



Residential heat pump with Alfa Laval heat exchanger and R290 refrigerant delivers sustainable savings

WOLF GmbH, Mainburg, Germany

Heat pumps are an affordable pathway forward to energy security. German heat pump manufacturer WOLF turned to Alfa Laval to help develop its residential propane heat pump. The result? The WOLF CHA Monoblock with the Alfa Laval CB65 brazed plate heat exchanger, a highly efficient heat pump that uses less energy than traditional fossil fuel-based furnaces and less refrigerant than conventional heat pumps. Using the CB65 with the natural, non-toxic R290 refrigerant, the CHA Monoblock is paving the way to more sustainable heating and cooling – today and tomorrow.



Heat pumps boost sustainability

Among the fastest-growing and most economical ways to accelerate decarbonization, heat pumps are up to five times more efficient than natural gas boilers.¹ When the European Union set out the the F-Gas Regulation with the hydrofluorocarbon phase-down, WOLF began to pioneer the development of efficient residential air-to-water heat pumps. Collaborating with long-term partner Alfa Laval, WOLF incorporated the compact CB65 heat exchanger as a vital component to evaporate and condense the natural refrigerant in the CHA Monoblock heat pump circuit.

“Alfa Laval shares our sustainability commitment to reach net zero through innovation,” says Mr. Bernhard Siegmund, Project Manager at WOLF GmbH. “Plus, no other heat exchanger, which was available at that time, offers a better efficiency level in combination with the natural refrigerant R290 than the Alfa Laval CB65.”

Robust, anti-freezing design

After reviewing potential heat exchangers for size, efficiency and pressure drop on the water side, WOLF chose the Alfa Laval CB65. Taking advantage of Alfa Laval’s anti-freezing knowledge and expertise saved the German HVAC company time, money and resources.

“One of the biggest challenges in designing an efficient heat pump is avoiding the risk of freezing inside the plate heat exchangers to ensure the refrigerant does not mix

¹ IEA (2022), The Future of Heat Pumps, IEA, Paris
<https://www.iea.org/reports/the-future-of-heat-pumps>

with the water,” Mr. Siegmund notes. “Our team of engineers and designers saved at least one month in the lab, thanks to the calculation tool from Alfa Laval. Constructive dialogue with Alfa Laval included sharing actual performance data from real-life installations so our results were highly accurate.”

The Alfa Laval CB65 brazed plate heat exchanger selected as the heat pump’s condenser proved to be a good fit from the start. Minimalistic design. Ease of assembly. Highly efficient heating and cooling. Unparalleled engineering. Able to withstand freezing even during a power outage. That’s what resulted from WOLF and Alfa Laval’s close collaboration and iterative design process.

