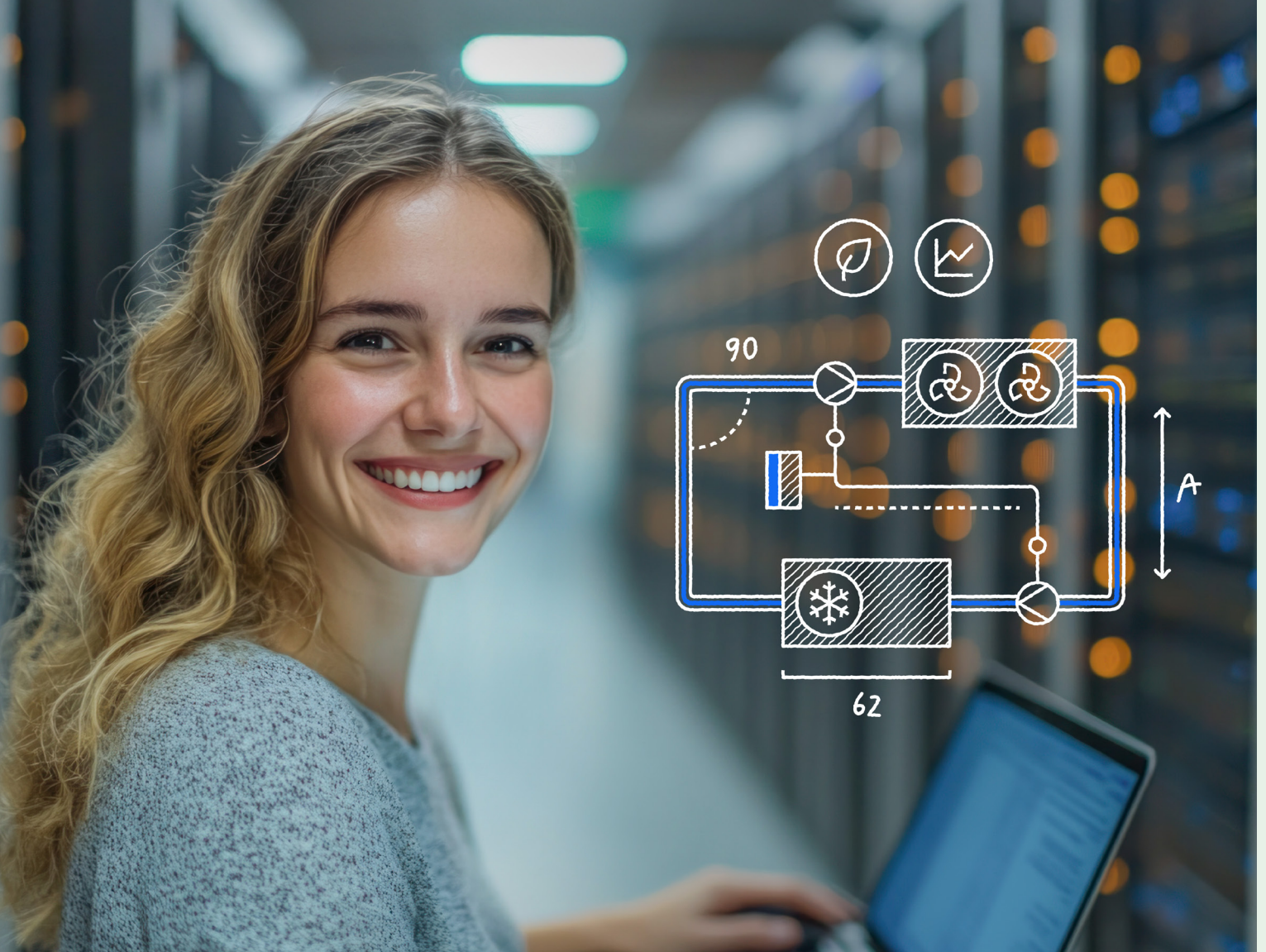




Pioneering green data centers

Efficient water solutions
for effective data flow

Cool your data center and meet your sustainability and redundancy goals with our high-efficiency, energy-saving pumping solutions.

GRUNDFOS 

grundfos.us/datacenters

Possibility in every drop



Energy production is responsible for

73.2%

of total greenhouse gas emissions ¹

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¹ <https://ourworldindata.org/ghg-emissions-by-sector>

The rising demand for data centers

Data centers power our digital world, and as demand for data grows, so does the need for more sustainable and efficient solutions. Evolving technologies like Artificial Intelligence (AI), machine learning, and high-performance computing (HPC) are increasing rack densities, adding to the challenge of cooling and water management.

Grundfos develops reliable, energy-efficient pumping and water solutions to help data centers move towards achieving their sustainability goals. With a global presence and over 80 years of experience, we deliver standardized solutions that meet industry demands while adapting to regional and local requirements.

Why Grundfos?

We are the first water solutions company with a Science-Based Target-approved Net Zero goal

By 2030

- Reduce absolute Scope 1 and Scope 2 Greenhouse Gas (GHG) emissions by 50%
- Reduce absolute Scope 3 GHG emissions by 25%

By 2050

- Reduce absolute Scope 1, Scope 2, and Scope 3 GHG emissions by a minimum of 90%

Our solutions help data centers by bringing down the PUE and WUE to the most ambitious sustainability targets



Source

Whatever your water source, we have an efficient system to get your water to where it is needed.

