HeatBooster Heaten

Figure 1: HeatBooster VHTHP

Summary of Technology

Heaten's patented very-high-temperature heat pump is based on an efficient, durable, and highly flexible piston compressor. By using electricity, the HeatBooster turns waste heat into process heat with a value, and is the only technology that can provide an output temperature up to 200°C.

- The heart of the heat pump is the biggest piston-based compressor on the market. The V4 has a maximum swept volume of 1,476 m^3/h. The V16 has a maximum swept volume of 5,904 m^3/h.
- The HeatBooster HBL4 and HBL16 are closed-looped heat pumps in three different variations, water/water, water/steam, and steam/steam which could be installed in systems as two-stage, parallel or cascade.
- The suitable heat transfer fluid on the source and sink sides is water or steam. The temperature range for the heat source is 20 – 150°C, and the temperature range for the heat sink is 80 – 200°C.
- The HeatBooster spans from 1 to 8 MW_{th} per heat pump. HeatBooster systems can deliver more than 50 MW_{th}.
- There are vast opportunities for implementation of Heaten's technology. Please see "Project example" for key industries and processes.
- The table shows typical expected performances under relevant operating conditions. The performance data are based on the actual performance of an industrial small scale 200 kW_{th} pilot system, including design and performance improvements.
- The technology is proven with machines with more than 30,000 operational hours in the field without any maintenance needed.
- Heaten's piston compressor manufacturing can be scaled in standard heavy-duty diesel engine facilities worldwide.
- The HeatBooster has a rapid start-up and shut-down time and has a turn-down ratio down to about 20 %. It can handle rapid load changes.
- Heaten is currently scaling up the current technology platform to a product family in the megawatt range.

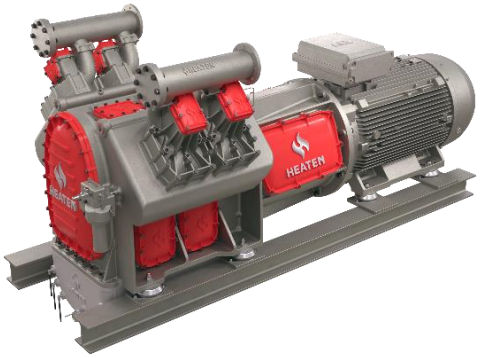

Figure 2: HeatBooster compressor

Table 1: Performance.

Example	$T_{source,in}$	$T_{source,out}$	$T_{sink,in}$	$T_{sink,out}$	$P_{sink\ out}$	COP
#	[°C]	[°C]	[°C]	[°C]	[bar(a)]	[-]
1*	80	60	95	120	2	3.4
2	40	30	80	90		3.3
3*	95	85	95	140	3.6	3.9
4	120	115	155	165		4.6

**Direct steam supply*

Project example

Customer projects are confidential and differ in application and economics, depending on industry needs, customer asks, and regulatory environment.

Heaten's very-high-temperature heat pumps can be applied in the following key industries: Pulp & paper, food & beverages, chemicals, District Heating, and new industries like CCS, DAC and PtX.
Key processes are: Drying, boiling, evaporation, sterilization, distillation and tempering. Please see Table 1. for main performance indicators.

Key success areas for the application of heat pumps are system engineering and integration at customer sites and close cooperation between heat pump suppliers, and customers EPC's.

FACTS ABOUT THE TECHNOLOGY

Heat supply capacity: 1-8 MW_{th} per HeatBooster.

Temperature range: Up to 200°C (current hardware is prepared for up to 215°C).

Working fluids: HCs and HFOs.

Compressor technology: Piston compressor.

Specific investment cost for installed system without integration: Price range from 280 to 450 €/kW_{th} (depending on the application and the version of the heat pump).

TRL level: 7-9. Heaten's technology has achieved TRL 9. TRL 7 refers to the individual applications of the client.

Expected lifetime: Low-maintenance design and service life of 20 years.

Size: HeatBooster can be installed in cascaded, parallel, and/or two-stage systems. This allows operation in large scale applications with more than 50 MW_{th}.

Contact information

Heaten
post@heaten.com
(+47) 380 45 000
http://heaten.com

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.