



CITYMULTI VRF heat recovery technology providing simultaneous heating and cooling integrated into Building Management and Control System with energy monitoring and management.



Project Info

Project Name	Location
Mark Moran Vaucluse	Vaucluse, NSW

The Team

Client	HVAC Contractor
Mark Moran Group	Statewide Mechanical Services

The Challenge

The vision of Mark Moran Vaucluse was to create a wellness and lifestyle precinct, to celebrate elders, and connect them to the community, with a priority on mind, body and spirit.

As different parts of the site would be exposed to full sun and shade at the same time, an air conditioning system that provided simultaneous heating and cooling would be required.

Units and commercial areas which are leased require power logging and individual billing.

The Centre has a complex design with many different systems and a robust Building Monitoring and Control System would be needed. For ongoing power management, energy monitoring and reporting is required.

All of the systems would need to align with the vision of creating a comfortable environment in which residents can live, relax and connect with the community.

The Solution

Heating, cooling and ventilation

Mitsubishi Electric commercial air conditioning contractor Statewide Mechanical Services designed a system that delivered air conditioning to the whole site including 91 aged care units, 14 rehabilitation units and 82 independent living units, retail, commercial,

entertainment, community facilities and common areas such as the four storey Grand Atrium.

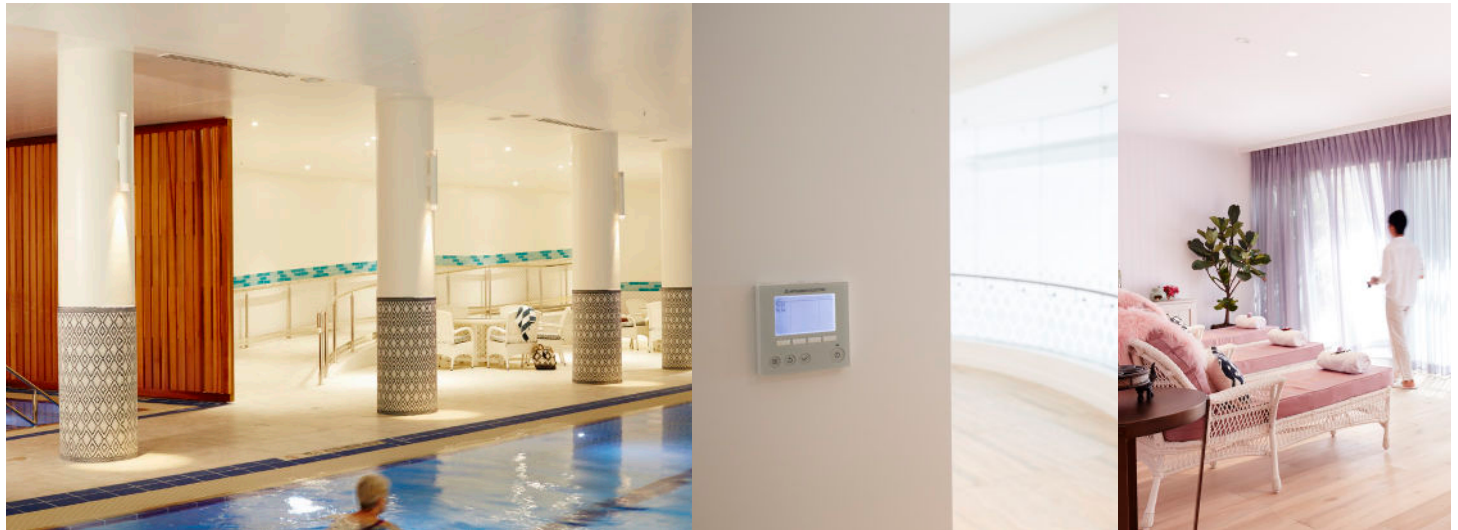
Mitsubishi Electric CITY MULTI R2 heat recovery variable refrigerant flow (VRF) was selected to provide air conditioning throughout the site. Throughout the day different areas are exposed to full sun and shade at the same time. CITY MULTI 2-pipe heat recovery VRF provides simultaneous heating and cooling. The 2-pipe system reduces the amount of copper pipe required compared to a 3-pipe system, and therefore is cheaper to install, particularly over a large site.

