



## AIR CONDITIONING SYSTEMS



# HYBRID

## CITY MULTI

### Case Studies

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

Mitsubishi Electric's

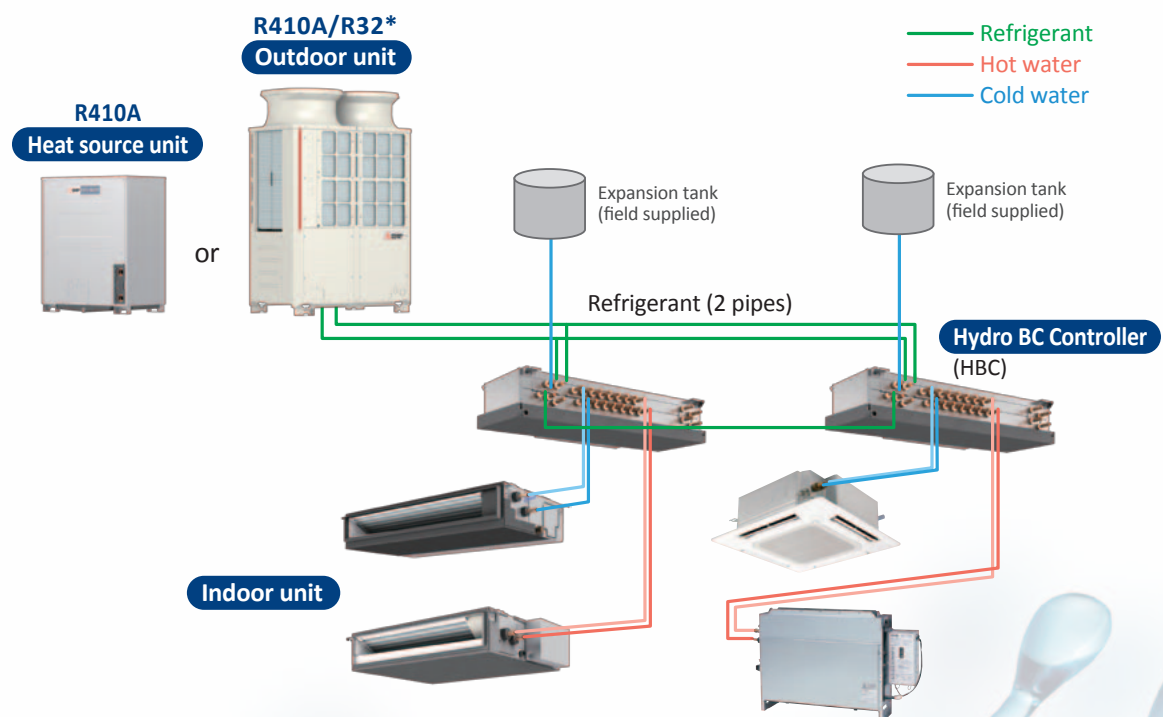
# HYBRID

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.



\* R32 is flammable and certain restrictions apply to the installation of units. When installing new units, moving the existing units, or changing the layout of the room, ensure that installation restrictions are observed. For detail, refer to the section in the Databook on installation restrictions.

# 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 maintenance.



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 at the heart of R2 technology that enables simultaneous cooling in one zone and heating in another. Furthermore, the R2 system delivers great energy savings when cooling and heating are provided at the same time.



vs VRF

## Refrigerant removed from occupied spaces with the separation of refrigerant and water systems

The HYBRID CITY MULTI system only uses refrigerant 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

## 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. Our clients are extremely satisfied with their choices.





# 01 Hotels & Residences

## COMFORT

In hotels, offering a comfortable environment throughout the building is imperative to the guests' hotel experience. The HYBRID CITY MULTI system provides comfort with mild outlet temperatures with 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 only used 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

<Others>

**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 only uses refrigerant 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 R32 refrigerant, which has a lower GWP compared to R410A. Mitsubishi Electric adopted R32 refrigerant for the first time in the industry for VRF systems (multi-split air conditioners for building applications). R32 can reduce GWP by approximately 67% compared to R410A.

