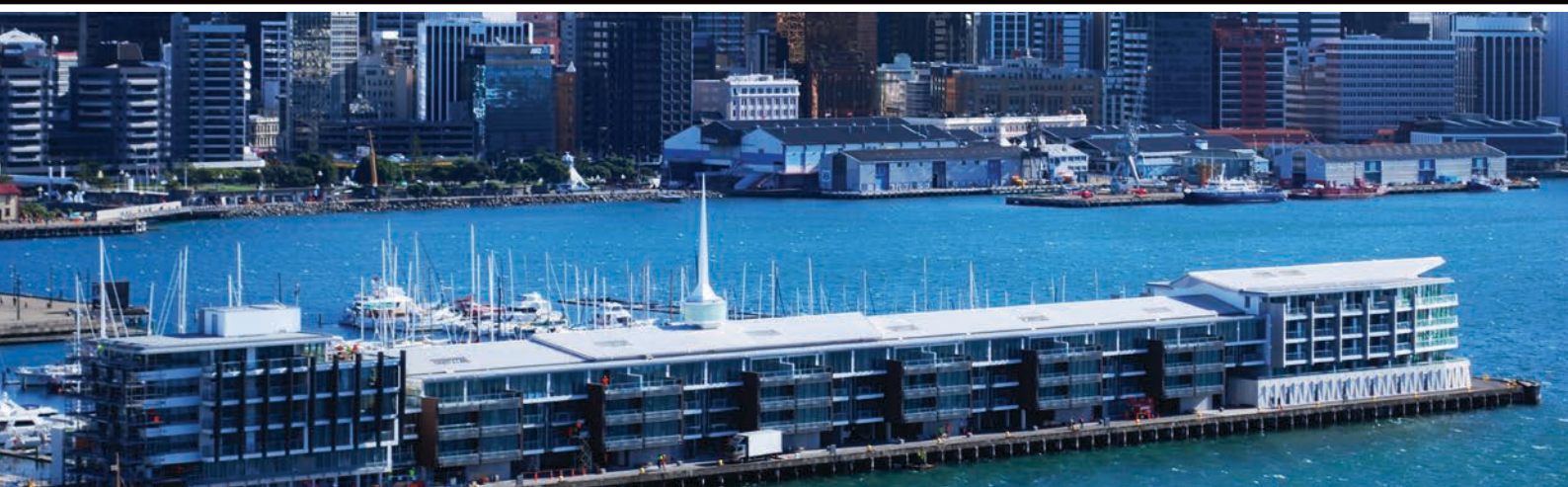


CITY MULTI

New Zealand Showcase

Edition 2





Mitsubishi has been a trusted name for many years. Founded in 1921, the company known today as Mitsubishi Electric quickly rose to the forefront of the air conditioning industry - a position still enjoyed today. Mitsubishi Electric takes pride in offering some of the most energy efficient systems available in the market.

Known for exceeding the expectations of today's market, Mitsubishi Electric invests 4% of global turnover in product design and development, ensuring that the air conditioning systems produced are the most advanced and efficient products available.

Mitsubishi Electric is dedicated to creating superior technologies while having as little impact on the environment as possible. The company is the only air conditioning manufacturer recognised in the top five companies in the world for their sustainable environmental policy. The policies and practices meet the demanding requirements of Portfolio 21; a US mutual investments fund that invests only in companies with an explicit commitment to sustainable business practices.

This constant investment in product development enables Mitsubishi Electric to produce the most efficient equipment possible, whilst helping to protect the environment at the same time.



BDT is the exclusive distributor of Mitsubishi Electric in New Zealand, celebrating a 30 year partnership in 2011.

Founded in 1981 by Ron Woodrow, Black Diamond Technologies Limited (formerly Melco New Zealand) is a leader in the New Zealand air conditioning market, both residentially and commercially. Close factory relationships established over three decades ensure that we are able to influence design to tailor products specifically to the New Zealand market.

BDT is 100% New Zealand owned and is committed to supplying New Zealand consumers and businesses with superior, energy efficient technologies. BDT is committed to supporting City Multi products throughout New Zealand. All staff who work within the City Multi division are refrigeration, electrical, or mechanical engineering qualified, ensuring accurate and skilled assistance.

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Commercial Air Conditioning | CITY MULTI

Mitsubishi Electric's industry leading City Multi VRF technology is designed for today's building needs. With emphasis placed on energy efficiency, adaptability, reliability and control, City Multi addresses the most current market issues. Utilising integrated air conditioning, hot water, ventilation and control solutions City Multi is the benchmark in VRF technology.

Heat Interchange Circuit

The unique Heat Interchange Circuit (HIC) enhances efficiency by providing additional sub-cooling. This allows the expansion device to effectively control the refrigerant distribution. This increases the operating efficiency and reduces the volume of refrigerant in each system.

Intelligent Power Module (IPM) Technology

Mitsubishi Electric's YJM-A range provides precise control of energy input, through its Intelligent Power Module (IPM) technology. Using this technology it is possible to closely match the building requirements, achieving more accurate control of the occupied space. Using incremental 1Hz steps of capacity control, the amount of power input required is significantly reduced, resulting in greatly improved COPs.

IPM technology ensures effective performance under partial load conditions, a condition that most systems will be in for the majority of their normal working life. By taking account of the efficiency at both part load and peak load conditions, R410A City Multi is designed to provide unbeatable year-round efficiency.

More Efficient Refrigerant

Governments in many countries are enforcing a ban of HCFC-based refrigerants for new installations. The most popular choice for chillers, R22, an HCFC-based refrigerant, has been targeted by the Montreal Protocol to be phased out in new equipment. Because of these restrictions, R410A refrigerants which are a blend of HFCs that do not deplete the ozone are desirable.

R410A is a more efficient refrigerant as it has a higher specific heat capacity when compared to R407C or R22. This higher energy carrying capacity allows for smaller pipe sizes, longer pipe runs and reduces the volume of refrigerant within a system. This is a major factor for safety and environmental requirements in the design, manufacture, installation, operation, maintenance and disposal of refrigerating systems.

Water-Cooled - Unique to Mitsubishi Electric

Combining the features of VRF and a water circuit using City Multi WR2/WY, heat is rejected to a water source rather than to the outside air. The advantage of water cooled systems is that the water can be delivered at optimised temperatures and volumes, which allows even greater flexibility and increased COP.

WR2 (Heat Recovery)

Mitsubishi Electric now offers double heat recovery operation. The first heat recovery is within the refrigerant system, where simultaneous cooling and heating operation is available with heat recovery performed between indoor units.

The second is within the water loop, where heat recovery is performed between the PQRY units. This double heat recovery operation substantially improves energy efficiency and makes the system the ideal solution for modern office buildings, where areas require cooling even in winter.

Inverter Driven Technology

Striving to continually meet the increasing demands of our customers, Mitsubishi Electric was the first in the industry to offer inverter-driven systems. Using inverter technology, systems produce precise output, matching exact requirements of any building. They work efficiently to ensure no valuable energy is wasted by over-heating or over-cooling – greatly reducing running costs.

Increased COP's

COP or "Coefficient of Performance" is a measure of the useful energy a system can deliver compared to the energy it consumes. It is calculated by dividing the energy output by the energy input of a system. The higher the figure, the more efficient the system is deemed to be. Mitsubishi Electric VRF models, the world's highest energy efficient air conditioners, will undoubtedly reduce millions of tons of CO₂ emissions.

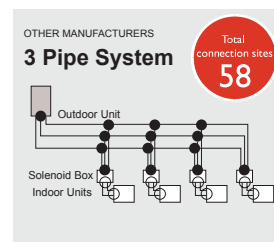
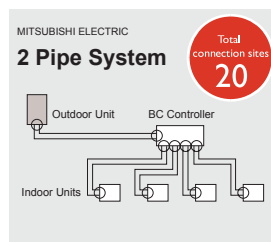
Not only does Mitsubishi Electric provide some of the most efficient R2 series, simultaneous heating and cooling systems on the market, they have developed a high COP range of condensers as well. The PURY-EP range of condensers (available in eleven sizes) have a full load COP of 4.1 in cooling and 4.3 in heating.

If your client is after the highest efficiency possible for their project, then look no further than the Mitsubishi Electric high COP, EP series of air conditioning.



The world's only two-pipe system

Mitsubishi Electric City Multi VRF (variable refrigerant flow) is the cutting edge in commercial air-conditioning technology – the only two-pipe simultaneous heating and cooling system in the world. Proven in the field under rigorous conditions, two-pipe technology is not only cheaper to install, but is durable, reliable, energy efficient and provides superior levels of control accuracy.



○ = 2 sites ● = 3 sites

Benefits of Two Pipe VRF

1. Fewer Pipe Connections

On a City Multi R2 Series VRF with four indoor unit system, there are 20 refrigerant joints, compared to an equivalent three-pipe system with 58 connections. Each extra joint requires extra labour, materials and time. Copper prices have risen significantly and less copper pipe means much less capital cost for equivalent projects. This makes City Multi R2 a significantly cheaper product to install. There are also no expensive proprietary branch fittings required. Fewer pipe connection sites also mean less potential leak sites.

2. No-Oil Recovery Cycle

Unlike three-pipe systems, R2 systems do not require regular oil recovery cycles. With less refrigerant volumes and velocities during mode change over, oil recovery is minimized. This prevents zone-temperature drift during recovery cycles and improves energy efficiency and control accuracy.

3. Tight Dead Band Control

Two-pipe architecture allows for quick, individual changeover of indoor units from heating to cooling. Due to the unique engineering of the BC (branch control) box, +/- 1°C of set point is possible with +/- 1.5°C dictating changeover mode.

4. Heat Recovery in the BC Box

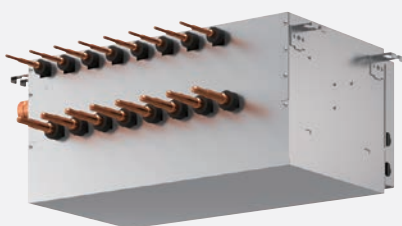
Heat recovery between indoor units is carried out in the BC boxes. This allows pinch technology (heat integration) energy recovery to be diverted, reducing pipe transmission losses. Heat is redirected in the valve blocks, directly to the branch that requires it, reducing overall running costs and lifting operational COPs.

5. Fewer Electrical Connection Sites

Two-pipe VRF has significantly less electrical termination points than equivalent three-pipe systems. This reduces complexity of the initial wiring process and simplifies fault finding; reducing installation cost, time and materials. Fewer components in the system mean less plant to potentially fail in the future.

