





AIR CONDITIONING SYSTEMS



HYBRID

CITY MULTI

Case Studies

-  Hotels & Residences
-  Offices
-  Education Facilities
-  Hospitals & Healthcare Facilities

Mitsubishi Electric's

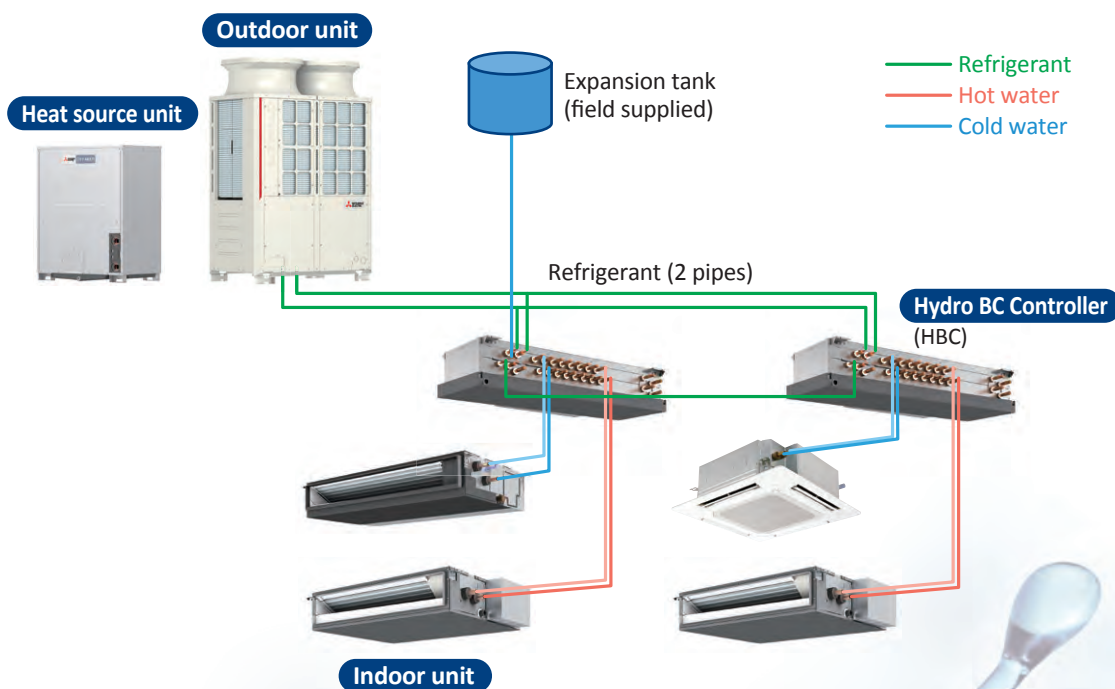
HYBRID

CITY MULTI

– The industry's first and only technology –

As a leading company in the industry, Mitsubishi Electric has developed the HYBRID CITY MULTI as a top-of-the-line CITY MULTI system by using the industry's first and only technology.

The HYBRID CITY MULTI system uses refrigerant only between the outdoor unit and the Hydro BC Controller (HBC), and water between the HBC Controller and the indoor units. It combines the comfort level of a traditional 4-pipe chiller and VRF technologies with maintenance and installation ease.



Award History



The RAC Cooling Industry Awards 2016

Air Conditioning Product of the Year
*Awards presented in the UK.



The ACR News Awards 2017

Air Conditioning Product of the Year
*Awards presented in the UK.

Since its release in 2012, the HYBRID CITY MULTI has received several awards. The system have been used in hotels, business offices, government offices and for various applications. Many of our clients are happy with their choices.

Highly evaluated features in HYBRID CITY MULTI projects



Comfort with control

The HYBRID CITY MULTI system can provide individual control by indoor unit or by zone with the integration of Mitsubishi Electric's MELANS control system. Whether by local controller or centralized controller, air conditioning can be monitored and operated remotely.



vs chiller

Easy installation and maintenance with less piping and fewer key components

The HYBRID CITY MULTI system is a 2-pipe system requiring less piping comparing to a 4-pipe system. It also requires fewer key components to be installed because hydraulic components such as the pumps, heat exchanger, and valves are incorporated in the Hydro BC Controller. This feature simplifies not only the installation work, but also the maintenance process.



vs chiller

High efficiency with heat recovery operation

The HYBRID CITY MULTI R2 Series offers cooling and heating in one system. The Hydro BC Controller is the technological heart of the R2 technology that enables simultaneous cooling in one zone and heating in another. Furthermore, the R2 system delivers high energy savings when cooling and heating are provided at the same time.



vs VRF

Refrigerant less in occupant spaces with the separation of refrigerant and water system

The HYBRID CITY MULTI system uses refrigerant only between the outdoor unit and Hydro BC Controller, and uses water to transfer the heating and cooling effects to occupant spaces. This enables the system to comply with refrigerant regulations and eliminates the need for a leak detection system, thereby reducing equipment and maintenance costs.

01

Hotels &
Residences

02

Offices

03

Education
Facilities

04

Hospital &
Healthcare Facilities



01 Hotels & Residences

COMFORT

In hotels, offering comfortable air environments throughout the building is imperative to the guests' hotel experience. The HYBRID CITY MULTI system provides comfort with mild outlet temperature and individual control while delivering heating and cooling simultaneously.

Hotel Il Sereno - Italy

"The pursuit of the perfect conditions for guests is also reflected in a choice of utility systems combining technological innovation and environmental sustainability with comfort."

LESS REFRIGERANT

What's more, with the HYBRID CITY MULTI system, refrigerant is used only in the outdoor unit, and occupant spaces are free of refrigerant. This helps hotels comply with refrigerant regulations, which usually require refrigerant leak detection in occupant spaces.

Hotel Klingenstein - Germany

"HYBRID CITY MULTI was also a choice made in consideration of the current F-gas discussion and to have a future-oriented system for heating and cooling installed."



“The original building used conventional chillers, but the hotel had a specific requirement in choosing a system that ensures no presence of refrigerant in occupant spaces.”

Installation Summary

Outdoor unit
PURY-M x 7

Hydro BC controller
Main
16 port x 6
8 port x 1
Sub
8 port x 5

Indoor unit
Ceiling concealed low static pressure type
x 117
Ceiling concealed medium static pressure type
x 10

Remote controller
PAC-YT52 x 1
PAR-CT01 x 126
PAR-W31 x 1

Centralized controller
AE-200 x 1
EW-50 x 2

Hot water supply
QAHV-N x 3

Courtyard by Marriott Amsterdam Airport

Hoofddorp, Netherlands

R32

Overview of the Project

Courtyard by Marriott Amsterdam Airport is located only 10 minutes away by car from Schiphol Amsterdam Airport. The hotel was considering a new air conditioning system for its new extension which adds 111 guest rooms.

