Johnson Controls Arabia

Thermal management | Building controls | Fire protection | Facility security | Proactive services

Data center controls solutions

For precision environmental control that supports innovation, sustainability and success

Smarter and Healthier Buildings for a Sustainable Tomorrow

#driving_sustainability

Driving success with **innovation, scalability and consistency**

How we can help

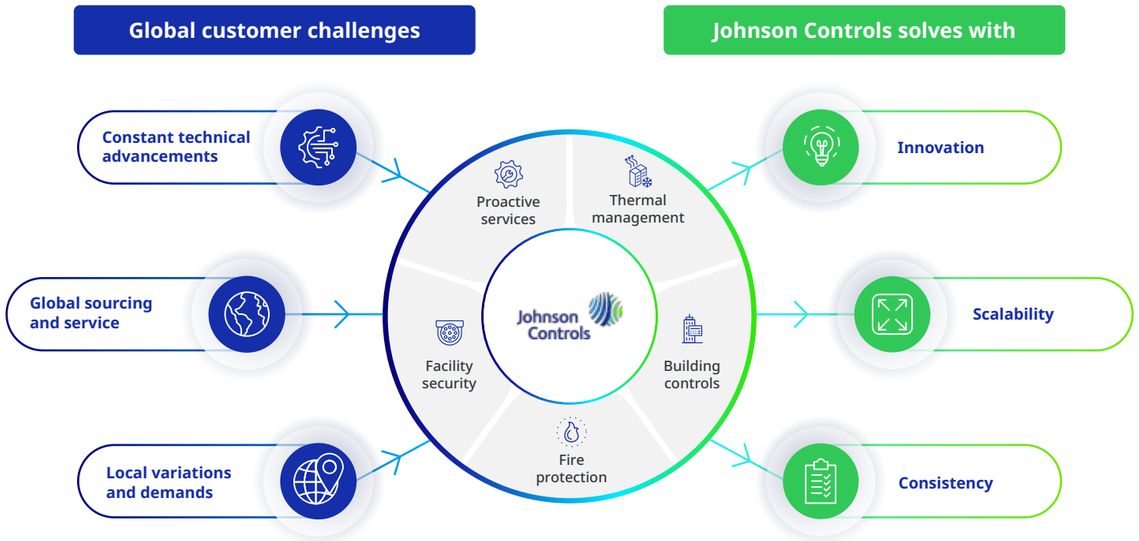
From hundreds of customer engagements, we've learned that building and operating data centres attracts many challenges that fall into three main categories:

- How to keep up with constant advancements in technology
- How to reliably source products, parts and services around the world
- How to implement design requirements when local regulations, resources and environmental constraints cause complications

We solve these challenges firstly with our commitment to innovation in thermal management, controls, facility security, fire protection and services. Then, the scalability of our manufacturing and services provides the required global and local coverage. And, with our ability to satisfy requirements consistently despite local challenges, we help clients get their data centres into service and running effectively anywhere in the world.

With decades of experience, we can help accelerate your time to deployment, enhance operational efficiency and ensure reliability, safety and security for your data centre. Find out more or connect to an expert to learn how our **customer driven innovation**, **global scalability** and **engineered consistency** can help you at: **https://www.johnsoncontrols.com/industries/data-centers**

Johnson Controls is your dedicated global data centre solutions partner



Controlling the demands on data centres

In today's interconnected world, data centres are the lifeblood of modern innovation, underpinning everything from smart consumer devices to cloud-hosted services and the ever-expanding horizons of artificial intelligence.

As the critical foundation of our connected age, data centres orchestrate the management of client data, the hosting of services and the computational power required to automate tasks that fuel daily life. These digital factories must not only deliver uninterrupted access but also strive to minimise their environmental footprint.

Johnson Controls is uniquely positioned to meet the demanding environmental needs of modern data centres with integrated thermal management equipment and controls solutions. Our comprehensive offerings ensure precise temperature, humidity and airflow management. With unmatched expertise in thermal management systems and building automation systems, Johnson Controls delivers the efficiency, reliability and scalability required to support mission-critical data centre operations by ensuring optimal environmental conditions.