6. Flexibility for Future Alterations

Two-pipe architecture makes future proofing and servicing of the VRF system simpler, reducing through-life costing. Alterations and additions to individual branches are made easy by installing branch ball valves at the time of installation. This allows individual branches to be worked on while the rest of the system is still in service. All BC connections are brazed, reducing further possible leakage sites. Future additions to the system can be engineered and added while the system is still in operation.



How do City Multi systems work with only two pipes?

The secret of City Multi Heat Recovery Systems lies in the BC Controller. The BC Controller houses a liquid/gas separator, allowing the outdoor unit to deliver a mixture (2 phase) of hot gas for heating and liquid for cooling, all through the same pipe. Three-pipe systems allocate a pipe to each of these phases. When this mixture arrives at the BC Controller, it is separated and the correct phase delivered to each indoor unit depending on the individual requirement of either heating or cooling.

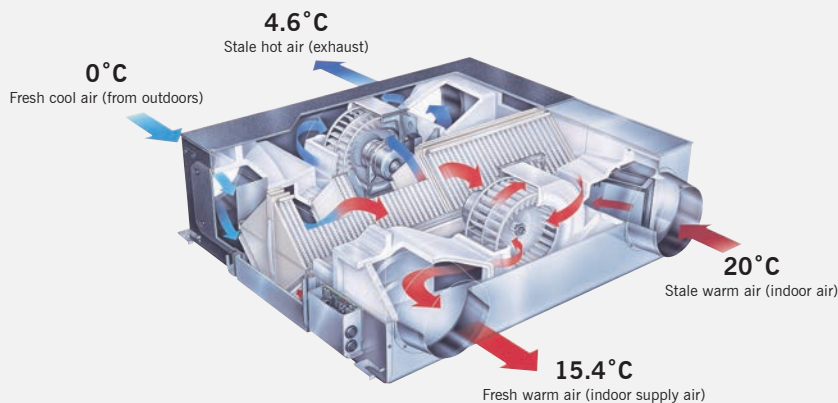
Lossnay - Fresh air without wasting heat

Fresh, clean air is an essential ingredient in any climate control system. Good ventilation ensures that the air inside a building is constantly replaced with fresh air from outside. Usually, the outside air is warmer or cooler than the air inside the building. Circulating fresh air through a building can significantly increase the air conditioning system's energy consumption.

Providing adequate ventilation to buildings has traditionally compromised heat levels. Mitsubishi Electric's Lossnay unit resolves this issue by transferring heat from stale exhaust air to fresh incoming air. Inside the Lossnay system, a heat exchanger transfers heat between the inlet and exhaust ducts, recovering up to 84% of the heat energy from the exhaust air.

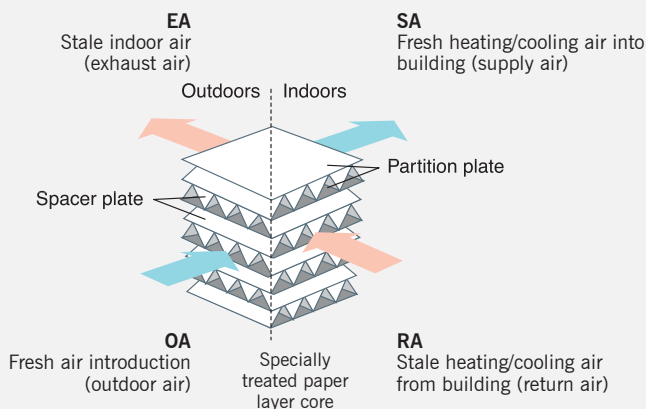
For more information on Lossnay go online to www.mitsubishi-electric.co.nz/citymulti

How Lossnay fresh air energy recovery works

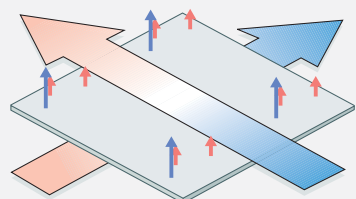


In this example the energy efficient Lossnay system provides an indoor temperature of 15.4°C, the air conditioning system only needs to raise the temperature by 4.6°C, rather than working to provide the full 20°C.

Two paths ventilation



Total energy transfer



- ↑ **Sensible heat transfer**
- ↑ **Latent heat transfer**
- Conventional systems, on cooling, would normally dry the air significantly
- With Lossnay's fresh air system, moisture from outdoor air is retained not lost



City Multi Air Handling Unit Controller

The fresh air requirements for commercial buildings, gymnasiums, halls or wherever there are large numbers of people inside can be huge – often many cubic metres. With such large volumes of fresh outside air comes the need to temper it, normally to around 18°C.

For very large air volumes or where the application of Lossnay is not possible to return-duct the exhaust air, you are faced with the job of heating the air in a 'once through total loss' system. Traditionally this has been done using an Air Handling Unit (AHU) with either hot water coils or electric element banks, neither of these options providing a COP greater than 1.

Example

- Required = $m^3/5$ at 18°C indoors
- Outside air temperature = 0°C
- Required heating capacity = 65.34kW

In the past, unless there has been a central boiler plant handy, electric elements have been seen as the only viable option. In this case, the heating load would add just fewer than 100 amps load per phase to the building mains, increasing the load capacity, not to mention the additional electricity charges associated with maximum demand.

The New Solution – The City Multi AHU Controller

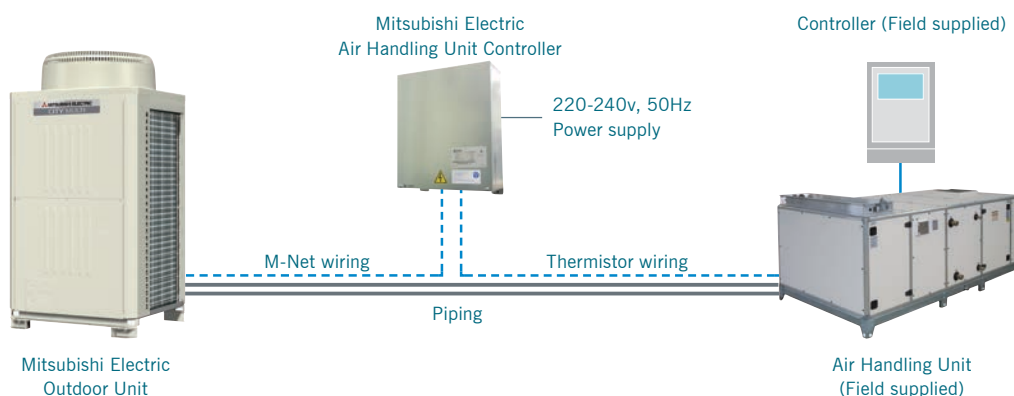
The AHU Controller unit enables the connection of our standard range of City Multi outdoor units, to DX coils mounted in the AHU or duct work.

The key is the sophisticated City Multi inverter controls and R410a refrigerant – the system can handle a coil air-on condition as low as -10°C. The control logic is factory set to provide leaving-air temperature control, making these units perfect for full, fresh air supply. The leaving-air temperature control is very stable as the inverter driven outdoor unit adjusts to meet the load. The COP in heating you can expect from our standard units is 3.8 to 4, and when using the high COP models – 4.3 to 4.4!

Not only does this system provide unbeatable energy efficiency in heating mode, it is able to run in cooling mode to 'pre-cool' fresh air in summer, reducing load on the air conditioning equipment installed.

The application of this product is not limited to new buildings, as it offers very significant opportunities for retro-fitting an energy efficient solution into existing systems. Savings in annual running costs, over electric element banks, will almost always be in the order of 75%, providing payback on capital expenditure that most customers would expect.

BDT now has available a very accurate energy logger to assist with identifying and verifying opportunities for retro fits of this product. If you have an opportunity that you wish to explore please contact a member of our City Multi team.

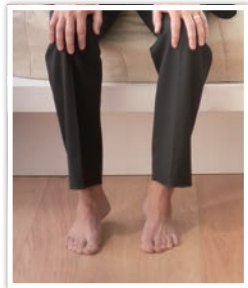


Hot Water Heat Pumps

VRF Water Heating Units are the latest technology breakthrough from the Mitsubishi Electric City Multi Range with the ability to heat water more efficiently than ever before. Mitsubishi Electric's City Multi Series has the flexibility to adapt efficiently to any building requirement. A diverse line up of indoor units and simple piping systems enable an easy fit to even the most complex configurations. Both R2 and Y Series systems can be simply operated through a central controller. With its flexible system architecture, easy operation and energy saving technology City Multi offers an ideal blend of comfort, efficiency and economy.

Underfloor Heating

Underfloor Heating Systems are used in many applications to heat either the entire space, or in specific areas as required. These systems use warm water circulated through pipes buried in the floor slab and deliver radiant energy to heat controlled spaces, providing the ultimate in comfort for the occupants.



Connecting a Mitsubishi Electric Hot Water Heat Pump to an Underfloor Heating System is simple, as most existing Underfloor Systems include the necessary in-floor water pipes, distribution manifolds, pumps and controls. The water from the Hot Water Heat Pump is piped to the underfloor heating panel, and is circulated through the Underfloor Heating System. The space heating temperature is controlled by the underfloor system controller, which is supplied by the heating installer. The Mitsubishi Electric Hot Water Heat Pump wall-mounted controller allows the water flow temperatures to be set for the individual system modes and set up requirements i.e. heating / heating eco / hot water.

Sanitary Hot Water

Mitsubishi Electric PWFY-P~AU and PWFY-P~BU Water Heating Units allow water to be pre-heated and even fully heated by using the waste heat energy normally lost into the atmosphere from a commercial air conditioning system. It is also possible to provide the same heating from a stand alone PWFY system to heat water up to 70°C. Depending on the system required and whether an existing system is used to recover energy, this offers energy savings from 300 – 550%.



Swimming Pools

Many swimming pools are used in only the warmest summer months and often remain unused for the rest of the year. Installing a Hot Water Heat Pump allows you to enjoy your swimming pool year-round!



When connecting a Mitsubishi Electric Hot Water Heat Pump to a swimming pool it is recommended that a secondary heat exchanger and circulating pump be installed to prohibit corrosion caused by any aggressive chemical treatment in the water.

Hydroponics

Most hydroponic growing systems require the water or nutrient solutions to be heated to a specific temperature dependant on the crop. The heated water is then pumped around the growing beds to provide both heat and nutrients to the plants. As the heat pump controller can be set to accurately control the water temperature, sensitive crops are easily cared for. With the ability to alter the temperature remotely, the Heat Pump can be interfaced with most green house controllers and hydroponic growing systems. The advanced "Eco Mode" allows flow temperature compensation based on outside air temperature to ensure the highest possible energy efficiency.