The Challenge

The original building used conventional chillers, but the hotel had a specific requirement in choosing a system that ensures no presence of refrigerant in occupant spaces.

The Solution

The HYBRID CITY MULTI was the perfect solution to this requirement. The system uses refrigerant only between the outdoor unit and the Hydro BC Controller (HBC), and water between the HBC Controller and indoor units. The flow of refrigerant is limited to certain areas, and guests have control over their own rooms with a MA Touch Remote Controller. The hotel chose the newest HYBRID CITY MULTI series that uses the R32 refrigerant, which has a lower GWP compared to the R410A. Mitsubishi Electric adopted the R32 refrigerant for the first time in the industry for VRF systems (multi-split air conditioners for building applications). The R32 can reduce GWP by approximately 67% compared to R410A. For domestic hot water, Mitsubishi Electric's QAHV Series Hot Water Heat Pump with CO₂ natural refrigerant was the choice. It can provide large volumes of hot water required in the hotel's new extension with reliable performance and high heating capacity even at low ambient temperatures.



“HYBRID CITY MULTI was also a choice made in consideration of the current F-gas discussion and to have a future-oriented system for heating and cooling installed.”

Installation Summary

Heating Capacity 150.0 kW
Cooling Capacity 135.0 kW

Outdoor unit
PURY-EP x 3

Hydro BC Controller
Main
CMB-WP x 5

Indoor unit
Ceiling concealed low
static type
x 63
4-way flow ceiling cassette type
x 10

Remote controller
PAC-YT52 x 63

Centralized controller
AE-200 x 1
TG-2000 x 1

Hotel Klingenstein **R410A**

Würzburg, Germany

Overview of the Project

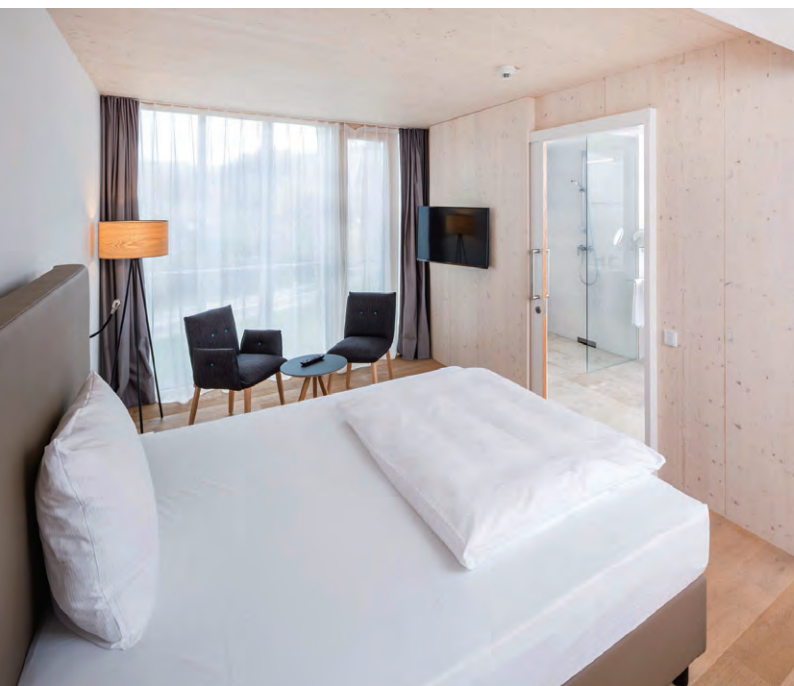
The Klingenstein comprises a hotel, inn and brewery and is located in the Klingenstein district of Blaustein. It was used as a lodging house, hostelry and brewhouse that stretching back 400 years. In 2017, the traditional ensemble of buildings was expanded to include a modern new hotel section, which was constructed entirely in wood and deliberately contrasts with the original, classified heritage structure. The ground floor was designed as a classic shell construction in exposed concrete. Above this are three further floors built of solid wood in a modular design.

The Challenge

The hotel comprises 63 single, double and family rooms on three floors. The ground floor of the new building contains six meeting and conference rooms that can be used flexibly and provide a floor area of up to 104 m². The client and owner was looking to achieve the best possible air conditioning comfort for guests, high energy efficiency, low operating costs and ease of use. "The requirements for this building were very demanding. In particular, the solid wood design of the building poses special demands in terms of fire safety," explains the Managing Director.

The Solution

The branch manager of a wholesaler highly evaluated the HYBRID CITY MULTI system, which is the world's first 2-pipe system to provide simultaneous cooling and heating with heat recovery, combining the benefits of a direct evaporation system and those of a chilled water system. It was also a choice made in consideration of the current F-gas discussion and to have a future-oriented system for heating and cooling installed.

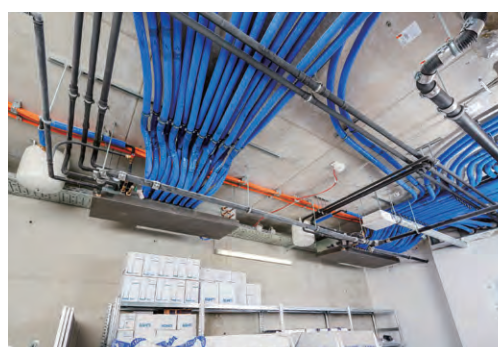


Three HYBRID CITY MULTI outdoor units with different capacities are installed on the side roof. They transport the refrigerant via pipe trains to a total of five HBC controllers, which are located in storage and technical rooms on the ground floor. From there, they supply the indoor units with the required heating or cooling capacity. Two pipes with a small pipe cross-section run through the building to each indoor unit, so that the heating and cooling system requires little space.

Each of the 63 guest rooms has a concealed indoor unit installed in the suspended ceiling in the entrance area. On the ground floor, there are six conference and seminar rooms of different sizes, which are air-conditioned with 4-way flow ceiling cassettes. There is also a 4-way flow ceiling cassette in the entrance foyer and one in the beer store to maintain a uniform temperature. A total of 73 indoor units have been installed in the new hotel building.

The hotel showed particular importance in controllers. This requirement was met using a compact remote controller for the indoor units. The temperature and desired fan speed can be set individually in each hotel room or conference room. When guests are not in the rooms or the rooms are not occupied, the indoor units are scheduled to maintain a moderate room temperature.