For domestic hot water, Mitsubishi Electric's QAHV Series Hot Water Heat Pump with CO<sub>2</sub> 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 and brewery and is located in the Klingenstein district of Blaustein. It was used as a lodging house, hostelry and brewhouse 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 m<sup>2</sup>. The client and owner was looking to achieve the best possible air conditioning comfort for guests, great 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 expansion 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 have been installed on the side roof. They transport the refrigerant 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 have 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. These requirements were 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

**<Others>**  
**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.

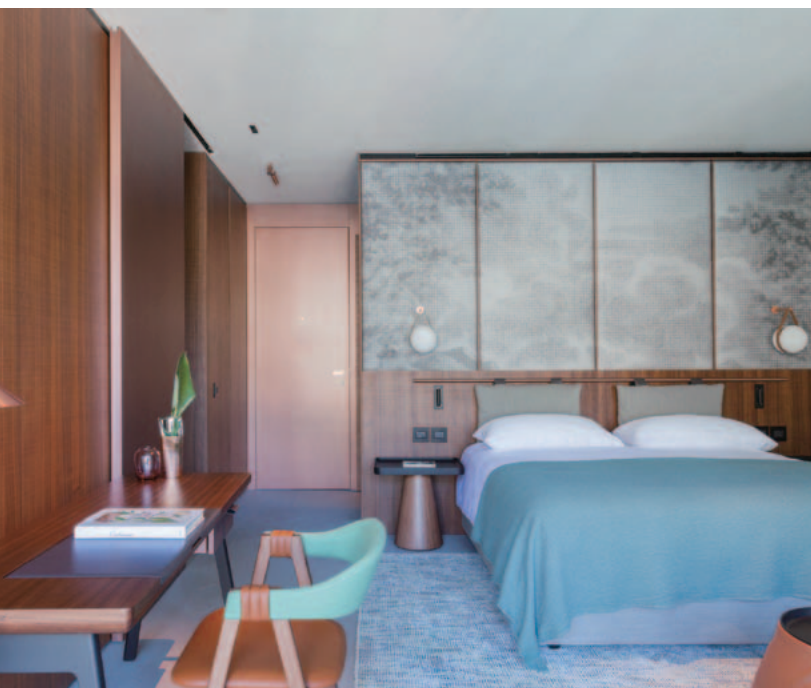
### The Challenge

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 installed utilizing the lake water as a heat source.

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 Controllers, 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 HYBRID CITY MULTI system reduces the amount of on-site refrigerant because it uses water to transfer heating or cooling to the the hotel bedrooms. This removes the need for additional leak detection equipment and lowers the annual maintenance costs for the hotel.”

## Installation Summary

Heating Capacity 232.0 kW  
Cooling Capacity 224.0 kW

**Outdoor unit**  
PURY-P x 4

**Hydro BC controller**  
**Main**  
CMB-WP x 7

**Indoor unit**  
Floor standing concealed type  
x 5  
Ceiling concealed low  
static pressure type  
x 59  
Ceiling concealed middle  
static pressure type  
x 2

**Remote Controller**  
PAR-CT01

**Centralized Controller**  
AE-200 x 2

## Hotel du Vin R410A

Stratford upon Avon, United Kingdom

### Overview of the project

At the heart of Shakespeare's home town Stratford-upon-Avon, Hotel du Vin opened in May 2018. The stunning refurbishment offers guests the option to stay in one of 46 stylish bedrooms spread across two converted townhouses, dine on home-style French cooking and make use of an event space for up to 70 people.

### The Challenge

“Every aspect of our focus is on absolute guest comfort and this runs through everything from the décor, the service and the feeling within each room. It is therefore vital that we have reliable heating and cooling that both we and our guests can control, so that we can provide the right environment with minimum energy use,” commented the hotel's general manager.

### The Solution

As part of the complete refurbishment, the installation of Mitsubishi Electric's unique HYBRID CITY MULTI air conditioning has ensured comfortable environment for guests with energy efficient control for the hotel.

The system reduces the amount of on-site refrigerant because it uses water to transfer heating or cooling to the the hotel bedrooms. This removes the need for additional leak detection equipment and lowers the annual maintenance costs for the hotel.