Aquaculture

Aquaculture systems often require both heating and cooling depending on the species and time of year. For example, Paua cultivated on land and indoors will require some heat in winter and often an amount of cooling in summer time.

Water Chilling

Water chilling is available down to a flow temperature of 6°C from a capacity of 20kW in the PWFY range. The systems require external pumps and, depending on application, a brine or antifreeze solution will be required to prevent freezing of the plate heat exchanger. Applications include small process and liquid data cooling, and chilled water for selected fan coil units.



VRF Hot Water Heat Pump Range

PWFY-P~BU Series 12.5 kW



The PWFY-P~BU indoor module can be installed in conjunction with standard City Multi VRF air conditioning indoor units creating huge potential for heat recovery.

Available in one size, the PWFY-P100VM-E-BU (12.5kW heating) is modular, to create larger solutions. Sanitary water heating is ideal for residences and hotels, commercial kitchens and laundries, office buildings, industry such as food processing plants. Heat recovery from air conditioning systems into sanitary water storage and direct sanitary water heating is also an option.

The BU Series water heating unit is perfect for sanitary hot water with excellent heat recovery possibilities. It houses a second compressor running on R134A refrigerant creating a cascade circuit between two plate heat exchangers. With the ability to sense flow or return water temperature with a dipswitch setting, these units can only be connected onto R2 City Multi outdoor units. The smallest stand alone VRF hot water system is therefore 25kW of heating.

Heat recovery from air conditioning systems into sanitary water storage and direct sanitary water heating is also possible. Heat recovery technology taps into and utilises otherwise wasted heat energy, extracted from areas of a building that require cooling, providing heating for hot water. Recovering the heat in this manner maximises the efficiency of the system all year round, therefore increasing energy savings and substantially lowering running costs.

PWFY-P~AU Series 12.5 kW and 25.0kW



The PWFY-P~AU indoor modules can be installed in conjunction with standard City Multi VRF Air Conditioning indoor units, creating huge potential for heat recovery.

Available in two sizes: PWFY-P100VM-E-AU (12.5kW heating / 11.2kW cooling) and PWFY-P200VM-E-AU (25.0kW heating / 22.4kW cooling) which are modular to create large solutions.

Suitable applications of pre-heating of sanitary water (through energy recovery), swimming pools, under-floor heating, low temperature hot water for fan coil units and convectors, hydroponics, aquaculture and water chilling.

The AU Series water heating and cooling unit utilise a 316 stainless steel plate heat exchanger with the ability to sense flow or return water temperature with a dip-switch setting. PWFY-P~AU units can be connected onto either Y or R2 series City Multi outdoor units.



PWFY-P100VM-E-BU

Heating: 12.5 kW

PWFY-P100VM-E-AU

Heating: 12.5 kW

Cooling: 11.2 kW

PWFY-P200VM-E-AU

Heating: 25.0 kW

Cooling: 22.4 kW



PAR-W21

LCD Wall Mounted

7 Day Timer/Controller

The industry's first and only Hybrid technology

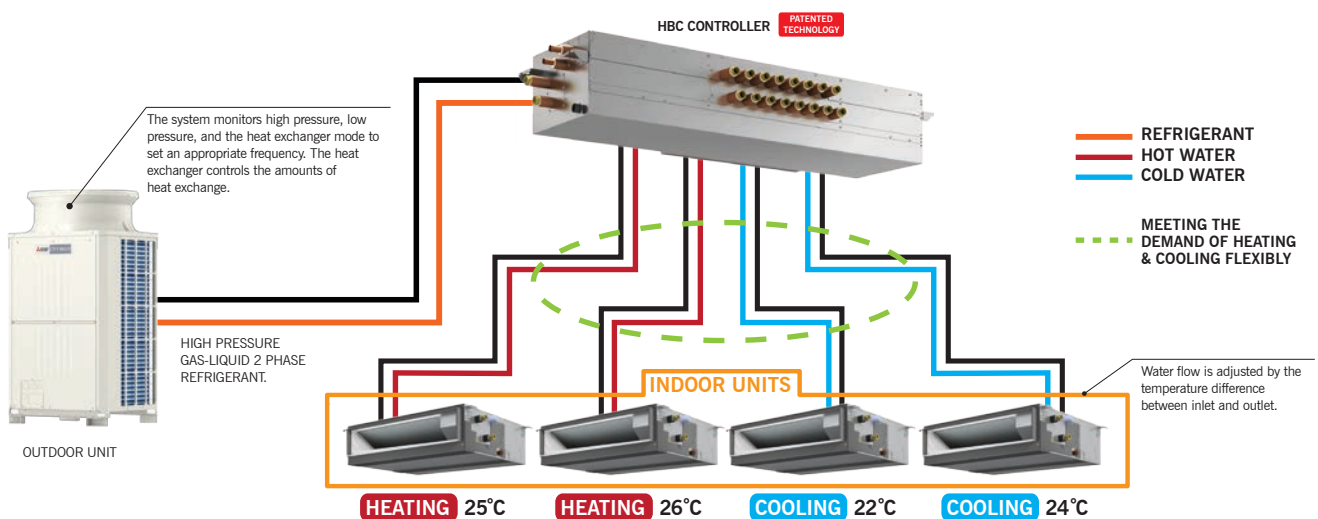
As a leading company in the industry, Mitsubishi Electric has developed the Hybrid City Multi as a top-of-the-line City Multi system by using the industry's first and only hybrid technology.

The Hybrid City Multi is the industry's first system which uses refrigerant between the outdoor unit and the HBC (Hydro BC Controller), and water between the HBC and the indoor units. HBC is the most unique part in this system and allows heat exchange between refrigerant and water.

The Hybrid City Multi system is an improvement to Mitsubishi Electric's original technology. This system is suitable for a wide variety of installations by allowing centralized control, individual operation, and simultaneous cooling and heating with heat recovery just like our existing systems do.

Features

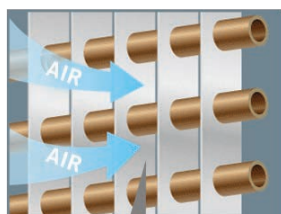
- Simultaneous cooling/heating operation
- Milder off coil temperatures
- Reduction in frost time
- Removes critical concentration of refrigerant hazard



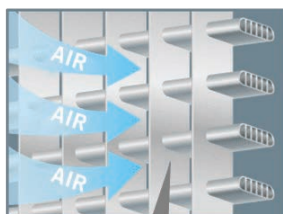
High COP Condenser

The high COP range of City Multi outdoors have undertaken some significant changes in order to offer industry leading COP's. The change from PUHY / PURY-EP YJM series to the new PUHY / PURY-EP YLM utilise world first technologies specifically developed by Mitsubishi Electric for City Multi applications. The new high COP EP-YLM range has optimised the capacity of the scroll compressor and modified the windings of the compressors motor, making it more efficient by up to 7% during low load operation.

What's more, the world first aluminium flat tube heat exchanger developed by Mitsubishi Electric results in even higher efficiency. In this unique design, both the heat exchanger fins and the refrigerant pipe work are manufactured from aluminium. The flat refrigerant pipe work has an increased surface area when compared to the typical round copper pipe work resulting in more direct contact between the refrigerant and the outdoor air.

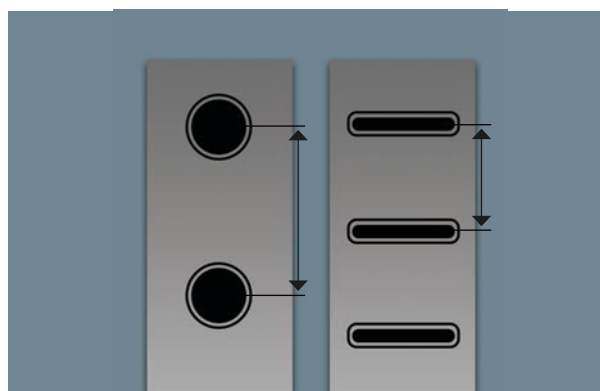


Aluminium fin & copper pipe



Aluminium fin & flat tube

The low profile of the aluminium flat tube heat exchangers allows the heat exchanger to have 30% more rows compared to round copper pipe work. All of these features result in the new EP-YLM heat exchangers being a significant 30% more efficient than its predecessor.



This new heat exchanger technology will also allow cooling operation in outdoor ambients as high as 52 degrees!

Controllers

Controllers are one of the most important and familiar devices in an air conditioning system. Not only do they provide system control from a common point, but also provide a platform to minimise running costs and conserve energy.

Management from Anywhere

- Building managers can control all their sites from a central location by simply having an internet connection.
- Mitsubishi Electric's AE-200E Controller - provides connection to one building site.
- Mitsubishi Electric's TG-2000A System - controls multiple sites.

Web Based Controller

- View and control your air conditioning systems using Internet Explorer.
- In the unlikely event of a fault, receive emails direct to your maintenance team.
- Ultimately, the ease of access to controllers enables frequent fine tuning of system performance for greater energy efficiency.

Monitoring Energy Consumption

Accurately monitor building energy consumption down to specific areas and individual indoor units. Mitsubishi Electric's control systems allow building managers to limit energy consumption by adjusting the cooling and heating set point unit operation or by load shedding.

Remote Controllers

We offer the choice of simple wireless infrared or wired remote controllers to manage all standard features. Functions can be limited or locked to ensure that the system is not misused and operates in an energy efficient manner.

BMS

Whether new build or refurbishment, Mitsubishi Electric's control systems readily integrate with industry standard BMS protocols – BACnet® and LonWorks® providing a single management system covering all aspects of building services.

CASE STUDY : Online Control - Wellington to Nelson

While Nelson is the sun capital of New Zealand, this does not mean that it is forever summer! The Abel Tasman region is also a winter haven and as such, heating was a key consideration for a corporate Wellington family when building their holiday home at Kaiteriteri Beach near Nelson. City Multi VRF Air Conditioning Systems quietly and efficiently take care of not only the room heating and cooling but also the hot water used for underfloor heating of polished concrete floors on both levels of this house.

The Mitsubishi Electric AG-150A Control System has a large colour LCD panel for controlling all the aspects of the home's heating and ventilation systems, including the underfloor heating system. This web enabled controller has allowed the owners to maintain complete control of their remote residence, through the control system's online accessibility.