At the right flow, at the right pressure and at the right time.



Treat

We ensure your water source is of the correct quality for your distribution systems.

In the most efficient way, utilizing fewer chemicals, reducing waste, while maximizing quality.



Distribute

Within water distribution, ensuring the right flow, at the right pressure, at the right delta T, and at the right time is our prerogative.

Doing it the most energy-efficient and water-saving way is our mission.



Discharge

Maximizing water reuse in your systems and minimizing waste is our focus within the discharging process.

Therefore, our drainage systems can be incorporated into rainwater harvesting units or water reuse systems.



Solving critical data center challenges

At Grundfos, we believe it's possible to cool data centers without warming the planet. That's why we share a sense of responsibility with the data center industry that drives us towards more energy-efficient solutions, helping you exceed your own sustainability goals.

Our dedicated specialists can guide you through our smart pumping solutions or assist in designing custom systems tailored to your needs. Together, we can build data centers that support the future without compromising the planet.

Speed and agility

Our solution

- Present in **55+** countries
- **500+** authorized service partners
- **4** distribution centers globally

Uptime

Our solution

- **Quality certification:** ISO 9001, ISO 14001, ISO 45001
- **Split case pumps** are fully compliant with the **ISO 9906** standard and offer a **Grade 1U option for tighter tolerance**
- **11** testing facilities worldwide
- **100%** pumps testing at the manufacturer's factory

WUE

Our solution

- Water treatment and distribution that **optimizes flow control and reduces water use.**

PUE

Our solution

- **Energy optimization** through system controls and innovative digital solutions
- **Best-in-class efficiency with IE4/5 standards**

Water treatment and distribution

Efficient solutions for sourcing, distributing, treating and discharging water all contribute to optimizing your data center's PUE and WUE and reliably integrating into your monitoring systems.

- Efficient distribution from any source
- Superior treatment to combat legionella
- Turnkey wastewater solutions
- Easy BMS & SCADA integration

Did you know?

Simply improving pump controls can result in 70% lower energy consumption, prolonged service intervals, and reduced risk of production downtime¹

Cooling

Grundfos keeps water flowing efficiently around air or liquid cooling systems through an array of intelligent pumps and sensors, saving water and energy, and guaranteeing uptime.

- Smart pumps, up to IE5 efficiency
- Redundancy 2N+1 uptime
- High density liquid cooling
- Easy commissioning & monitoring

Solutions for air and liquid cooling systems

Our air and liquid cooling solutions are designed to maximize energy efficiency and minimize environmental impact, ensuring your data center operates at peak performance.

Air cooling systems

Air cooling is the traditional data center cooling method, relying on pumps and controls. Our cutting-edge pumping technology ensures efficiency, reliability, and water savings—helping your data center meet its sustainability goals.

Liquid cooling systems

Liquid cooling is gaining momentum worldwide, with solutions like Cold Plate, Immersion, and RDHx being continually developed. At Grundfos, we’re dedicated to advancing sustainable water and pump solutions to meet these evolving challenges.

Hybrid cooling solutions

Hybrid cooling, a combination of air and liquid cooling, is expected to grow to meet the diverse needs of modern data centers. We’ve integrated our pump, control, and sensor technologies with our fluid management expertise to deliver robust and versatile pumping solutions for this complex cooling system.



KPVS

- Exceptional efficiency in a space-saving design
- Longer life span – Double volute design balances loads & improves overall performance
- Easy servicing – Access the seal without the need to remove the motor or field align



TPE3/TPE3D

- Integrated motor, drive, and control provide a plug-and-pump solution
- Simplified pump optimization via integrated intelligent control modes
- 7-10% decreased energy costs over NEMA premium via IE5-rated permanent magnet motor



