



First indoor aquatic centre in Australia to achieve a Six-Star Green Star Design score and the first to go all-electric for pool heating.



Project Info

Client

Brimbank City Council

Location

Keilor Downs, Vic

The Challenge

Brimbank City Council, Melbourne's second largest municipality, located in the Western Region about 20 km from the central business district, planned for the development of the St Albans Leisure Centre at Keilor Downs.

This development aimed to deliver a world-class inter-generational aquatic, health and well-being hub for the community, with a minimum 5 Star Greenstar accredited building and aspirations for 6 Star if possible.

The original design called for air conditioning for dry area small spaces with independent on/off and full temperature control via zoning and heat recovery.

Large, heavily populated rooms with high heat were to be treated using air conditioning fan coil units with heating and cooling provided by a central heating and cooling plant comprised of chillers and boilers.

The original design also called for heating only to be provided to aquatic spaces and associated wet-area change rooms. The heating plant for all systems was proposed to be gas-fired boilers.

The Solution

To achieve a '6 Star Green Star' rating for the Brimbank Aquatic and Wellness project, a Mitsubishi Electric ERACS2-Q-G05-CA-1962 four-pipe heat pump system was used. This system provides simultaneous heating and cooling, including water-to-water heat recovery to provide whole-of-facility heating for all spaces including pools and showers.

BRT Consulting Engineers provided the calculations which showed the potential energy savings achievable by switching to this four-pipe heat pump system. During summer, the Mitsubishi Electric ERACS2 system provides cooling with free heating via heat recovery.

The Team

HVAC Consultant

BRT Consulting Engineers

HVAC Contractor

P & R Air-conditioning Services

The system provides hot and cold water for controlling pool water temperatures and humidity.

Mitsubishi Electric E-Series modular chillers operate when there is no free heating from heat recovery and to top-up pool water temperatures. The E-Series are inverter driven which makes them efficient on part load, ideal for seasonal changes.

Hot water for showers is delivered via Mitsubishi Electric AW-HT-CA-E-0404 high temperature air to water heat pumps, which are capable of delivering very high water temperatures.

City Multi VRF heat recovery units were used for the dry area spaces taking advantage of the simultaneous heating and cooling.

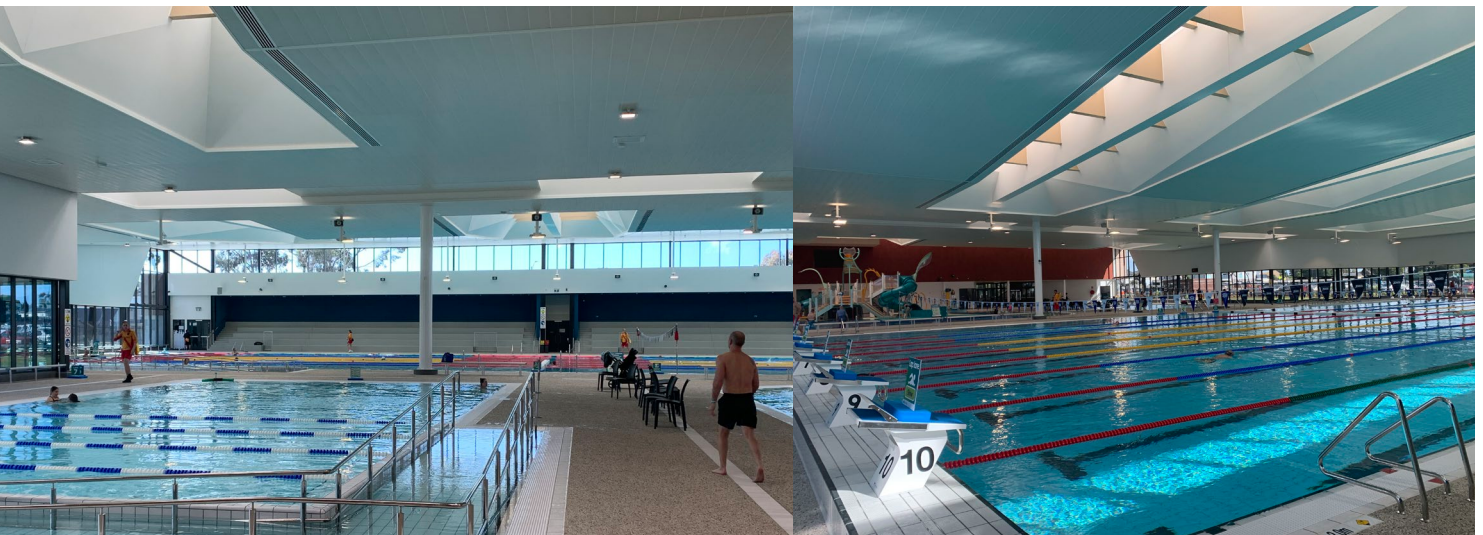
To meet certain certifications, the lower GWP R513A refrigerant was used over R-134A in the ERACS2 system, while the E-Series uses R32 refrigerant.

E-Series & City Multi VRF units connect to the same AE-200 controller, reducing the number of wall controllers needed. Both systems use MNet connections and the same communication protocols.

The Centre will be designed to achieve a '6 Star Green Star' rating. The efficient building shell and high efficiency energy system is expected to deliver an energy reduction of more than 80 per cent compared to other traditional aquatic centres.

The Outcome

The Centre was recognised for its "world-leading" sustainable design by the Green Building Council of Australia with its highest rating, a Six-Star Green Star Design score, making it the first indoor aquatic centre in Australia to achieve this rating. The centre is also the first all-electric aquatic centre in Australia, cutting energy use by up to 65% compared to traditional aquatic centres.



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ERACS2 System & E-Series units providing hot water supply.

Mitsubishi Electric E-Series inverter driven modular chillers operate when there is no free heating from heat recovery and top-up pool water temperatures.

ERACS2-Q-G05-CA-1962 four-pipe heat pump system

UNIT INFORMATION



Hot Water System

ERACS2-Q-G05 x 1
AW-HT-CA-E-0404 x 1
EAHV-M1500YCL x 2
EAHV-M1800YCL x 3
AE-200E x 1



Comfort System

BACNET gateway x 1
AE-200E x 1
PURY-P200YNW-A1 x 2
PURY-P250YNW-A1 x 2
PUZ-ZM71VHA-AR1 x 1



SUZ-M35VAD-A.TH x 2
SUZ-M50VAD-A.TH x 2
PKFY-P63VKM-ER1 x 1
PLA-M71EA-A.TH x 1
PLFY-P25VFM-E1.TH x 16



PLFY-P32VFM-E1.TH x 9
PLFY-P50VFM-E1.TH x 4
PLFY-P80VEM-A.TH x 1
SLZ-M35FA-A.TH x 2
SLZ-M50FA-A.TH x 2