The system's remote controllability and high operating efficiency means pre-heating or even pre-cooling the home is both simple and cost effective.



AG-150A Centralised and Web Central Controller with LCD Touch Screen, also available in white.



Central Controller Options

Any of these central controllers can be interfaced to any Mitsubishi Electric air conditioning system in our current range, allowing these central controllers to be utilised in residential homes through to large commercial developments.

The AE-200E touch screen controller is a new and improved version of the AG-150.

Each indoor group is represented by an icon that represents the type of indoor it is. A colour floor plan can also be loaded onto the screen as well as loading a different floor plan to represent the different levels of your client's building or residence. As standard it is designed to control up to 50 indoor groups, but with the addition of expansion modules, this can be extended to 200.



AE-200E

*Touch Screen
Central Controller*

The **AE-200E** central controller is also web accessible. This allows the central controls to be monitored and adjusted from a networked managers desktop via web browser, or even allow your client to remotely turn the air conditioning on at home before they leave work or jump on the plane. The 365 day time schedule option also allows you to pre-programme off times for public holidays, saving running costs when the air conditioning is not required.

The **AT-50B** is a simplified version of the **AE-200E**, but still gives you full control of the indoor functions available on the local wall controllers. It's designed for applications where you want a very simple central controller without all the bells and whistles and access via the internet is not necessary.



AT-50B

*Touch Screen
Central Controller*

The touch screen is a smart 5 inch backlit colour liquid crystal display. It comes with a 7 day programmable timer and can control up to 50 indoor groups, each being represented by an icon on the main screen.

A standard feature of these central controllers is the night setback function. This allows you to set an upper and lower temperature limit to ensure the building does not cool down or overheat in periods when the air conditioning is switched off. If the lower or upper temperature limit is reached, the air conditioning will turn on and control to this preset temperature, resulting in a lowered operating load the next time the air conditioning is scheduled to come on. This is one of many energy efficient and temperature comfort features that our central controllers offer.



PAC-YG66DCA

(DIDO) control module

The **PAC-YG66DCA** digital input / output (DIDO) control module also gives you the ability to manually, or via time schedule, start and stop external equipment that are not part of the Mitsubishi Electric range. This gives you the flexibility to build a control system with all the functionality of a small BMS where you may want to interlock supply / extract fans with the air conditioning system, or turn on / off lighting or irrigation zones in a residential setting.

The level of control across all Mitsubishi Electric Air Conditioning products is second to none when one of our central controllers is included in the system. We have demonstration cases set up with these controllers mounted in them to help show how simple these controllers are to use and also show the high level of control you can achieve over the system. Please contact your local Mitsubishi Electric representative to arrange a viewing. We are even happy to set up a demonstration with you and your client!

New Zealand Case Studies

AUCKLAND



EMU Maintenance Depot

Page 14



Central Park

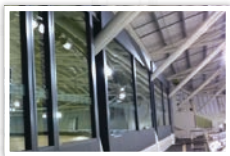
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Mini Garage

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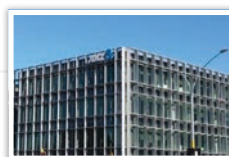
HAMILTON



Waikato Avantidrome

Page 18

TAURANGA



Cameron Road

Page 20

WELLINGTON



Clyde Quay Wharf

Page 21



One Market Lane

Page 22



Royal Thai Embassy

Page 23



CHRISTCHURCH



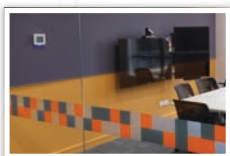
Pacific Tower

Page 24



Lincoln Library

Page 25



Transpower Islington

Page 26



Three35 Lincoln Road

Page 27



Gloucester Street

Page 28

MOUNT COOK



The Hermitage Hotel

Page 29

QUEENSTOWN



Highlands National Motorsport Museum

Page 30



Hilton Hotel Kawarau Falls

Page 31



Remarkables Primary School

Page 32



EMU Maintenance Depot

The EMU Maintenance Depot is a large maintenance and office building used as a main servicing hub for Auckland's new electric trains.

TOTAL CAPACITY

Heating Capacity: 396 kW

Cooling Capacity: 354.3 kW

OUTDOOR UNITS

8 x PURY-YJM-A-BS Heat Recovery Units

4 x PURY-EPYJM-A-BS High COP Heat Recovery Units

INDOOR UNITS

21 x PEFY-VMH-E Ducted Units

1 x PEFY-VMHS-E Ducted Unit

1 x PEFY-VMA-E Ducted Unit

1 x PKFY-VHM-E Wall Mount Unit

AIR HANDLER UNITS

1 x PAC-AH100M-J AHU Controller Unit

4 x PAC-AH200M-J AHU Controller Units

2 x PAC-AH250M-J AHU Controller Units

CONTROLLERS

24 x PAC-YT52CRA-J Remote Controls

2 x PAR-21MAA-M Remote Controls

1 x AG-150A Colour Touch Panel

1 x BAC-HD150 BACnet Interface

CONTRACTOR

HEATWAVE

The Challenge

The EMU Maintenance Depot comprises of a main maintenance hall where train servicing takes place, ground floor offices, and a first floor depot control office. The sheer size and scope of this new facility meant that efficient air conditioning systems as well as variable fresh air tempering systems (to pre-heat the outdoor air over 18°C minimum) were required to meet the diverse needs of all staff on-site.

The Solution

As specified by Opus, Mitsubishi Electric City Multi VRF equipment was selected to meet the cooling and heating, as well as the ventilation requirements in the EMU Depot.

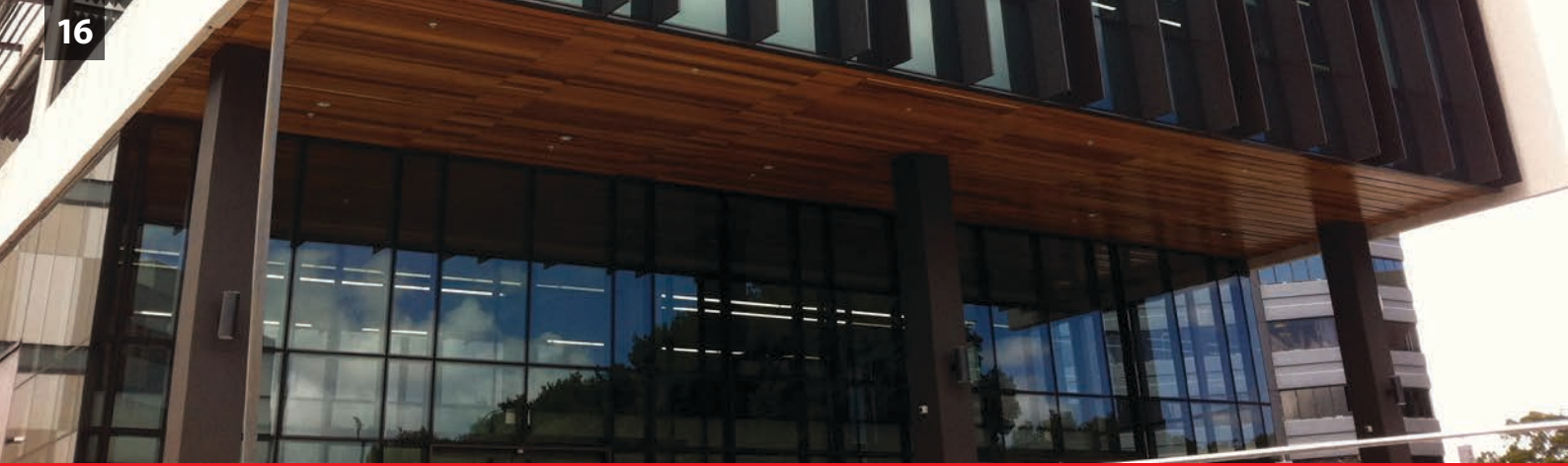
In total, seven City Multi Heat Recovery Systems were chosen with 23 x concealed ducted indoor units and 1 x high wall indoor unit to provide the office sections of the building with efficient heating and cooling, and temperature control. These systems proved to be the most sensible solution as the ducted units are unobtrusively concealed in the ceiling out of sight, and the R2 Heat Recovery outdoor units allow for simultaneous heating and cooling of different indoor units operating off a common outdoor. This means the cooling/heating needs of each of the offices can be achieved simultaneously without compromise.

Variable tempered fresh air in this depot was also achieved using our range of "EP" High COP outdoor units connected to a DX coil located in an Energy Products AHU. This combination with the High COP outdoors enabled a COP in heating in excess of 4 to be achieved.

It was also very important to have the equipment centrally controlled and linked into the EMU's Building Management System (BMS). By utilising a Mitsubishi Electric AG-150A-J central controller, both the VRF air conditioning systems and tempered fresh air systems can be controlled from a central point, which also allows for web access and a 365 day time schedule. In this case the Mitsubishi Electric BAC-HD150 was installed along with the central controller to provide high level control of all the available air conditioning functions through the BMS.







Central Park – Building 7

Building 7 is the newest addition to the coveted Central Park Corporate Centre situated in Penrose, Auckland, just 6km from the Auckland CBD.

BUILDING 7: AIR HANDLING UNIT

TOTAL CAPACITY

Heating Capacity: 190 kW

Cooling Capacity: 170 kW

OUTDOOR UNITS

4 x PUHY-YJM-A-BS Heat Pump Units

AIR HANDLER UNITS

8 x PAC-AH200M-J AHU Controllers

WALL CONTROLLERS

2 x PAR-31MAA-J Wall Controllers

BUILDING 7: GENESIS FITOUT

TOTAL CAPACITY

Heating Capacity: 45 kW

Cooling Capacity: 40 kW

OUTDOOR UNITS

1 x PUHY-YJM-A-BS Heat Pump Units

INDOOR UNITS

1 x PEFY-VMA-E Ducted Units

5 x PKFY-VKM-E Wall Mount Units

CONTROLLERS

6 x PAC-YT52CRA-J Remote Controls

6 x PAC-SE41TS-E Remote Sensors

1 x AG-150A Colour Touch Central Controller

1 x BAC-HD150 BACnet Interface PC

CONTRACTORS & CONSULTANT

AIR MARK SERVICES LTD

BTL

THURSTON CONSULTING

The Challenge

Being a new office complex the challenge was set to provide highly efficient tempered fresh air to the building with a minimum fresh air design requirement of 1.43 l/s (per m² of floor). Varying occupancy rates throughout the working day means the air handler unit fans would operate on variable speed drive. Adding to this challenge was the desire to connect the building's fresh air ventilation solutions to the Building Management System.