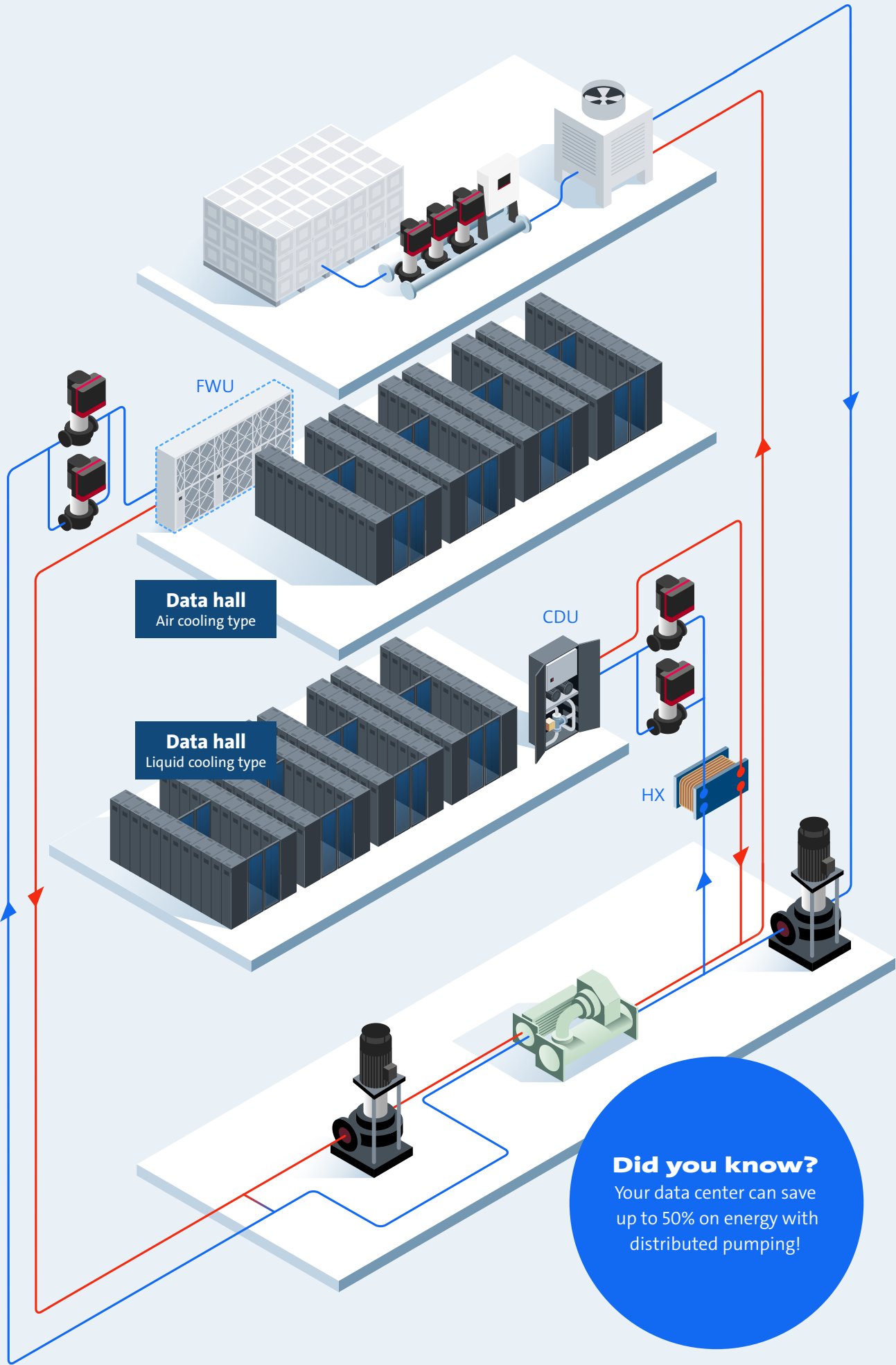
DELTA HCU Modular Pumping Systems

- Save time with a pre-packaged pumping system that comes pre-piped, wired and tested
- Save money with easier commissioning and integration with pre-programmed controls
- Save energy with intelligent CU 352 controller that automatically adjusts the sequence of multi-pump operation



Distributed Pumping

- Intuitive, valveless hydronic system design is easier & quicker to commission and integrate
- Intelligent pumps provide automatic system rebalancing, making it easy to control Delta T
- Up to 80% energy savings on annual pumping power, as well as significant energy savings for the chiller and entire system



Heat reuse systems and our solutions

Data centers produce a substantial amount of heat. Instead of letting this energy go to waste, heat reuse captures and redirects this excess heat for other applications. This approach helps data centers reduce their overall energy consumption and lower operational costs while supporting their environmental goals.

Key methods for heat reuse

Heat collection

Excess heat from server operations is collected using heat exchangers, ensuring valuable thermal energy is effectively harnessed.