Balancing key objectives in data centres

Modern data centres must maintain an equilibrium of environmental priorities, balancing operational excellence with sustainability. To safeguard hosted data, extend the lifespan of critical infrastructure and meet stringent regulatory requirements, operators must focus on four fundamental objectives:

Environmental control
Excessive heat generated by server racks must be mitigated to comply with and exceed manufacturer recommendations.

Regulatory compliance and cost management
As data centre footprints expand, the drive for efficiency in limited resources like electricity and water becomes paramount.

Operational uptime
Proper staging and deployment of cooling systems are essential to ensure uninterrupted data availability 24/7/365.

Cybersecurity
Comprehensive security measures will help protect sensitive data and critical systems to ensure secure, reliable performance.

The necessity of environmental control

In the intricate ecosystems of data centres, maintaining precise environmental conditions is imperative. Among the foremost challenges is the management of heat, as the constant generation of thermal energy by server racks can jeopardise equipment performance, shorten lifespan and cause costly interruptions. Temperature fluctuations are particularly risky, as they can lead to unplanned downtime and expensive repairs.

Humidity control is equally vital; excessive moisture risks condensation, while dry conditions can foster static electricity, endangering sensitive electronics.

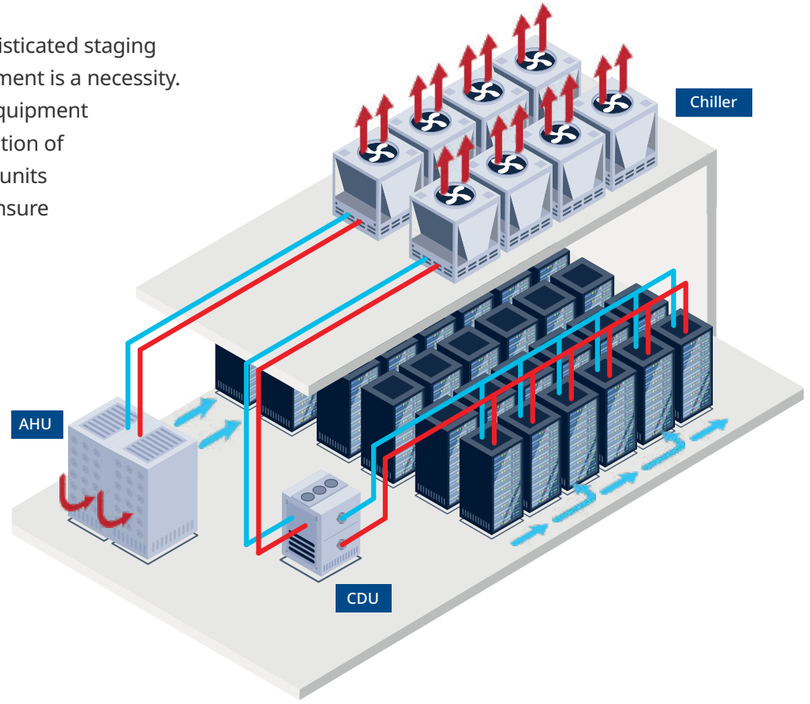
Pressure dynamics must also be maintained with precision, as fluctuations can diminish cooling efficiency and disrupt heat transfer, creating hotspots that compromise operational integrity.

To address these challenges, sophisticated staging of distributed HVAC cooling equipment is a necessity. Continuous monitoring of HVAC equipment performance enables the optimisation of cooling strategies for air handling units and cooling distribution units to ensure that critical temperature, humidity and pressure conditions required by server racks are maintained within a data hall.

Key environmental management strategies include:

- Airflow optimisation: ensuring that the proper airflow is delivered to servers to prevent hot spots
- Precise temperature and humidity control: maintaining stable temperature and humidity conditions at each server
- Dynamic cooling distribution: delivering cooling effectively and efficiently to each server

When pairing these strategies with proactive maintenance of all HVAC systems, data centres will recognise heightened reliability of critical equipment, prolonged lifespan of servers and reduced energy costs – all contributing to operational excellence.



