

# REALIZING SUSTAINABLE DATA CENTER OPERATIONS

Reducing energy consumption in power and cooling systems.



# BUILDING GREEN DATA CENTERS

## LET'S CHANGE THE FUTURE TOGETHER

Our planet is in a precarious position. It's not something that one person, one company, or one country can fix. We must all do our part to enable a sustainable future.

For us, that means sharing know-how and actively collaborating to find new ways of using automation — not just to address data center challenges, but to create a sustainable future.

We believe we can address climate challenges through continuous technological innovation, rapid adoption of digitalization, and aggressive decarbonization.

Join us.

## TOP 5 DRIVERS OF DATA CENTER DEMAND:

1. Remote work
2. Digitization
3. Digital technologies
4. Streaming services
5. IoT

— TECHJURY



# DRIVE ONGOING SAVINGS WITH FULL FACILITY VISIBILITY

## POWER AND COOLING INFRASTRUCTURE MATTERS

Our digital world is powered by data centers, which are now considered critical infrastructure by the government. With increased government oversight, it's in everybody's best interest to adopt solutions that reduce energy consumption and enable energy transparency.

The more we live, work, and play online, the more data centers we'll need. McKinsey & Company predicts U.S. data center demand will grow by approximately 10% a year until 2030. That means data center demand will double in 7 years. Growing demand means increased power consumption.

IT Equipment is a prominent consumer of energy in a data center, but cooling systems, lighting, and power backup/distribution can consume just as much. Optimizing these essential non-IT systems is critical for sustainable data center operation.

**Integrated. Secure. Sustainable.**

Our data center solutions include everything you need for your high-performance, energy-efficient power and cooling infrastructure. These hardware and software solutions are fully integrated, secure, and highly reliable.

## ENERGY EFFICIENCY END-TO-END

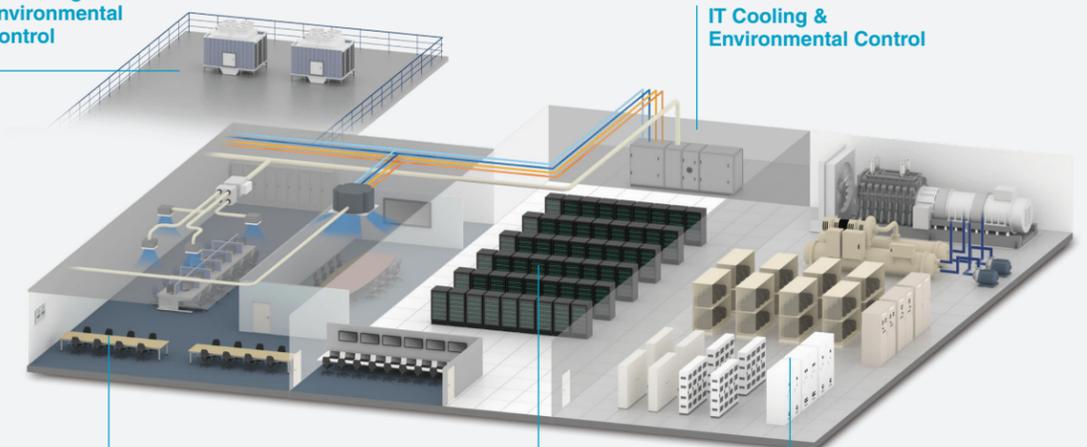
IT Cooling & Environmental Control

IT Cooling & Environmental Control

Monitoring & Control Solutions

UPS

Critical & Auxiliary Power Distribution Solutions





## VISUALIZE, HISTORIZE, ANALYZE, MOBILIZE INFORMATION

Lose the data silos and bring the power of real-time intelligence to data center operations. Our ICONICS data center infrastructure management (DCIM) software unifies data. It eliminates the switching between different PCs, servers, and systems so you can get the insights you need when you need them.