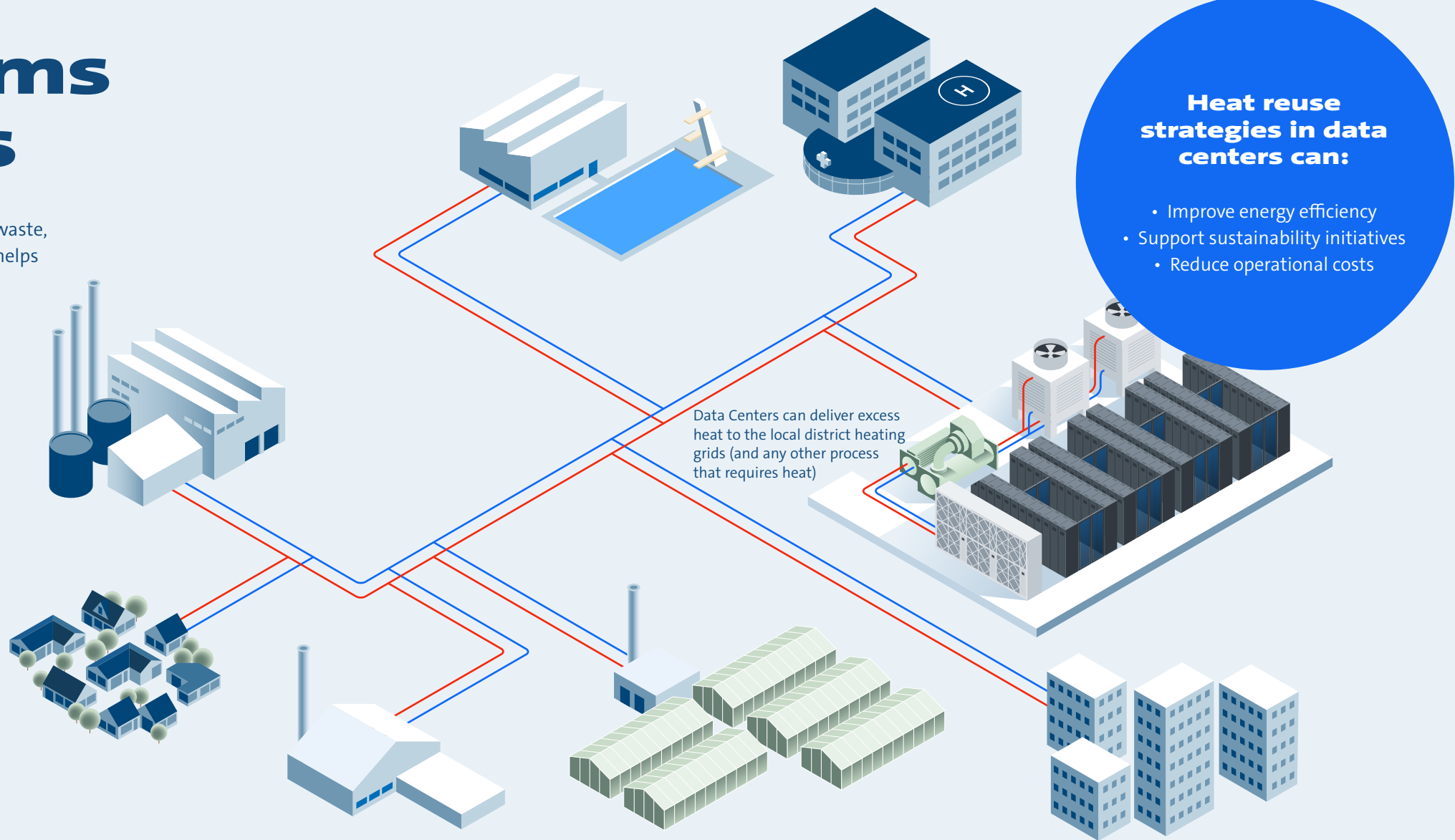
Heat transfer

The collected heat is transferred to a medium, typically water, which is then circulated through the system to optimize energy utilization.

Heat distribution

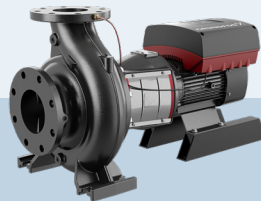
The heated medium is repurposed for various uses, such as supporting other industrial processes, providing a sustainable and efficient energy source.

Our advanced heat recovery systems and intelligent controls help data centers capture, transfer, and repurpose heat effectively, supporting sustainability goals by reducing overall energy consumption and lowering operational costs.



KPVS

- Exceptional efficiency in a space-saving design
- Longer life span – Double volute design balances loads & improves overall performance
- Easy servicing – Access the seal without the need to remove the motor or field align



NBSE

- 35% smaller footprint than traditional frame-mounted pumps
- Reduced installation costs with no baseplate or grouting required
- Lifetime alignment guarantee prevents undue wear and tear on seals & bearings
- 7-10% decreased energy costs over NEMA premium with IE5 permanent magnet motor



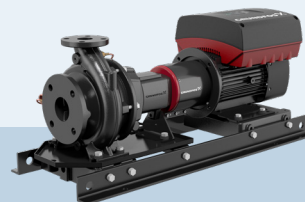
VLSE

- Integrated motor, drive, and control provide a plug-and-pump solution
- Service-friendly design allows rapid mechanical seal access without motor removal
- Double volute extends seal and bearing life, minimizes vibration, and improves efficiency
- 7-10% decreased energy costs over NEMA premium with IE5 permanent magnet motor



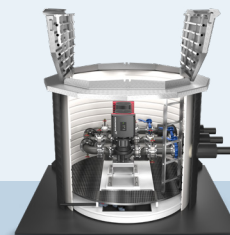
NBE

- End-suction close-coupled pumps
- No baseplate or grouting required
- No alignment between the pump and motor
- Foot-mounted volute provides increased stability
- 7-10% decreased energy costs over NEMA premium with IE5 permanent magnet motor



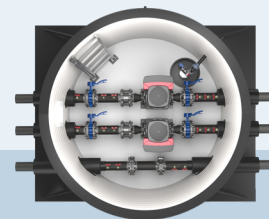
NKE

- End-suction, long-coupled, single stage
- Frequency-controlled motors



iGRID Temperature Zone

- Intelligent mixing loop designed to reduce supply temperature in the district heating grid



iGRID Pressure Zone

- Prefabricated pumping station designed to deliver pressure in the district heating grid

Water reuse systems and our solutions

While carbon emissions and electricity often dominate discussions about data center sustainability, water usage is equally critical and is seen as the next major challenge. As a limited resource, water management is essential for more sustainable operations.

