

Data Centre Solutions





Mitsubishi Electric Data Centre Solutions

Together, we can build better.

Mitsubishi Electric offers totally integrated, secure, end-to-end products and solutions for cooling, performance management and energy optimisation for Data Centres.

In recent years, the substantial increase in the use and storage of digital data has made the efficient operation of data centres integral to network integrity. As digital transformation leverages the IoT (Internet of Things), data becomes an even more crucial asset for all industries and sectors.

Enter Mitsubishi Electric. Leveraging decades in the field and cutting-edge know-how, we are uniquely positioned to support the establishment and optimal operation of data centres to meet the demands of today's data-driven economy and to do so while complying with environmental pressures.

Mitsubishi Electric manufactures a wide range of electrical equipment and electronics which can be integrated for the benefit of data centre owners and operators. Our products and solutions can be combined to help data centre owners and operators maximise efficiency, reduce energy costs and optimise operations whilst limiting their carbon footprint and achieving their sustainability objectives.

Our automation software solutions support the centralised management of information to support more efficient and effective operations. We also work to improve functions that reduce product maintenance and assist with the identification of operational issues before they occur.

We use a variety of methods to bring PUE (Power Usage Effectiveness) numbers down, pushing forward with efforts to promote the establishment of green data centres.

As a leading manufacturer of HVAC equipment, we are offering a greater transparency about embodied carbon in our products so our customers can more broadly assess the environmental impact of using or specifying our equipment from a whole-of-life perspective.

In this capability statement, we outline the breadth of our products and solutions and highlight the features and benefits for data centre owners and operators. We also share a number of case studies that demonstrate the outcomes achieved for our customers.

For any data centre related enquires, please send us an email at:

datacentre@meaust.meap.com



Company Overview

The aim of Mitsubishi Electric Australia is to be a successful Company committed to the manufacture, sale, and support of advanced technology that both anticipates and satisfies the evolving needs of the Company's customers and society.

Mitsubishi Electric Australia operates in the areas of Living Environment, Home Appliances, Transportation and Heavy Engineering, Automation & Controls, Automotive Equipment, Transmission & Distribution, Semiconductors and Communication Systems.

Mitsubishi Electric Australia is wholly owned by Mitsubishi Electric Corporation, Japan. A representative office of Mitsubishi Electric was opened in Australia in 1967. MEAUST was established in 1974 as MELCO Australia PTY Ltd and then became Mitsubishi Electric Australia in 1982.

Global Purpose & Vision

Purpose

To contribute to the realisation of a vibrant and sustainable society through continuous technological innovation and ceaseless creativity

Vision

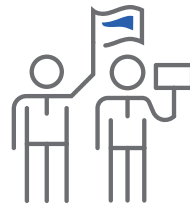
Is underpinned by its core values being intent on sustaining its enduring commitment to make

Changes for the Better

Statistics



Operating in Australia for almost 50 years



Total Employees: 299 (March 2023)