The units are also connected to a centralized controller for monitoring and managing the air-conditioning systems. It is installed in a small technical room and integrated to TG-2000 operating software which offers further functionalities and additional energy-saving potential.





“The pursuit of the perfect conditions for guests is also reflected in a choice of utility systems combining technological innovation and environmental sustainability with comfort.”

Installation Summary

Heating Capacity 270.0 kW
Cooling Capacity 240.0 kW

Outdoor unit
PQRY-P x 6

Hydro BC Controller
Main
16 port x 6

Indoor unit x 79
Floor standing concealed type
Ceiling concealed middle static type
4-way flow ceiling cassette type

Centralized controller
AE-200 x 3
LonWorks

Hot water supply
CRHV-P x 2

Hotel Il Sereno R410A

Como Lake, Italy

Overview of the Project

The Hotel Il Sereno, a 5 star luxury is located in Torno (Como) by Como Lake. The facility boasts 34 spacious guest rooms, all with a lake view and private, partitioned balconies, a 18 meter infinity pool suspended over the lake, a fully equipped spa and a restaurant staffed by award-winning chefs.

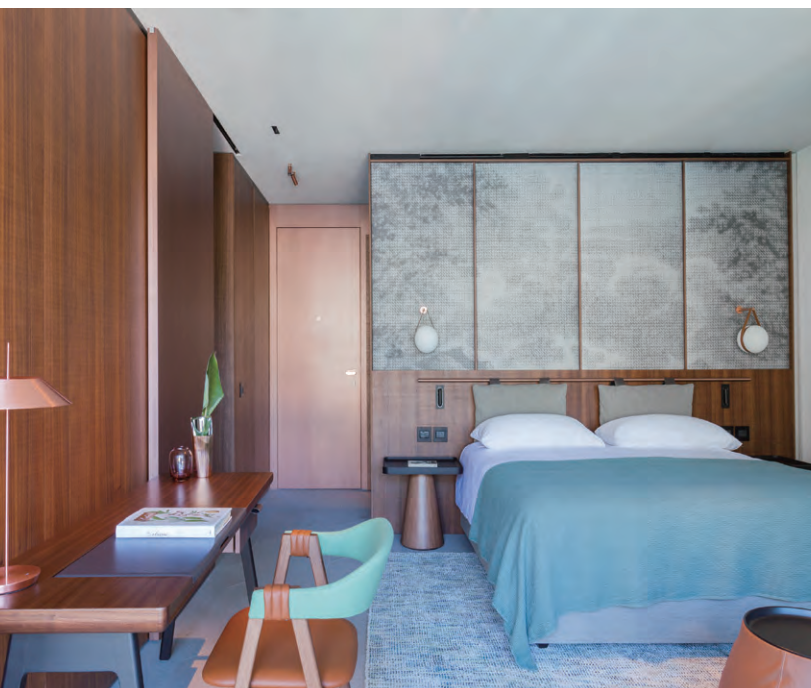
The Challenge

The prerogative for the project was to create the perfect conditions to give guests the sensation of being cocooned in an oasis of tranquility, where the opportunity to enjoy the spectacular landscape is made all the more special by every conceivable comfort.

Every space in the property was designed to offer a privileged window onto the lake and the mountains, and as a consequence, the use of predominantly natural materials – such as wood, stone, copper and textiles – was a logical choice. This pursuit of the perfect conditions for guests is also reflected in a choice of utility systems combining technological innovation and environmental sustainability with comfort.

This is why Mitsubishi Electric was chosen as a supplier, which responded to the primary energy requirements of the facility (heating, cooling and domestic hot water production) with its state of the art air conditioning systems.

HYBRID CITY MULTI was specifically chosen for the hotel.



The Solution

To provide primary heating and cooling functionality for the utilities situated on floors -1 to 4, a total of six HYBRID CITY MULTI systems have been used utilizing lake water for condensation.

Lake water is drawn by a pumping station installed 15 meters below the surface of the lake. The six HYBRID CITY MULTI systems have a combined cooling capacity of 240.0 kW, and 270.0 kW of heating capacity. Via six Hydro BC Controller, these systems feed a total of 79 indoor units of a variety of different types, from concealed floor standing indoor units (used predominantly in bedrooms), to medium static pressure ducted indoor units and 4-way flow ceiling cassette indoor units. The Hydro BC Controller have been fitted in the ceiling of a technical room on the second floor.

Two Ground Source Hot Water Heat Pump units have been installed to supply the hotel with domestic hot water. With a combined thermal capacity of 120 kW, these two units produce hot water of up to 65°C by exchanging the thermal power of the array via the heating coil of a 2,000 liter capacity domestic hot water boiler.

Installation



Hydro BC Controller



Indoor unit



Ground Source Hot Water Heat Pump



Plate heat exchanger
(Field supplied)



“The hotel was considering renovating the air conditioning system after experiencing several instances of failure with their old chiller system. The hotel had specific requirements focusing on efficiency of the system without the presence of refrigerant and on simultaneous heating and cooling.”

Installation Summary

Heating Capacity 315.0 kW
Cooling Capacity 275.0 kW

Building size 3,000 m²

Outdoor unit
PURY-P x 4

Hydro BC Controller
Main
16 port x 8

Indoor unit
Ceiling concealed low
static pressure type
x 128

Remote controller
PAR-32MAA x 7
PAC-YT52 x 128
PAR-U02 x 4

Centralized controller
AE-200 x 1
EW-50 x 2

<Others>

Outdoor unit
PUHY-P x 1

Indoor unit
Ceiling concealed middle
static pressure type
x 11

Holiday Inn **R410A**

Nice, France

Overview of the Project

Holiday Inn® hotel is a 4-star hotel located in the heart of Nice, close to the train station and just a seven-minute walk from the beach. The hotel has recently undergone a renovation of its 131 rooms and suites, bar, restaurants, and seminar rooms.

The Challenge

The hotel was considering renovating the air conditioning system after experiencing several instances of failure with their old chiller system. The hotel had specific requirements focusing on efficiency of the system without the presence of refrigerant and on simultaneous heating and cooling.

The Solution

The outdoor units are positioned on the roof. The HYBRID CITY MULTI system serves 8 floors of guest rooms and the standard CITY MULTI system serves the restaurants and meeting rooms. The HYBRID CITY MULTI was the ideal solution to the hotel's requirements.

By providing simultaneous heating and cooling (R2), the system can recover heat efficiently, particularly in mid-seasons when the cooling-heating ratio is 50%. Also, in consideration of the F-gas regulation and BS EN378, the solution to have less refrigerant in the system was a perfect choice for the hotel to be relieved from concerns about refrigerant concentration.