From any web-enabled device, you have complete visibility of power usage and available capacity, as well as power and cooling asset performance. Other advanced energy management software from ICONICS includes the EnergyAnalytiX Module, which lets you:

- Monitor the efficiency of your UPS systems
- Visualize cost savings
- Drill down into causes of abnormal energy use
- And more

Here's how this industry-leading software solves four common data center problems.

### 1 OUTAGES

**Know at a glance if you have enough capacity to handle a potential failover.** The DCIM software includes checks and balances. It accurately measures data and alerts users to potential problems, which prevents outages caused by human error.

85% of major outages are caused by human error.

— UPTIME INSTITUTE  
2022 ANNUAL OUTAGE ANALYSIS REPORT  
BASED ON SURVEYS AND PUBLICLY  
REPORTED OUTAGES



### 2 POWER USE & COST

**Know how and where power is used at-a-glance.** The DCIM software lets you monitor and analyze the power consumption of each floor, server room, and compartment, as well as power backup, distribution, and cooling systems. Real-time data visualization and analysis proactively optimize power and cooling using key data center metrics such as EER, PUE, iPUE, CUE, and WUE.

97% of N100 companies now report on sustainability.

— THE KPMG SURVEY OF SUSTAINABILITY  
REPORTING 2022, BASED ON OUTSIDE AUDITS  
OF 5,800 COMPANIES

### 3 BILLING ACCURACY

**Know exactly how much power each customer uses.** Colocation data centers typically charge customers based on expected energy consumption per rack. The DCIM software continuously monitors energy consumption by customers. It accurately records power fluctuations, contract changes, and measurement breakdowns so you can charge customers based on actual vs. expected energy consumption.

Reduce turnover by up to 15% in colocation data centers by billing for actual vs. expected power use.

— MITSUBISHI ELECTRIC EUROPE



### 4 IT CAPACITY

**Know the best location for additional hardware.** The DCIM software overcomes capacity and process planning concerns. It identifies current power, cooling, network, and rack space availability and leverages AI, predictive analytics, and historical data to determine proper placement.

Save up to 75% in CAPEX by understanding where investments are best made and by monitoring and analyzing the results of previous energy initiatives.

— MITSUBISHI ELECTRIC EUROPE

# POWERING THE DIGITAL WORLD

## ENERGY-SAVING PERFORMANCE END-TO-END

We offer a total power and cooling infrastructure solution that can significantly reduce running costs year after year. Everything has been designed to enable flexible use of space and to achieve the highest possible energy efficiency without compromising performance.

*By 2025, data centers may consume 20% of the world's energy supply. Roughly half of that energy will be consumed by systems for:*

1. Monitoring & Control
2. Power Distribution
3. Uninterrupted Power Supply
4. Cooling & Ventilation

— TECHJURY



## Monitoring & Control

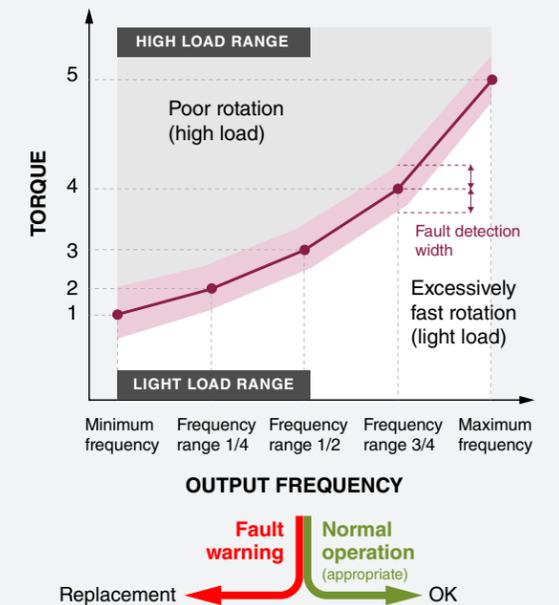
### DELIVER TOTAL SYSTEM INTEGRATION

In air cooling systems, our industry-leading PLCs (programmable logic controllers) and VFDs (variable frequency drives) deliver total system integration, data capture, and analytics across multiple operational assets. They support all major networks and provide the link to the DCIM software. When combined with our spring clamp terminal block units and CPUs, our PLCs streamline installation, maintenance, and system design.