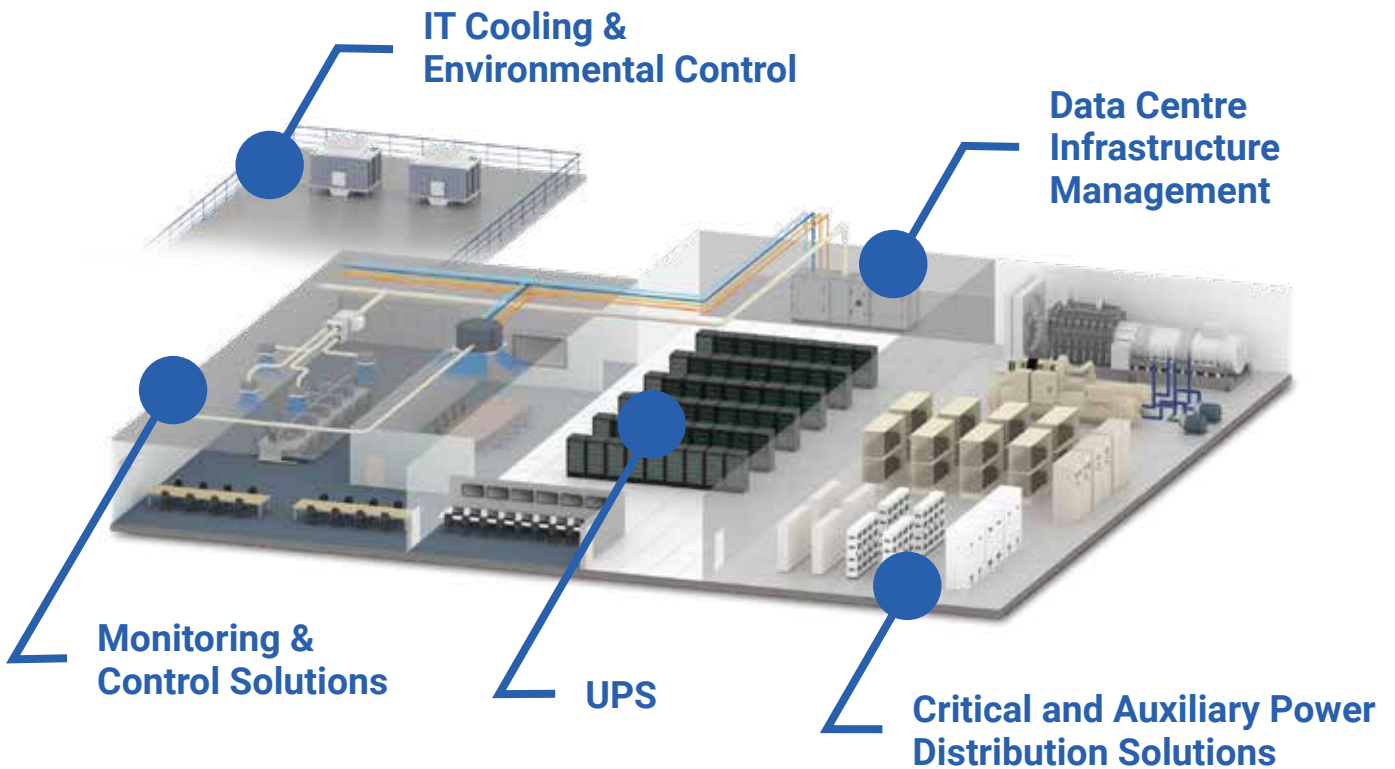


FY2022/2023 Actual Sales: \$449 Million



MEAUST Locations

Data Centre Solutions



Our Products & Solutions

Our goal is to provide a one-stop-shop for integrated, smart, secure, safe and sustainable products and solutions to support the critical needs of data centre owners and operators: high reliability, optimal operations, efficient life-cycle costs and a reduced environmental impact.

Mitsubishi Electric supplies a wide range of software, electrical equipment and electronics which can be integrated into numerous systems to the benefit of data centre owners and operators.

Automation & Control of Equipment and Operations

Mitsubishi Electric monitoring and control systems, including Data Centre Infrastructure Management Systems, enables data centre owners and operators to gather operational data in a central location and manage this data to ensure more efficient and effective operations.

This improves decision-making and reduces the risk of unscheduled breakdowns and stoppages which may arise from problems such as system overload.

High Durability and Long-Term Reliability of Equipment

Mitsubishi Electric ensures that high durability and long-term reliability is incorporated into all product design.

This contributes to improved reliability of data centres, and assists data centre owners and operators to maintain the optimal operation of their facilities, reduce life-cycle costs and streamline maintenance activities to ease the burden on maintenance engineers.

Maximising Power Efficiency, Uptime and Sustainability Outcomes

Mitsubishi Electric manufactures and supplies power and cooling products, systems and solutions needed by data centre owners and operators to maximise facility uptime, Power Usage Efficiency and power quality, whilst maintaining the right temperature and a comfortable environment for staff. This supports data centre owners and operators to achieve power efficiency and sustainability goals.







SCADA



Solution Overview

SCADA (Supervisory Control and Data Acquisition) systems are structured to gather data from signals transmitted from sensors installed on equipment. This data is then leveraged to control equipment and analyse operational status to optimise performance.

ICONICS from Mitsubishi Electric is innovative software that delivers a high-level supervisory system for data centres. GENESIS64™ monitors and controls equipment by gathering all relevant data in one place on the network and empowering teams to make prudent and efficient decisions.

Benefits

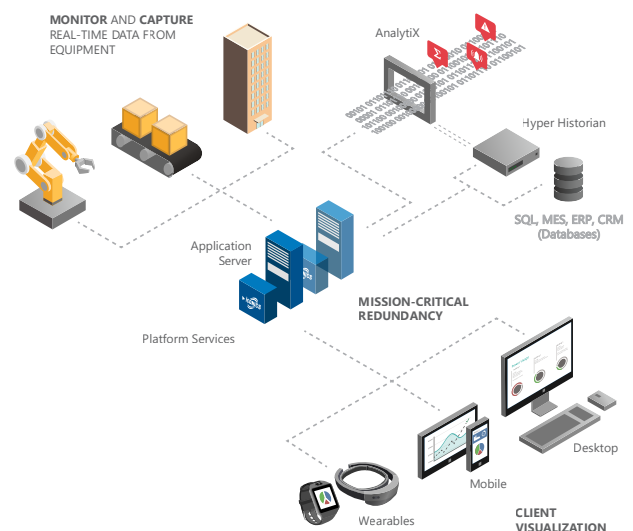
Linking and monitoring data centre components through a data information management system and customisable graphical user interface provides improved user experience and valuable information to drive results.

Our ICONICS solution supports planning to realise operational efficiency, cost savings and energy savings and optimise preventative and predictive maintenance schedules to prevent unexpected equipment failures. It is open & secure for interoperability with IOT, computer & computing systems of all types.

Mission-critical redundancy solutions are easy to install, configure, and deploy and visualisation from any device means the status can be viewed and assessed on premises and remotely.

