



Mitsubishi Electric E-series modular chiller provides a compact and quiet replacement for the Mildura Arts Centre.



Project Info

End User

Mildura Rural City Council

Location

Mildura, Vic

The Challenge

The Mildura Arts Centre is a cultural hub in regional northwest Victoria. It is home to the Rio Vista Historic House, a gallery with five exhibition spaces, a café bar, and a 500-seat theatre featuring a forestage lift and modern production capabilities.

The Centre's ageing chilled water system was at the end of its service lifespan and required replacement. The project had an existing electrical power provision of 360 amps available for the chiller plant, which would not be upgraded, limiting replacement options.

The plant is located in Mildura, Victoria, and requires considerably wide external ambient design considerations, ranging from 45°C DB in summer and down to 0.5°C DB / 0.5°WB in winter. Traditional chillers operating envelop cover up to 46°C DB.

The existing plant area where the old chiller is positioned is very small, and the building was to remain unchanged. If possible, existing piping and indoor hydronic units should be reused.

Other project constraints included a noise level requirement of NR55 and the Centre's plan to continue operating throughout the upgrade, requiring air conditioners to be maintained in the Gallery at all times.

The replacement chiller would require a High Level Interface (HLI) BACNET connection to the Centre's existing Building Management System (BMS).

The Team

HVAC Consultant

Playford Consulting

HVAC Contractor

Devilee's Air Conditioning & Refrigeration

The Solution

Mitsubishi Electric E-series modular chillers were selected for their small footprint and to provide independent redundancy, critical to maintaining the Arts Centre's classification and ability to hold high value exhibitions.

Inverter technology (inverter compressors and fans) provided a solution to the limitations of the existing power supply allocation, switchboards, electrical cables, and safety switches. This inverter technology guarantees high efficiencies in full load and part load and an impressively low 8-9% minimum capacity turn down per module, which ensures stable operation even at low load conditions.

Three EACV-M1500YCL 150 kW modular chillers upgraded the cooling capacity of this project from 325 kW to 450 kW. A Mitsubishi Electric AE-200E Central Controller with a BACnet pin was supplied for HLI connection to the BMS.

The Centre's existing hydronic indoor units and plumbing were integrated with the replacement chiller units to provide cooling/air conditioning, and humidity control.

E-series modular chillers can be used in a wide range of operating conditions, up to 52°C ambient in cooling and the system could operate at -15°C in winter. This provides confidence to both the consultant and the End Client in the selection and specification of the E-series chillers for this regional project.

The modular design of the E-series chillers provides a very compact footprint and requires smaller installation and maintenance spaces. This further resolves the issue of limited plant area space for this project.



Mitsubishi Electric EACV-M1500YCL E-series Modular Chillers in place for the Mildura Arts Centre chilled water plant replacement project.

The operation of the E-series units is quiet, with only 65 dB(A) sound pressure level measured at 1 m from the unit (service space).

Visitor disruptions to the gallery were eliminated thanks to the proactive measures taken by the HVAC Contractor Devilee's Air Conditioning & Refrigeration. They provided a temporary chilled water supply throughout the construction program to provide uninterrupted air conditioning for the Centre.

The Outcome

The EACV-M1500YCL E-series Modular Chillers are a stock item, allowing the HVAC contractor to provide a short lead time for the client.

Peter Playford, the consultant for Playford Consulting, said, "The 52°C outdoor unit ambient operating temperature on the air conditioning plant provides our client and us with confidence in the selection and specification of premium quality and efficient air conditioning plant."

The Consultant also recognised the support provided by the Mitsubishi Electric chiller team by saying, "Thank you for providing outstanding service during the Design and early Procurement Stages of this Project."

Devilee's Air Conditioning & Refrigeration worked closely with the Client and HVAC Consultant to ensure the chillers were installed to a high standard. The handover of the upgraded system to the Mildura Arts Centre went smoothly.



UNIT INFORMATION



Outdoor Units
EACV-M1500YCL x 3



Control
AE-200E x 1
BACNET gateway x 1