Energy-efficient drives improve the efficiency of motors in IT cooling systems and extend their life through advanced error detection. Implementing VFDs in cooling system fan and pump control significantly reduces energy consumption. When combined with permanent magnet (PM) motors, energy savings can be up to 50%.

All of these solutions are manufactured by Mitsubishi Electric so you can count on their quality, performance, and compatibility.

### VFD ERROR DETECTION FUNCTION IN FANS



Mitsubishi Electric Automation Monitoring and Control Systems include the industry's most advanced PLCs and VFDs, which greatly improve the efficiency of air cooling systems.



## Critical & Auxiliary Power Distribution

### ENSURE SAFE, RELIABLE POWER NETWORK OPERATION

Our state-of-the-art MVS (medium voltage switchgear) and LVS (low voltage switchgear) deliver the durable, reliable breaking performance needed for stable and sustainable data center operation. These systems also achieve SF6free operation for a clean, energy-efficient environment.

An innovative design separates the main and control sections in our power-saving VCB (vacuum circuit breaker). This approach enables it to deliver superior workability, maintainability, reliability, and sustainability. It even captures power usage data on circuits.

We also offer a wide variety of energy-measuring devices that reduce total costs through energy visualization.



Mitsubishi Electric Automation offers MVS and LVS with superior durability and high impermeability, contributing to the stable operation and safety of data centers



## Uninterrupted Power Supply (UPS)

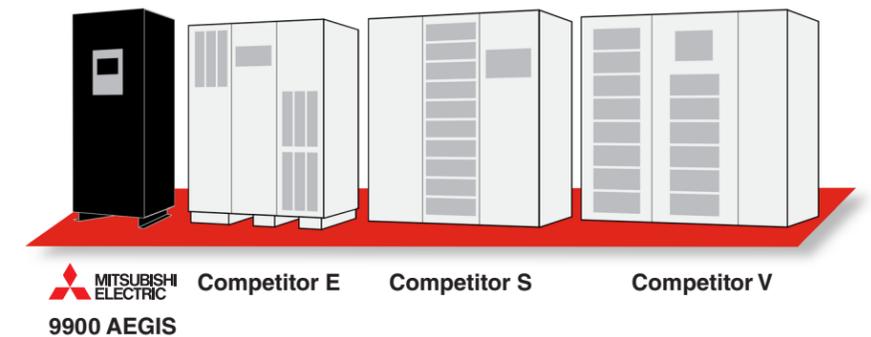
### THE INDUSTRY'S HIGHEST RELIABILITY AND POWER DENSITY

Our precision-engineered UPS systems protect data center infrastructure from power fluctuations and outages, which can damage IT equipment. They also allow data centers to use power efficiently and effectively in a uniquely compact footprint.

All of the UPS systems from Mitsubishi Electric are online double-conversion systems and feature our

world-renowned Insulated Gate Bipolar Transistor (IGBT) technology for enhanced UPS performance and reliability. While others only estimate reliability, our installed base of high-end UPS systems have sustained load carrying capability of 99.9995% of their actual operational history.

These industry-leading UPS systems supply clean, continuous power to data centers and other critical equipment while significantly reducing operating costs, space requirements, and carbon footprint.



Mitsubishi Electric Power Products have a proven track record of delivering high-quality Uninterruptible Power Supply (UPS) solutions to meet the most demanding uptime requirements



## IT Cooling & Environmental Control

### DELIVER OPTIMAL CONDITIONS FOR DATA CENTERS

Decades of experience in the air conditioning sector has helped us deliver increasingly energy-efficient solutions to the IT cooling market. We've combined advanced VFD technologies with cutting-edge electronics and mechanical technologies. Together, they deliver a synergistic effect that increases cooling performance while significantly reducing energy consumption. We offer a range of IT cooling and environmental control solutions that guarantee redundancy and auto-recovery.



