

Calora Heat Pump

AGO Energie + Anlagen



Figure 1: The Calora heat pump

Summary of technology

The base of the Calora heat pump technology is the Os- enbrueck compression heat pump process with solution cycle. AGO has further developed that cycle to achieve higher temperatures and efficiencies based on market ready components. The refrigerant is an ammonia/water solution.

Calora heat pumps are customized closed loop electrical driven heat pumps with up to three compression stages and up to three compressors in parallel per stage. Depending on temperatures and capacities open oil lubricated reciprocating or screw compressors are used.

As heat source any liquids, especially cooling water or river water, can be used as well as exhaust air or ambient air. For ambient air applications a special defrosting mode is developed, which enables very efficient defrosting in parallel to heating supply. As heat sink hot water, superheated pressurized water, thermal oil and even steam can be supplied. The compressors as well as the solution pump are frequency controlled, which

enables low part load operation until about 30 % of the nominal capacity.

Actually, two plants in industrial capacity and temperature ranges are sold.

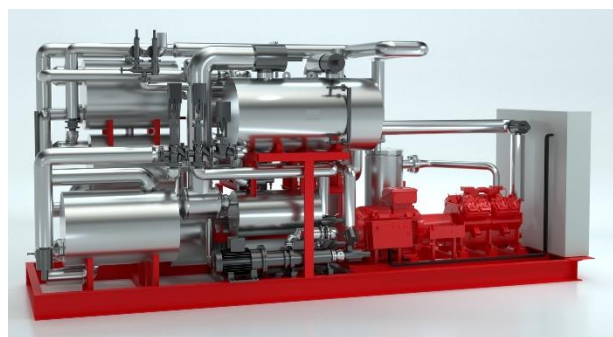


Figure 2: 3D assembly of the heat pump

Table 1: Performance.

T _{source,in} [°C]	T _{source,out} [°C]	T _{sink,in} [°C]	T _{sink,out} [°C]	COP _{heating} [-]
15	10	65	85	2,9
85	70	90	130	5,1



Project example

River water heat pump at Stadtwerke Lemgo

Heat source is river water from the small river Bega, heat sink is the district heating network of the City of Lemgo:

- River water temperatures differ between 4 °C and 20 °C during the year. The heat sink temperatures differ between 78 °C and 85 °C at a district heating return temperature between 50 °C and 70 °C.
- The measured COP is depending on the actual temperatures between 2.7 to 3.2.
- After fixing some teething problems, it runs efficiently and reliably.
- The heat pump is part of an iKWK project, which is supported by funding of the German government.

FACTS ABOUT THE TECHNOLOGY

Heat supply capacity: 0.7 MW to 10 MW

Temperature range: heat source temperatures from -10 °C to 90 °C

Heat sink temperatures: From 50 °C to 160 °C

Max. steam pressure: 3.0 bar (140 °C)

Max. temperature lift: 110 K

Working fluid: R717 - R718 (ammonia/water-solution)

Compressor technology: Piston, screw

Specific investment cost for installed system without integration: The specific investment costs are related on the specific solution and between 800 €/kW and 1600 €/kW

TRL level: 8-9 depending on the specific type

Expected lifetime: -

Size: weight: 20 to 70 tons; size: from 2.5 m x 7 m x 3.6 m to 8 m x 12 m x 6 m

Contact information

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All information were provided by the supplier without third-party validation. The information was provided as an indicative basis and may be different in final installations depending on application specific parameters.