Building Monitoring and Control System (BMCS)

Mitsubishi Electric Australia designed a Building Monitoring and Control System (BMCS) which integrated the TG-2000A and Mitsubishi Electric's own BMCS.

The TG-2000A centralised PC-based graphical software package allows staff to monitor and control the temperature for individual clients. The TG-2000A also provides complete energy consumption data which can be printed off on a monthly basis and used for billing tenants. Other energy consumption such as lighting can also be monitored and included in the bill.

BACnet interface BAC-HD150-E provides integration of Mitsubishi Electric equipment with the BMCS. The BMCS uses the Diamond Control DC-600E (JACE), direct digital controllers, and the Mitsubishi Electric FX Series PLC.



The BMCS provides monitoring and control of ventilation, temperature, energy, critical power systems, hydraulic systems such as pumps, gas guard and metering, fire alarms and monitoring of the lifts.

The BMCS provides monitoring and control of ventilation for the atrium, pool and car parks. Mitsubishi Electric FR-A800 variable frequency drives handle all of the ventilation requirements such as outside air supply, exhaust air and relief air.

Temperature monitoring and control of the 40 x CITY MULTI R2 outdoor units, 314 x indoor units and 40 x branch controllers is handled by the BMCS.

AG-150A centralised controllers and PAR-32MAAE-J remote controllers provide easy access to individual control of room temperatures in both common areas and single rooms.

Ultimate in comfort

The owners didn't want users of the pool to feel cold when they get out of the water. So thanks to the BMCS, the temperature of the water and room air temperature and humidity are closely monitored and controlled in such a way that there is one degree Centigrade difference between the two. This creates the effect that it doesn't feel cold when you get out of the pool.

Typically most heating pool systems use modulating valves with a

fixed pump speed which results in higher energy consumption. On this site, the pool heating plant room also uses one of the inverter drives to modulating the heating water pump speed to ensure the right amount of hot water is used to maintain the pool temperature. Over time, energy consumption is reduced, compared to a non-inverter controlled system.

To create a "refreshing feeling" in the spa rooms, the BMCS maintains fine temperature and humidity control to deliver this effect.

Energy efficiency

The BMCS monitors internal building pressure and a positive pressure is maintained through the use of FR-A800 drives controlling the relief air fan in the Atrium. Positive internal building pressure helps to prevent unconditioned infiltration to the building. Hence, it eliminates the need of excess energy consumption to condition infiltrated air flow.

In addition, a slightly pressurised building also prevents dust and other small particles being blown into the building when the main entrance automatic door is open to ensure tenant comfort and less cleaning cost.

BMCS allows for fine control of ventilating, heating and cooling systems. The system is scheduled to tune the HVAC system seasonally to ensure the system achieve its optimum performance.

Vauluse Mark Moran Aged Care Facility

markmoran group
MITSUBISHI ELECTRIC
Outside Humidity: 6.0 %RH
24-Feb-16 11:22 AM EST

Floor Plan Mechanical Electrical Gas Schedules Alarms History Help Logoff

Occupancy Time Schedule

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
3:00 AM	Unoccupied	Unoccupied	Unoccupied	Unoccupied	Unoccupied	Unoccupied	Unoccupied
6:00 AM							
9:00 AM		Occupied	Occupied	Occupied	Occupied	Occupied	
12:00 PM							
3:00 PM							
6:00 PM							
9:00 PM							

Event Start: 11:21 AM
Event Finish: 11:21 AM
Event Output: null true

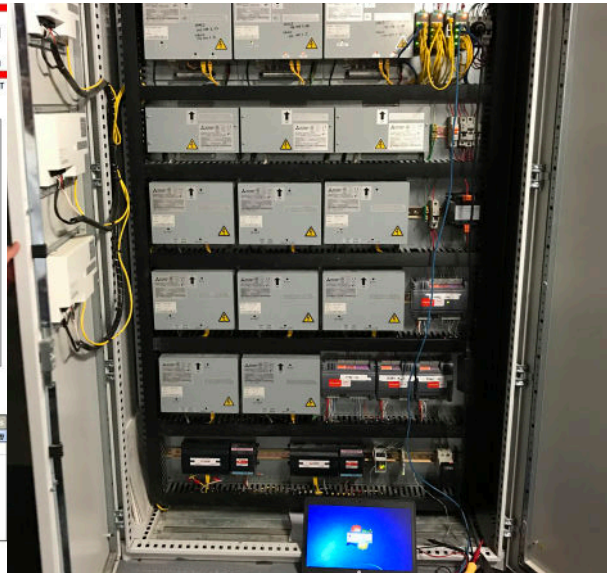
Weekly Schedule Special Events Properties Summary