Guests have control over their own rooms with the stylish MA Touch Remote Controller, whilst the use of a centralized controller gives hotel staff the setting ability to ensure the equipment is only used when rooms are occupied, and that rooms are brought to a comfortable temperature before guests arrive.

Mitsubishi Electric's solution has the ability to deliver heating and cooling simultaneously throughout the hotel. It has also helped the hotel to comply with BS EN378 regulations on refrigerants, which would usually require all bedrooms to be fitted with leak detection.





“HYBRID CITY MULTI system provides comfortable and stable air temperature control, without using refrigerant in occupied spaces. A truly integrated solution, this 2-pipe solution offers simultaneous heating and cooling, flexible controls and high seasonal efficiency.”

## Installation Summary

Heating Capacity 232.0 kW  
Cooling Capacity 224.0 kW

**Outdoor unit**  
PURY-P x 3

**Hydro BC controller**  
**Main**  
16 port x 4  
8 port x 2

**Indoor unit**  
Ceiling concealed low  
static pressure type  
x 59  
4-way flow ceiling cassette type  
x 12

**Remote Controller**  
PAC-YT52

**Centralized Controller**  
AE-200 x 1  
EW50 x 2

<Others>

**Outdoor unit**  
PURY-P x 1

**Indoor unit**  
4-way flow ceiling cassette type  
x 8

## Ronald McDonald House Charities **R410A**

London, United Kingdom

### Overview of the project

Ronald McDonald House Charities offers vital support to families with a child in hospital, providing them with a comfortable place to stay that's just a stone's throw away from the hospital building. The new Lambeth Road accommodation takes the form of a four story residential block and will allow families to prepare their own meals and get a good night's sleep, providing a home away from home and a degree of stability in an often distressing and uncertain time. The need of the house has expedited for the brand new 59-bedroom building at Evelina London Children's Hospital.

### The Challenge

As part of this new build, project consultants identified the need for an energy efficient heating and cooling system and a regular supply of fresh air. VRF (Variable Refrigerant Flow) air conditioning was initially considered for the entire building but it was eventually decided that a HYBRID CITY MULTI system would be the best overall fit in the accommodation rooms.

### The Solution

The ground floor, designed as a communal area for resident families, is served by a standard CITY MULTI system and LOSSNAY, whilst the first, second and third floors, accommodating individual residency rooms, benefit from a HYBRID CITY MULTI system. In total, 76 family rooms are served by HYBRID CITY MULTI system.

The selection and installation of the HYBRID CITY MULTI system removed the need for leak detection in occupied spaces because the system uses water to transfer heating and cooling between a special Hydro BC controller.

To provide the right controls to ensure that the system be monitored and adjusted with the minimum of fuss, a touch screen centralized controller was incorporated. It is capable of controlling and monitoring the units and providing detailed analysis on energy consumption. In addition, individual wall mounted room controllers enable guest families to alter the temperature in their rooms.



“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 m<sup>2</sup>

**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 it's 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 as easy as the VRF system, and adaptable with flexible layouts and system integration of the MELANS control. Compared 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 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."

### PROXIMA V- France

The HYBRID CITY MULTI system contributes to reducing installation work compared to a 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.





The director of the contractor has commented, “We like what the R32 HYBRID CITY MULTI achieves, in particular the enhanced occupier comfort of using water instead of refrigerant in the conditioned space, plus also the environmental benefits of using the low GWP R32 refrigerant. The system proved easy to install and we’re looking forward to measuring the benefits for use on future projects.”

## Installation Summary

Heating Capacity 75.0 kW  
Cooling Capacity 67.0 kW

**Outdoor unit**  
PURY-EM x 2

**Hydro BC controller**  
**Main**  
16 port x 2

**Indoor unit**  
4-way flow ceiling cassette type  
x 15  
Ceiling concealed middle  
static type  
x 4

**Remote Controller**  
PAR-33MAA x 20

**Centralized Controller**  
AE-200 x 1

## Acticare Head Office R32

Hereford, United Kingdom



### Overview of the Project

Acticare is a nursing and care home supplier which head office is located in Hereford. The office area adjacent to a warehouse was completed in December 2018, includes open plan spaces, satellite offices and meeting rooms, all of which required a solution that would keep employees comfortable and productive at work.

