

# Combitherm

# HEAT PUMPS

FOR BUILDINGS & INDUSTRY FROM...

20 KW HEATING CAPACITY UPWARDS

SPECIAL FEATURES

*Geothermal energy, springs, rivers and lakes as heat source · Waste heat recovery from industrial processes · Heat and raw water, process water · Heating, cooling, natural cooling · A wide range of application · Customization · Integrated energy systems with combined heat and power plant, solar energy and natural resources · More than 35 years of experience*



**Combitherm**  
APPARATE- UND ANLAGENBAU

# Combitherm Presents...

Operator	Kruck + Partner GmbH & Co. KG,
	Heilbronn
Engineering office	Ingenieurbüro Pfähler + Rühl GmbH,
	Heilbronn
Year of construction	2005
Heating capacity	72 kW with + 50° C
	heating water temperature

The heat pump is using ground water from the close river Neckar as heat source. The recovered heat is used mainly for concrete core heating and radiant heating. The concrete core concept allows natural cooling in the summer time directly via the ground water. The energy efficiency evaluation is monitored by a scientific institution.



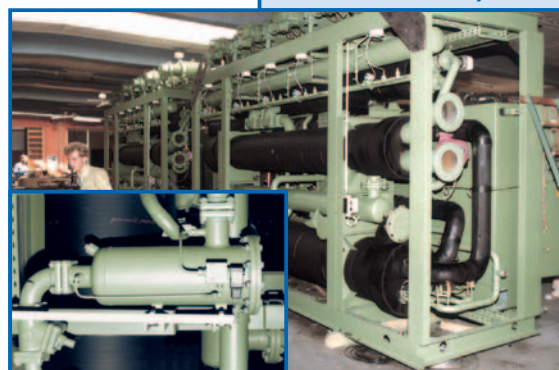
> Heilbronn Innovation Center HIP 2



Operator	Automobile manufacturer
Engineering office	Krebs Ingenieure GmbH, Ditzingen
Year of construction	1984
Heating capacity	2 x 970 kW with + 60° C
	heating water temperature

From the waste heat of industrial processes the heat is recovered at a comparatively high temperature level of +25°C. Two heat pumps with 5 screw compressors each raise the water temperature to a level usable for process heating. All-year operation of the plant ensures a high degree of efficiency.

Automobile Industry South Germany <



Operator	Community of Althengstett
Year of construction	1980
Heating capacity	342 kW with + 50° C
	heating water temperature

The heat pump system serves as unique heating installation for the entire school complex. Absorbers on the roof and various earth storage systems with plastic pipes are used as heat source. Depending on the actual heating demand and according to the external conditions the energy is taken from the ambient air of the solar absorbers or from the geothermal energy of the earth storage system.

> School in the Black Forest



Operator	Leisure and Family Park Mack KG,
	Rust
Engineering office	EnBW Energy Solution, Stuttgart
Year of construction	2004
Heating capacity	428 kW with + 45° C
	heating water temperature
Cooling capacity	327 kW with + 6° C
	cold water temperature

The climatisation profile of the hotel requires heating as well as cooling, during the transitional season even both at the same time. In winter, a spring provides the unit with ground water as heat source in heat pump mode. During summer time the spring serves for removal of excess heat from the unit's chiller mode. An integrated building management system ensures that all users are provided with exactly the required heating or cooling capacity in a highly efficient way.

Hotel Colosseo at Europapark Rust <



## ... Examples of Heat Pump Projects.

Operator	Alfred Kärcher GmbH & Co., Winnenden
Engineering office	Ingenieurbüro Förderer + Zimmermann, Backnang
Year of construction	2004
Heating capacity	55 kW with + 38° C heating water temperature
Cooling capacity	74 kW with + 16° C cold water temperature

The geothermal heat pump removes the heat directly via energy piles from the ground. If cooling is required during the transitional season natural cooling can be used without the need of electrical energy. With increasing cooling demand in summer time the system is switched over to chiller mode regenerating the ground heat.