By adopting circular water solutions and recycling or repurposing water, data centers can lower consumption, improve water and energy efficiency, and reduce operational costs. At Grundfos, we offer integrated technologies and solutions that enable circular water solutions, reuse, and recycling for data centers.

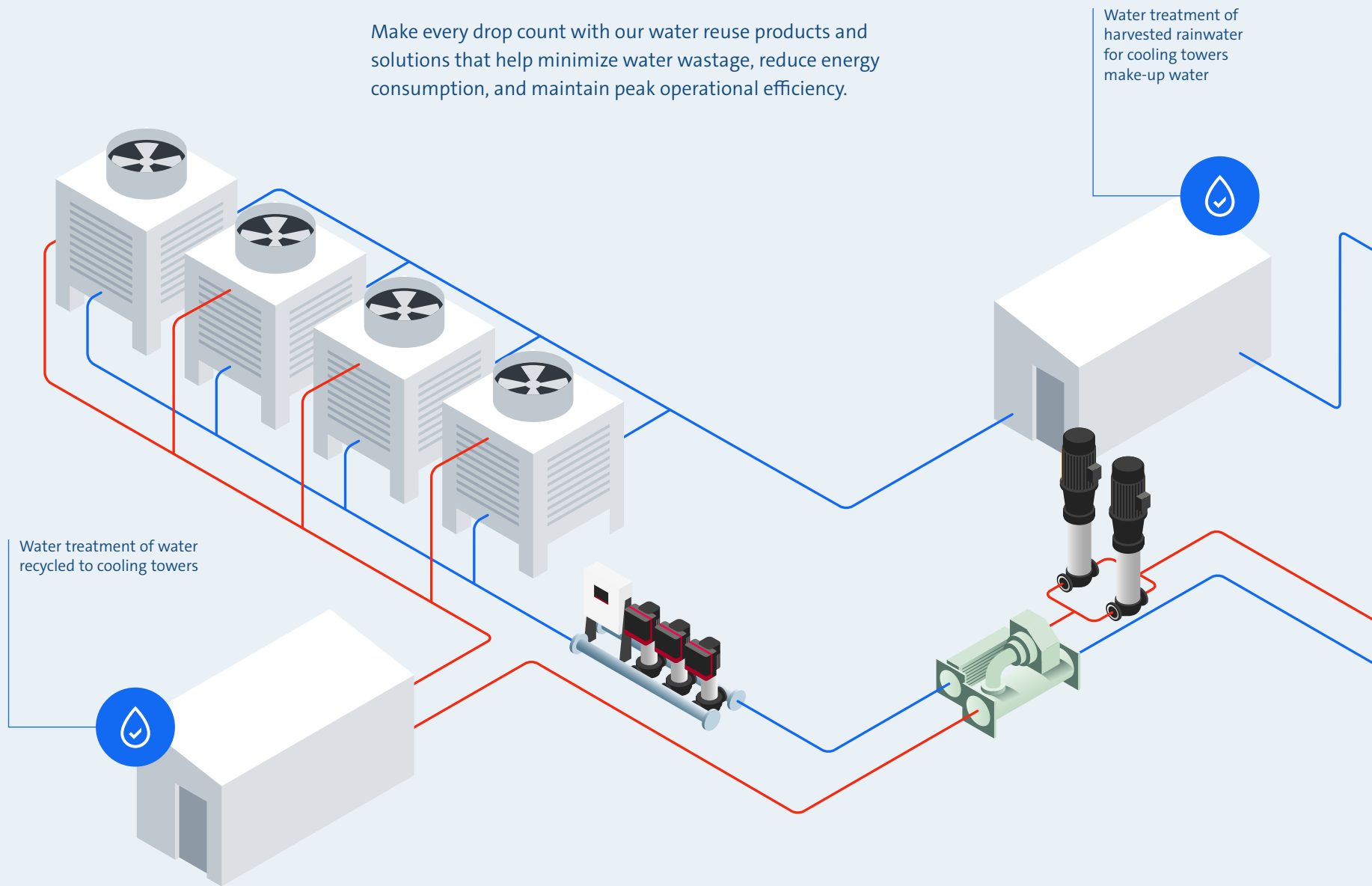
Cooling towers

Although water-intensive, cooling towers are suitable for water reuse. Recycling water for cooling tower make up reduces consumption and operational costs while offering a strong return on investment and a short payback period.

Rainwater harvesting

Rainwater harvesting provides a more sustainable, cost-effective solution for cooling water needs that reduces the reliance on municipal supplies. With proper storage and treatment, water security and resilience can be greatly enhanced.

Make every drop count with our water reuse products and solutions that help minimize water wastage, reduce energy consumption, and maintain peak operational efficiency.