Features

- » Security camera video feature enables uniform monitoring and control of facility conditions.
- » 3D graphics increases the amount of information that can be displayed on a single screen and improves supervisory capabilities.
- » Users can build scalable, XAML vector-based graphics or use preconfigured symbols with dynamic properties, reference colours and flexible animations.
- » Smart Tiles can display KPIs within operational dashboards.
- » Graphic design of processes such as data recording, alarm notification, and report output using flowcharts improves response times and decision making.
- » Compatibility with many industry-standard protocols, such as OPC™, MODBUS® and BACnet, provides flexibility when it comes to building equipment networks.





BMS



Solution Overview

Today's Building management expectations have changed. They must be more durable, hyper-efficient, and people-centred. Technological advancements and Internet of Things (IoT)-enabled devices make it possible to meet sustainability goals, reduce operating costs, improve occupant experience, boost productivity, and raise building performance and efficiency. If your building management system (BMS) is not future-ready, our BMS team can help you implement the industry leading Niagara Framework®, a software technology designed to integrate diverse building systems and devices into one seamless system.

Benefits

Building management solutions can help reduce energy consumption and costs by optimising the use of heating, ventilation, and air conditioning, lighting, and other building systems. Improved comfort and safety with real-time monitoring and control ensures that temperature, humidity, and indoor air quality levels are maintained at optimal levels for the comfort and safety of people and equipment.

Support for the integration, operation and maintenance of building management systems provides data centre owners and operators with powerful data analysis and insights into energy consumption trends, equipment performance and employee/tenant behaviour which leads to improved decision making regarding current and future investment in systems.

Features

- » Standalone HVAC control system or fully integrated into SCADA via industry standard protocol such as BACnet, Modbus, and OPC.
- » Capable of supporting multiple building management technology systems, including ICONICS GENESIS64, Niagara/Tridium and Legacy Control System.
- » Choice of maintenance and support services to suit owner and operator needs, including comprehensive, preventative and reactive maintenance packages.
- » Project management to ensure projects are delivered on time and on budget.
- » Design and engineering of a system that meets and may improve on specified requirements.
- » Configuration of graphical interfaces to ensure a user-friendly experience.



Programmable Controllers



Solution Overview

High uptime and reliability requirements mean data centre owners and operators need high performing controllers which support efficient and effective front-line and redundant systems. Mitsubishi Electric leverages the technology in its factory automation (FA) business to consolidate all data for data centre operations on the highly reliable MELSEC series programmable controller.

Benefits

MELSEC programmable controllers can be implemented as a dual structure so they continue to operate as control centres with no suspension of operations, even during an abnormal event.

Consolidating all facilities data on the highly reliable MELSEC series programmable controller via networks such as Modbus, BACnet and CC-Link, also enables energy-saving support information to be centrally managed.

Features

- » Can be implemented as a dual structure using controlled CPUs and standby CPUs.
- » Optical-fibre tracking cables enable the standby system to be installed in a remote location up to 550m from the control (primary) system
- » System switching speed from the control system to standby system of approximately 10 ms, further improving system reliability
- » Online replacement of cables and modules (hot-swapping) is possible while continuously operating the system when an error occurs, enabling prompt troubleshooting.



INVERTER / Variable Frequency Drive (VFD)



Solution Overview

The power consumed by air conditioning systems in data centres and other facilities is largely consumed by the motors driving the compressors and blowers. Mitsubishi Electric VFD are highly reliable and proven to deliver exceptional functionality and efficiency year over year. Our solution can reduce power consumption, connect to the broader network and support reduced downtime through the identification and analysis of alarms.

Benefits

Our FREQROL inverters are used to improve the efficiency of various types of motors to the maximum extent possible, while at the same time contributing to the longevity of the product, therefore contributing to energy and resource savings of air conditioning equipment.

Features

- » Power consumption can be reduced by adjusting the amount of airflow by controlling the rotation frequency inverter.
- » Compatible with the majority of industrial Ethernet network protocols used worldwide including BACnet/IP and MODBUS/TCP.
- » The state of the inverters and energy savings can be communicated via the network, enabling more centralised monitoring.
- » To connect to the engineering tool, FR Configurator2, data from inverters can be analysed by AI to assist in identifying the cause of alarms and reducing downtime.



AIR CONDITIONING



Solution Overview

Mitsubishi Electric's range of air conditioning systems is specifically designed to deliver high-efficiency temperature control, making them ideal for commercial buildings that accompany small to medium-sized enterprise data centres or larger high density data centres with accompanying offices. Our expertise, extensive experience and innovative product lines enable building operators to significantly improve their energy performance, reduce operating costs, and comply with ever-stricter regulations.

Office environments accompanying data centres face a growing emphasis on energy efficiency and operating expenses, which requires a low-carbon, economically viable solution. Our objective is to assist companies in reducing their building's energy usage and operating expenses, particularly in comfort cooling offices that accompany data centres. With Mitsubishi Electric, you can achieve optimal energy efficiency and cost savings while maintaining a comfortable and productive working environment.

Benefits

Mitsubishi Electric products meet the challenge of delivering heating, cooling, ventilation and hot water with flexibility of design and control, while maximizing energy efficiency. Our air conditioning solutions utilise sustainable energy resources to keep power consumption to a minimum, while providing the highest levels of comfort available.