The HYBRID CITY MULTI system also contributed to reducing the installation work comparing to the 4-pipe chiller system, as the Hydro BC Controller incorporates the pump, heat exchanger and other major components and thus requires fewer components to be installed. The hotel was able to carry out the installation during the busy season without closing its business.



02 Offices

COMFORT

Offices can be a comfortable place offering an air conditioned environment with independently controlled zones or to tenants. The HYBRID CITY MULTI system provides mild air for greater comfort, minimizes draughts and operates at a low sound level.

EASE of INSTALLATION and MAINTENANCE

The HYBRID CITY MULTI system installation is easy as the VRF system, and adaptable to flexible layout and the system integration of the MELANS control. Comparing to a conventional 4-pipe chiller system, it requires less plant space, and maintenance is easier with less piping and fewer key components.

Radio7 - Germany

"The disadvantage of the previous system was that all the recording studios could only be provided uniformly with either heating or cooling. The operators consequently decided on an investment that had to fulfill three requirements: the new air conditioning technology had to conserve energy, offer a high comfort level for the user and keep rooms used by people free of refrigerant."

PROXIMA V- France

The HYBRID CITY MULTI system contributes to reducing installation work comparing to the 4-pipe chiller system, as the Hydro BC Controller incorporates a pump, heat exchanger and other major components and requires fewer components to be installed.



“After installation in 2017, customer feedback has been very positive for both the indicators of comfort level and system operation. Moreover, the refurbishment project has given the building an innovative profile and a clear commitment to sustainability and energy efficiency, such that the building has received the LEED PLATINUM certificate.”

Installation Summary

Heating Capacity 777.0 kW
Cooling Capacity 691.0 kW

Building size 9,000 m²

Outdoor unit

PURY-WP x 22
PURY-P x 2

Hydro BC Controller

Main
CMB-WP x 26

Indoor unit

Ceiling concealed middle
static type
x 164

Remote controller

PAR-32 x 159

Centralized controller

AT-50 x 24
BAC-HD150 x 4

Zurich Offices Blue Building

Madrid, Spain

R410A



Overview of the Project

The office building is owned by the Zurich Group, and has been remodeled by the architect Rafael de La Hoz. It has eight floors with a total area of more than 9,000 m², and house offices of between 300 and 1,200 m² in the financial center from Madrid.

The Challenge

The property was looking for an air conditioning system that would combine efficiency, comfort and minimum maintenance costs. The decisive factors in choosing an air conditioning system were also the small space needed for installation and versatility of installation, to provide flexibility and adaptability of spaces to all types of companies.

The Solution

The building's choice was the unique HYBRID CITY MULTI series. The HYBRID CITY MULTI uses refrigerant between the outdoor unit and Hydro BC Controller (HBC) and water between the HBC and indoor units. The HBC is the most unique feature of the system which allows heat exchange between refrigerant and water.

Thanks to the energy efficiency of the air conditioning equipment and the low energy demand of the building, it has been possible to reduce energy consumption compared to a conventional water system.



“In consideration of the F-gas regulation and BS EN378, the solution to have less refrigerant in the system was a perfect match for this project. It was also ideal to achieve the LEED Gold label and to be relieved from the concerns of refrigerant concentration.”

Installation Summary

Heating Capacity 585.0 kW
Cooling Capacity 520.0 kW

Building size 6,700 m²

Outdoor unit
PURY-P x 13

Hydro BC Controller
Main
16 port x 19

Indoor unit
Ceiling concealed low
static pressure type
x 203

Remote controller
PAC-YT52 x 203

Centralized controller
AE-200 x 2
EW-50 x 3

PROXIMA V R410A

Guyancourt, France



Overview of the Project

PROXIMA V is a five-story new commercial real estate complex situated in Guyancourt, city center of Saint-Quentin-en-Yvelines located north central of France.

The former building had been vacant for a few years and the reconstruction began in 2016, and tenants have gradually settled and started operations from 2019.

The Challenge

In order to offer comfortable environment to tenant offices, a simultaneous heating and cooling solution and flexibility of installation were requested. Moreover, the project had a strong requirement in achieving LEED GOLD label.

The Solution

The HYBRID CITY MULTI was the perfect choice to answer to these requirements. The system with simultaneous heating and cooling is able to recover heat and is the most efficient in the mid seasons when the ratio of cooling and heating is 50% each.

Also, in consideration of the F-gas regulation and BS EN378, the solution to have less refrigerant in the system was a perfect match for this project. It was also ideal to achieve the LEED Gold label and to be relieved from the concerns of refrigerant concentration.

The system also contributes to reducing installation work comparing to the 4-pipe chiller system, as the Hydro BC Controller incorporates a pump, heat exchanger and other major components and requires fewer components to be installed.



“It was particularly important to us that a refrigerant circuit was not installed in the occupant spaces. We wanted only water to be used as the medium for cooling.”

Installation Summary

Heating Capacity 384.0 kW
Cooling Capacity 342.5 kW

Outdoor unit
PURY-EP x 10

Hydro BC Controller
Main
16 port x 10

Indoor unit
4-way flow ceiling cassette type
x 118
Ceiling concealed middle
static pressure type
x 5

Remote controller
PAR-CT01 x 126

Centralized controller
AE-200 x 1
EW-50 x 3

Infosim **R410A**

Würzburg, Germany

Overview of the Project

Infosim GmbH & Co. KG is a market-leading manufacturer of automated service fulfilment and service assurance solutions on a global scale. The new five-story office building in the Hubland district of the city is situated on a former military site close to the University of Würzburg. The building is divided into three sections. Offices are situated to the left and right of the central service core, which contains elevators, server rooms, logistics rooms and sanitary facilities.

The Challenge

The requirements for this building were very demanding, particularly in terms of the air-conditioning system.

The owner and the managing director of the company explains, "The overall task was to design an office building for an IT company in the software development sector. The particular challenges here were that the building had above-average thermal loads and a clear north-south orientation." Another requirement to consider was stated; "It was particularly important to us that a refrigerant circuit was not installed in the occupant spaces. We wanted only water to be used as the medium for cooling".

The Solution

A HYBRID CITY MULTI system from Mitsubishi Electric was suggested as the simultaneous heating and cooling air conditioning solution. The system was specially developed to meet the demands of modern building architecture with high efficiency and comfort requirements. Each individual indoor unit can be operated independently in heating or cooling mode.

The Hydro BC Controllers are located in the technical room and are responsible for heat exchange between the refrigerant-controlled outdoor circuit and the water-based indoor circuit.

For control, PAR-CT01 Touchscreen Remote Controllers are used for individual operation of the indoor units in the offices and conference rooms.