CR Flex

- In-line multi-stage solar pump
- Designed for renewable energy supply
- Ideal for rainwater harvesting



RSI

- Solar power inverter
- Use renewable energy as the primary energy source
- For pumps up to 250kW

Water treatment systems and our solutions

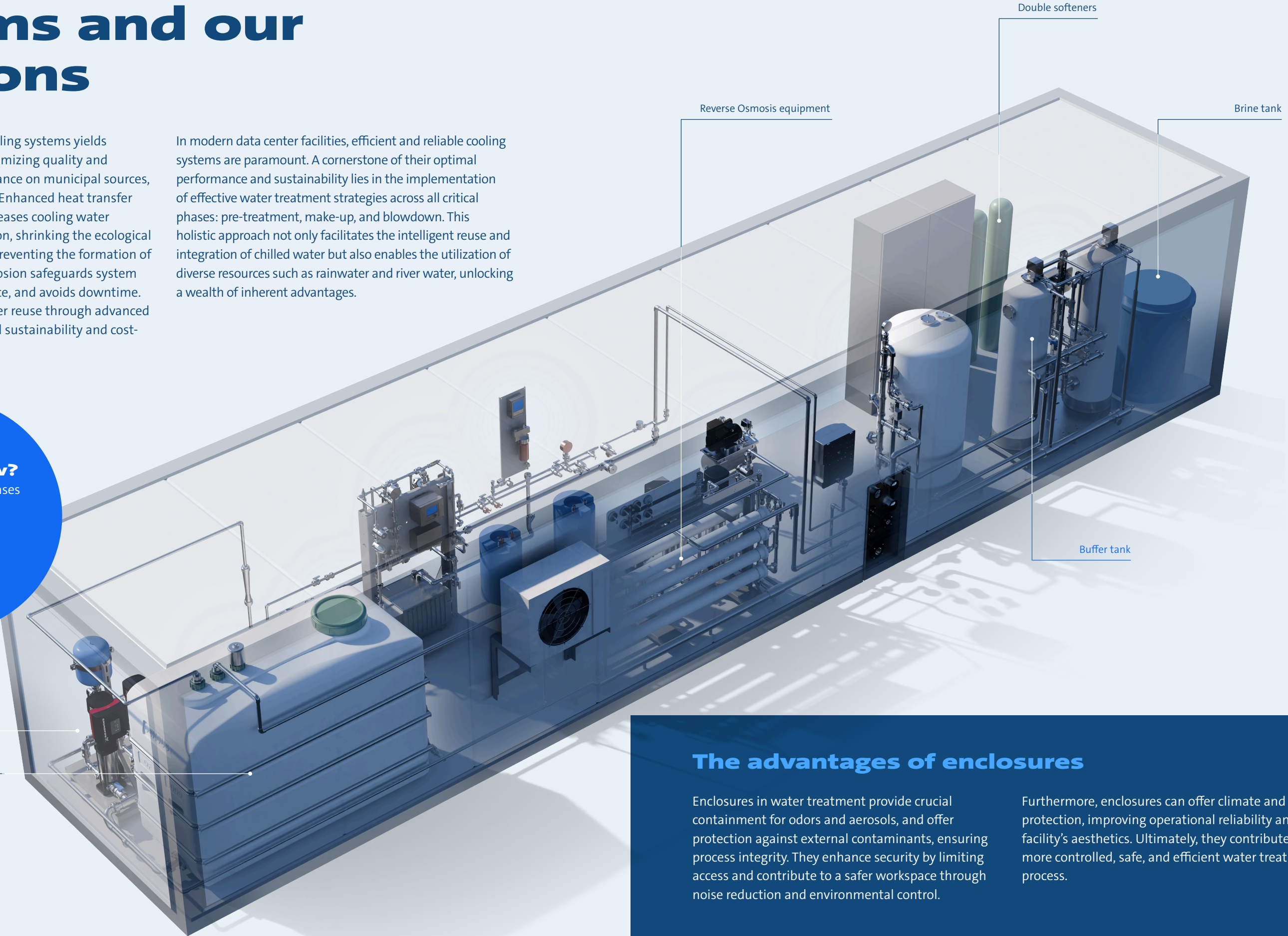
Effective water treatment in cooling systems yields significant water savings by optimizing quality and minimizing losses, reducing reliance on municipal sources, and lowering operational costs. Enhanced heat transfer from cleaner water further decreases cooling water demand and energy consumption, shrinking the ecological footprint and utility expenses. Preventing the formation of viruses, bacteria, scale, and corrosion safeguards system integrity, minimizes maintenance, and avoids downtime. Crucially, it enables reliable water reuse through advanced solutions, bolstering operational sustainability and cost-effectiveness.

In modern data center facilities, efficient and reliable cooling systems are paramount. A cornerstone of their optimal performance and sustainability lies in the implementation of effective water treatment strategies across all critical phases: pre-treatment, make-up, and blowdown. This holistic approach not only facilitates the intelligent reuse and integration of chilled water but also enables the utilization of diverse resources such as rainwater and river water, unlocking a wealth of inherent advantages.

Did you know?

There are three key phases of water treatment:

- Pre-treatment
- Make-up
- Blowdown



The advantages of enclosures

Enclosures in water treatment provide crucial containment for odors and aerosols, and offer protection against external contaminants, ensuring process integrity. They enhance security by limiting access and contribute to a safer workspace through noise reduction and environmental control.

Furthermore, enclosures can offer climate and freeze protection, improving operational reliability and the facility's aesthetics. Ultimately, they contribute to a more controlled, safe, and efficient water treatment process.

Keeping data flowing around the world

Our reliable solutions optimize cooling for any type of data center while maximizing efficiency, cost-effectiveness, and redundancy. Here are some of the many operators who've implemented Grundfos' high-efficiency cooling solutions for the next generation of data infrastructure.