### The Challenge

Maximizing workplace productivity was the key factor when considering which air-conditioning system to install in their new building. Like many office workers, Acticare employees are sat at their desks for most of the day. A fresh, temperate working environment was essential. Moreover, another important considerations was how well it would future-proof the building against changing environmental standards.

### The Solution

The R32 HYBRID CITY MULTI system from Mitsubishi Electric was the choice for the office and meeting rooms. The system only uses refrigerant between the outdoor unit and the Hydro BC Controller (HBC) which was installed on the warehouse part adjacent to the office. The R32 units are designed to deliver high operational efficiency meeting the building's environmental standards whilst minimizing the global warming potential (GWP) of the system. By delivering a lower GWP than current refrigerants, the R32 solution can meet both BREEAM building standards for sustainability performance and government environmental regulations - plus future proof against ongoing environmental legislation.

The HYBRID CITY MULTI system is fundamentally different from traditional VRF systems as it uses water throughout the majority of its pipework to transfer simultaneous heating and cooling to different rooms. However, it still maintains full flexibility in its design, lower annual maintenance costs and advanced controllability.

\* Building Research Establishment Environmental Assessment Method



“Originally, a chiller solution was planned but the customer was well convinced with the advantages of R32 HYBRID CITY MULTI is able to offer. R32 was chosen for its low GWP. The GWP of R32 is reduced by approximately 67% compared to the R410A making it an ideal solution to comply with future environmental legislation in Europe.”

## Installation Summary

Heating Capacity 84.0 kW  
Cooling Capacity 94.5 kW

**Outdoor unit**  
PURY-EM x 3

**Hydro BC Controller**  
**Main**  
8 port x 3

**Indoor unit**  
4-way flow ceiling cassette type  
x 18  
Ceiling concealed low  
static type  
x 1  
Ceiling concealed middle  
static type  
x 6

**Remote controller**  
PAR-CT01 x 18

**Centralized controller**  
AE-200 x 1

## Zalando Headquarter Office R32

Berlin, Germany

### Overview of the Project

Zalando is a Europe's leading online fashion platform established in 2008 in Berlin. With it's expanded international logistics network, Zalando connects brands and customers in European markets. Their office complex including the head office is called a "campus", located in the heart of Berlin, within the Friedrichshain/Kreuzberg district. Along with their business expansion, more space for the office, photo studio and storage rooms were required and the refurbishment of an existing building took place.

### The Challenge

Calling their campus, "A home for all Zalandos", having a comfortable environment and to maximize the productivity and creativity was essential to the company. At the same time, there was a strong request to consider compliance with future environmental legislation.

### The Solution

The R32 HYBRID CITY MULTI system from Mitsubishi Electric was the choice. Originally, a chiller solution was planned but the customer was well convinced with the advantages of R32 HYBRID CITY MULTI is able to offer.

Compared to a chiller system, the HYBRID CITY MULTI system components are all supplied by Mitsubishi Electric; indoor units, outdoor units, controls, pumps, hydraulic scheme included. This makes the system installation as easy as the VRF system, and adaptable with flexible layouts and system integration of the MELANS control. It also requires less plant space, and maintenance is easier with less piping and fewer key components. R32 was chosen for its low GWP. The GWP of R32 is reduced by approximately 67% compared to the R410A making it an ideal solution to comply with future environmental legislation in Europe.







“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 m<sup>2</sup>

### 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 m<sup>2</sup>, and houses offices of between 300 and 1,200 m<sup>2</sup> 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.

\* Leadership in Energy & Environmental Design





“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 m<sup>2</sup>

**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 a 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 compared to a 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.

\* Leadership in Energy & Environmental Design



“For the office space, a 4-pipe chiller system was initially considered but the HYBRID CITY MULTI solution was thought to be an ideal alternative, combining the comfort and efficiency required with design flexibility and smaller external plant space.”