“The disadvantage of the previous system was that all the recording studios could only be provided uniformly with either heating or cooling. The operators consequently decided on an investment that had to fulfill three requirements: the new air conditioning technology had to conserve energy, offer a high comfort level for the user and keep rooms used by people free of refrigerant.”

Installation Summary

Heating Capacity 25.0 kW
Cooling Capacity 22.4 kW

Outdoor unit
PURY-EP x 1

Hydro BC Controller
Main
CMB-WP x 1

Indoor unit
Ceiling concealed middle
static pressure type
x 8

Remote controller
PAR-31 x 4

Radio7 **R410A**

Ulm, Germany

Overview of the Project

Radio 7 is one of the three big regional stations in Baden-Württemberg. More than a million listeners a day tune into the private radio station in its transmission area which program is put together by a staff of 70. The popular broadcaster's multistory building is in Ulm city center consisting; editing studios, program management and recording and live studios for the presenters on the ground floor, and administrative offices on the upper floors. The studios were previously air conditioned by a central ventilation system with a heat register supplied by a classic chiller unit.

The Challenge

At Radio 7, the broadcasting and recording studios are air conditioned on account of their internal location and the heat generated by the technical equipment. This task was previously performed by a central ventilation unit and a chiller, which still ran on the R22 refrigerant, now no longer obtainable in Germany. The disadvantage of the previous system was that all the recording studios could only be provided uniformly with either heating or cooling. The operators consequently decided on an investment that would fulfill three requirements: the new air conditioning technology had to conserve energy, offer a high comfort level for the user and keep rooms used by people free of refrigerant.

The Solution

The HYBRID CITY MULTI system was an ideal solution. The system combines the advantages of a direct evaporation system with those of a water-based system offering operating reliability, comfort and energy efficiency. The overall efficiency of the heating and cooling simultaneous system is significantly higher than that of conventional systems.



“The conventional chiller system was out of a choice due to the lack of flexibility, the limited space on the roof and the requirement to obtain a high energy efficiency. HYBRID CITY MULTI system was the ideal choice which obtains a high energy efficiency and at the same time reduces space of the facilities both on the roof and in the building.”

Installation Summary

Heating Capacity 735.0 kW
Cooling Capacity 657.0 kW

Building size 10,000 m²

Outdoor unit
PURY-EP x 26

Hydro BC Controller
Main
CMB-WP x 29

Indoor unit
Ceiling concealed middle
static type
x 224
Floor standing concealed type
x 2

Remote controller
PAR-31 x 223

Centralized controller
AE-200 x 1
AT-50 x 11

La Rotonda **R410A**

Barcelona, Spain

Overview of the Project

La Rotonda is an emblematic modernist building in Barcelona, designed and built in 1906 by the architect Adolf Ruiz Casamitjana. After going through different uses, in 1999, a reform have been carried out and was turned into offices keeping the modernist façade.

The Challenge

When the engineer received the order, they dispensed with the unique structure of the building. The conventional chiller system was out of a choice due to the lack of flexibility, the limited space on the roof and the requirement to obtain a high energy efficiency.

VRF systems were also excluded, as the only space to install the indoor units was on the technical floor and the system was required to supply higher temperatures.

The Solution

The HYBRID CITY MULTI was chosen as it combines the benefits of the VRF and mild air conditioning using water.

It delivers high efficiency and at the same time reduces space of the facilities both on the roof and in the building. The 2-pipe heat recovery system, which also allows the installations to be located on the technical floor for maximum flexibility.

The air provided by the system is mild as the water temperature is very stable and allows higher flow temperatures than direct expansion, obtaining a higher comfort level as well as a lower sound level.

Nevertheless, the installation is easy as the VRF system adaptable to flexible layout and the system integration of the MELANS control was also the reason of choice.



“As the overnight accommodation rooms are small, in order to meet the country's refrigerant concentration standards, the HYBRID CITY MULTI system was chosen. Compared to a 4-pipe chiller system, it requires less plant space and can deliver greater heat recovery efficiency.”

Installation Summary

Heating Capacity 19.2 kW
Cooling Capacity 16.7 kW

Outdoor unit
PURY-P x 1

Hydro BC Controller
Main
8 port x 1

Indoor unit
Ceiling concealed low
static pressure type
x8

Centralized controller
AE-200 x 1

<Others>

Outdoor unit
PURY-P x 1

BC controller
8 port x 1

Indoor unit
Ceiling concealed mid
static pressure type
x6

Laverton Fire Station R410A

Melbourne, Australia

Overview of the Project

Laverton Metropolitan Fire Brigade (MFB) station is located in the western suburbs of Melbourne. Built in 2017, Laverton Station FS#40 is a small unit comprising a general administration office, gymnasium and multipurpose rooms along with 8 overnight accommodation rooms.

