



## Climate Wizard reference book



VENITA RHEA'S RESTAURANT (CW-H15)  
CALIFORNIA, USA



# About Climate Wizard

Climate Wizard is an air conditioner that uses an indirect evaporative heat transfer core that provides hyper-efficient cooling of outside air. It delivers 100% fresh, cool, outside air, with greatly reduced energy consumption. Climate Wizard is a proven technology that has been adopted across the world.

## Climate Wizard's hyper-efficient benefits

- **Improved IAQ (indoor air quality) with 100% outside air**

In stand alone applications, 100% outside air means better indoor air quality and reduced incidence of "sick building" syndrome. The Climate Wizard cooling system will far exceed the regulatory standards for outside air ventilation rates, as Climate Wizard can supply 100% fresh outside air all the time.

- **Reduced running costs**

Climate Wizard can use up to 80% less energy than an equivalent refrigerated system performing the same duty, thanks to the unique indirect evaporative heat exchange core technology.

- **No moisture added**

Climate Wizard does not add any moisture to the supply air and can cool the supply air to several degrees below the ambient wet bulb temperature, which means it can be used in a very wide range of geographic locations.

\*Climate Wizard Supercool (indirect/direct option) adds a small amount of moisture to the supply air.

- **Total cooling performance increases when air temperature rises**

With Climate Wizard, total cooling performance increases as temperatures increase. This does not happen with refrigerated air conditioning, which shows reduced cooling capacity as temperatures rise.

- **Reduce the energy use and improve the cooling performance of existing refrigerated systems**

Climate Wizard can be used on its own or in combination with refrigerated systems to dramatically reduce energy usage by pre-cooling outside air. Used with refrigerated systems, it can also extend the life of the air conditioning equipment.

- **Reduced electrical kW demand**

When summer cooling loads increase, the electrical demand from refrigerated cooling systems also increase; leading to higher electrical demand charges.

In contrast, a Climate Wizard's electrical demand remains steady even in hot weather, helping you control your electrical demand charges.

- **Ideal for use as a DOAS (dedicated outdoor air system), data centre cooling, or for comfort cooling applications**

Climate Wizard cools the air to conditions suitable for data centres, including class A1 data centres, at ultra-low PUE's (power usage efficiency).

- **Flexible design and engineering configurations**

Climate Wizard is easy to retrofit into existing buildings with refrigerated air conditioning plants, as well as brand new projects in a variety of configurations.

- **Savings on the installation costs**

In some countries, the cost of installing a Climate Wizard on a new building can be up to 30% cheaper compared to installing VRF (variable refrigerant flow) equipment.

- **Wiser use of water (R-718)**

Climate Wizard is the best technology available to take full advantage of environmentally friendly R-718. It produces high quality cooling at high electrical efficiencies.

- **No synthetic refrigerants or chemicals to harm the environment**

Climate Wizard does not require any additives to maintain cooling performance. Also, it uses water sparingly, so it does not require large amounts of water to operate.

- **Simple, reliable solution to improve COP / EER (coefficient of performance / energy efficiency ratio) and to meet various regulatory requirements**

Whether it's airflow, pressure, cooling capacity, or efficiency, Climate Wizard tops them all. At Seeley International, Australia's largest manufacturer of cooling and heating solutions, and the leader in developing energy-efficient cooling technologies, we rigorously test all of our energy efficient products, to ensure they surpass all relevant standards.

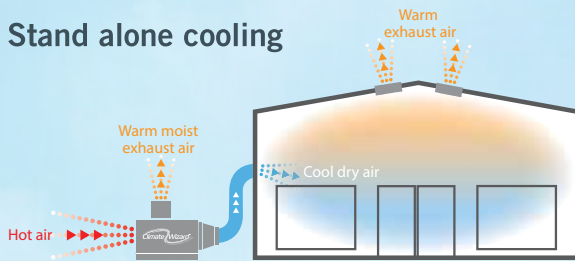
- **NATA (National Association of Testing Authorities) accredited laboratory**

Seeley International is Australia's only air conditioning and heating manufacturer with a NATA accredited test laboratory. NATA provides assessment, accreditation and training services to laboratories and technical facilities throughout Australia and internationally.



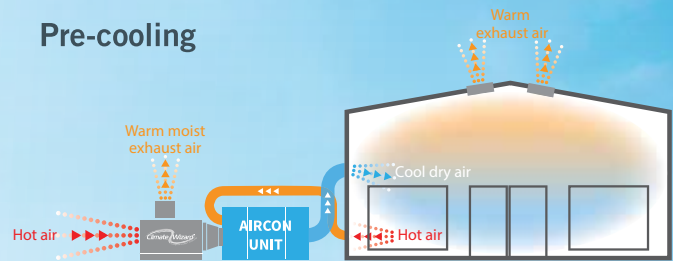
# Climate Wizard can be used in diverse configurations and a range of applications:

## Stand alone cooling



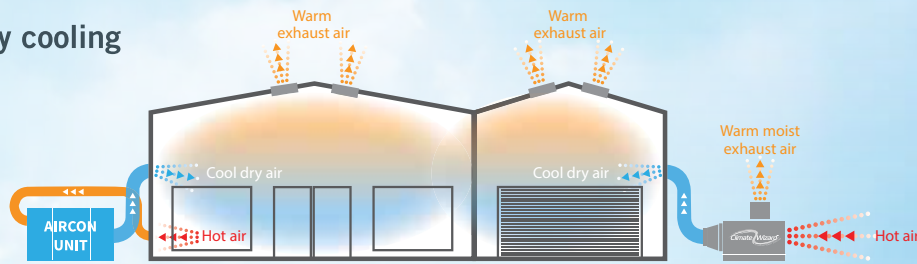
Climate Wizard used to provide stand alone cooling.