Grundfos becomes the cornerstone for data center's cooling systems

Location: US

Challenge: A hyperscale data center company, and prominent global leader in data center operations, has sourced cooling water pumps from modular contractors for over a decade. Reliable and high-performing pumping solutions are essential for them to maintain optimal cooling efficiency in their server rooms and guarantee uninterrupted productivity.

Grundfos solution: Grundfos stepped in as a valuable partner and gradually became the primary pump supplier for this global data center leader. The shift was driven by several key improvements:

- Reliable Deliveries
- Engineering Support
- Quick and Reliable Service
- Spare Parts Management
- Dedicated Project Management
- Reliable Product Performance

Result: The Grundfos KPVS pumps proved to be superior to competitors' vertical inline pumps in several aspects: efficiency, power draw, reliability, serviceability, and compact design. By meeting rigorous standards and addressing critical operational challenges, Grundfos and their KPVS pumps have become the cornerstone for the hyperscale Data Center company's cooling systems.



Grundfos integrated pump solutions maximize performance in a space-constrained data center

Location: UAE

Challenge: A data center faced efficiency challenges due to hot climatic conditions and limited space for HVAC circulation pumps, leading to suboptimal performance of air-cooled chillers.

Grundfos solution: Grundfos Hydro MPC-E and Hydro Multi-E water boosting systems with IP55 rated MLE motors and an adiabatic chiller booster system.

Result: A 30% reduction in energy consumption, enhanced system efficiency, and positive feedback on installation quality, supporting the client's carbon neutrality goals.

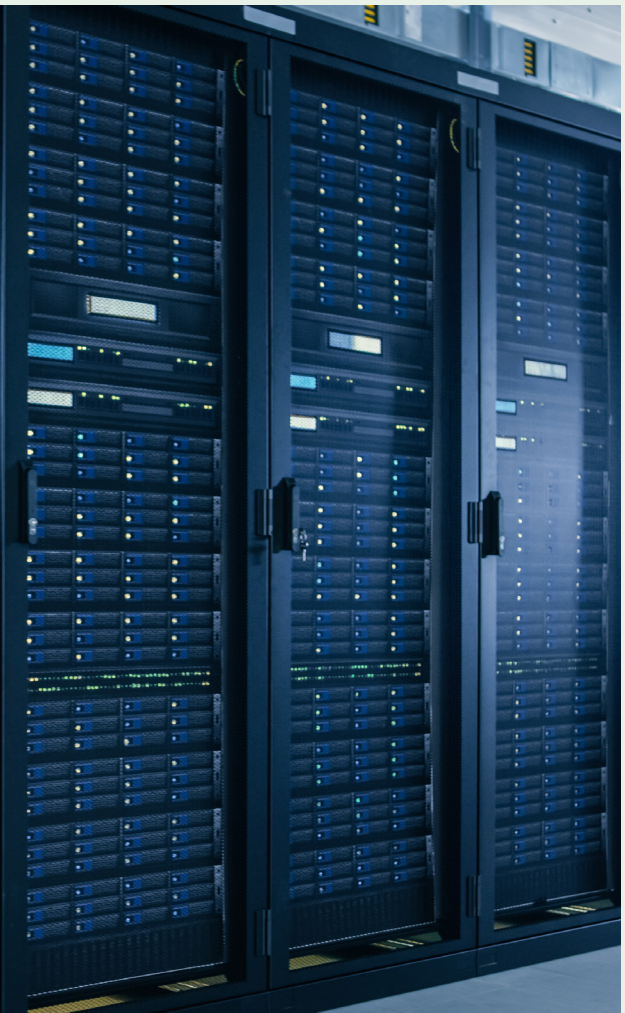
Modular plant rooms help fast track data center construction

Location: Netherlands

Challenge: A leading data center operator needed to meet a tight construction schedule for a rapid build data center, requiring modular, off-site plant room construction to align with pre-installed piping and electrical infrastructure.

Grundfos solution: Grundfos designed, built, and supplied seven packaged chilled water and water treatment plant rooms, featuring Hydro MPC Boosters with intelligent variable-speed controllers and BMS connectivity. The plant rooms were constructed in the UK and delivered to the Netherlands within 20 weeks.

Result: The customer received fully commissioned plant rooms on time, enabling their rapid data center rollout while achieving outstanding energy efficiency.



Grundfos pumps enable sustainable cooling for award-winning data center

Location: United Kingdom

Challenge: Digital Realty's Cloud House data center needed a highly efficient cooling solution using dock water to regulate server temperatures. The system required pumps capable of achieving suction lift, maintaining a sufficient flow rate, and ensuring the return water temperature stayed below 80.6 degrees Fahrenheit to meet stringent environmental requirements and avoid fluctuations that could damage IT systems.

Grundfos solution: Grundfos NBG 150-125315/336 pumps with high-efficiency IE3 motors and variable speed drives were installed. These corrosion-resistant pumps handle brackish water, lift up to 50 liters/second, and maintain a temperature differential of no more than 45.5 degrees Fahrenheit.