Today: [Dropdown]

Open Alarm Sources

TimeStamp	Source State	Ack State	Source	Alarm Class	Priority	Message Text
24-Feb-06 11:22:02 AM EST	Normal	0 Aided / 32 Unacked	Temp	Default Alarm Class	255	

Acknowledge Hyperlink Notes Silence Filter Review Values



Energy monitoring

To manage energy usage, energy meters track power consumption and this data is logged into the TG-2000A.

BMCS is used as a measuring tool to track energy efficiency benchmark such as NABERS, and Green Star or Calculating Cool to compare the building to other efficient buildings and identify areas for improvements.

An Energy Consumption Report is produced from the system and provides an overview to the owners how power is consumed on a daily basis for the previous month and on a monthly basis for the last 12 months.

Accurate energy reporting is the first step to a proactive approach to ongoing energy management.



UNIT INFORMATION



Outdoor Units

PURY-P800YSLM-A-BS x 1
 PURY-P700YSLM-A-BS x 1
 PURY-P550YSLM-A-BS x 6
 PURY-P500YSLM-A-BS x 5
 PURY-P450YSLM-A-BS x 7
 PURY-P400YSLM-A-BS x 2
 PURY-P400YLM-A-BS x 2
 PURY-P350YLM-A-BS x 14
 PURY-P300YLM-A-BS x 9
 PURY-P250YLM-A-BS x 25
 PURY-P200YLM-A-BS x 16

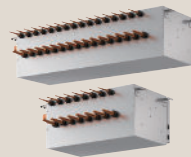


Indoor Units

PLFY-P125VLM-D-E x 3
 PLFY-P125VBM-E x 7
 PKFY-P63VKM-E x 1
 PKFY-P50VHM-ER1 x 1
 PKFY-P50VHM-E x 1
 PKFY-P25VBM-E x 1
 PEFY-P80VMA-E x 29
 PEFY-P71VMA-E x 15
 PEFY-P63VMA-E x 56
 PEFY-P50VMS1-E x 1
 PEFY-P50VMA-E x 23



PEFY-P40VMS1-E x 28
 PEFY-P40VMA-E x 15
 PEFY-P32VMS1-E x 62
 PEFY-P32VMA-E x 3
 PEFY-P25VMA-E x 7
 PEFY-P20VMA-E x 8
 PEFY-P200VMH-E x 3
 PEFY-P140VMH-E x 1
 PEFY-P140VMA-E x 11
 PEFY-P125VMA-E x 12
 PEFY-P100VMA-E x 25



BNC

CMY-R200VBK2 x 2
 CMY-R160-J1 x 62
 CMY-R100VBK-A x 14
 CMY-R100VBK2 x 6
 CMB-P108V-GA1 x 3
 CMB-P108V-G1 x 3
 CMB-P106V-G1 x 8
 JCMB-P105V-G1 x 5
 CMB-P1016V-HA1 x 2
 CMB-P1013V-GA1 x 3
 CMB-P1013V-G1 x 5
 CMB-P1010V-GA1 x 14
 CMB-P1010V-G1 x 1



Controllers

TG-2000A x 2
 AG-150A-J x 3
 PAR-31MAAE-J x 313
 PAC-YG60MCA-J x 4
 PAC-YG50ECA-J x 8
 PAC-YG10 x 8
 PAC-SC51KUA-J x 3



BMS

BAC-HD150-E x 3
 DC-600E x 6
 FX5U-32MR-ES x 1
 FX3S-10MR-ES x 4
 FX3S-14MR-ES x 4
 FX3S-20MR-ES x 2
 ME96SSH-MB x 7
 FR-A846 x 36