



Boosting CHP efficiency with gas-to-liquid technology

Customer: Hubert Tippkötter GmbH, Warendorf, Germany



Hubert Tippkötter GmbH is an innovative designer and manufacturer of complete combined heat and power (CHP) systems, in operation since 1970. Based in Warendorf, Germany, the company engineers flexible solutions that generate anywhere from 30 to 2100kw of electrical power, and which are always fully adapted to match specific customer circumstances.

By simultaneously generating electricity and re-using the resulting heat, CHP, or cogeneration, is a highly efficient solution for a number of modern applications. Like all CHP manufacturers, Tippkötter continuously works to optimize their technology and get every possible extra percentage point of efficiency out of their systems. This has included considering new ways to take advantage of the heat transfer involved in cooling the modified turbo-charged engines that drive the systems.

However, this is easier said than done. CHP systems typically use air-air coolers, with ambient air cooling the engine's compressed charge air to the required inlet temperature of 75°C. It has traditionally been difficult – if not outright impossible – to reuse the energy generated through this process due to the challenges of working with gas media. As a result, there have been limits to the potential efficiency that can be achieved with the system as a whole.

The optimal charge air cooler solution

Tippkötter has been able to overcome these challenges by equipping their CHP plants with Alfa Laval gas-to-liquid plate heat exchangers. In contrast to traditional air-air cooler technology, Alfa Laval’s gas-to-liquid design makes it possible to use water as the cooling medium. This improves the overall energy balance by as much as 5% of the engine’s power.

GL model heat exchangers use cold water in a countercurrent flow arrangement to cool a relatively smaller amount of compressed charge air to the



The prototype heat exchanger in the lab.



Example specifications for Tippkötter CHP system

Engine

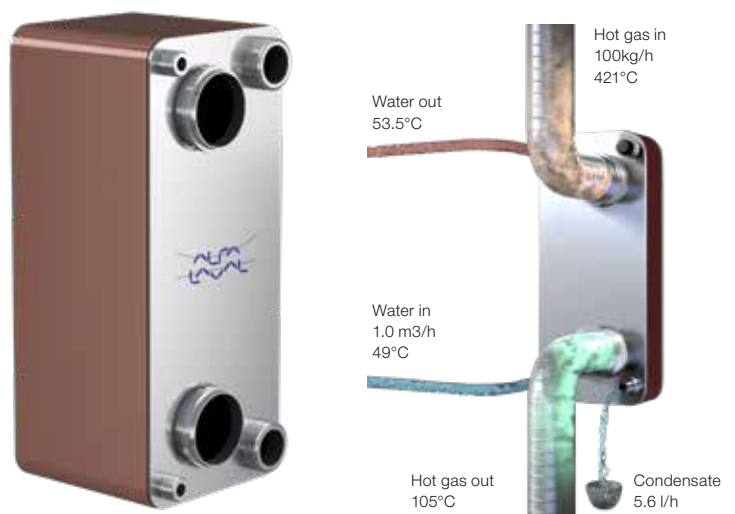
Engine type: Diesel
 Motor power: 120 kW
 Electrical power: 50 kW

Heat exchanger

Type: Alfa Laval GL gas-to-liquid brazed plate heat exchanger
 Material: Stainless steel with copper brazing
 Number of plates: 10
 H x W x D: 320 x 727 x 48 mm
 Weight: 22 kg

correct inlet temperature. An additional advantage of the GL design is that all connections are integrated in the unit, including two connections for gas, two for water and one for condensate. The result is an ultra-compact heat exchanger, which makes installation easier, quicker and more cost-effective for Tippkötter and allows them to provide a smaller system footprint for their customers.

The use of Alfa Laval GL gas-to-liquid heat exchangers has played a major role in Tippkötter’s ongoing development to drive forward the optimization of their CHP technology. Today, the company can now proudly offer their customers cogeneration efficiency of 91% or higher!



GL100 heat exchanger model.

How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com

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Alfa Laval reserves the right to change specifications without prior notification.