Result: The cooling system is up to 20 times more energy efficient than traditional methods, significantly reduces water waste, and supports Digital Realty's goals of cutting emissions and achieving climate neutrality by 2030. The solution also contributed to the building's BREEAM Excellent rating, aligning with sustainability targets and reducing costs for users worldwide.

Services

We offer a wide range of services, including digital services, operation services, optimization services, repair services, and service agreements.



Energy check

An easy-to-understand assessment of pump performance

A basic check that uses data from the nameplates of pumps and motors, or an advanced version that pulls data from your SCADA system or on-site measurements. A customized energy check report details the energy consumption of your installed pumps based on variables like nameplate information, pump age, load profile, and operating hours. The report presents suggestions for saving energy and energy expenses.



Energy audit

A comprehensive analysis of pump performance

An energy audit is a diagnostic tool developed to identify excessive energy consumption. The audit measures aspects of the system such as flow, energy consumption, pressure, temperature, and incident rates such as pump start/stop and valve open/close. Based on these metrics, the audit assesses the overall efficiency of your pumps and proposes changes to improve efficiency.



Customized service agreements

Improved operational reliability and safety

A Grundfos customized service agreement is an arrangement between you and Grundfos that allows you to always stay ahead of maintenance needs. The agreement is fixed in time and can include any of our existing service offerings. From information about your installed base and current situation, we help you define your maintenance needs and draw up the customized agreement.

Offsite construction

The surge in data center construction has led to a rapid expansion in capacity. To keep up with these demands and meet tighter project timelines, data center providers are increasingly turning to offsite construction methods.



1. Consultation & design



2. Sizing & planning



3. Engineering & production



4. Installation



5. Commissioning



6. Operation



7. Maintenance



8. Monitoring

Why choose offsite construction?

Safer

Fewer accidents and health risks in a controlled environment.

More sustainable

Less waste, thanks to a factory-controlled environment.

Less disruption

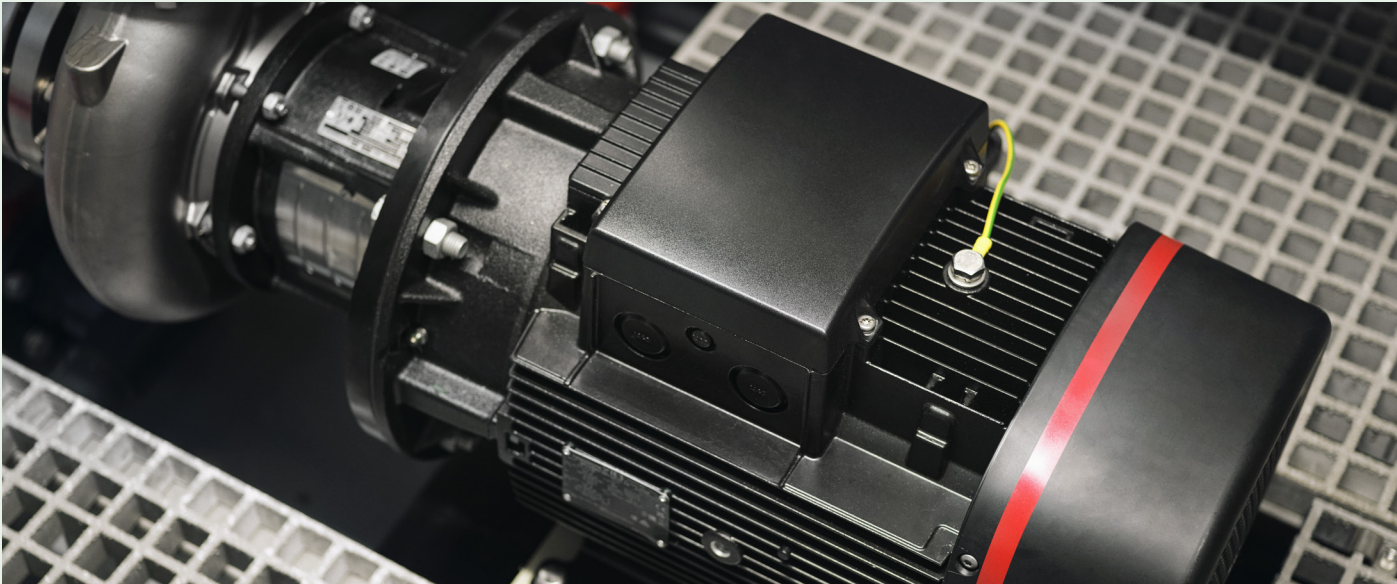
Reduced environmental impact, with less noise, dust, and litter.

Faster

More control over labor, scheduling, and materials.

Higher quality

Pre-tested components and fewer defects.



We believe it's possible to cool data centers without warming the planet

Sustainability is at the core of everything we do at Grundfos.

We share a sense of responsibility with the data center industry that drives us towards ever more energy-efficient solutions, helping you exceed your own sustainability goals.

With data center specialists around the world, we'll be by your side at every stage: from consultation and design through to commissioning, maintenance, and monitoring.

To discuss your next cooling, water treatment, or distribution project, contact us today at **Grundfos.us/datacenters**

**Explore Grundfos
data center solutions**



Visit grundfos.us/pei to learn more about Department of Energy (DOE) pump energy index (PEI) requirements and PEI ratings on specific Grundfos models.