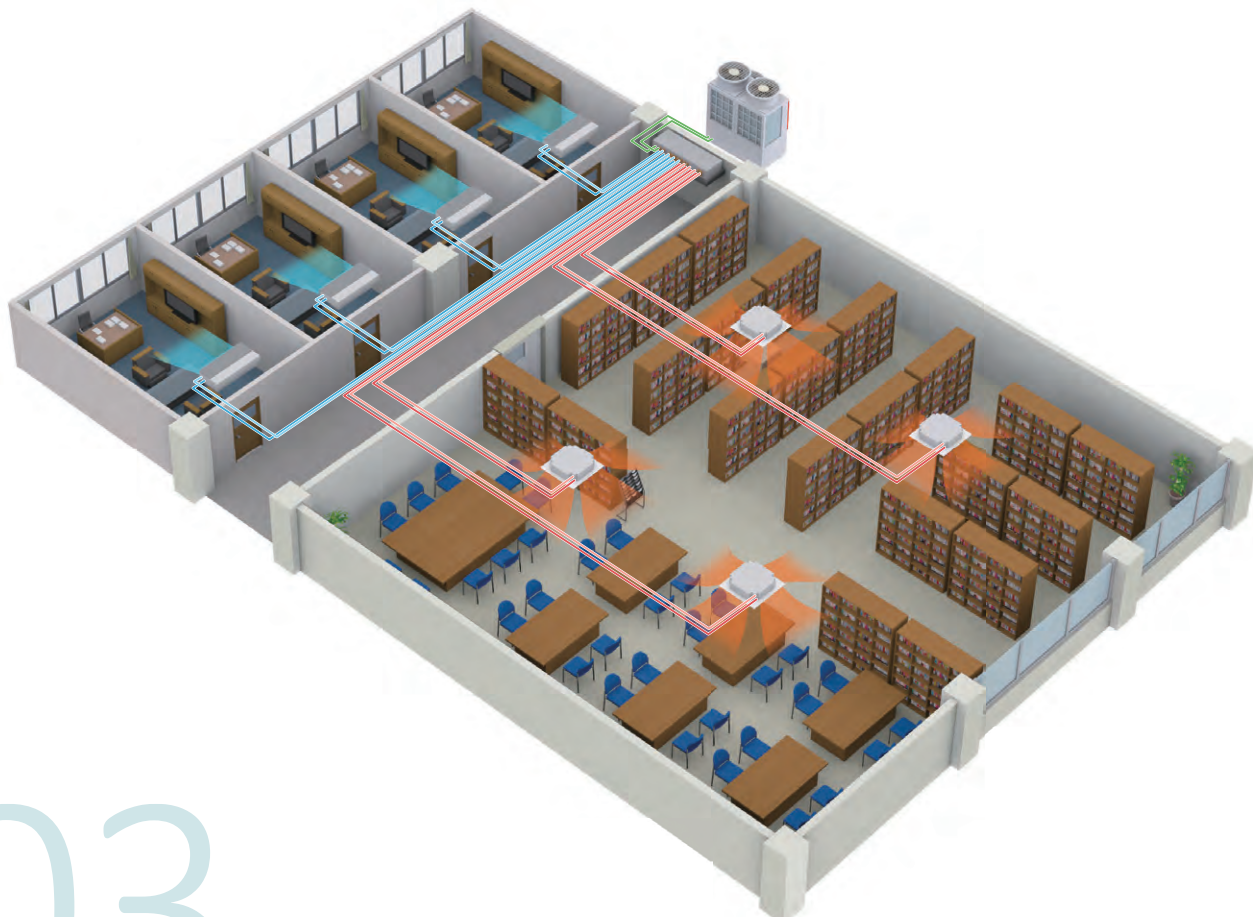
The Challenge

With the new building, the requirement was to have the most up-to-date air conditioning system that would serve and provide comfort to all areas while maintaining efficiency and providing flexibility. The system was also required to be networked to enable monitoring of air conditioning by a centralized controller integrated to a building management system (BMS), and to satisfy building standards.

The Solution

Mitsubishi Electric's HYBRID CITY MULTI and standard CITY MULTI VRF systems were adopted and both systems are integrated seamlessly to the controls systems and to a BMS. As the overnight accommodation rooms are small, in order to meet the country's refrigerant concentration standards, the HYBRID CITY MULTI system was chosen. Compared to a 4-pipe chiller system, it requires less plant space and delivers greater heat recovery efficiency.





03 Education Facilities

COMFORT

Having an optimal air environment is mandatory to concentrate and learn better. The HYBRID CITY MULTI system provides mild air for greater comfort with fewer draughts and a low sound level.

LESS REFRIGERANT

Education facilities requires rooms of different sizes and usage to be air conditioned.

HYBRID CITY MULTI provides a solution that complies with refrigerant regulations by not using refrigerant in occupant spaces and eliminating the need for leak detection.

Leonardo da Vinci National Science and Technology Museum - Italy

"To respect the spirit of the place itself and ensure the ideal conditions for guests, a more appropriate system was needed, with technologically innovative, ecologically sustainable solutions and offering greater levels of comfort."



“Ten systems were selected by the consultant for the principle reason of having less extreme air off temperatures, and slower temperature change responses across the indoor units. This was particularly important in areas of the building with slightly lower than usual internal ceilings.”

Installation Summary

Heating Capacity 447.5 kW
Cooling Capacity 408.4 kW

Outdoor unit
PURY x 10

Hydro BC Controller
Main
8 port x 16

Indoor unit
Floor Standing concealed type
x 12
Ceiling concealed middle
static pressure type
x 54
4-way flow ceiling cassette type
x 14

Remote controller
PAR-U02 x 60
PAC-SE41 x 24

Centralized controller
AE-200 x 1
EW-50 x 1
PAC-YG66 x 2

Rotorua Children's Health Hub & Library

Rotorua, New Zealand

R410A

Overview of the Project

Located in the center of Rotorua, the building is a shared community facility comprising the Rotorua Library, a children's health clinic and District Health Board offices. Rotorua Library building had the vision to upgrade into a new state of the art building.

The Challenge

The key challenge for this building was to cater for two tenants with very different layouts on each of the four floors.

Adding to this initial challenge was the desire to provide an efficient and comfortable HVAC solution that best fit within the scope of the pre-existing building structure.

The Solution

The best solution to meet these challenges was to select HYBRID CITY MULTI system to provide the heating and cooling requirements to many of the mixed-use library and health hub areas. Ten systems were selected by the consultant for the principle reason of having less extreme air off temperatures, and slower temperature change responses across the indoor units. This was particularly important in areas of the building with slightly lower than usual internal ceilings. Along with the floor standing concealed units, middle static ducted units and cassette units across multiple sizes were used to suit each of the individual spaces. As an external wall was extended out onto what was previously a courtyard / balcony area, several concealed floor standing units were then selected to best suit this long, newly-created open plan area that could be easily boxed out once the external wall had been constructed.

ME Remote Controller were installed with these units for the advanced energy saving capabilities associated with the built-in sensors. An AE-200 Centralized Controller was also installed to provide complete system management.



“To respect the spirit of the place itself and ensure the ideal conditions for guests, a more appropriate system was needed, with technologically innovative, ecologically sustainable solutions and offering greater levels of comfort.”

Installation Summary

Heating Capacity 90.0 kW
Cooling Capacity 80.0 kW

Outdoor unit
PQRY-P x 2

Hydro BC Controller
Main
8 port x 2

Indoor unit
Floor standing concealed type
x 18

Remote controller
PAR-32 x 6

Centralized controller
AE-200 x 1

Leonardo da Vinci National Science and Technology Museum

R410A

Milan, Italy

Overview of the Project

The museum has been a point of reference for the dissemination of scientific knowledge in Italy and Europe since it was founded in 1953, in the very heart of Milan. Built up progressively since the 1930s, the collections of the museum now consist of over 16,000 scientific and artistic articles and are representative of the history of Italian science, technology and industry from the 19th Century to the present day.

The Challenge

Mitsubishi Electric took part in installing the air conditioning in the Sala delle Colonne, the historical library of the former Olivetan monastery. This is a spectacular space flanked by two evocative Renaissance cloisters. Demarcated by a regular succession of arches and columns, the linear architecture of the space makes it ideal for hosting exhibitions and other exclusive events.

The 600 m² hall frequently hosts conventions, conferences and gala dinners with up to 300 guests. The prior air conditioning system serving the hall consisted of a hydronic installation with fan-coil indoor units fed by a water-water heat exchanger.