Our advanced range of air conditioning models includes the popular MSZ Series and Mr Slim split systems, as well as the City Multi VRF (Variable Refrigerant Flow) system.

Our products are designed to maximise combined energy efficiency, and we provide Mechanical Heat Recovery Ventilation through our Lossnay units to further enhance efficiency. In addition, our hot water heat pumps offer a low-carbon solution to satisfy the demand for hot water, and our Climaveneta chillers with heat recovery capabilities can provide cooling throughout the year while redirecting any rejected heat to provide hot water for accompanying offices. Even our modular E-series range of heat pump chillers can be configured to meet both cooling and heating loads throughout the year.

Features

- » Direct expansion and Hydronic Solutions
- » Centralised and Localised solutions
- » Low GWP Options
- » Heat Recovery Options
- » Hot water Heat Pump Solutions (Integrated and stand-alone)
- » Mechanical Ventilation Heat Recovery
- » Enthalpy and Sensible Heat Exchange solutions



IT COOLING SYSTEMS



Solution Overview

CLIMAVENETA IT COOLING leading-edge cooling technologies and solutions for IT applications are designed to support even the most challenging Data Centre and Telecom projects.

Benefits

Our IT Cooling Systems products are available for Direct Expansion (DX), Chilled Water (CW) or Air to Air, and they offer increasingly efficient, sustainable, and reliable cooling solutions.

These products incorporate smart integration of the most advanced technologies such as: full inverter concept, free cooling, heat recovery management and adiabatic cooling.

Data centre owners & operators can reduce operating costs in infrastructure working 24 hours per day, 365 days per year, over an average of 10 years, with every energy improvement allowing for significant reduction in OPEX (operating costs).

Complete reliability and extended lifetime; with the uptime of server infrastructure and hence the most critical services in modern society, is tightly related to the reliability of the IT cooling system, which must guarantee Tier IV uptime standards over its whole lifetime.



Climaveneta IT Cooling ensures the widest use of the available power capacity. In all installations where power feeds are at capacity, and expanding, there is scope to significantly improve the energy performance of the whole data centre.

Intelligent energy management is crucial also for sustainability, considering the growing impact of the data centre industry in terms of total CO2 emissions.

Features

- » Active Free Cooling is available both as direct and indirect free cooling (no glycol), to exploit the outdoor air to cool the data centre.
- » Smart Thermal Energy Management, is an innovative heat recovery system that allows the smart use of rejection heat from the data centre for comfort heating and other neighbouring applications.
- » Real active redundancy delivered through the combined adoption of innovative EC PUL fans, inverter DC brushless compression and a smart algorithm that balances heating load also among stand-by units.
- » V-AIR is our high efficiency EC technology fan, extensively adopted for their advantages both in internal units as well as in remote condensers with energy reduction up to 15% compared traditional EC fans.



UPS



Solution Overview

Running a data centre requires supplying IT equipment with a stable flow of electricity as a power failure could lead to significant losses. Accidents and temporary outages must be considered, as well as momentary drops in voltage and power fluctuations caused by weather events and natural disasters.

Mitsubishi Electric has a proven track record of delivering high-quality uninterruptible power supply (UPS) solutions to meet the most demanding uptime requirements.

Adopting UPS is the key to protecting IT equipment from such power failures. Mitsubishi Electric's UPS systems for data centres do not merely serve as backups for the loss of power supply, the true online double conversion UPS offered by Mitsubishi Electric is always on, provides filtered clean power supply to critical IT equipment that is susceptible to power harmonics and voltage fluctuation.

Benefits

UPS reliability is at heart of Mitsubishi Electric UPS design, and system reliability is built on high quality parts and proven system topology design.

Mitsubishi Electric's UPS products achieves high efficiency by reducing power loss arising during power conversion using the company's proprietary Insulated Gate Bipolar Transistors (IGBT). These semiconductors have achieved one of the highest levels of efficiency seen in the industry.

Features

- » The 9900D UPS is optimised for typical load levels of 25% to 75%, delivering high efficiencies across all hyper-scale load levels via online double conversion technology, and efficiency is more than 96% at 100% Load.
- » Only premium electrolytic capacitors and cooling fans are used our system, together with proprietary IGBTs semiconductor ensuring the highest product reliability.
- » The transformer-less true on-line double conversion UPS utilises three-level topology and offers the most benefits and reliability.
- » Lithium-ion batteries possess many benefits over conventional VRLA batteries, and are considered an essential part of a modern hyper scale data centre. Mitsubishi Electric UPS system can be paired with the latest generation lithium ion batteries from our pre-qualified vendors, offering lower life cycle cost, higher efficiency, reduced maintenance, longer lifespan, and smaller installation footprint (size and weight).



Image: Mitsubishi Electric 9900D Three Phase UPS



LOW AND MEDIUM SWITCHGEAR



Solution Overview

Mitsubishi Electric offer a comprehensive range of low and medium switchgear, which has gained a solid reputation for superior durability and high reliability, contributing to the stable operation and safety of data centres.

