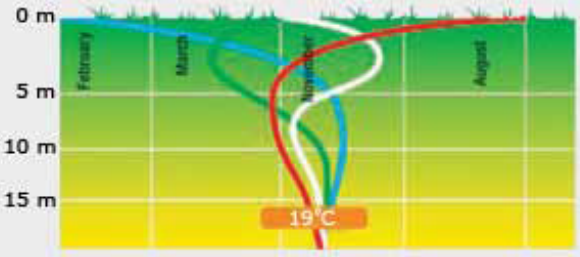
A plastic geothermal energy probe is inserted into a borehole in the ground. The brine flows deep into the ground and back again, bringing up free heat from the surrounding earth.

The probes are guarenteed for 50 years but are expected to last longer

For a heating performance of 10kW, one or more probes up to a length of 100m are needed depending on the structure of the ground.

Deep bore direct cooling

- At a depth of 20m or more, the ground temperature remains constant at over 19°C with no seasonal fluctuation. This constant temperature means the brine is warm in winter and is ideal for cooling in summer.

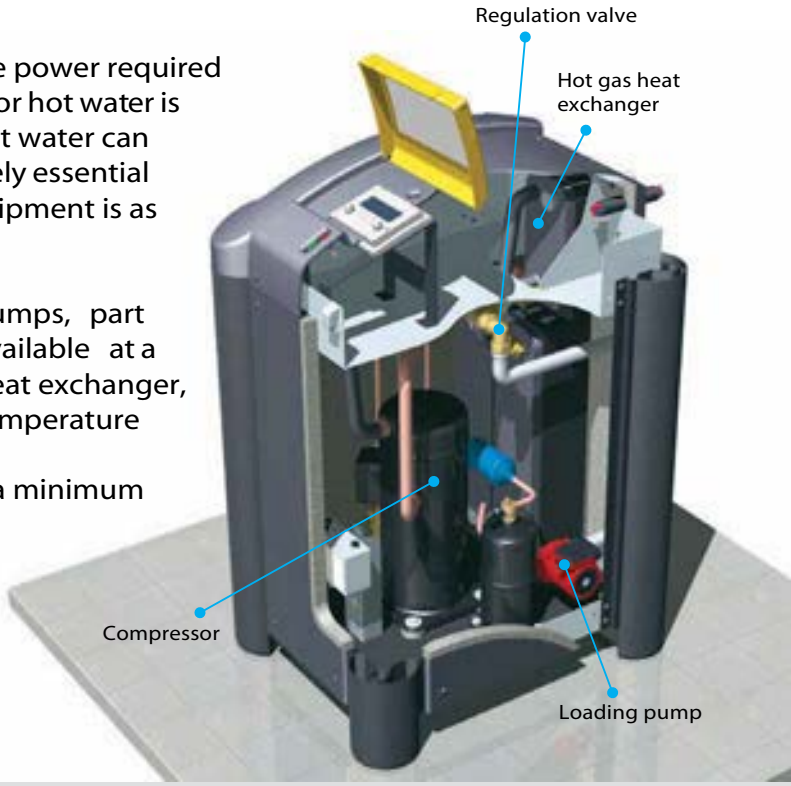


A modern and non-polluting technology for now and for the future

Hot water heating technology
In modern buildings with very good heat insulation, the power required for heating is much lower. On the other hand, demand for hot water is increasing. The amount of power needed to provide hot water can therefore be as much as 30 - 40%. It is therefore absolutely essential that the water heating capability of the heat pump equipment is as efficient as possible.

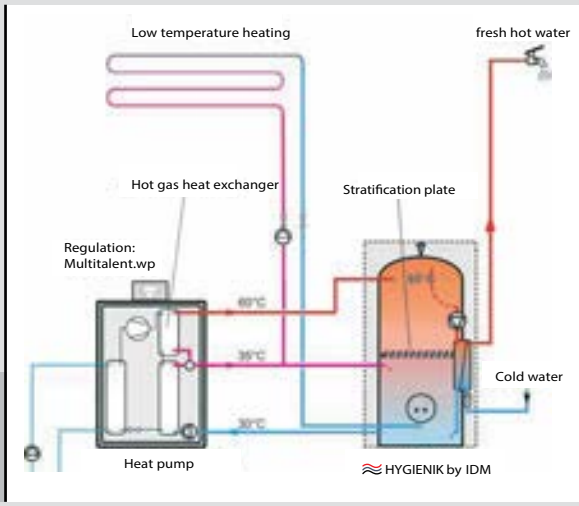
Hot gas loading technology is ideal for this. With heat pumps, part of the acquired heat energy (approx 15% = hot gas) is available at a higher temperature. This part is sent to an additional heat exchanger, which heats up the upper part of the buffer tank to a temperature of 60°C.
This technology optimises hot water comfort by using a minimum of energy.

In winter, the heat pump heating operates at a lower temperature (approx. 35°C), but it can heat the upper part of the reservoir to produce hot water up to 60°C (approx. 15% of the performance).



Advantages of Hot Gas Loading
- High reservoir temperature with low compressor pressure
- Lower power consumption
- Increased compressor life
- The heating water is heated first
  => Safe circulation
  => No danger of calcification
- Hot water stratified in layers
- Hot water is available immediately

A patent application has been made for the Hot Gas Loading technology by IDM



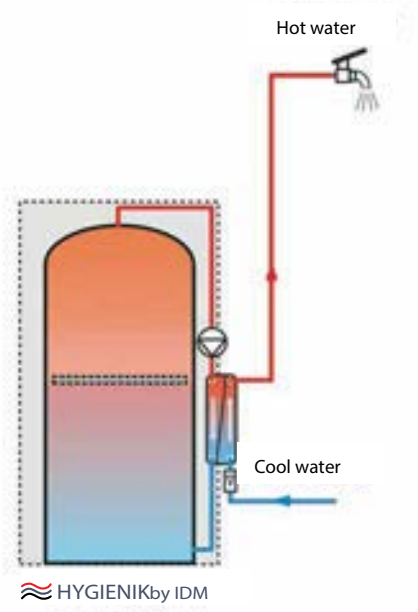
Hot & **Hygienic**

Hot water may be a luxury but it is indispensible for staying healthy

A coordinated system using the IDM Hygienik
The IDM Hygienik is a thermal storage system which is heated via the heat pump. When the hot water tap is turned on, the water is heated directly as it passes through a large heat exchanger.