Cost management and regulatory compliance

In this time of rising operational costs and stringent environmental regulations, data centres face the dual challenge of cost containment and compliance. Achieving energy efficiency and resource optimisation is paramount to balancing performance and expense, while adherence to regulatory standards maintains sustainability and avoids penalties.

Metrics such as **power usage effectiveness (PUE)** and **water usage effectiveness (WUE)** serve as critical benchmarks for measuring resource consumption, identifying inefficiencies and driving improvements. Building automation systems help data centres operate within prescribed thresholds for temperature, humidity and pressure, safeguarding compliance while maximising efficiency.

Dashboards and reporting tools are invaluable in navigating these challenges. These systems provide operators with real-time insights into energy usage, cooling performance and environmental conditions, empowering informed decision-making.

Automated reporting simplifies regulatory documentation, streamlining audits and inspections while reducing administrative burdens. By analyzing trends and pinpointing inefficiencies, operators can optimise resource utilisation, lower operational costs and achieve regulatory compliance, while maintaining peak performance.

Our building automation systems epitomise efficiency and compliance, offering comprehensive analytics and actionable insights that enable data centres to align operational objectives with financial goals while adhering to evolving regulations.

Operational uptime, high availability and redundancy in cooling systems

For data centres, operational uptime is a non-negotiable imperative. Uninterrupted functionality is essential to meet the relentless demands of a digital world, necessitating robust systems of redundancy and high availability within the mechanical cooling infrastructure. Redundant systems mitigate risks, ensuring continuity even in the face of unforeseen equipment failures or environmental disruptions.

Common redundancy strategies include:

Dual cooling paths (2N)
Independent cooling systems guarantee stability even in the event of a mechanical failure.

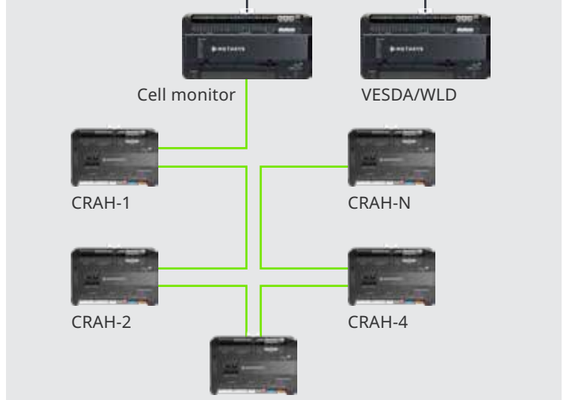
Backup cooling systems (N+1/N+2, etc.)
Additional capacity supports seamless operations under adverse conditions.

Redundant servers (2N)
Failover support to allow for monitoring and command of critical systems.

These redundancy strategies form the backbone of reliability, allowing data centres to maintain uninterrupted service and meet stringent service-level agreements.

Metasys servers - 2N redundancy

Network



Cybersecurity – the foundation for success

Data centres sit at the heart of modern business, powering industries and housing sensitive information essential for operations and innovation. However, in an increasingly digital world, these hubs face mounting cyber threats that can compromise data, disrupt essential services, and erode customer trust. Protecting data centres requires a proactive, multi-layered approach to address vulnerabilities and ensure resilience.

From guarding against unauthorised access and mitigating software and hardware vulnerabilities to monitoring for threats and responding swiftly to incidents, cybersecurity challenges for data centres are both vast and complex. Evolving global privacy standards demand stringent protections to safeguard sensitive data and maintain customer confidence.

At Johnson Controls, privacy isn't just a feature – it's a philosophy. Our Global Privacy Program is driven by internationally accepted principles of Privacy by Design, ensuring data protection is embedded in every process, product and solution from the outset.

Through the Global Privacy Office, we rigorously comply with stringent global privacy laws, enabling our customers to manage personal data with transparency and control.

Our building automation systems empower customers to take control of their data. Administrators can configure user accounts to become dormant or lock out after inactivity, generate reports to identify dormant accounts for deletion, and export personal data in machine-readable formats. This flexibility ensures compliance with data retention policies while tailoring the user experience for security and personalisation. With detailed logs of user activity, our solutions help improve accountability, enhance audit capabilities and reinforce compliance.