## Installation Summary

**Outdoor unit**  
PURY-P x 4

**Hydro BC controller**  
**Main**  
CMB-WP x 10

**Indoor unit**  
Ceiling concealed middle  
static pressure type  
x 59

**Remote Controller**  
PAR-32 x 40

**Centralized Controller**  
AE-200 x 1

## iPort **R410A**

Doncaster, United Kingdom

### Overview of the project

iPort is a brand new 337-acre development site in Doncaster, offering six million square feet of logistics space and its own 35-acre dedicated strategic rail freight terminal. The very first building to be constructed on site was a 7,500 square foot 2 story office connected to a warehouse unit. The office building will act as a base for support staff directing operations at the company and incorporates open plan office areas, segregated office areas, a canteen, a post room and a reception.

### The Challenge

In a modern office such as this there is a clear need for an efficient heating and cooling system that can provide high levels of comfort for the staff. Alongside the requirement for staff comfort and high levels of efficiency, ease of maintenance was a key consideration for the developer.

### The Solution

For the office space, a 4-pipe chiller system was initially considered but the HYBRID CITY MULTI solution was thought to be an ideal alternative, combining the comfort and efficiency required with design flexibility and smaller external plant space.

The system allows for the implementation of a full system maintenance plan instead of the separate system inspection associated with a 4-pipe chiller, thereby simplifying the entire maintenance process. The solution also readily fulfilled the country's building regulation, Part L criteria and the system's capacity for heat recovery further broadened its appeal.

To ensure complete control over the new state-of-the-art system, an AE-200 centralized controller was chosen as the ideal system management interface. To allow employees to make changes in individual rooms, wired MA controllers were also installed.

With the first building now complete, HYBRID CITY MULTI systems are set to feature in a number of the new developments at iPort, promising highly efficient heating and cooling allied with a comfortable working environment across the site.





“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.

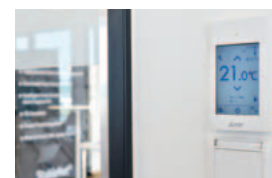
The owner and the managing director of the company explains, "The overall task was to design an office building for an IT company in the software development sector. The particular challenges here were that the building had above-average thermal loads and a clear north-south orientation." Another requirement 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 expansion 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 unacceptable due to the lack of flexibility, the limited space on the roof and the requirement to obtain a high energy efficiency. The 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 m<sup>2</sup>

**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

With the unique structure of the building, the conventional chiller system was unacceptable 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.

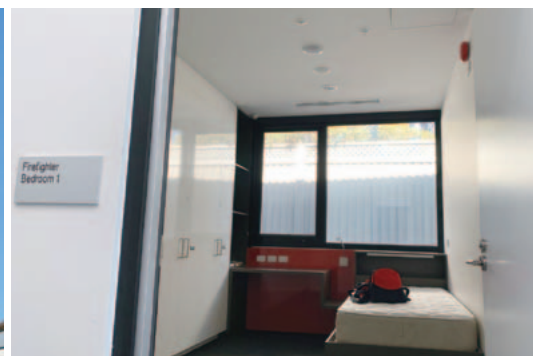
### The Solution

The HYBRID CITY MULTI was chosen as it combines the benefits of 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 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 as easy as a VRF system as it is adaptable to flexible layouts and easy system integration of the MELANS control.