Healthy hot water guaranteed and legionella free
The reservoir heats up quickly because the large capacity of the heat pump. A hot water temperature of up to 60°C can be reached with the additional installation of the hot gas heat exchanger.

At the same time, the lower storage area is used as an interim heating buffer so the heat pump is switched on less often, thus prolonging the life of the pump.



Solar power for free
IDM HYGIENIK is a highly efficient energy buffer, which can be used in conjunction with solar systems to support the heating system.

The brain of the facility - the mulitalent control
The Terra heat pump is regulated by means of a modern microprocessor and a clever control programme which is designed to provide precise and efficient use of the heat pump.
The whole heat pump facility only cuts in when it is needed. It has a number of monitoring, safety and message functions.

Data can also be tranferred via a modem for long distance monitoring on a PC or by SMS to a mobile phone.

Hot water will always be fresh and hygienic!

Additional advantages of the multitalent-control

- Simple operation with only two control knobs
- Operating menu, easy to follow and understand
- Large graphic display with clear graphic representation
- Can be placed in the living room
- Alternate cooling system is already integrated
- The number of revolutions of the circulation pump can be adjusted (speed control)
- Energy saving control of the circulation pump
- System can be easily extended

Technical **data**

TERRA (-HGL)	5 S/W	7 S/W	8 S/W	10 S/W	12 S/W	15 S/W	17 S/W	19 S/W	22 S/W	26 S/W	30 S/W	37 S/W	45 S/W
for brine application:													
Heating capacity at B0/W35 in kW	4,99	6,28	7,67	9,12	11,28	14,01	16,17	18,42	20,77	25,00	28,67	34,59	42,77
Heating capacity at B0/W45 in kW	4,83	6,12	7,43	8,84	10,83	13,49	15,76	17,67	20,00	24,32	27,99	33,39	41,48
Power input at B0/W35 in kW	1,24	1,57	1,91	2,24	2,77	3,34	3,83	4,38	5,18	6,23	7,15	8,55	10,60
Power input at B0/W45 in kW	1,58	2,00	2,40	2,83	3,44	4,12	4,74	5,37	6,38	7,74	8,88	10,00	13,20
Coefficient of performance (COP) at B0/W35	4,02	4,01	4,02	4,07	4,08	4,19	4,22	4,21	4,01	4,01	4,01	4,04	4,03
for groundwater application:													
Heating capacity at W10/W35 in kW	6,62	8,26	10,08	12,00	15,07	18,53	20,64	24,29	26,78	32,45	37,63	43,58	56,06
Heating capacity at W10/W45 in kW	6,43	8,06	9,84	11,52	14,50	17,90	19,87	23,42	26,11	31,78	36,96	42,43	54,72
Power input at W10/W35 in kW	1,32	1,65	1,94	2,34	2,94	3,65	4,07	4,78	5,50	6,70	7,75	9,00	11,50
Power input at W10/W45 in kW	1,71	2,09	2,51	2,99	3,69	4,44	5,02	5,71	6,75	8,23	9,40	10,52	14,10
Coefficient of performance (COP) at W10/W35	5,02	5,01	5,20	5,12	5,12	5,08	5,08	5,08	4,87	4,84	4,86	4,84	4,88
general data:													
Voltage	230V/50Hz - 3x400V/50Hz					3x400V/50Hz							
Refrigerant	R 407 C												
Dimensions in mm width	622	622	622	622	622	622	622	622	750	750	750	750*	750*
depth	762	762	762	762	762	762	762	762	762	762	762	1100*	1100*
height	1160	1160	1160	1160	1160	1160	1160	1160	1260	1260	1260	1300*	1300*

* in aluminium casing

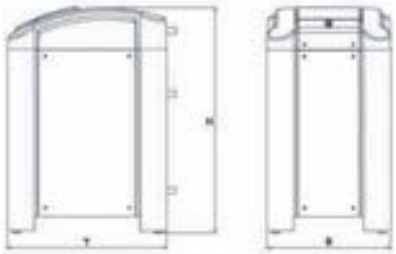
Performance data according to EN 14511 (temperature difference between inlet and outlet = 5°K)
B0/W35 = brine entry temperature 0°C, flow pipe temperature 35°C
B0/W35 = brine entry temperature 0°C, flow pipe temperature 45°C
W10/W35 = ground water entry temperature 10°C, flow pipe temperature 35°C
W10/W45 = ground water entry temperature 10°C, flow pipe temperature 45°C

Design variations:

TERRA HGL:
The additional heat exchanger for hot gas loading, the appropriate control valve, the loading pump and the multi talent regulator are already built in.

TERRA:
Heat pump without HGL technology, including the basic electrical equipment with maximum thermostat and control lamps, sliding flow pipe regulator also available.

TERRA - MAX:
Heat pump with high performance up to 200 kW, for commercial, office and industry buildings (detailed documentation as per seperate leaflet).



IDM heat pumps have the heat pump marks of quality.
This guarantees the highest level of safety and quality in terms of technology and service.

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