Through conscientious product design and manufacturing, with consideration for the environment, we help reduce the environmental footprint of data centres by using recyclable materials, and in accordance to the ROHS directive, ensure no harmful substances are used.

Benefits

Our broad range of switchgear incorporates circuit breakers including medium voltage Vacuum Circuit Breakers (VCB), Air Circuit breakers (ACB), Moulded Case Circuit Breakers (MCCB), and both low and medium voltage contactors, that are safe, compact, and easy to use.

The MELVAC range of VCB achieve high reliability due to the separation of the main and control circuits, and require reduced maintenance as the centred design allows inspection of the mechanical components by simply removing the faceplate.

Our range of low voltage MCCB, achieves the industry's smallest class dimensions with the high current limiting function of the highly reliable breaking performance technology "arc running shut-off method", while maintaining the conventional breaking performance.

Mitsubishi Electric's low voltage contactors with spring clamp terminals, reduce wiring time at installation, and eliminate the need for re-tightening during inspections, improving maintainability, while contributing to cost reduction.

Features

- » MELVAC series vacuum circuit breakers with rated voltages up to 24kV, and contactors up to rated voltages of 7.2kV.
- » Mitsubishi Electric are a major manufacturer of vacuum interrupters which are included in our MV switchgear, and provide safe and reliable protection even in the most demanding operating conditions.
- » We support the export of our devices globally by complying with the latest overseas standards. Providing safety and security to all parts of the world.



Image: Mitsubishi Electric medium voltage Vacuum Circuit Breakers (VCB), Air Circuit breakers (ACB), Moulded Case Circuit Breakers (MCCB) - (from left to right)



ENERGY SAVING SUPPORTING DEVICES



Solution Overview

The amount of energy consumed in a Data Centre environment means Data Centre owners and operators need a clear line of sight to energy consumption.

Data centre energy consumption can be accurately monitored to easily identify the status of energy usage, across the data centre floor, or room by room to assess energy saving opportunities.

Mitsubishi Electric offers a complete range of integrated energy optimisation solutions for data centres, to maximise power usage efficiency.

Benefits

Energy saving supporting devices facilitate measuring, collecting and analysing energy consumption, providing a visual solution.

Elimination of energy waste being consumed by air conditioning, lighting systems, and production equipment leads to reduced costs due to energy savings.

Together this results in energy savings with reduced facility-wide costs and improved production and operation efficiency.

Features

- » Scalable system expansion is possible depending on the number of energy-saving support devices connected to manage functions and measurements.
- » Visualise energy consumption while remote monitoring via a web browser, or via integration with a SCADA system.



Case Studies

Cloud Europe S.r.l

Rome - Italy

PROJECT

Cloud Europe builds, hosts and manages modular infrastructure for customer data centres in the private and public sectors. It identified a need to carry out a centralisation project at its European Data Centre aimed at helping its customers provide a business continuity equal to or greater than 99.995% hours per year.

“The ICONICS system has allowed us to minimise failure incidences and optimise energy consumption. It has also strengthened the trust and confidence our customers have in our company.”

Giulio Lucci, CEO of Cloud Europe

CHALLENGE

Cloud Europe needed to implement a system capable of collecting and monitoring the status of more than 6,000 energy and environmental data points and making this information available in easy-to-interpret graphs and tables, including to help operators distribute machine workloads.

SOLUTION

Cloud Europe chose to implement the ICONICS GENESIS64™ HMI/SCADA suite (including GraphWorXTM64, Hyper Historian™, AlarmWorXTM64, Mobile HMITM and WebHMITM) for monitoring the energy and environmental resources of its server rooms.

The system is installed in a Virtualisation infrastructure with redundant configuration. Two virtual machines assist in ensuring product security and reliability are ensured. It has a ‘responsive’ graphic interface which integrated 2D and 3D objectives, as well as Smart Symbols.



Image: Iconics Website - Cloud Europe Success Stories

The status of over 4,000 electrical switches, uninterruptible power supply operating parameters, generators and air conditions are monitored, and the data centre is protected by an extensive fire prevention system and anti-intrusion and video surveillance systems. All of these systems are centralized using numerous communication protocols such as Modbus TCP, SNMP, OPC, RESTful Web API's and RTSP/ONVIF. In addition, there are 12 UPS of more than 300 kVA and two Diesel Generator Sets with a power of over one Megawatt. No less important are the climatic conditions of temperature and humidity, which must be constant and well calibrated. For this reason, there are 60 air conditioners inside the Data Centre, all controlled and logged.

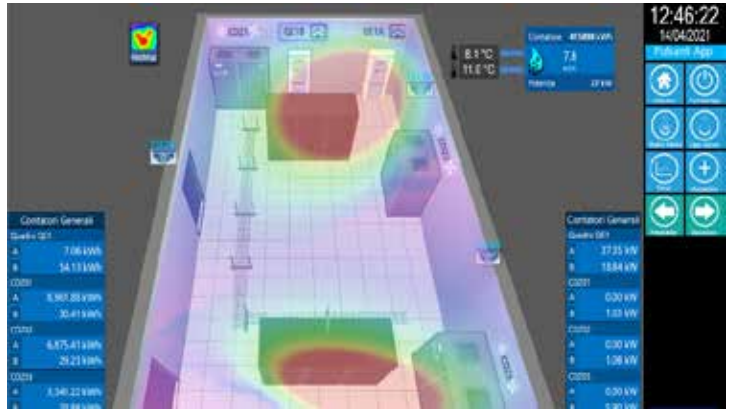
The ICONICS software takes care of monitoring and connecting the data from all these devices and creating alerts when anomalous conditions arise. It also offers operators an overall view of all systems.

