

enexio

Thermal heat pumps

Absorption heat pumps



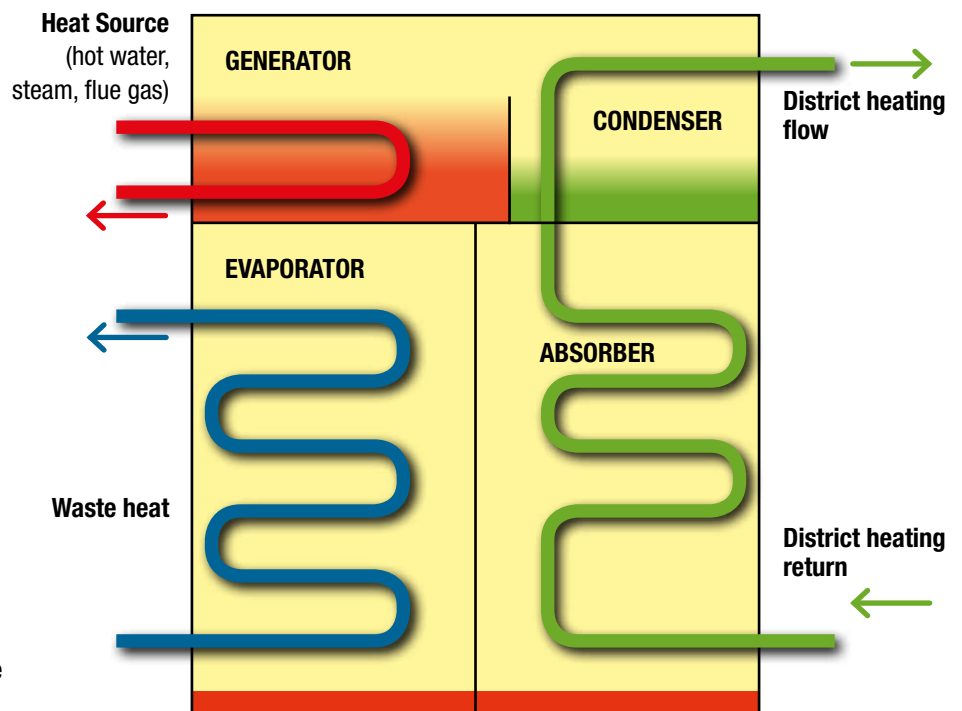
Utilisation of surplus heat
and maximum energy efficiency

Operation

An absorption heat pump consists of 4 heat exchangers, which together act as a thermal heat pump. The machine uses water as a coolant and a salt (LiBr) to absorb water vapour at low pressure.

The absorption heat pump is powered by a generator which is supplied with energy in the form of hot water, steam or flue gases. It can also be direct fired with natural gas. The machine's evaporator is supplied with energy at a low temperature. This low temperature energy can, for example, be supplied from industrial waste heat or by cooling the flue gas in biomass boilers. The energy absorbed is deposited in the machine's absorber and condenser at a higher temperature and can thus be utilised as district heating.

Conceptual design of an absorption heat pump



An absorption heat pump can also be used as a chiller, for example in a district cooling system. If there is a simultaneous heating requirement, the chilled water circuit of the evaporator can be used for cooling at the same time as the absorber/condenser circuit is used for heating. When working as a chiller only, the energy from the absorber/condenser circuit is deposited in a cooling tower.

- **Cooling capacity: 150 kW – 11.6 MW**
- **Heating capacity: 365 kW – 28.5 MW**



Applications

An absorption heat pump is a natural part of a green and efficient energy system. The machine is ideal for utilising heat at low temperatures, thus recovering energy that would otherwise be wasted. Unlike a conventional heat pump, the absorption heat pump is fueled by thermal energy, which means minimal electricity consumption and very low operating costs.

At district heating plants, the absorption heat pump is ideal for flue gas cooling where the flue gas from, for example, a biomass boiler can be cooled right down to 10°C, thus maximising the use of the energy in the fuel.

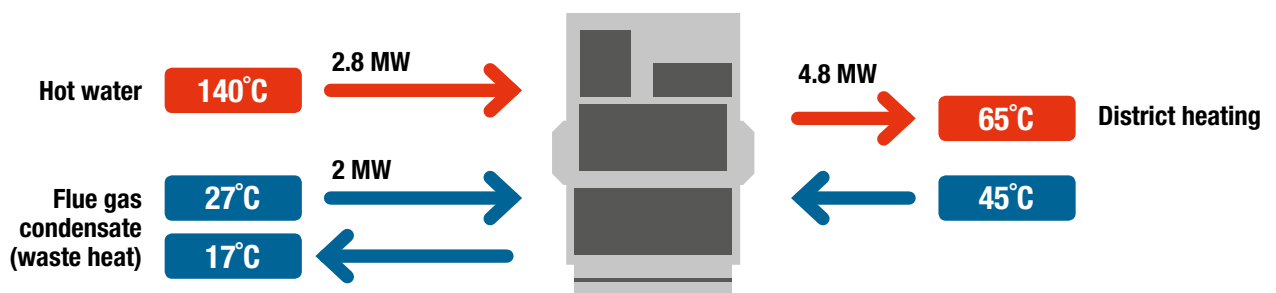
The absorption heat pump can also be used to utilise surplus heat and optimise the performance of solar heating systems.

When gas is used as the powering energy, the absorption heat pump acts as a gas boiler with an efficiency of 170%. While the intermediate circuit of the absorption heat pump can be used for district heating and heating purposes, the cold circuit from the evaporator can be used for cooling, either as a locally positioned refrigerating machine or in a district cooling system.

- Utilisation of surplus heat
- Optimisation of solar heating systems
- Flue gas condensation
- District cooling

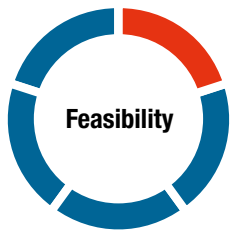


Example – Flue gas condensation



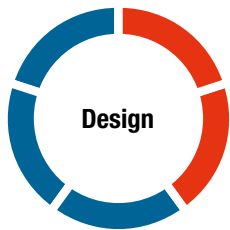
Partner in all phases of the project

We believe that the optimum technical solution is found through dialogue and close cooperation. At Enexio, we contribute with technical sparring through all phases of the project, and we are there from conception to the installation, operation and maintenance of the finished plant.



Feasibility

Heat balances
Savings calculations
Financial calculations



Design

Sizing
Performance calculations
Product selection



Installation

Initiation
Customisation
Integration with SCADA



Commissioning

Operational deployment
Training and education
Test and documentation



Operation and maintenance

Service agreements
Remote monitoring
Preventive maintenance



Increased efficiency
Improved economy
Green district heating