The Solution

Factory corrosion treated Mitsubishi Electric City Multi Y Series Outdoor units (-BS) were combined with Mitsubishi Electric Air Handler Unit (AHU) controllers fitted to two purpose built air handlers from Energy Products International to provide tempered outdoor air to the entire building.

The Mitsubishi Electric Air Handler Unit (AHU) controllers enable variable volumes of fresh air to be supplied to the building depending on its needs at any given time. In Building 7 this is achieved through the use of CO₂ sensors which have been strategically stationed at key areas around the building. These CO₂ sensors then link back to the Building Management System, and the air handler units and outdoor units will either ramp up or down depending on the levels of occupancy. The variable air volume systems on the air handler units which allow this provide developers with the flexibility to isolate unoccupied floors without wasting energy or affecting the operation of the system.

In short, by controlling the amounts of outdoor air delivered to the building based on actual requirements the maximum efficiency can be achieved as is the case for Building 7.

In adhering to the developers other wishes to link the air handler units and outdoor units to the Building's Management System, the relatively simple solution of using a BAC-HD150-E (BACnet) interface was decided upon.





MINI Garage

Tucked under the Newmarket flyover, this unique, eye-catching building houses another simple yet effective City Multi system.

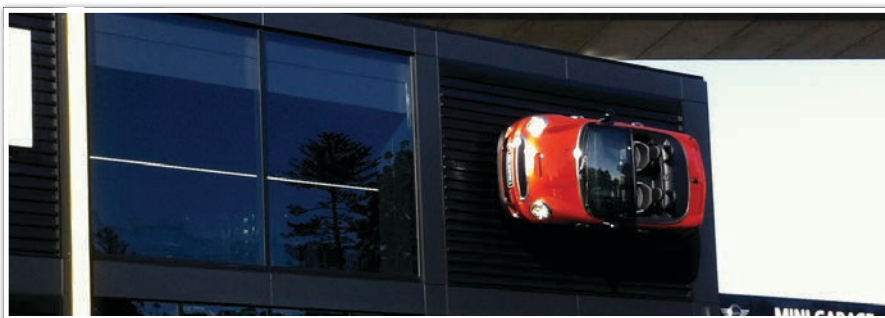
The Challenge

To provide an efficient heating and air-conditioning solution for a small building with a variety of different usable spaces. The building posed a challenge in that it has an upstairs conference room with narrow ceiling spaces, and the downstairs level was a showroom with high ceilings.

The Solution

Y-Series heat pumps are the unsung heroes of VRF. Able to connect to hot water modules, AHU, and the complete range of more conventional indoors, they are ideal for heating larger areas/zones where heat recovery isn't required, but all the other benefits of City Multi, are.

Given the nature of the spaces it was always apparent that Y-Series outdoor units were going to be the most cost effective solution for the project. PEFY-VMA-E indoor units are the workhorses of the City Multi ducted range. Historically they make up 51% of all City Multi indoor unit sales and they proved their worth again here. With five static pressure settings and optional condensate pump, they were ideal for both the conference room – with narrow ceiling spaces and little or no room for condensate drains, to the high ceiling show room with long duct runs. The ability to sense temperature at either the wall controller or return air also made them the ideal choice for both situations. Compact outdoors minimised visibility and ensured the complete package for the end user.



TOTAL CAPACITY

Heating Capacity: 101.5 kW

Cooling Capacity: 91.4 kW

OUTDOOR UNITS:

3 x PUHY-P-YJM-A Heat Pump Units

INDOOR UNITS

6 x PEFY-VMA-E Ducted Units

1 x PKFY-VHM-E High Wall units

WALL CONTROLLERS

7 x PAR-31MAA-J Remote Controls

CONTRACTOR

TEMPEST



Avantidrome

Avantidrome - the home of cycling is the new high profile Velodrome Cycling facility located in the Waikato.

The Challenge

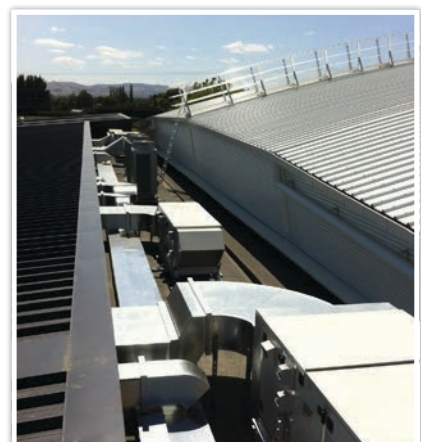
To provide this unique Velodrome complex with the appropriate heat recovery VRF, variable fresh air tempering and control equipment to provide the most efficient and comfortable solution for the diverse state of the art facility.

The Solution

The new Avantidrome in Cambridge has only just opened but has already successfully hosted its first event, the Elite and Under 19 Track Cycling Championships. This is also another success story for Mitsubishi Electric City Multi VRF systems, boasting nearly 500 kW (nominal) of cooling/heating capacity. The overall complex is broken into two main areas, the circuit itself and the three story support building on the East side. This in turn is divided into a wide range of different spaces, from offices and meeting rooms to other separate tenancies like Revolve Café and Avanti cycles. These spaces house a total of 58 Mitsubishi Electric indoor units including cassettes, ducted units and hi-walls - all controlled by an AG150 Touch Screen controller.

As well as having overall control of each individual unit on site the AG150 also oversees the fresh air requirements for the building, including two rooftop AHUs and other smaller fans dotted around the complex. The clever AHU's, connected to Mitsubishi Electric's outdoor units are now a familiar sight around New Zealand and on this project deliver a combined 2320l/s of tempered fresh air to the whole building. Each AHU houses Mitsubishi Electric's unique PAC controllers which allow precise control of air-off temp. Other smaller fans are connected via CN51 input plugs to their corresponding indoor units, allowing easy control and efficient operation. The AG150 (via interlock software) very cleverly only brings on the AHU that is required at any given time to avoid running the bigger fans unnecessarily.

Behind the scenes the Mitsubishi Electric TG2000 is quietly monitoring the entire system, plotting temperature trends and power usage, and even calculating the power used in individual tenancies/spaces.



TOTAL CAPACITY

Heating Capacity: 528 kW

Cooling Capacity: 473 kW

OUTDOOR UNITS

13 x PURY-YJM-A Heat Recovery Units

2 x PUHY-YJM-A Heat Pump Units

INDOOR UNITS

6 x PLFY-VCM-E 4 Way Cassette

28 x PLFY-VBM-E 4 Way Cassette

1 x PEFY-VMA-E Ducted Unit

10 x PKFY-VBM-E Wall Mount Units

6 x PKFY-VHM-E Wall Mount Units

AIR HANDLER UNITS

1 x PAC-AH100M-J AHU Controller Unit

1 x PAC-AH125M-J AHU Controller Units

4 x PAC-AH250M-J AHU Controller Units

CONTROLLERS

52 x PAR-31MAA-J Remote Controls

1 x AG-150A Colour Touch Panel

2 x PAC-YG50ECA-J Expansion Modules

1 x PAC-YG66DCA-J DIDO Module

1 x PAC-YG60MCA-J PI Module

1 x TG2000 PC

CONTRACTOR

HADEN
EXPERTISE • COMMITMENT • RESULTS

CONSULTANT

LHT DESIGN





244 – 255 Cameron Road

Located in Central Tauranga, 244- 255 Cameron Road, also known as the ANZ Building, is a large architecturally designed office building. The building remains one of the largest City Multi installations undertaken in Tauranga.

TOTAL CAPACITY

Heating Capacity: 1010 kW

Cooling Capacity: 901 kW

OUTDOOR UNITS

22 x PURY-YJM-A-BS Heat Recovery Units

3x PUHY-YJM-A-BS Heat Pump Units

INDOOR UNITS

123x PEFY-VMA-E Ducted Units

AIR HANDLER UNITS

3 x PAC-AH400M-J AHU Controller Units

WALL CONTROLLERS

112x PAC-YT51CRB-J Remote Controls

85x PAC-SE41TS-E Remote Sensors

CENTRAL CONTROLLERS

6x AG-150A Central Controllers

1x TG2000 PC

6x PAC-YG66DCA-J DIDO Modules

2x PAC-YG60MCA PI Modules

CONTRACTOR



The Challenge

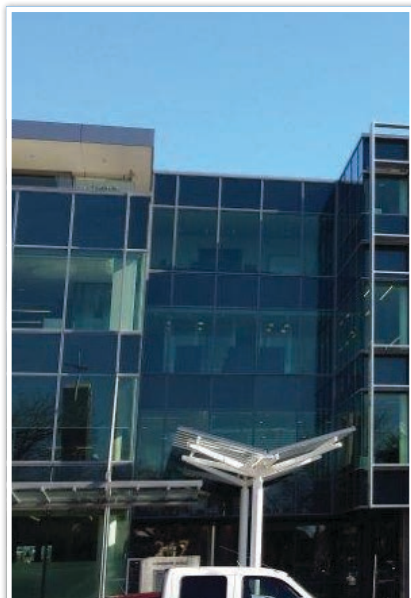
To provide an efficient heating and air-conditioning solution for a large building with a range of tenants and tight ceiling spaces.

The Solution

244 - 255 Cameron Road is occupied by a wide variety of tenants including the ANZ Call Centre, offices and even a café. All these spaces have their own heating and cooling requirements, often at the same time.

From the outset it was clear that using City Multi R2 Heat Recovery condensers was the most suitable solution to satisfying the often differing simultaneous heating/cooling requirements of each of the tenancies. These outdoor units were selected in conjunction with PEFY-VMA-E mid-static ducted indoor units. These mid-static ducted units proved to be the perfect application for the ANZ Building as they were slim enough to fit into the tight ceiling spaces, and they are able to be used with long duct runs. For example all PEFY-VMA-E units have a height of only 250mm and five stage external static pressure settings provide flexibility for duct extensions.

Finally, to ensure optimum control across all systems and across the outdoor air tempering equipment in the building, six AG-150 central controllers were installed across each of the tenancies along with DIDO and PI modules.





Clyde Quay Wharf

The Clyde Quay Wharf redevelopment complex is built on the existing Clyde Quay Wharf in Wellington, providing 360 degree views of the CBD and surrounding suburbs. The Overseas Passenger Terminal building was demolished to make room for this new retail and luxury apartment building.

The Challenge

To provide heating and cooling as well as ventilation to a complex which consists of 76 high end apartments, a gymnasium, business centre, theatre, and several high end retail tenancies/restaurants.