Mitsubishi Electric Trane US provides state of the art systems that keep data center and server rooms in optimal conditions at all times.



## CONTINUED SUPPORT FOR CONTINUED SUCCESS

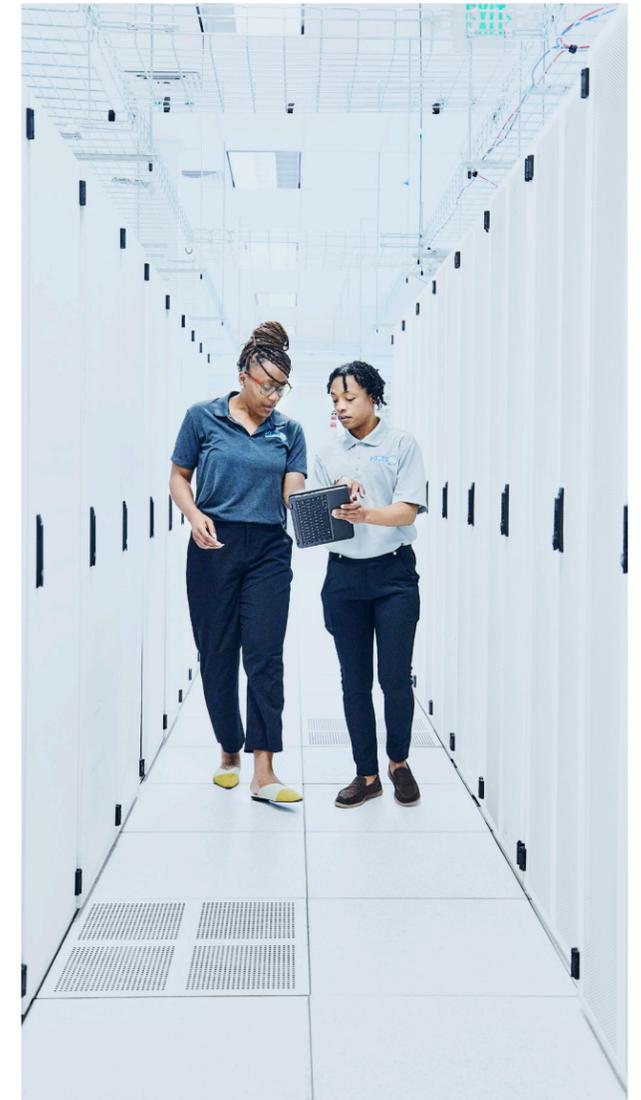
### WE'RE WITH YOU ALL THE WAY

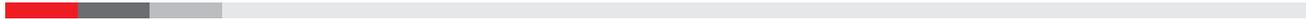
If you're ready to modernize your power and cooling infrastructure and management, we're ready to help. Mitsubishi Electric Automation supports the entire lifecycle — from consulting to maintenance and operation. Our data center experts can design the right solution for your data center project. Start your journey to more sustainable and affordable data center operation today.

Let's change the future together.

**Schedule a meeting.**

Visit our website to learn more about the **F800 series safety features** that can save *your* data center.





## Americas Offices

<p>US Mitsubishi Electric Automation, Inc. 500 Corporate Woods Parkway Vernon Hills, Illinois 60061 847-478-2100</p>	<p>Canada Mitsubishi Electric Automation, Inc. 4299 14th Avenue Markham, Ontario L3R 0J2 905-754-3805</p>	<p>Mexico Blvd. Miguel de Cervantes Saavedra 301 Col. Ampliación Granada, Miguel Hidalgo CDMX, 11520, México</p>
--	---	--



**e-Factory**



Mitsubishi Electric's e-F@ctory concept utilizes both FA and IT technologies, through collaboration with e-F@ctory Alliance Partners, to reduce the total cost of development, production, and maintenance, with the aim of achieving manufacturing that is a "step ahead of the times".