“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

**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

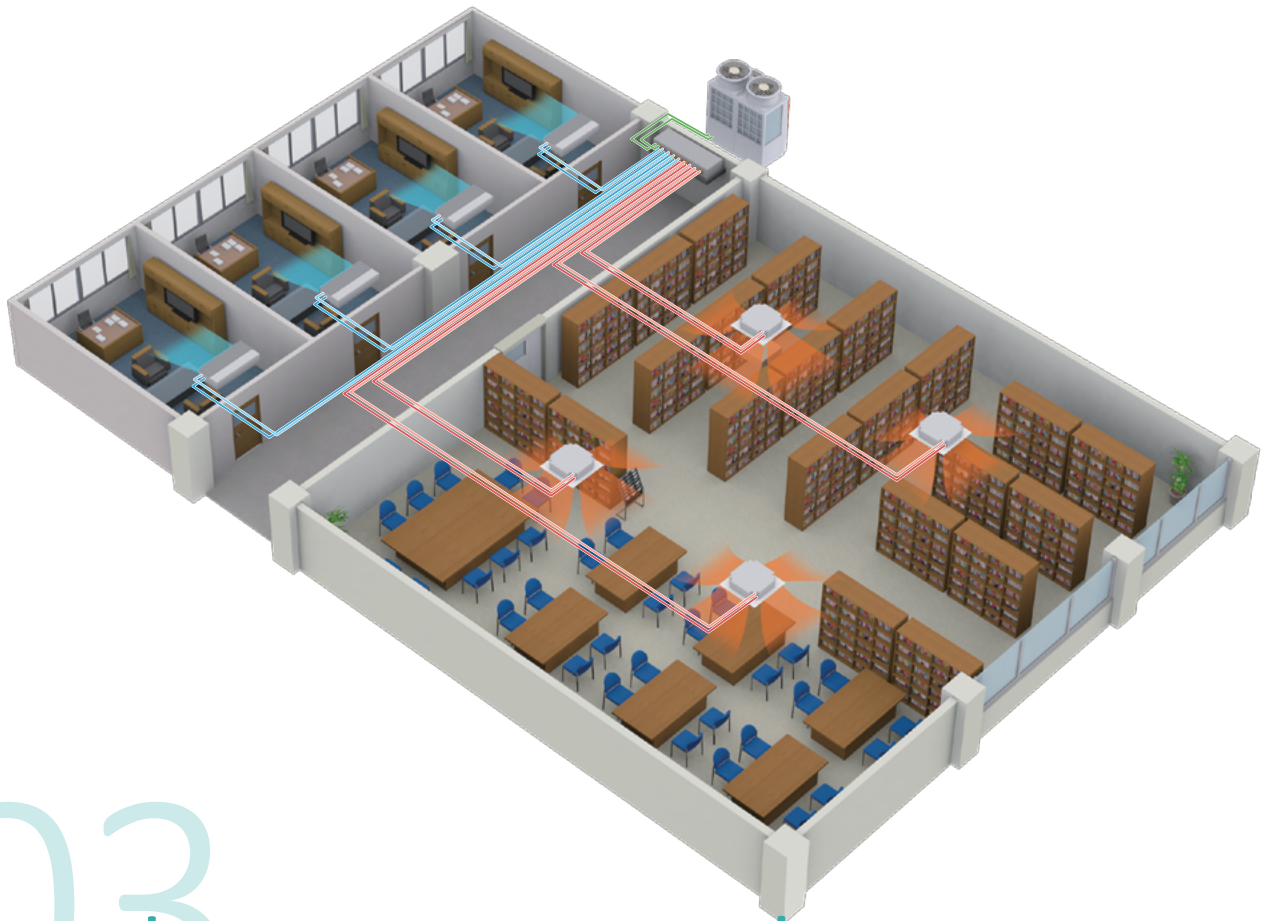
With the new building, the requirement was to have the most up-to-date air conditioning system that would serve and provide comfort to all areas while maintaining efficiency and providing flexibility. The system was also required to be networked to enable monitoring of air conditioning by a centralized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



“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 m<sup>2</sup> 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.





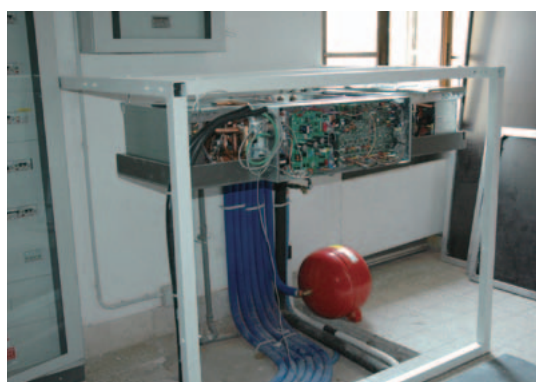
## The Solution

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 are 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