High-efficiency heat pump uses a green refrigerant

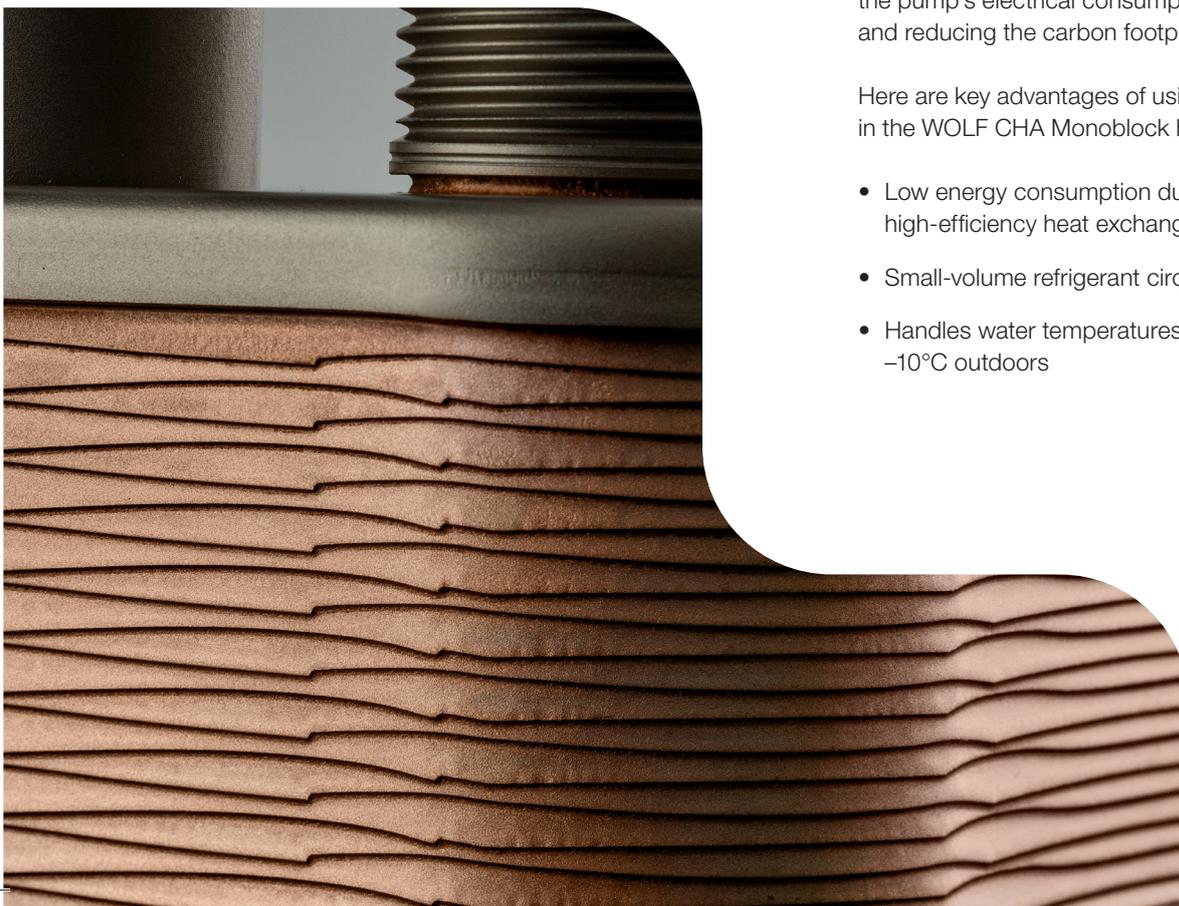
With a coefficient of performance (COP) of 5.7 (A7/W35), the WOLF CHA Monoblock heat pump delivers a higher efficiency, uses less energy and reduces operating costs compared to natural gas boilers. Moreover, using an efficient natural refrigerant was a key design criterion. WOLF decided on propane as the refrigerant; R290 has a global warming potential of less than one, making it an excellent choice to help accelerate decarbonization.

Why WOLF chose an Alfa Laval brazed plate heat exchanger for its heat pump

The compact Alfa Laval CB65 brazed plate heat exchanger works as a condenser to heat the water circuit and tap water. In reverse mode, the condenser becomes an evaporator for cooling the residential water circuit. Low condensing temperatures provide greater efficiency, and the asymmetric channels optimize energy efficiency. A low refrigerant charge combined with a lower pressure drop on the water or brine side reduces the pump’s electrical consumption, increasing the COP and reducing the carbon footprint.

Here are key advantages of using the Alfa Laval CB65 in the WOLF CHA Monoblock heat pump:

- Low energy consumption due to a compact, high-efficiency heat exchanger
- Small-volume refrigerant circuit
- Handles water temperatures of 70°C indoors at -10°C outdoors



“Quality and environmental stewardship are key. After 20 years of working with Alfa Laval, we know that we can count on both.”

