



NorthC deploys MIXIT for chip cooling in a high-power and sustainable data centre

Optimization and energy efficiency of the cooling systems are ongoing focus areas in Data Centres. Heat produced by servers needs to be dissipated. Doing so in a more sustainable way allows for considerable savings. And that's exactly what Grundfos' MIXIT solution does.

One of NorthC's data centres is located at the High Tech Campus in Eindhoven. NorthC has over 10 data centres spread across the Netherlands, and several sites in Germany and Switzerland. CTO Ronald van den Bosch describes the application of Grundfos' MIXIT at the data centre on the High Tech Campus, and how it fits in with NorthC's sustainability philosophy. "A data center generates an enormous amount of heat. We've been exploring ways to use this heat effectively through heat exchange for quite some time. At our location in Rotterdam, for example, we plan to use a thermal energy storage system (TES) to partially heat 10,000 homes with residual heat. However, while the heat supply from the data center remains constant throughout the year, the demand from the homes does not. That's why a substantial buffer is needed."

CO₂-neutral by 2030

NorthC aims to operate carbon-neutral by 2030. To achieve this, the company has defined several key pillars: green hydrogen, renewable energy, reuse of residual heat, artificial intelligence, and modular construction.

Green hydrogen plays a crucial role in reducing the carbon footprint of emergency power systems. The location in Groningen and the second data centre in Eindhoven are already equipped with this technology. Moreover, all of the company's data centres run entirely on renewable energy, and every new facility is prepared to share residual heat. Artificial intelligence is used to monitor ambient conditions within the data centres, ensuring optimal control and energy efficiency. AI-driven pilot projects further optimize layout and cooling performance. The modular construction approach ensures that new facilities are only built when needed to expand capacity, minimizing unnecessary resource use.

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Possibility in every drop

Chip cooling

“At this data centre, we applied chip-level cooling, using water as a cooling agent for the first time,” says Van den Bosch. “The energy density of chips keeps increasing, along with the associated high temperatures - reaching up to 70 °C. This demands the most efficient cooling possible. Each chip is fitted with a small cooling block, and cooling water is circulated through the server via flexible hoses to extract heat directly at the source. The temperature shifts very quickly and very significantly, and the MIXIT-solution responds with extremely high speed and accuracy. The effectiveness and efficiency are exceptional, which is why we’re seeing a clear shift from air cooling to liquid cooling. As computing power continues to grow, so does the amount of heat that needs to be managed. Water can dissipate up to



From left to right: Nico Verdonck and Ronald van den Bosch

four times more energy than air. Only oil performs better - far better, in fact. Oil cooling is done via immersion cooling, where servers are submerged in a non-conductive fluid. But that requires a modified infrastructure, whereas chip-integrated liquid cooling can be implemented within the existing architecture.”

From new product to proof of concept

The company responsible for NorthC’s technical installations is Hamer, a long-time partner of Grundfos. Verdonck explains that the proof of concept was developed through close collaboration, and that alignment from the very first moment was essential. NorthC was already familiar with Grundfos’ quality, but Van den Bosch particularly appreciated the approach during the preliminary phase of the first MIXIT implementation. “We worked together intensively to achieve the projected result. Grundfos played a truly important role in that process. When deploying a new product for such a critical function, you need to work together to ensure it performs as intended—just as you envisioned it together beforehand. Not every supplier is willing to think that far ahead with you. Grundfos took that responsibility, allowing us to deliver on our promise to our customers.”

“ Chip cooling needs to respond quickly, and the temperatures are higher than with conventional cooling. With MIXIT, we now have a system that requires no intervention — it’s a worry-free solution that regulates optimally. ”

Each of the three parties contributed their expertise to validate the system. “The project started in 2021 and was delivered mid-2022. Nearly three years later, it’s running flawlessly,” says the satisfied client. “I think it’s worth mentioning that the system requires little to no maintenance, and that the MIXIT operates with high reliability.”

Standardised design

The MIXIT-solution also makes a significant contribution to the aspect of modular construction, thanks to its standardised design. Van den Bosch: “We have complete skid-mounted modules built by the installer, which are then transported as turnkey units to the desired site. The installer also integrates all components and infrastructure, including (emergency) power connections, pump sets and sensors. Depending on the required capacity, we supply several skids, each with a fixed output. Specifications may sometimes vary slightly, based on location or specific customer requirements. But working with standardised modules greatly improves maintenance efficiency and helps reduce our carbon footprint. It reduces engineering hours, speeds up construction and minimises logistics.



For a greenfield location, where we are building a completely new data centre, the construction time is approximately thirteen months. That is extremely fast. Of course, that requires having the building permit in place and securing the sufficient power connection - currently the biggest challenge. When the project is about upgrading or integration into existing sites, we can deliver in six to twelve months.”

Optimizing for tomorrow

As chip performance increases, liquid cooling is becoming ever more important, Van den Bosch notes. “We always want to be one step ahead. The trend is heading towards 300, 400, even 500 kW per rack. Chip cooling needs to be highly responsive, as the temperatures exceed those seen in conventional cooling systems. With MIXIT, we now have a system that requires no attention; it is carefree and regulates conditions optimally.”



NorthC: Sustainability at the Core

Van den Bosch observes that new technologies offer better options for heat exchange. IT consumes a lot of energy due to the intensive use of digital services that require significant computing power. This demand is concentrated in data centers.

NorthC demonstrates a different approach with its EIN-01 location: less than 20% of the total energy consumption there is used for cooling and securing the data center—a performance that is far from standard elsewhere.

“Precisely because the sector is under scrutiny, we always aim to go the extra mile and lead the way in sustainability. “For example, by deploying innovations and artificial intelligence to make processes smarter and more efficient.”

NorthC’s data centers are medium-sized, stand out for their sustainability, and focus on regional service delivery. “Any company can come to us to rent square meters. This is especially interesting for organizations that don’t want to rely on the cloud such as hospitals, municipal governments, pension funds, financial institutions, and high-tech companies. IT firms that provide hosting services are also among our clients.

Our core business is the rental of secure, high-availability space, complete with redundant power supply, cooling and physical security. System uptime must be guaranteed 24/7. Security — in every aspect — is paramount, while at the same time we strive to offer our customers maximum flexibility. The data center we’re visiting is connected to the heating network of the High Tech Campus Eindhoven. Residual heat from the servers is supplied to various buildings on the campus.

“This was accounted for during the design phase. And wherever there’s a local initiative near our sites to participate in local heat exchange initiatives, we actively contribute.”

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Possibility in every drop

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