The Solution

Due to Clyde Quay Wharfs' highly corrosive environment careful consideration was given to products that could withstand the exposure to sea salt. It made perfect sense for the consultant to specify Mitsubishi Electric's "BS" marine grade protection to the outdoor units. This protection is applied during the outdoor units manufacturing process to ensure all components are 100% protected before the outdoor unit is assembled.

In order to maximise apartment size an underground car park was built, which partly sits below the mean sea level of Wellington harbour. The entire site is split into eight cores which is air conditioned by nine R2 series simultaneous heating and cooling VRF systems.

Tempered fresh air for code compliance is supplied to the apartments via nine EPI air handling units complete with DX refrigerant coils. These are then connected to nine Y series City Multi outdoor units which provide efficient reverse cycle pre-heating or pre-cooling of the air.

The apartments are individually owned, vary in floor size, and have different aspects to the sun, so it was essential that accurate power proportioning of the common outdoor units was monitored for each tenant. A Mitsubishi Electric AG150A central controller complete with three expansion controllers and a TG2000A PC was installed. Not only does this automatically proportion the power of the outdoors for each tenant, but also gives the building manager site wide control over the air conditioning, and a common place where filter signs or faults can be monitored.



TOTAL CAPACITY

Heating Capacity: 469 kW

Cooling Capacity: 418.5 kW

OUTDOOR UNITS

11 x PURY-YJM-A-BS Heat Recovery Units with Marine Protection (BS)

INDOOR UNITS

104 x PEFY-VMA-E Ducted Units

3 x PKFY-P VMH-E High Wall Units

VENTILATION

9 x PUHY-P200YJM-A-BS outdoors connected to 9 x EPI AHU's

WALL CONTROLLERS

115 x PAR-30MAA-J Remote Controls

1 x AG150A Central Controller

1 x TG2000A PC

CONTRACTOR





One Market Lane

In January 2013 construction commenced at One Market Lane Wellington with the goal of building a modern premises in the heart of the Wellington CBD. The development is a mixed use building incorporating ground floor retail, car park floors, office spaces and apartments.

TOTAL CAPACITY

Heating Capacity: 947 kW

Cooling Capacity: 846 kW

OUTDOOR UNITS

24 x PURY-YJM-A-BS Heat Recovery Units with Marine Protection (BS)

INDOOR UNITS

110 x PEFY-VMA-E Ducted Units

VENTILATION

1 x PUHY-P500YSJM-A-BS outdoors connected to 1 x EPI AHU

CONTROLLERS

110 x PAR-30MAA-J Remote Controls

1 x AG150A Central Controller

1 x TG2000A PC

1 x BAC-HD150 BMS Interface

CONTRACTOR

AQUAHEAT WELLINGTON

The Challenge

The complex is situated only a few hundred meters from Wellington Harbour, and although the outdoor condensers are predominantly situated behind louvers on the car park floors the air is still highly corrosive with salt. This is why the consultant specified Mitsubishi Electric's "BS" marine grade protection to the outdoor units. This protection is applied during the manufacturing process of the outdoor units to ensure all components are 100% protected before the outdoor unit is assembled.

The Solution

Commercial offices are located on Levels 3, 4, and 5 and are currently leased by a famous NZ online auction website company and have a very unique fit out style throughout. The majority of the low profile mid-static ducted units installed are exposed, giving the ceilings an industrial feel. This of course demanded a very high quality of install throughout including all the pair coil refrigeration pipework being run on cable trays.

All five systems installed on the office floors are the Mitsubishi Electric R2 series offering simultaneous heating, cooling and heat recovery between indoors running on opposite modes. This was essential due to the large open plan floor areas being exposed to North, East and South aspects.

Energy efficient fresh air is supplied to these office floors via an EPI air handler complete with a DX refrigerant coil. This provides reverse cycle preheating or precooling of the incoming Wellington air before it is ducted onto the rear of the fan coil units.

One Market Lane offers premium apartments occupying the top six levels, where each apartment is individually designed and sits above the roofline of the existing heritage buildings. Bathed in light and sun, the apartments sit above the streets below to offer spectacular views across the harbour and city to the surrounding hills and mountains. There are over 20 different apartment layouts, accommodating two-, three- and four-bedroom options. As a minimum the open plan kitchen living and dining areas are served via a singled mid-static ducted.

The single BC controller per outdoor unit on these floors allowed the consultant to specify spare ports in case the apartment buyers wanted to add additional units. This fit out flexibility unique to Mitsubishi Electric's R2 Series City Multi was put to excellent use in the final stages of construction as late buyer changes were instructed. The single BC controller with spare ports allowed additional units to be added without having to cut into the existing pipe work when compared with a typical 3 pipe system.

The entire site is controlled via an AG150 central controller and BMS interface via BACNet protocol. Energy management is also utilised via our TG2000A PC controller to proportion the amount of outdoor power consumed by each of the apartment tenants.



Royal Thai Embassy

The new site for the Royal Thai Embassy saw Fletcher Construction completely gut the existing two storey tavern (which had become a blot on the local landscape after 15 years of abandonment) and add a third level extension.

The building is mainly office space, but the extension houses large function and pre function spaces, a commercial kitchen on the ground floor and four two bedroom apartments above. All which require heating, cooling and adequate ventilation.

The Challenge

To design an air conditioning system with so many different spaces that each have different purposes, the building required a number of different products to ensure that all spaces were provided the heating or cooling they needed. Added to this, the outdoor condenser plant decks were very tight – so finding a logical site would require its own solution.

Added to the practical nature of the project was the challenge of ensuring that our customer, Aquaheat, was made to feel like we were on top of the project the entire time as we were the main supplier for most of the building's mechanical services.

The Solution

230kW of City Multi R2 Series simultaneous heating and cooling condensers were installed to serve the office areas. These office areas are exposed to all four orientations creating a huge potential for heat recovery. The indoors are primarily low profile (250mm) mid-static ducted units, offering up to 150Pa of external static pressure. Three four-way blow cassettes have been installed in a detailed ceiling within the reception area.

A further 134kW of S and Y series condensers have been used for the remainder of the building. The Y series condensers have been utilised to build large 28kW ducted split systems, one in each of the three conferences spaces. A portion of tempered fresh air is brought onto the rear of these indoors to meet the building code. The S series condensers have been utilized to build a three-headed multi to service the living room, and two bedrooms in each of the four apartments. To address the tightness of the plant decks we decided that we would need to allocate two separate spaces on the site.

The Royal Thai Embassy is due for occupancy in mid September 2014.



TOTAL CAPACITY

Heating Capacity: 322 kW

Cooling Capacity: 284 kW

OUTDOOR UNIT

7 x PURY-YHM-A Heat Recovery Units

3 x PUHY-YHM-A Heat Pump Units

4 x PUMY-YHMB Heat Pump Units

INDOOR UNITS

4 x PLFY-VBM-E Four Way Cassettes

2 x PLFY-VCM-E Four Way Cassettes

31 x PEFY-VMAL-E Ducted Units

12 x PKFY-VBM-E Wall Mount Units

WALL CONTROLLERS

46 x PAR-20MAA-G Remote Controls

3 x PAC-SE41TS-E Remote Sensors

1 x AG-150A Colour Touch Panel

CONTRACTOR

AQUAHEAT WELLINGTON

Aquaheat Industries Ltd approached BDT in 2012 to supply them with an energy efficient air conditioning system for the Royal Thai Embassy located in Molesworth St in Wellington.

While this was a design build project for Aquaheat on the mechanical services side for Fletcher Construction, they also employed the expertise of Chris Rowe of CORA Associates to assist them with the initial design concepts.



Christchurch

TOTAL CAPACITY

Heating Capacity: 846 kW

Cooling Capacity: 757 kW

OUTDOOR UNITS

15 x PURY-YGM-A Heat Recovery Units

INDOOR UNITS

12 x PLFY-VCM-E Four Way Cassettes

8 x PLFY-VAM Four Way Cassettes

7 x PLFY-VLMD-E Two Way Cassettes

160 x PLFY-VBM-E One Way Cassettes

4 x PKFY-VAM-E Hi Wall Units

1 x PCFY-P40VGM-E Under Ceiling Units

14 x PEFY-P32VMS-E Ducted Units

WALL CONTROLLERS

34 x PAR-21MAA

160 x PAC-YT51 CRA

CENTRAL CONTROLLERS

6 x G50A Central Controllers

1 x TG2000 PC

CONTRACTOR

BEDFORD MECHANICAL

Pacific Tower

This new training facility provides trade and pre-trade courses for the automotive, electrical, refrigeration and building trades, along with non trade courses including call centre training and a diploma in mental health.

The Challenge

The project was a design build and BDT had significant involvement right from the start. Budgetary concerns were always important but there were bigger challenges such as finding sufficient plant space for condensing units serving the lower floors while avoiding issues with boundary noise levels or taking up precious car park space. Floor to ceiling height is always an issue in this type of high rise building.

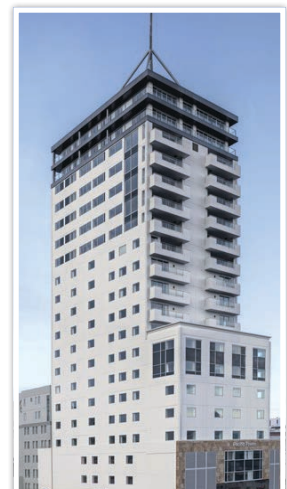
There was also the need to be able to provide energy billing for the air conditioning systems to the various tenants and overall control of the whole system without involving a BMS company.

The Solution

The City Multi R2 System was used throughout the building. The condensers from ground to level 13 were placed on level 4 internal balcony plant decks which were open to the car park six-storey stacking machine inside the building. Suitable ventilation was provided to the car park levels by the entrance ramp and a large array of wall louvers on the west and south of the building. The condensers cannot be seen or heard from outside the building. The remaining condensers for levels 14 to 23, were placed on the roof.

With floor height restrictions and a directive from the architect that 'high wall units shall not be used in the hotel rooms' PLFY 1 way cassettes were selected and proved to be a very successful and cost effective solution.

A TG2000 was installed to umbrella the six G50A controllers and provide a 'BMS' style front end while at the same logging and billing the electricity consumed by the various tenants.





Lincoln Library

Located in the fast growing Selwyn district, Lincoln Township's new library and service centre draws inspiration from Lincoln's rural heritage. The building is constructed from metal with stone cladding - materials commonly used in agricultural buildings.