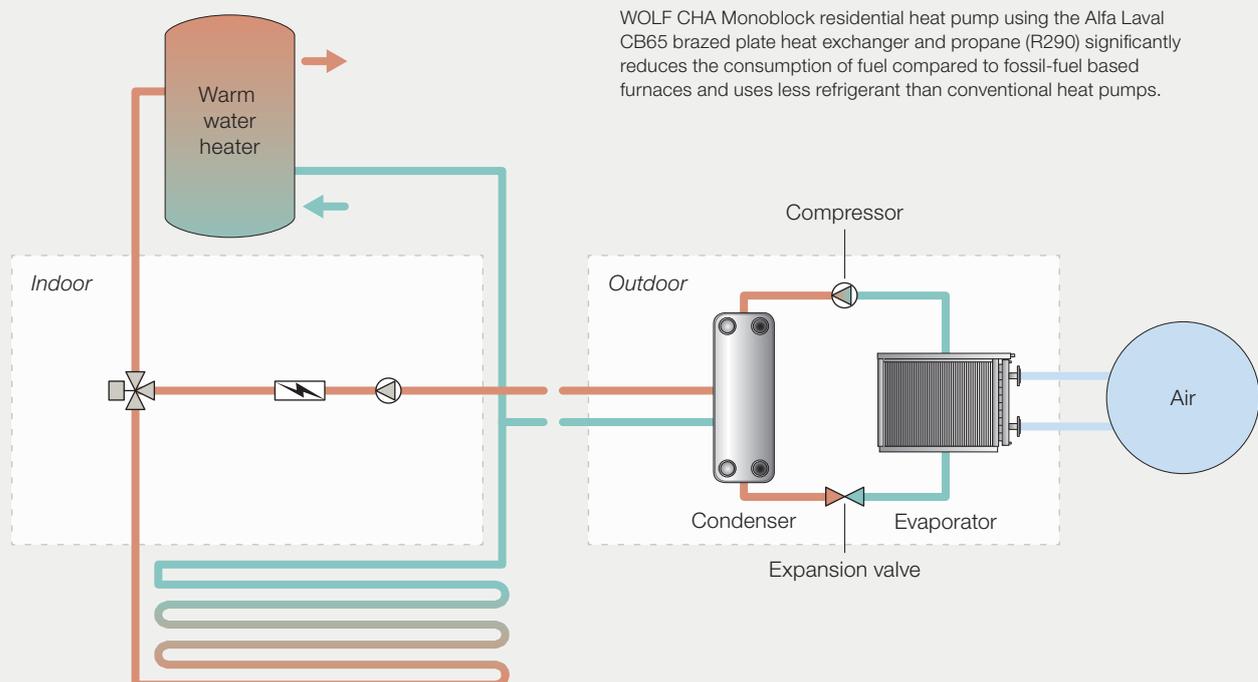
Mr. Bernhard Siegmund, Project Manager at WOLF GmbH



A strong partnership contributes to the renewable energy transition

Rising energy prices, readily available technology, strong government incentives and reduced heat pump costs are spurring demand for the WOLF CHA Monoblock. Introducing heat pumps to newbuilds and older housing stock, such as single-family homes, promises to accelerate the heating sector’s decarbonization.

Since 2003, WOLF has collaborated with Alfa Laval on innovative solutions for commercial and residential heat systems. The German HVAC supplier’s shift in focus from fossil-fuel heating systems to renewable energy-based heat pumps makes good sense for the future, and their commitment to quality and sustainability is unwavering. The company is ISO 9001- and ISO 14001-certified and requires the same of its suppliers.



WOLF CHA Monoblock residential heat pump using the Alfa Laval CB65 brazed plate heat exchanger and propane (R290) significantly reduces the consumption of fuel compared to fossil-fuel based furnaces and uses less refrigerant than conventional heat pumps.

Looking ahead

The International Energy Agency (IEA) reports that the global energy crisis is driving a surge in demand for heat pumps. Transitioning to more energy-efficient, sustainable heating and cooling solutions is essential for energy security and affordability. To that end, WOLF plans to continue collaborating with Alfa Laval to roll out new residential and commercial heat pumps using propane as the natural refrigerant. Since WOLF launched the CHA Monoblock in 2019, the demand for its residential heat pump has increased about tenfold year-over-year. In 2023, the company anticipates its residential heat pump sales will double.

“We are expanding our residential CHA range beyond the 7 kW and 10 kW capacities to larger sizes for residential customers and will roll out our 16 kW (max. power A-7/W35) heat pump in 2023,” says Mr. Siegmund. “Within three to five years, we plan to launch commercial heat pumps using natural refrigerants and hybrids that combine a heat pump with a conventional heating system.”

Heat pumps have the potential to reduce global carbon dioxide emissions by at least 500 million tonnes in 2030, according to the IEA. WOLF and Alfa Laval plan to continue to work together to accelerate the transition to cleaner energy.

Alfa Laval CB features boost performance



FlexFlow™
Superior thermal performance



IceSafe
Controlled, non-destructive freezing



PressureSecure
Unparalleled strength for demanding duties



REFUTURE
A future-proof investment for tomorrow's refrigerants



ValuePlus
Total support with value-adding options to fit your needs



Alfa Laval CB brazed plate heat exchangers provide efficient heat transfer with a small footprint. The CB65 is the heat exchanger of choice for the WOLF CHA Monoblock residential heat pump.

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.