By taking an intentional approach to cybersecurity throughout product development and implementation, Johnson Controls helps data centres safeguard critical infrastructure, protect operations and ensure customer trust.

The Johnson Controls advantage

With over 140 years of experience in environmental controls and a global distribution network touching every continent, Johnson Controls is a beacon of excellence in the field of environmental control systems. By putting to work our unparalleled expertise in managing environmental conditions, alongside real-time analytics technology, Johnson Controls drives efficiency, reliability and sustainability in data centres around the world through the implementation of Metasys® building automation systems.

Metasys provides a singular web-based user interface for data centre operators, uniting all critical systems – environmental controls, fire suppression, security and power management – into one intuitive platform.

With its ability to deliver real-time insights and centralised control, Metasys empowers operators to orchestrate the balance of temperature, humidity, pressure, energy usage and equipment performance with precision and ease. It seamlessly integrates with third-party systems, offering unparalleled flexibility and scalability, adapting effortlessly to the evolving needs of modern data centres.

Through advanced analytics, intelligent automation and robust fault detection capabilities, Metasys transforms operations, ensuring uninterrupted uptime, regulatory compliance and operational excellence. All this from a single, user-friendly interface that simplifies complexity, drives innovation and enables data centres to thrive in an increasingly connected world.

A full range of products
to meet all of your control needs

Metasys server
A series of scalable software solutions that allow the monitoring, commanding and reporting of a network of distributed controllers, sensors and end devices.

Metasys DDC controllers
Distributed controllers providing environmental control of connected equipment and spaces.

Sensors
Complete portfolio network and non-network sensors covering temperature, humidity, pressure, CO_2, current, etc.

Valves and actuators
Complete product line delivering consistent, accurate flow rates to support the most complex HVAC applications.

Leak detection
Early warning indication of refrigerant leaks to prevent hazardous conditions.

Case study
Large cloud provider

A major cloud provider sought a partner to boost operational efficiencies, reduce costs and prioritise standardisation to accelerate time-to-market while maximising ROI.

The challenge
Rapid implementation required consistency and standardisation across disciplines. The provider's team manually tested and rewrote sequences for the data centre's 24/7 efficiency standards, a labor-intensive process that delayed revenue generation for nearly two years. These inefficiencies highlighted the need for a streamlined solution to reduce delays and optimise processes. To meet these challenges, the provider sought an OEM partner to help accelerate installation and implementation without sacrificing quality or performance.

The solution
With multiple data centre sites under construction, the provider needed a reliable partner to minimise delays and maximise ROI. Johnson Controls delivered the Metasys building automation system, which integrates HVAC, lighting, fire detection and security systems on a single platform to improve energy management and productivity. Johnson Controls also provided pre-tested controllers for air handling units (AHUs), enabling a standardised approach to installation and ramping up resources as needed to meet project demands. These pre-packaged solutions reduced errors and optimised deployment timelines.

The outcome
The Metasys system delivered immediate benefits. Factory testing of AHUs ensured quality and reduced the test schedule from three months to four weeks, saving 8-12 weeks and millions in operating costs. Pre-tested AHUs were shipped ready for plug-and-play installation, eliminating on-site commissioning and cutting another 4-6 weeks from deployment time. Through smart planning and standardised solutions, Johnson Controls helped the provider achieve faster commissioning, significant cost savings and on-time delivery of a world-class building automation system.

About Johnson Controls:

At Johnson Controls (NYSE:JCI), we transform the environments where people live, work, learn and play. As the global leader in smart, healthy and sustainable buildings, our mission is to reimagine the performance of buildings to serve people, places and the planet.

Building on a proud history of 140 years of innovation, we deliver the blueprint of the future for industries such as healthcare, schools, data centers, airports, stadiums, manufacturing and beyond through OpenBlue, our comprehensive digital offering.

Today, Johnson Controls offers the world's largest portfolio of building technology and software as well as service solutions from some of the most trusted names in the industry.

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