The Challenge

There were several objectives of this project:

- To provide a small capacity multi system suitable for air-conditioning the administration areas;
- To provide an efficient, unobtrusive hot water heating source capable of maintaining the 700m2 buildings' heating requirements through underfloor heating circuits;
- To allow for high level control via an external BMS system.

The Solution

3x 25kW hot water modules were selected to be paired with independent condensing units in order to meet the heating requirements of the space in a varied climate, while also offering additional diversity and staging possibilities via BACnet protocol through a BAC-HD150 Interface.

In conjunction with the underfloor heating, ducted air conditioning units were installed to heat the administration area; the ducted units are connected to an 18kW City Multi Heat Pump.



TOTAL CAPACITY

Heating Capacity: 18 kW

Hot Water Heating to 45°C: 75 kW

OUTDOOR UNITS

3 x PUHY-YJM-A Heat Pump Units

2 x PUMY-YHMBR3 Heat Pump Units

INDOOR UNITS

3 x PEFY-VMA-E Ducted Unit

3 x PWFY-200AU Hot Water Modules

WALL CONTROLLERS

3 x PAR-31MAA-J Remote Controls

3 x PAR-W21MAA-J Remote Controls

1 x BAC-HD150 BACnet Interface

CONTRACTOR

DAWN GROUP LTD



● Christchurch

WALL CONTROLLERS

2 x PAR-U02MEDA-J Remote Controls

Transpower Islington

Mitsubishi Electric's new Infrared Occupancy Controller featuring an occupancy sensor has been installed into Transpower Christchurch's new offices to maximise energy efficiency and minimise deadweight energy loss.

The Challenge

To maximize energy efficiency and minimize deadweight energy loss associated with the varying occupancy rates of both the communal and meeting areas at Transpower's new offices located in Islington.

The Solution

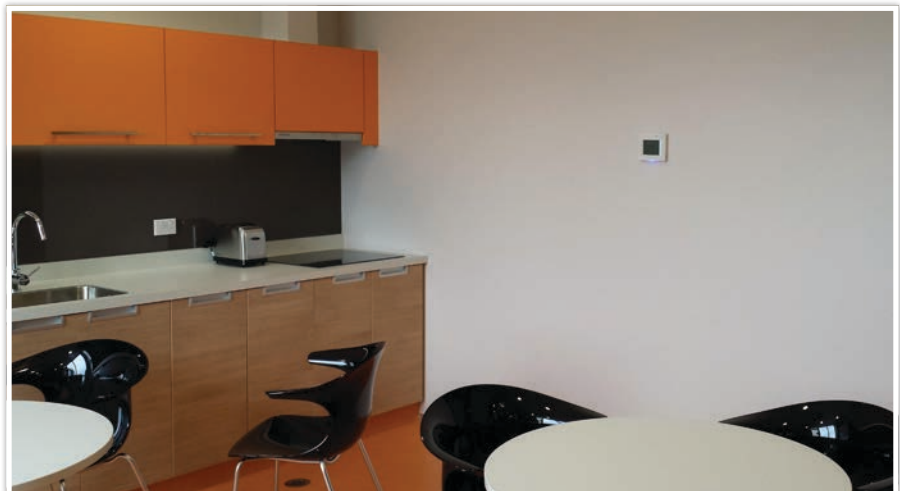
The new PIR Controller (PAR-U02MEDA-J) was selected as the local control option in both the Meeting Room and Cafeteria at Transpower Islington. The unique occupancy sensing and brightness sensing functions of this controller meant it quickly became the obvious solution when aiming to provide maximum energy efficiency in this building.

The PIR sensing was best suited to the client's needs of maintaining the space condition while avoiding the additional running costs associated with varying daily rates of occupancy.

While in use the PIR sensor will recognize the presence of people and turn itself on, and by the same token when occupancy is not sensed the controller can automatically turn itself off after the programmable delay time, maximising energy saving.

Other added features of this controller including its full backlit touch screen and LED mode indicator light ensured this controller would fit in nicely amongst the other hi-tech equipment in the modern meeting room.

Combining the PIR sensor with the 0.5°C increment display and humidity display, the Mitsubishi Electric PIR controller was the obvious choice when it came to maximising comfort for clients and staff at the Christchurch Transpower Offices.





Three35 Lincoln Road

Large scale office development located on the fringe of the Christchurch CBD, this 5500sqm commercial office precinct development focused on high quality urban design and the creation of a great workplace. The precinct consists of two three-story buildings.

The Bernard Street building consists of a ground floor allocated to retail space, café, bar and restaurant facilities and two floors of office space. The second building is 50% tenanted by MediaWorks Canterbury, and the remainder of the building is dedicated to office space.

The Challenge

The goal of this project was to provide a complete heating, air-conditioning and ventilation system, incorporating the latest in energy efficiency technologies and heat recovery ventilators. It was also important to offer a complete control solution for time scheduling, fault monitoring and energy consumption reporting with full remote connectivity.

The Solution

City Multi R2 series simultaneous heating and cooling systems were selected for this project, complemented by Lossnay heat recovery ventilators to meet the fresh air requirements of the building. Two AG150 Touch Screen Controllers were incorporated into this project, as was a central TG2000 computer monitoring both buildings providing high level control, temperature trending and power monitoring.



TOTAL CAPACITY

Heating Capacity: 791Kw

Cooling Capacity: 713Kw

OUTDOOR UNITS

10 x PURY-YJM-A Heat Recovery Units

INDOOR UNITS

92 x PEFY-VMA-E Ducted Unit

VENTILATION

31 x LGH-RX5 Lossnay Heat Recovery Ventilators

AIR HANDLER UNITS

3 x PAC-AH400M-J AHU Controller Unit

WALL CONTROLLERS

89 x PAR-31MAA Remote Controls

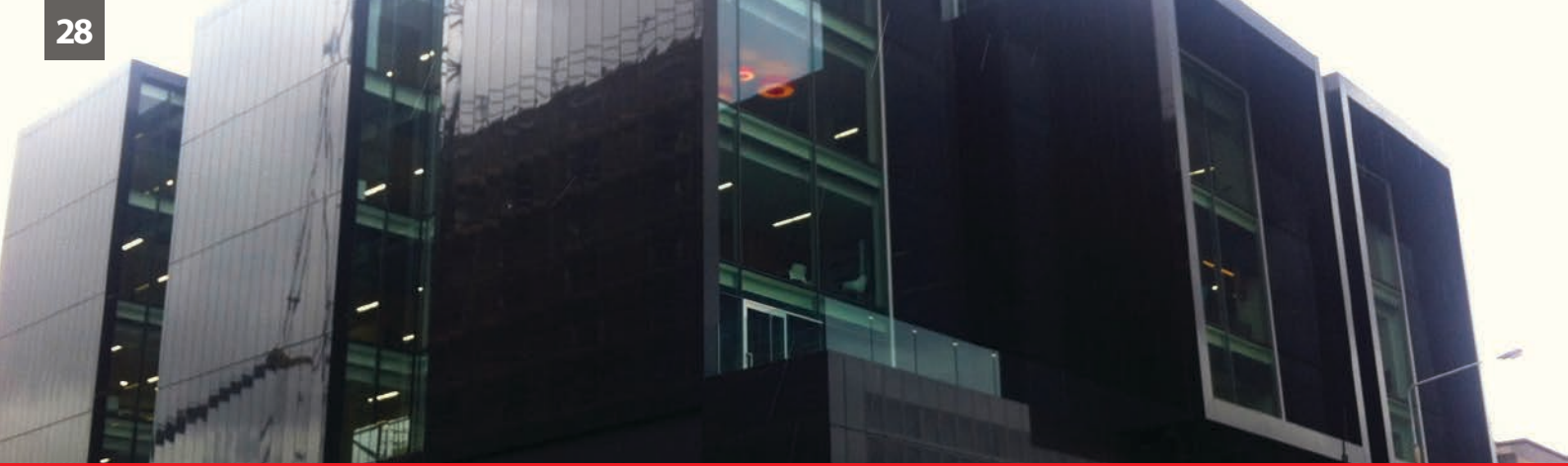
CENTRAL CONTROLLERS

1 x AG-150A Central Controllers

1 x TG2000 PC

CONTRACTOR





TOTAL CAPACITY

Heating Capacity: 319.5 kW

Cooling Capacity: 299 kW

OUTDOOR UNITS

5 x PURY-YJM-A Heat Recovery Units

INDOOR UNITS

59 x PEFY-VMA-E Ducted Units

VENTILATION

11 x LGH-RX5 Lossnay Heat Recovery Ventilators

WALL CONTROLLERS

59 x PAR-30MAA-J Remote Controls

1 x AG150A Central Controller

1 x GB-50ADA Controller

1 x TG2000A PC

CONTRACTOR



70 Gloucester Street

Located in the heart of the Christchurch CBD this six storey commercial office development incorporates ground floor retail space, indoor car parking for approximately 30 vehicles plus 20 bicycles, and 2600sqm of office space. With a key tenant occupying the 4th and 5th floors and Anderson Lloyd occupying the 3rd floor and taking naming rights for the building, this will be one of the first major developments approved and completed since the release of the Christchurch central recovery plan.

The Challenge

To provide independent heating, air-conditioning and ventilation systems for each tenancy while incorporating the latest in energy efficiency technologies and heat recovery ventilators. As well as offering a complete control solution including web access for the key tenant, time scheduling, fault monitoring and energy consumption reporting and the added possibility of remote connectivity.

The Solution

City Multi R2 series simultaneous heating and cooling systems were selected for this project complemented by Lossnay heat recovery ventilators to meet the fresh air requirements of the building. An AG150 Touch Screen controller plus a separate web accessible GB50ADA were included for the key tenant and a central TG2000 computer monitoring the entire complex providing high level control, temperature trending and power monitoring, providing greater control

An AG150A provides central control functions on this site and with the addition of a DIDO controller also took care of switching the various extract fans.





The Hermitage Hotel

Providing luxurious comfort, even in sub zero conditions.

The Challenge

The Hermitage offers luxury accommodation to tourists from around the globe. Set against a backdrop of clean, unspoilt scenery at the foot of New Zealand's highest mountain, the hotel is pivotal to Mount Cook Village's role as a gateway to the mountains and glaciers of Aoraki Mount Cook National Park.

The mountain landscape is well-known for environmental extremes. In Mount Cook Village, the temperature can soar into the high thirties and night-time temperatures can fall below -10°C. When the Hermitage was renovated a six-storey accommodation wing was constructed. The sixty luxurious rooms offer floor-to-ceiling views of Aoraki (Mount Cook) and it was important to the client that guests be able to enjoy the view in comfort.

