

Case story | Condair

## 26 Danfoss PAHT pumps keep things cool at Facebook's first European data center

**100%**

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When Facebook chose Condair to provide an evaporative cooling and humidification system for a massive new data center in Luleaa in northern Sweden, Condair called on Danfoss to provide the high-pressure pumps.

Not only must the pumps distribute up to 13,000 liters of water per hour – they also have to do it with zero risk of oil contamination to keep hygiene intact throughout the center's 28,000 m<sup>2</sup>.

**The challenge:****Pump 13,000 liters of mineral-free water per hour at high-pressure – without using oil-based products for lubrication**

Most pumps need oil-based lubricants to keep moving parts working smoothly. And in most cases, lubricants are not a problem: the risk of contamination from well-made pumps is low, and even if there is some small oil discharge, the consequences of a minor leak are minimal.

In advanced evaporative cooling and humidification applications, however, things are different. Even infinitesimal amounts of atomized oil droplets can be enough to tip the balance between "clean" and "not clean" – and jeopardize staff health, hard-won ISO 22000 certification as well as an entire business model.

"You could say that we have bet the ranch on Danfoss's PAHT pumps," explains Kasper Gissel, Condair's managing director in Denmark. "There are plenty of other companies that provide adiabatic cooling and humidification systems for data centers, but we're not like our competition. We work in health care facilities as well as food processing, manufacturing, data and other industries. The niche we want to dominate is characterized by zero contamination – not low contamination. Legionella and other airborne pathogens like nothing better than a little oil-based fertilizer to proliferate, and that's the last thing air treatment needs. We compete on our ability to provide consistently contaminant-free humidity, and Danfoss pumps are a cornerstone of our competitive strategy."

*Kasper Gissel  
Managing Director Condair Denmark*



**The Solution:**  
**Condair's ML System® with Danfoss**  
**high-pressure PAHT pumps**

The ML System® supplied by Condair humidifies and cools Facebook's massive space of 28,000 m<sup>2</sup>. The innovative solution has a cooling effect of 8.8 MWh, but uses as little as 63 kWh per hour to achieve it.

Energy consumption for evaporative cooling dips as low as 0.005 kWh per kW of cooling. In conjunction with other energy saving measures, the ML System® slashes nearly 50% of energy costs compared to traditional cooling methods. "Danfoss PAHT pumps set the standard for clean evaporative cooling and humidification systems," says Gissel. "The pumped medium does the lubrication, and when this medium is mineral-free water, this places incredible demands on the pumps' metallurgical makeup and tolerances. We choose PAHT pumps for their cleanliness, but in a data center where 100% uptime is a must, reliability and low maintenance play a major role as well. We know how these pumps are made and how they perform; after all, Condair's engineers worked closely with Danfoss's to design them to our specifications."

In addition to providing contaminant-free humidity, Condair's ML System® also maintains humidity at optimal levels to keep electrostatic discharge in check and prevent damage to sensitive electronics – and even worse – data loss. Nobody wants to miss out on a status update because of static electricity.

**The results:**  
**One of the most energy efficient data centers ever built is**  
**also one of the world's cleanest**

Facebook's Luleaa data center came on line in December 2012, and has since proven to be one of the world's most advanced and energy efficient with power usage efficiency (PUE) of just 1.05. It gets its electricity exclusively from hydropower and is thus 100% reliant on renewable energy resources. And it is clean.

"Server farms generate huge amounts of heat," concludes Gissel, "and cooling them is a major source of energy consumption. Facebook takes its environmental pledges seriously, and deserves to be "liked" both for saving energy and for radically reducing the risk of airborne pathogens for the people who maintain the servers."



*The Danfoss PAHT 6.3 high-pressure pump is part of the cooling system that Condair has designed for the Facebook data center in Luleaa.*

*Condair was established in 1948 and is the world's leading provider of commercial and industrial humidification, with a market share of over 20%. Condair products are sold in more than 70 countries. Condair maintains production in Switzerland, Denmark, Great Britain, Germany, Canada and China.*

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