“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

**Remote sensor**  
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.

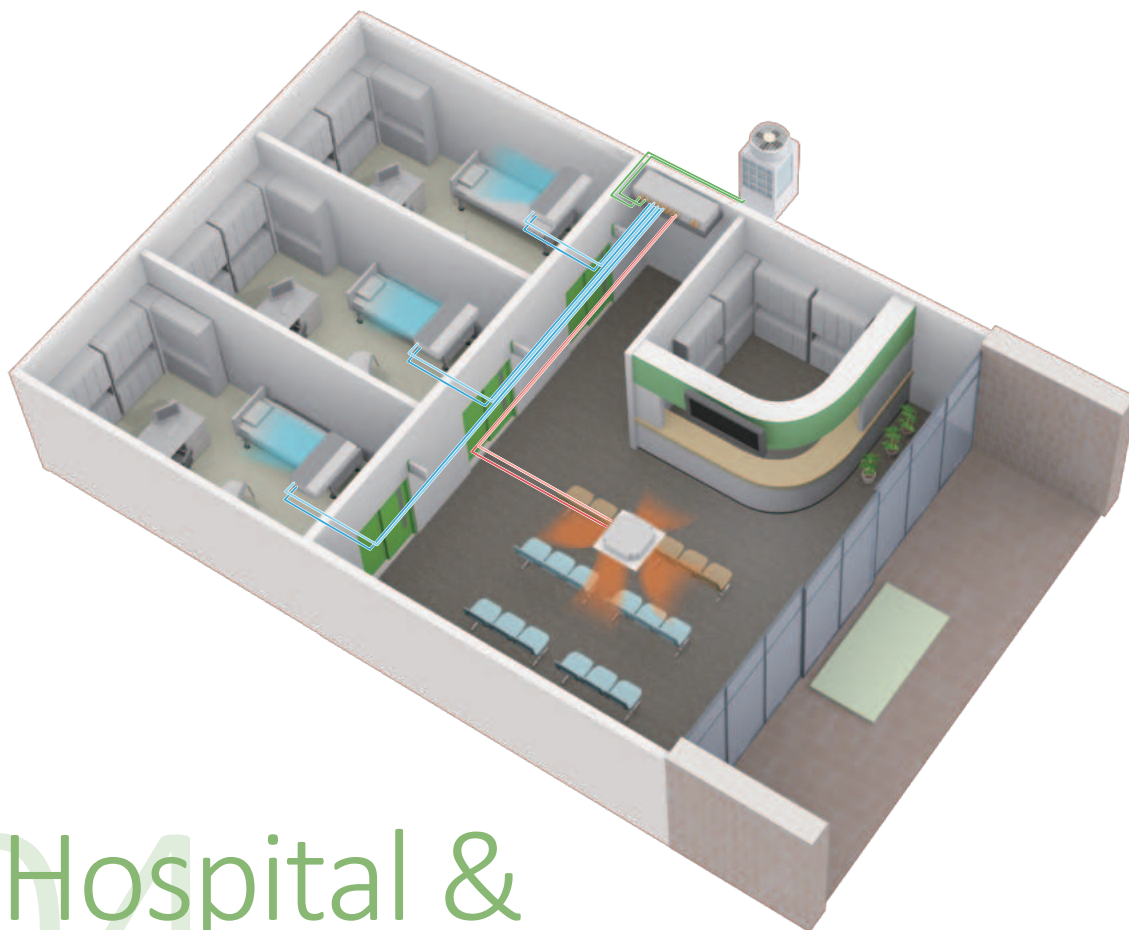
### The Solution

The best solution to meet these challenges was to select the 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 Controllers 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.





# 04 Hospital & Healthcare Facilities

## COMFORT

In order for patients and residents in a hospital or healthcare facility to spend quality time, 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 m<sup>2</sup>

**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 this 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 does 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 1

**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 a 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

**Air to Water**  
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 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 theater requiring a high volume of fresh air filtered to a very high standard, and 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 locally procured small Air Handling Unit (AHU) installed to treat and filter the air to the high standard required.

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



# MEMO

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**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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