The data is transformed into graphs that have allowed Cloud Europe to improve its energy consumption and increase equipment life. Climate conditions are monitored to ensure temperature and humidity are constant and well calibrated. The alarm notification system helps operational staff provide business continuity, prevent failure, rapidly resolve issues and optimize the prevention and resolution of faults. All of these outcomes assisted Cloud Europe to strengthen the trust of its customers in the company and ensure the best performance and efficiency possible.

OUTCOME

Thanks to ICONICS' capacity for the collection, processing, and historisation of energy and environmental data, it was possible for Cloud Europe to improve productivity, efficiency and optimize consumption. The Cloud Europe operational staff are tasked with the fundamental mission to prevent failure and rapidly resolve issues. The ICONICS Suite has become their main working tool to ensure business continuity to customers.

Additionally, technical and maintenance staff are equipped with tablets with a Mobile HMI application, allowing them to continually consult the data and status of the systems and take action before faults occur. This means Cloud Europe can optimize the prevention and resolution of faults.



Thermal Map of One of the Server Rooms



Detail Page for Air Condition Units

IT Cooling for leading data centre company in Australia

Australia

PROJECT

For several years now, Mitsubishi Electric Australia has been backing a leading provider of top-tier, secure data centre services in Australia. This service provider, expanding its presence across campuses in Australia and New Zealand, specializes in constructing, owning, and operating data centres. They also ensure the consistent availability of mission-critical systems.

Equipment supplied

For Data centre load:

- » Air-cooled Free cooling screw compressor chillers
- » Air-cooled inverter screw compressor chiller

For Office load:

- » Air-cooled 4 pipe screw compressor unit (suitable for simultaneous use for cooling and heating)

CHALLENGE

By partnering with Mitsubishi Electric Australia, the data centre operator aimed to acquire dependable, energy-efficient, and sustainable cooling solutions for its data centre infrastructure. These solutions were deployed in Hyper Scale, as well as various sizes of data centres throughout their portfolio.

Their goal was and is to design and implement reliable, secure, and efficient cooling solutions for their rapidly expanding data centre infrastructure. With a commitment to sustainability, they sought solutions that minimised environmental impact while maintaining operational excellence.

The operator's footprint has expanded, increasing the complexity of operations and escalating the demands on their infrastructure. As the operator has grown, the addition of new data centres across Australia and New Zealand presented unique challenges. Ensuring consistent performance, regardless of size or location, became an urgent requirement.

Security was another significant concern. Given the critical applications running on their systems, any breach could have severe consequences. Therefore, implementing robust security measures was imperative to maintaining trust and continuity in their operations.

Efficiency and sustainability are key to the operator's vision, requiring solutions that not only perform optimally but also promote environmental stewardship. The operator sought to balance the technical demands of cooling their facilities with the need to minimize energy consumption and carbon emissions.

Noise pollution was another crucial factor. The operator needed to ensure that the noise emissions from their facilities did not disturb the surrounding communities, thereby making acoustic management a key element of the project.

Finally, the entire solution had to be thoroughly vested through Integrated Systems Testing (IST). This would validate that all components of the cooling solution functioned together seamlessly, providing the necessary reliability, and efficiency while adhering to strict security and sustainability standards.

Addressing all these challenges was a complex task requiring not only expertise in data centre design and operation but also a comprehensive understanding of the unique needs and constraints of the operator.

SOLUTION

Mitsubishi Electric engaged in a collaborative effort with this data centre operator to source air-cooled chillers and heat pumps, capable of offering cooling capacities between 660kW and 126MW across various locations. These systems incorporated Free Cooling, Screw, Multi-Scroll, and Evaporative Free-Cooling Chillers, in addition to Air-cooled INV Scroll Heat Pumps (Modular Units).

Custom-built to meet the specific needs of the customer, the chillers were delivered and set into operation within the framework of a highly accelerated work schedule.



Image: Mitsubishi Electric IT Cooling solutions on-site

In a bid to enhance efficiency under lower ambient conditions, free cooling chillers were incorporated. These chillers leverage the cooler outdoor or ambient air to regulate the temperature of the free cooling circuit. This method temporarily deactivates or partialises the need for mechanical cooling, leading to increased operational efficiencies in the process. Bitzer screw compressors, renowned for their reliability and durability, were used; these compressors are known to have a carbon steel bearing lifespan of 150,000 hours.

A noise reduction kit was also implemented to manage acoustic levels. The units underwent rigorous performance testing and on-site Integrated System Testing to ensure their optimal functionality. All these processes were overseen by highly experienced technicians, who had received extensive training directly from the factory.

