

INTEGRATED WATER TREATMENT SOLUTIONS FOR DATA CENTER COOLING

Data centers utilize, high-quality water for cooling, humidity control, and continuous operation. As AI growth accelerates, operators must secure water supply, improve cooling efficiency, reduce wastewater, and meet increasingly strict discharge and ESG requirements.



IDE provides end-to-end water treatment solutions from treating various water sources to cooling tower blowdown recovery and ZLD/MLD compliance.

WATER IS BECOMING A STRATEGIC CONSTRAINT FOR DATA CENTERS

As AI and hyperscale infrastructure accelerate data center growth, water is becoming a defining factor in where data centers are built, how they are cooled, how they are permitted, and how they meet sustainability goals. Data centers need to secure reliable water supply, improve cooling efficiency, reduce wastewater, and manage discharge under evolving regulatory and ESG expectations.

This makes water treatment an essential part of data center infrastructure planning, not only an environmental consideration, but a reliability, compliance, and cost issue.

IDE'S INTEGRATED APPROACH TO DATA CENTER WATER MANAGEMENT

IDE helps data centers secure reliable water supply and address water challenges across the full cooling water cycle, from source water selection and water quality to cooling tower performance, wastewater reduction, reuse, and long-term compliance.

Drawing on its proven experience in complex water treatment projects, IDE develops site-specific water strategies based on available water sources, cooling requirements, discharge limits, sustainability goals, and future expansion plans.

IDE'S SOLUTION PORTFOLIO FOR DATA CENTER WATER MANAGEMENT

- ◎ **Municipal / City Water Optimization**
Higher water utilization and optimized cooling tower CoC and blowdown treatment and reuse.
- ◎ **Groundwater, Well & Surface Water Treatment**
A comprehensive water treatment solution, from basic filtration and pretreatment to advanced membrane technologies to address site-specific water quality challenges such as salinity, hardness, silica, fouling and scaling.
- ◎ **Reclaimed / WWTP / STP Water Reuse**
Enabling smart utilization of alternative water sources.
- ◎ **Cooling Tower Blowdown Recovery & Reuse**
To maximize reuse and minimize wastewater discharge.
- ◎ **Discharge Minimization / MLD / ZLD**
Reduce liquid waste volumes up to zero discharge and support regulatory and sustainability requirements.

Key IDE Technologies & Their Advantages

IDE's MAXH2O are advanced membrane-based technologies for industrial wastewater treatment designed to overcome the limitations of challenging water chemistry.

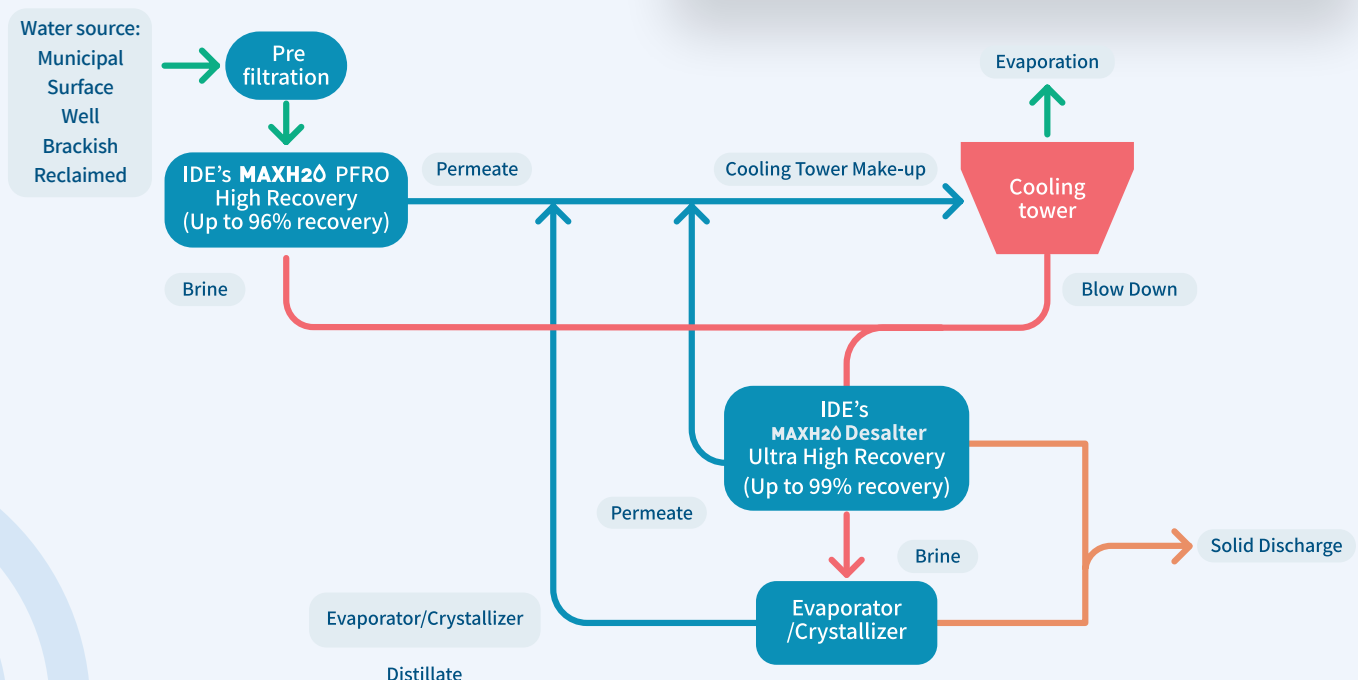
Pulse Flow Reverse Osmosis (PFRO)

- ◎ Pulse Flow RO (PFRO) technology optimizes reverse osmosis by operating in pulses and discharging brine in high-velocity.
- ◎ Achieves **up to 96% recovery** in a single stage for STP water, significantly surpassing conventional RO (70-85%).
- ◎ Minimizes **brine discharge**.

MaxH2O Desalter

- ◎ The MAXH2O Desalter maximizes treatment recovery by utilizing an integrated salts precipitation process.
- ◎ Achieves **up to 99% recovery** (through an integrated MAXH2O PFRO + MAXH2O Desalter configuration).
- ◎ Facilitates **Minimum Liquid Discharge (MLD) / Zero Liquid Discharge (ZLD)** by maximizing recovery up to membrane capabilities.
- ◎ Leads **up to 50% CAPEX and OPEX savings**, In full ZLD configurations, compared to traditional ZLD approaches.

Proposed WT Process Scheme



Benefits

- ◎ **Enhanced Water Security:** Utilize a stable, reliable, and weather-independent water source (treated wastewater), significantly reducing reliance on scarce freshwater.
- ◎ **Unmatched Technical Advantages:** Benefit from robust resistance against scaling, biofouling, foaming, and corrosion, leading to enhanced water usage efficiency.
- ◎ **Substantial Cost Savings:** Minimize chemical consumption, no sludge handling, lower operational downtime, and decrease maintenance costs, leading to a reduced Total Cost of Ownership (TCO).
- ◎ **Regulatory Compliance & Future-Proofing:** Proactively meet the ever evolving water management regulations (ZLD/MLD) and align with global tech companies' sustainability, water-positive, and ESG (Environmental, Social, and Governance) goals.

Conclusion

IDE is well-positioned to serve as a strategic partner, ensuring your data centers lead in digital innovation while fully aligning with national and international sustainability goals, securing critical water resources, and driving economic efficiency.