To respect the spirit of the place itself and ensure the ideal conditions for guests, a more appropriate system was needed, with technologically innovative, ecologically sustainable solutions and offering greater levels of comfort.

This is why Mitsubishi Electric was chosen as a supplier, which responded to the primary energy requirements of the facility (heating and cooling) with its state of the art air conditioning systems. Specifically, Mitsubishi Electric's HYBRID CITY MULTI was the choice.



The Solution

A Mitsubishi Electric HYBRID CITY MULTI water cooled system has been chosen to fulfill the heating and cooling requirements of the space. The hall is served by floor standing indoor units arranged symmetrically on the two sides of the hall, in concealed positions behind paneling.

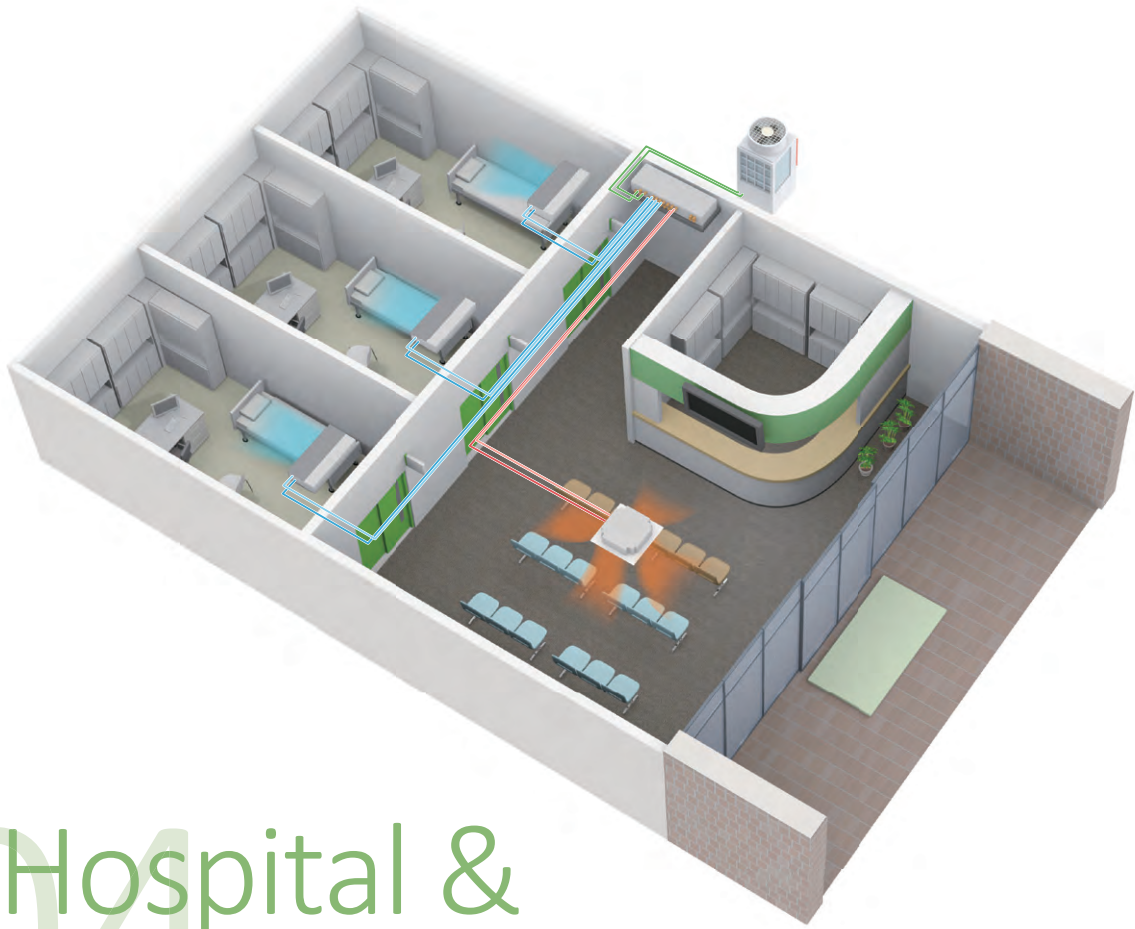
The system are installed in a utility room constructed specifically for this project, which contains the outdoor heat source units and the interface with the control system used. The two Hydro BC Controllers (HBC) for distributing thermal power are installed on opposite sides of the hall, in the utility room and in a service room. Moreover, to safeguard the integrity of the historical building in which the museum is set, the HBC Controllers are installed on load-bearing structures which distribute the weight of the units themselves evenly over the underlying floor. The internal components of the HBC Controllers can be seen through clear transparent panels installed on the unit.

The system has numerous practical advantages such as low noise levels and the possibility of installing the outdoor unit in an indoor space – both of which crucial in a historical context such as the building hosting the museum.

The system uses the groundwater condenser loop which was already available on site and feeds a number of different systems within the museum. A plate heat exchanger is used to transfer thermal power to and from the loop, controlling both available water flow and temperature. The condenser loop is fed with groundwater.



Hydro BC Controller



04 Hospital & Healthcare Facilities

COMFORT

In order for patients and residents in a hospital or healthcare facility to spend quality time in the facility, whether over a short term or long term, having individual control and mild off-coil temperature becomes important.

LESS REFRIGERANT

Consulting rooms are often small sized and airtight in consideration of patient confidentiality, and door grilles or door cuts were the conventional means to mitigate refrigerant concentration.

With the HYBRID CITY MULTI system as a solution, because refrigerant is not used in the occupant space, the concerns of concentration are relieved and the need of a leak detection is negated.

Re:Vision – Sight Correction Centre - New Zealand

"For the consulting rooms, Mitsubishi Electric's unique HYBRID CITY MULTI system was chosen for its ability to provide fully independent control efficiently to each space and eliminate the need for costly refrigerant leak detectors that require regular maintenance and certification."



“The use of such small quarters for medical examination rooms meant that high refrigerant concentration levels in these spaces became a primary concern. This coupled with patient/ doctor privacy being of upmost importance meant that door grilles could not be used for this project. Therefore, a traditional VRF system (without refrigerant monitoring) did not suit this particular application.”