The challenge of catering to a world audience is the varying definition of comfort. European tourists like those from Switzerland are conditioned to room temperatures of eighteen or nineteen degrees whereas guests from the Indian subcontinent are more accustomed to warmer temperatures.

Energy efficiency was a top priority for the client. The required system would need to be multi faceted. It needed to allow guests to control the temperature of their own rooms, be economical, and have minimal environmental impact. The efficiency of heat pump technology was recognised but few systems would cope with the icy night-time temperatures.

Finally, being a hotel, sound levels would be a key concern and due to fluctuating occupancy the system would need to cope with varying loads.

The Solution

City Multi R2 outdoor units were chosen for this project. These units can extract heat from air as cold as -20°C, ensuring that guests can enjoy their beautiful surrounds in comfort.

The simple and effective two-pipe architecture and BC controller allow rapid transition between heating and cooling modes. The system can easily cope with even the most dramatic of daily temperature fluctuations.

Control is essential in hotels. Wall controllers were installed in every room, easily adapting to the individual needs of each guest. And, the hotel staff uses a central controller to reduce air conditioning power to unoccupied rooms.

To further address the energy efficiency brief, Mitsubishi Electric's heat recovery technology transfers heat between rooms, maximising efficiency.

Mitsubishi Electric's outdoor units are among the quietest in the industry. With its compressor isolated in its own compartment and with the compressor and fan designed for minimum noise, the City Multi indoor units are also very quiet. Providing the ultimate quiet comfort so the guests can enjoy the hotel and the landscape – in peace.

This project was one of the first VRF systems sold in New Zealand to Airtech NZ. To date the system has had zero break downs which is impressive in the harsh conditions Mt Cook offers. This is due to reliable equipment and regular service and maintenance that Airtech offers to this site.



TOTAL CAPACITY

Heating Capacity: 530 kW

Cooling Capacity: 480 kW

OUTDOOR UNITS

17 x PURY - Heat Recovery Systems

INDOOR UNITS

PDFY-VM-E - Mid Static Ducted

PLFY-VBM-E - 4-way Cassettes

PEFY-VMH-E - Hi Static Ducted Systems

WALL CONTROLLERS

PAC-YT51 Simple Wall Controllers

PAR-20 Wall Controllers

CENTRAL CONTROLLER

1 x MJ-180 Main Controller

CONTRACTOR

AIRTECH NZ LIMITED



TOTAL CAPACITY

Heating Capacity: 127 kW

Cooling Capacity: 113 kW

OUTDOOR UNIT

1 x PUHY-YJM-A Outdoor Units

INDOOR UNITS

5 x PWFY-VM-E-AU Water Modules

WALL CONTROLLER

1 x PAR-W21MAA-J Remote Control

CONTRACTOR

CENTRAL HEATING SOLUTIONS

Highlands National Motorsport Museum

Highlands Motorsport is a brand new 4.5 km international-standard race circuit located near the township of Cromwell, approximately 50km north of the tourism capital of New Zealand – Queenstown. The circuit features three complete tracks that can be used at the same time.

Highland Motorsport Park is also home to the National Motorsport Museum including a Café and Gift Shop. The museum looks out over the racetrack but also has panoramic views of the surrounding snow-capped hills.

The Challenge

The climate of the Cromwell basin is dry and marked by hot summers and cold winters. These continental characteristics are caused by the presence of high mountain barriers to the west, creating the need for effective heating and cooling.

The architecturally designed museum has exposed rafters and no suspended ceiling automatically ruling out any DX fan coil units. Due to the solid polished concrete floors it was decided that underfloor heating would be the most effective heating solution for the museum creating a warm radiant feel, especially for those car enthusiasts who just need to lie on the floor and look underneath all the classic and modern race cars on display.

The Solution

BDT supplied 5 x PWFY-P200VM-E1-AU water modules connected to a single City Multi Y series condenser. Due to the cold outdoor design conditions of minus 5 degrees, this system re-rated to a total of 93kW. A purpose built plant room was constructed at the far end of the building to house the condenser set from view, but also to stack the water modules on the wall, piped in parallel to supply tempered water to multiple manifolds around the building.

One Mitsubishi Electric PAR-W21 wall controller sets the leaving water temperature of the entire system, and a room thermostat provides a start or stop signal. In extreme summer conditions, the PWFY-P200VM-E1-AU water modules have the ability to run in cooling if required.



Hilton Hotel Kawarau Falls

Queenstown's high influx of tourists every year creates high demand for 4-5 star luxury accommodation. Over the past 3 years, BDT has been involved in the design, construction, and commissioning aspects of Kawarau Falls Station Reserve, BDT's second largest VRF project in New Zealand.

The Challenge

Queenstown's high influx of tourists every year creates high demand for 4-5 star luxury accommodation. Over the past 3 years, BDT has been involved in the design, construction, and commissioning aspects of Kawarau Falls Station Reserve, BDT's second largest VRF project in New Zealand.

The Solution

The Reserve North building was BDT's very first water sourced condenser order of just over 2.1MW. This building was originally specified with another brand's water sourced condensers, but the Mitsubishi Electric alternative proved to offer better low temperature performance, resulting in BDT securing the order. We believe that Reserve North is the largest water sourced job in the Southern Hemisphere. All of the systems have been commissioned by BDT in-house engineers to ensure the project is successfully set up right from the start. The hotel is finished to a very high standard and is rated as a 5 star hotel.

The second building on this site, Kingston West, is home to 96 MSZ-GE35VA High Wall Heat Pumps and achieves a 4 star hotel rating. To date, Mitsubishi Electric is the only air conditioning brand installed in Kawarau Falls Station reserve, supplying just over 2.5MW worth of equipment.



TOTAL CAPACITY

Heating Capacity: 2142 kW

Cooling Capacity: 1904 kW

OUTDOOR UNITS

34 x PQRY-P500YGM-A Water Sourced Condensing Units

INDOOR UNITS

56x PEFY-VMH-E Ducted Units

173 x PDFY-VM-E Ducted Units

34 x PEFY-VMH-E-F Ducted Units

59 x PLFY-VCM-E Four Way Cassettes

25 x PLFY-P40VCM-E

25 x PKFY-VBM-E Hi Wall Units

WALL CONTROLLERS

260 x PAR-20MAA-G

7 x PAC-SE41TS-E

CENTRAL CONTROLLERS

8 x G-50A-J

8 x PAC-SC50KUA-F

1 x BACnet BMS Interface Computer

KINGSTON WEST

96 x GE15

CONTRACTORS





TOTAL CAPACITY

Heating Capacity: 220.5 kW

Cooling Capacity: 196 kW

OUTDOOR UNITS

7 x PURY-P250YHM-A R2 Series Heat Recovery Units

INDOOR UNITS

21 x PCFY-P63VKM-E Under Ceiling Units

4 x PKFY-VBM-E Hi Wall Units

1 x PLFY-VCM-E 4 Way Cassette

7 x PLFY-VBM-E 4 Way Cassette

VENTILATION

22 x LGH-RX4-E Lossnay Heat Recovery Ventilators

WALL CONTROLLERS

31 x PAC-YT51CRB

CENTRAL CONTROLLERS

1 x AG-150A-J Central Controller

2 x PAC-YG50ECA-J Expansion Modules

1 x PAC-YG66DCA-J DIDO Module

CONTRACTOR



Remarkables Primary School

This enviro-school is amongst the most technically advanced schools in New Zealand that fully integrates with the surrounding landscape. Set between Lake Wakatipu and The Remarkables, this primary school is situated on one of the most sought after spots in Queenstown.

The Challenge

While the setting of the site is spectacular, it is approximately half the size of a typical primary school site. However, the gross floor area of the school is 3030m² which includes 1820m² of classroom space. A large environment to heat, cool and ventilate, with different areas having different needs, control was also a major consideration.

The school is also located in close proximity to the Queenstown International Airport. With Ministry of Education requirements stipulating that acoustics of learning spaces must be under 35dBA it would require quiet equipment to ensure that the environment was kept at regulation sound as aircraft noise at boundary level is around 90dBA.

The Solution

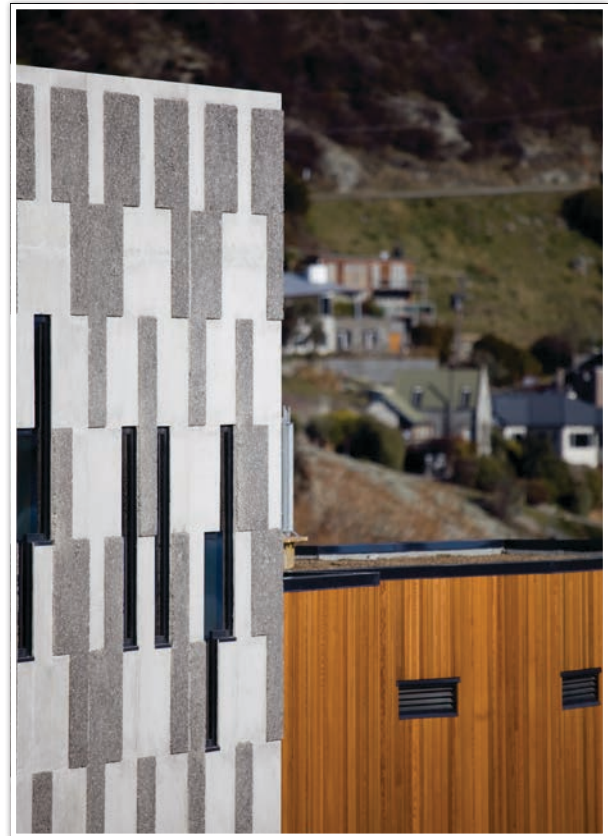
In order to service the needs of the whole building, 200kW of Mitsubishi Electric R2 simultaneous heating and cooling has been installed. Lossnay fresh air ventilators provide fresh air to each of the classrooms and the administration block. In order to address the noise, Lossnay units were fitted with noise attenuators, and the main indoors units are PCFY under ceiling units, and PLFY cassettes.

The school also has an AG150A with two expansion controllers, controlling all of the air conditioning and Lossnay systems. A DIDO module has also been installed to allow the AG150A to time schedule the toilet extract fans. The AG150A has a floor plan loaded in for each of the classrooms and administration block to create a small BMS.

There is also a small pre-school located on this site which is independent of the school, but still fitted out with Mitsubishi Electric split systems.



Photos kindly provided by Babbage Consultants





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