OUTCOME

Mitsubishi Electric continues to work with this data centre operator as it continues to expand its footprint and operations across Australia and New Zealand. All stages of testing have been successfully passed by Mitsubishi Electric's IT Cooling Equipment to date, and the customer has achieved its target for Power Usage Effectiveness, showcasing the effectiveness of the units.

Sabey Intergate Data Centers

Ashburn, VA, USA

PROJECT

Sabey Data Centers is one of the longest-lived and largest privately-owned, multi-tenant data centre provider in the world. They own, develop, and operate all of their facilities. Private ownership, coupled with the stability of large financial partnerships, allows them to maintain complete focus on each customer's requirements.

"Mitsubishi has a highly efficient double-conversion UPS. After cooling, the electrical distribution is typically the best opportunity for PUE improvement in a data centre, so high efficiency UPS are key to our Energy Star performance."

John Sasser, SVP Data Center Operations

Sabey Data Center's Ashburn Building C is a part of a 38-acre data centre campus located in the heart of the nation's densest connectivity corridor in Virginia, US. Two out of three buildings are now completed and leasing colocation and powered shell data centre space, thus offering tenants over 36 MW of power and access to multiple connectivity options.

CHALLENGE

Co-location customers demand highly reliable energy efficient data centre operation at competitive pricing. Finding critical solutions partners to help meet these needs and exceed customer expectations is vital to Sabey Data Centers' growth strategy. But it doesn't end there - after initial equipment installation, these partners must be able to support customer commitments for years to come through high quality maintenance and support.

SOLUTION

With reliability, efficiency, and total cost of ownership in mind, Sabey Data Centers looked to their long running relationship with Mitsubishi Electric and their 9900C Series UPS to support their data centre design. They knew that the highly efficient 9900C would help them meet their needs and achieve the highest rating from Energy Star for their Intergate Building C facility in Ashburn, Virginia.

The 9900C Series UPS is designed specifically for the relentless demand of cloud and colocation services facing today's hyper scale data centres. It is designed with reliability and maintenance in mind, ensuring consistent quality for the lifetime of the UPS. The 9900C leads the pack with real-world reliability numbers of 99.9994%, up to 97% efficiency, and an industry-leading footprint. This is backed up with a performance guarantee ensuring that the AC to AC efficiency of the 9900C Series UPS modules will not be less than 1% below the specified efficiency.

The 9900C Series UPS boasts a sustained load carrying capability of more than 99.9994% in the system's actual operational history providing unparalleled levels of uptime to their customers. Mitsubishi Electric's market-leading 97% efficiency reduces overall infrastructure energy consumption and cooling costs across all load ranges, resulting in significant operating cost savings.



The 9900C Series has now been superseded by the Mitsubishi Electric 9900D Series. This new series has higher power density, higher efficiency, a smaller footprint and better user interface. It is also modular, expandable, and more powerful than the 9900C Series. The 9900D is now available in both the US and Australian markets.

Image: Mitsubishi Electric 9900D Three Phase UPS



Schipol Airport Data Centre

Amsterdam - Netherlands

PROJECT

The data centre at Schipol Airport was acquired in April 2016, with the intent to bring it up to date and to enlarge the available floor space. From 1,000 square meters of space, they increased the total area to more than 4,500 square meters.

CHALLENGE

The data centre operator additionally wanted to revise and re-install the entire cooling system with the aim of achieving a low PUE (Power Usage Effectiveness) for both existing and new customers and thus significantly reducing energy costs in terms of cooling. At the same time, they wanted to increase the power density per square meter to between 1.6 and 1.8 kW for greater efficiency.

SOLUTION

For this reason, the IT Cooling system is based on RC 6 GLIDER EVO free-cooling chillers and 40 NEXT EVO water chilled close control units was chosen. NEXT EVO units were supplied with the air intake from the top and air delivery from the bottom of the unit.



OS-IX Data Centre

Oslo - Norway

PROJECT

OS-IX data centre is owned by Bulk Infrastructure and Akershus Energi. The OS-IX complex has a total area of 25,000 m², which makes it the largest data centre in Oslo. OS-IX is a connectivity hub for the national and international fibre grid to ensure redundancy.

CHALLENGE

Bulk Infrastructure and Akershus Energi decided to revitalise the building with new infrastructure with the aim of becoming the most competitive data centre location in Oslo, both in terms of cost effectiveness and in terms of achieving low PUE (Power Usage Effectiveness).

SOLUTION

When it came time to choose the IT cooling solution, a system based on RC units was selected. X TYPE T2 S close control air conditioners were chosen for the data halls, NEXT EVO Inv DW for the UPS/Battery rooms, NEXT EVO CW for the two MMR and carrier rooms, and UNICO TURBO air cooled chillers with free-cooling, designed for cooling capacity of 3,200 kW for the overall building. A solution of this kind, offers the lowest possible LCC and PUE and 100% free-cooling up to ambient temperature 16°C. Since the average year around temperature in Oslo is between -6 and 22°C, there is free-cooling 365 days a year.