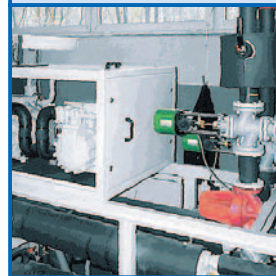


> Alfred Kärcher GmbH & Co. research building

Operator	Rexroth Group, Horb on Neckar
Year of construction	1998
Heating capacity	149 kW with + 57° C heating water temperature
Cooling capacity	114 kW with + 17° C cold water capacity

From the industrial production of the Rexroth Group several megawatt of energy accumulate, which are removed via cooling towers to the ambient air. During winter time the heat pump uses part of this waste heat increasing its temperature to a higher level thus reducing the load on the cooling towers. In the summer, the unit serves to cool the offices. The average COP of the system is > 5.

### Administration building of...



Brueninghaus Hydromatik GmbH <

Operator	SÜWAG Energy AG, Pleidelsheim
Engineering office	Ingenieurpartnerschaft H + H, Stuttgart
Year of construction	1984
Heating capacity	420 kW with + 51° C heating water temperature

To recover the required heat, water from a nearby river is conducted into a specifically designed water basin where the river water is cooled down all year round by means of large-size evaporator plates and a water turbine. 3 heat pumps with one screw compressor each ensure the workshop heating at any time.

> Workshop of SÜWAG Energy AG



Operator	Alcatel SEL AG, Bonndorf
Engineering office	Ingenieurbüro Jauch, Radolfzell
Year of construction	2001
Heating capacity	90 kW with + 70° C heating water temperature
Cooling capacity	66 kW with + 25° C cooling water temperature

Waste heat from the production process of injection moulding machines is led into a sprinkler basin, which is cooled by means of a heat pump. The energy is delivered to a conventional heating system. A double-purpose plant: the machines are provided with chilled water and the load on the existing heaters is significantly reduced. The operator

was awarded an environmental prize for this resource saving operating method.



Alcatel SEL AG Dunker engine works <



# Top Performance: The HEATTRANS-Process

Operator	Gebäudemanagementgesellschaft mbH Frankenberg/Saxony
General Engineering	Rasche Wärmetrans GmbH, Leipzig
Engineering office	Planungsgruppe U. Schmid, Göppingen
Holder of patent	Mr. Karsten Rasche, Ingenieurbüro Rasche Wärmetrans
Year of construction	2005
Heating capacity	1430 kW with + 65° C heating water temperature

The heating plant in Frankenberg provides a residential area as well as various industrial and municipal consumers with a total heat capacity of more than 8000 kW making use of a district heating network with 14 stations. Before retrofitting the heating plant with the HEATTRANS device heat was generated exclusively by gas boilers.

The HEATTRANS process is a patent-registered procedure allowing almost total utilisation of the natural gas combusting process. It is possible to obtain a degree of combustible utilisation of 160 % and more. Additionally, regulating energy from the cogeneration of heat and power can be supplied within seconds to the national grid.

The system includes central heating boilers and a block heating station, each with exhaust heat exchangers, as well as a central control system for integrated control of the entire complex. The high energy efficiency is a result of the usage of low temperature geothermal heat that is raised to a high water temperature required for the heat supply by heat pumps. It is first of all the exhaust heat of the gas boilers and of the block heating station, which serves as heat source. The heat pump allows to reduce the exhaust gas temperatures to a relatively low level of 30-35° C thus using the energy potential of the combined heat and power cycle to the greatest extent possible. In addition, the lost radiant heat of the boilers and CHP and - particularly during summer time - the ambient air serve as heat source for the HEATTRANS-process.

In already existing district heating plants (heating capacity over 1000 kW) the installation has a payback period of 4 to 7 years. Existing combined heat and power units can be integrated, stepwise expansion of the system is possible.



> Heat plant Frankenberg/Saxony



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