



65% Energy saving using Climate Wizard

Palace Nova Cinema

Project Address

3 Cinema Place, Adelaide SA 5000

Consultant

Bob Ellis, General Manager, Meinhardt

Mechanical Contractor

Climat Commercial Pty Ltd

Equipment

2x Climate Wizard CW-H15 units.
Multiple split ducted air conditioning units.
Schneider controls by D-Stall Electrical

A major redevelopment of Adelaide's Palace Nova cinema complex included renovating four large cinemas into eight new smaller cinemas. In turn, the air conditioning plant servicing the cinemas needed to be reduced in size and Climate Wizard was an integral part of achieving this.

Project Requirements

The design brief set the following requirements:

- Comfortable temperature and individual temperature controls
- Provide outside air to AS1668.2
- Low capital cost and reduced running costs
- Meet EPA noise requirements
- Noise level and impact of services noise level on the adjacent apartment buildings

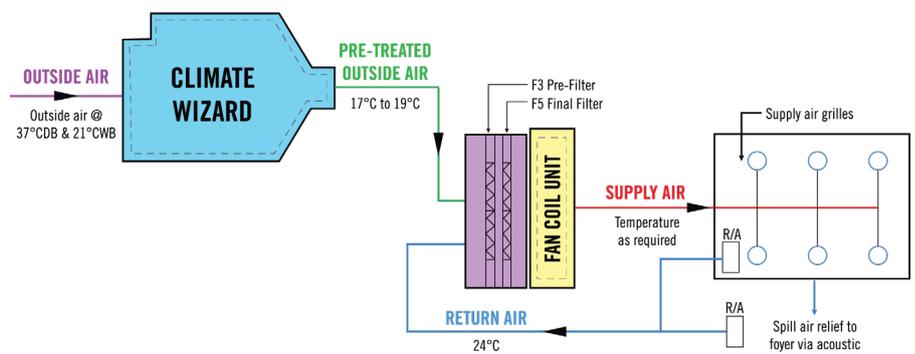
System Design

With these key factors in mind, the project design focused on the use of two Climate Wizard CW-H15 units to pre-cool outside air. The units were used in conjunction with split ducted units, BMS control and the use of theatre air to pre-cool the foyer area.

As the cinema complex is adjacent to a residential apartment building, internal and external noise levels were critical to the project. The large cinemas required 42kW air conditioning units which were too large for the confined plant room and too noisy to use in a residential setting. By utilising Climate Wizard as a pre-cooler, the air conditioning unit could be reduced to 30kW which could meet the spatial and noise constraints. There were also limitations with the existing mechanical services switchboard that only provided 250 Amps, known to trip on peak demand days.

A new building management system (BMS) was installed. Located in the plantroom and connected to the cinema office computer where weekly programming can be done by the Cinema Manager. The BMS controls room temperature, CO₂ levels in the cinemas, logs outside air temperatures and the air off temperatures for all air conditioning units and pre-coolers.

Climate Wizard Air Schematic



Air schematic for Climate Wizard providing pre-cooling to a fan coil unit in the Palace Nova - Rundle Street cinema complex.

As designed by Meinhardt, Adelaide.

The Savings

The design delivered energy savings without any additional capital cost to the project. Additional costs incurred from Climate Wizard, rooftop support platform and BMS controls were outweighed by the savings from a reduction in size of the refrigerated air conditioning plant and associated energy savings.

The smaller refrigerated units also meant they could be fitted into the new plantroom along with smaller duct sizes. Reducing internal and external noise also lead to a reduction in the size of acoustic barriers for the rooftop plant.

Further energy efficiencies were achieved through the selection of split-ducted air conditioning units serving the cinemas.

Within a few weeks of project completion, the system's performance had exceeded all expectations.



“Before starting the project the system was drawing 250 Amps, it is now operating on 84 Amps. The end result of the air conditioning redesign had an overall positive effect on the cinema while also reducing noise and providing substantial energy savings.”

Bob Ellis,
General Manager - Meinhardt

The Results

Redevelopment of Palace Nova's two Adelaide cinemas, Prospect and Rundle Street, were only months apart. Both cinemas are very similar in floor area, number of theatres and number of patrons per month.

The Prospect cinema incorporated air to air heat exchangers in lieu of a Climate Wizard for pre-treatment of outside air.

At the conclusion of summer, the power bill between the two sites showed a significant difference. By installing Climate Wizard as a pre-cooling solution, the Rundle Street cinema is now reaping the rewards of substantial energy savings.

	PROSPECT CINEMA (HEAT RECOVERY UNIT)	RUNDLE ST CINEMA (CLIMATE WIZARD)
No. of Theatres	14	11
Total Seats	678	738
Patrons per month	24,790	25,470
Floor Area (m ²)	2,000	1,600
Capital Cost	\$680,000	\$520,000
Capital Cost per m ²	\$340	\$325
Dec. Power Bill	\$12,656	\$5,589
Jan. Power Bill	\$15,658	\$10,723

Comparison of two Palace Nova cinemas that were redeveloped at a similar time.

Palace Nova final outcome

- Reduced maximum demand from 250AMPS to 84AMPS
- Reduced power consumption
- Lower carbon emissions from the reduced air conditioning plant
- A greener footprint

As a result, Palace Nova was able to install efficient outside air pre-cooling at net neutral capital cost, while meeting all of their project requirements

Performance

The table below outlines the cooling performance of Climate Wizard in various climate applications.

CLIMATE WIZARD CW- H15						
City	Design Condition	Leaving air temp (Deg °C)	Stand alone cooling performance (kW)	Stand alone cooling COP	Pre-cooling performance (kW)	Pre-cooling COP
Extreme	42.4 °C DB / 20.7 °C WB	18.4	12.3	6.8	32.7	18.2
Temperate	37.2 °C DB / 19.2 °C WB	17.4	13.6	7.6	27.0	15.0
Sub-Tropical	31.0 °C DB / 22.5 °C WB	21.7	7.6	4.2	12.5	6.9
Tropical	33.2 °C DB / 26.4 °C WB	25.7	2.2	1.2	9.8	5.5



For more information, please call 1300 475 091
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We provide full technical support to ensure optimal design for each application.

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