Davinci-1

Torre Fiumara, Genoa - Italy

PROJECT

Davinci-1 is the new supercomputer of Leonardo S.p.A., an Italian company active in the fields of defence, aerospace, and security. The name chosen for the new structure, installed in Torre Fiumara in Genoa, is therefore a double reference to the genius of the Renaissance and to the society that wanted and built it. A symbol of technological innovation and development in Italy and Europe, Davinci-1 has been included in the top 100 supercomputers in the world and is on the podium of the A&D sector (Aerospace & Defence).

CHALLENGE

Davinci-1 has a battery of over 100 supercomputer units, with a total computing power of more than 5PFlops – 5 quadrillion floating-point operations per second – with a high-performance network and storage system built by DDN, equipped with the latest hardware and software technologies, for storage capacity of the order of 20Pbytes (20 million Gigabytes).

SOLUTION

To ensure the correct and continuous operation of such a large and powerful data centre, you need to have a highly reliable and efficient cooling system. To this end, Mitsubishi Electric has supplied RC branded units for IT Cooling, specifically 2 FR-FC-G05-Z/SL-T+ 1702 water-cooled chillers and 12 w-NEXT precision air conditioners. The system has been designed to guarantee redundancy and therefore maximum reliability 24/7 as required by such a mission critical application.



WIIT Datacentre Milan

Milan - Italy

PROJECT

Mitsubishi Electric Hydronics & IT Cooling Systems, through its brand RC has supplied the HPAC units for the WIIT Data Centre in Milan. WIIT is an Italian company focused on Private and Hybrid Cloud continuative services, and is one of the main players in Europe and Worldwide, specialised in application management and critical applications such as disaster recovery and business continuity. WIIT owns three data centres in Italy.

CHALLENGE

The Milan Data Centre has a surface of 550 sq. metres. It is the company's primary Data Centre where the most complex ERP (Enterprise Resource Planning) infrastructure is located and managed. The structure achieved Tier IV certification from the Uptime Institute.

SOLUTION

The solution RC has supplied a high energy savings, fully redundant cooling system for this TIER IV certified Data Centre. Going in detail 10 NEXT EVO INV DX U and 18 remote condensers TEAM MATE STD have been installed. NEXT EVO INV DX U direct expansion precision air conditioners equipped with BLDC inverter scroll compressor matched with TEAM MATE remote air cooled condensers represent a perfect example of reliability and efficiency. The use of direct free cooling increases the efficiency of the system.



Fastweb Tier IV Data Centre

Milan - Italy

PROJECT

Italian telecom operator Fastweb already had a large market share for networking and valued-added services like hosting and server management and security. But it wanted to ensure it could offer best-in-class service for its client Enterprise with a data centre that was requirement-ready for both cooling and heating.

CHALLENGE

The centre has an unusual "dual" architectural design: dual cooling plants, dual pumping stations, and dual cooled water supply circuits. Consequently, any piece of equipment or circuit in the system can be serviced at any time without any data centre downtime. Such attention to risk and safeguards is what won the data centre its rare Tier IV certification, awarded to a system in which operation is never interrupted and that is designed to respond automatically to any fault, be it a leak, power failure, or something else.

SOLUTION

The Climaveneta technology was the keystone of this superior performance and enhanced sustainability. Four TECS2 0652 SL-CA-E units and the management and optimisation system ClimaPRO deliver precise and continuous cooling to the state-of-the-art structure. The Climaveneta ClimaPro control system provides parallel operation between the two stations. "This allows us to maximise the energy efficiency ratio coefficient of the cooling performance in any load condition of the data centre," says plant designer Ferdinando Ciardullo. With Climaveneta technology, advanced cooling performance and energy-saving efficiency are simultaneously attainable for data centres.



Fortum

Espoo - Finland

PROJECT

Data centres are vital parts of the infrastructure of modern life. But let's think about them in a different way: as a heat source. Because waste heat isn't waste if you know what to do with it. "With relatively minor modifications, we were able to convert the data centre into a heat production plant," recalls Petteri Hajanti, a senior consultant involved with this project, "and simultaneously with the same equipment, we were able to provide the cooling for the data centre."

CHALLENGE

The data centre was Ericsson's, which needed a better cooling system ahead of a rapid up-tick in its IT load. The other partner in the project was Finnish energy company Fortum, which wanted a heating network for the local district with modest investment. Ericsson and Fortum cooperated to achieve their respective goals. Heat pumps owned and operated by Fortum would supply the primary cooling for the data centre. But to make the project more sustainable and reliable, they needed the right units.

SOLUTION

Mitsubishi Electric provided two large Climaveneta heat pumps, each with a megawatt of cooling capacity and environmentally friendly HFO cooling refrigerants. "The heat of the data centre is recovered and the temperature increased to 70 degrees," explains Paolo Gentiluomo of Mitsubishi Electric Hydronics & IT Cooling Systems. This is useful, valuable heat. Fortum harnessed the excess heat by piping it into the local district heating system so that residents can benefit from it.

"For a data centre owner," Gentiluomo notes, "the possibility to purchase the cooling directly as a service rather than a full cooling plant is a new way of looking at the business."



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