Installation Summary

Heating Capacity 187.5 kW
Cooling Capacity 171.1 kW

Building size 2,000 m²

Outdoor unit
PURY-P x 3

Hydro BC Controller
Main
16 port x 4

Indoor unit
Ceiling concealed middle
static pressure type
x 22
Ceiling concealed low
static pressure type
x 22

Remote sensor
PAC-SE41 x 58

Centralized controller
AE-200 x 1
EW-50 x 1
PAC-YG66 x 1

<Others>

Outdoor unit
PURY-P x 1

BC controller
8 port x 1

Indoor unit
Ceiling concealed middle
static pressure type
x 5

Auckland University of Technology: North Med Clinic

R410A

Auckland, New Zealand

Overview of the Project

The North Med Clinic is a new building situated in Auckland University of Technology's (AUT) North Shore Campus. This innovative facility which opened in July 2017, comprises of modern medical offices and teaching space for Physiotherapy, Psychotherapy, Podiatry, Oral Health, and Student Health Services.

The Challenge

The use of such small quarters for medical examination rooms meant that high refrigerant concentration levels in these spaces were a primary concern.

This coupled with patient/ doctor privacy being of upmost importance meant that door grilles could not be used for this project. Therefore, a traditional VRF system (without refrigerant monitoring) was not suitable for particular application.

The Solution

Three HYBRID CITY MULTI systems were selected by the mechanical consultant to serve the smaller medical consulting rooms, along with one other standard CITY MULTI system to serve the common meeting and office areas.

The unique architecture of HYBRID CITY MULTI systems use water in the primary loop between the branch controller and indoor units, enabling the client's refrigerant concentration concerns to be completely mitigated. This allowed total privacy in consultation rooms to be maintained, without the need to install door grilles as refrigerant piping did not run anywhere near the confined spaces.



“The HYBRID CITY MULTI solution allowed for staged installation that corresponded to the construction program. It also allowed the air conditioning system to comply with the country's refrigerant concentration standards without requiring a refrigerant leak detection system.”

Installation Summary

Heating Capacity 94.0 kW
Cooling Capacity 94.5 kW

Outdoor unit
PURY-P x 2

Hydro BC Controller
Main
16 port x 1
8 port x 3

Indoor unit
Ceiling concealed low
static pressure type
x33

Centralized controller
AE-200 x 1

<Others>
Outdoor unit
PURY-P x 2

BC controller
10 port x 1

Indoor unit
Ceiling concealed high
static pressure type
x5

MannaCare - Aged care facility R410A

Melbourne, Australia

Overview of the Project

MannaCare is an aged care facility located in Doncaster, a suburb to the north of Melbourne. The facility has been in operation since circa 1984 providing 90 rooms for elderly patients care.

The Challenge

Through 2018-2019 a refurbishment of the existing aged care facility was carried out. This included mechanical system upgrades and air conditioning systems to serve new accommodation rooms.

As the facility was to remain operational during the construction work, the air conditioning was required to be installed in stages. However, the real challenge was in meeting the country's refrigerant concentration standards, given the small size of the accommodation rooms.

The Solution

Mitsubishi Electric's HYBRID CITY MULTI system offered a versatile solution and allowed for staged installation that corresponded to the construction program.

Using the HYBRID CITY MULTI system also allowed the air conditioning system to comply with the country's refrigerant concentration standards without requiring a refrigerant leak detection system. The ceiling concealed indoor units met the client's requirement for discreet system.

The HYBRID CITY MULTI offers advantages over a traditional 4-pipe chiller by offering a complete system package that includes indoor units and controls and provides heat recovery between the heating and cooling units to increase system efficiency by reducing the input energy of the system. This has proven to be one of the most efficient solutions in the market.



* Outdoor unit photo taken during installation process.



“For the consulting rooms, Mitsubishi Electric’s unique HYBRID CITY MULTI system was chosen for its ability to provide fully independent control efficiently to each space and eliminate the need for costly refrigerant leak detectors that require regular maintenance and certification.”

Installation Summary

Heating Capacity 147.5 kW
Cooling Capacity 164.0 kW

Outdoor unit
PURY-P x 1

Hydro BC controller
Main
8 port x 1

Indoor unit
Ceiling concealed middle
static pressure type
x 8

Remote controller
PAC-YT52 x 18
PAR-W21 x 1

Centralized controller
AE-200 x 1

<Others>

Outdoor unit
PURY-P x 3

BC controller
16 branch x 1
8 branch x 1

Indoor unit
Ceiling concealed middle
static pressure
x 9
PAC-AH x 1

Hot water supply
PWFY-P BU x 1

Re:Vision – Sight Correction Centre R410A

Auckland, New Zealand

Overview of the Project

The Re:Vision – Sight Correction Centre, is a private eye clinic designed to meet the varied needs of its patients from standard eye consultations through to eye surgery.

The Challenge

Medical facilities, whether they have small consulting rooms or large surgery rooms, come with a list of requirements which can make installing a HYBRID CITY MULTI complicated and costly. The Auckland based development had a variety of challenges ranging from a floor of small consulting rooms each needing to provide privacy for patients, to a surgical theatre requiring a high volume of fresh air filtered to a very high standard, and high hot water requirement for sterilization, cleaning and surgical preparation.

The Solution

The Auckland based contractor designed a solution to meet these requirements, while also ensuring the new facilities delivered maximum efficiency for the owner / occupier.

For the consulting rooms, Mitsubishi Electric’s unique HYBRID CITY MULTI system was chosen for its ability to provide fully independent control efficiently to each space and eliminate the need for costly refrigerant leak detectors that require regular maintenance and certification. Other traditional forms of mitigation for refrigerant leaks such as door grilles or door undercuts were not possible as these would have compromised patient confidentiality. The surgical theater had a small Air Handling Unit (AHU) installed to treat and filter the air to the high standard required.

Hot Water Heat Pump system, capable of producing 70°C hot water, was incorporated to provide hot water requirements for the building.



for a greener tomorrow

Eco Changes is the Mitsubishi Electric Group's environmental statement, and expresses the Group's stance on environmental management. Through a wide range of businesses, we are helping contribute to the realization of a sustainable society.

⚠ Warning

- Do not use refrigerant other than the type indicated in the manuals provided with the unit and on the nameplate.
 - Doing so may cause the unit or pipes to burst, or result in explosion or fire during use, repair, or at the time of disposal of the unit.
 - It may also be in violation of applicable laws.
 - MITSUBISHI ELECTRIC CORPORATION cannot be held responsible for malfunctions or accidents resulting from the use of the wrong type of refrigerant.
- Our air conditioning equipment and heat pumps contain a fluorinated greenhouse gas, R134a (GWP:1430), R410A (GWP:2088), or R32 (GWP:675) depending on the product. These GWP values are based on Regulation (EU) No. 517/2014 from IPCC 4th edition. In case of Regulation (EU) No. 626/2011 from IPCC 3rd edition, these are as follows. R410A (GWP:1975), R134a (GWP:1300), R32 (GWP:550)

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