## Pre-cooling



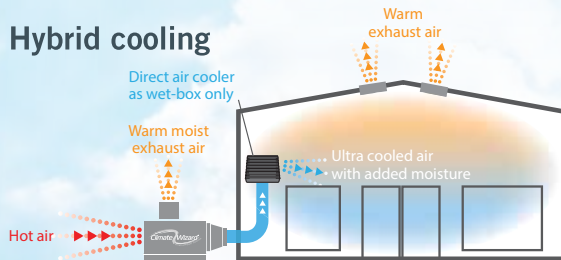
Climate Wizard installed in front of an air conditioning system to provide pre-cooling.

## Supplementary cooling



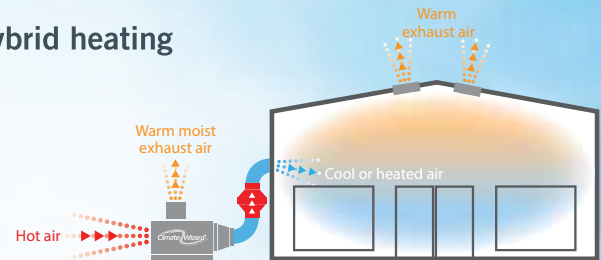
Climate Wizard used with an air cooling system to provide supplementary cooling.

## Hybrid cooling

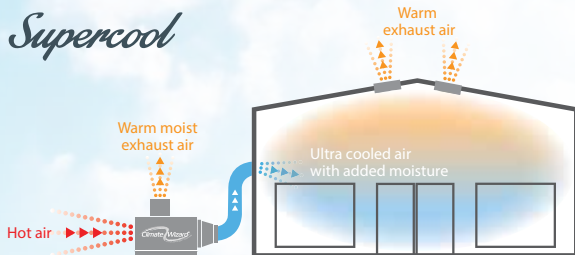


Climate Wizard is combined with other complimentary devices, such as direct evaporative 'wet-boxes' or heating devices; such as elements, hot water coils, gas-fired exchangers to successfully resolve a variety of heat load and comfort challenges.

## Hybrid heating

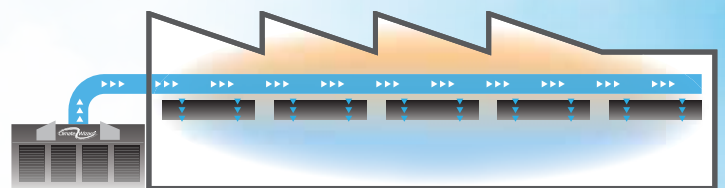


## Supercool



Climate Wizard Supercool delivers ultra cooled air with added moisture, that can be fine-tuned to specifications.

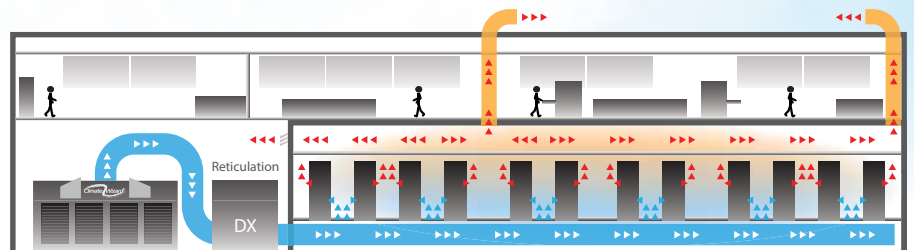
## High capacity with high volume module



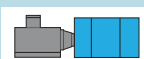
High capacity Climate Wizard with HVM (high volume module) used to provide stand alone cooling or be interconnected into a common air handling system.

## Customised to mechanical specifications

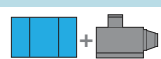
Climate Wizard HVM can be designed to integrate with other air conditioning equipment supplied by other contractors.



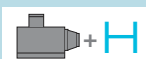
STAND ALONE



PRE-COOLING



SUPPLEMENTARY



HYBRID



CUSTOM DESIGN

# COMMERCIAL / INDUSTRIAL



## HOME FOR PROFESSIONAL PEOPLE

Nuriootpa, Barossa Valley, South Australia, Australia

### Challenge

To provide quality cooling for a weekend holiday home, delivering comfortable conditions, reflecting the ambience and environmental standards of the Barossa Valley, as well as cooling open plan living spaces.

### Solution: Climate Wizard stand alone cooling

The very nature of open planning and outdoor access meant that Climate Wizard was a 'natural' fit to the application. The cool air was introduced through a short fabricated duct with supply air diffusers at a high level and with directional guide vanes so that the cooling influence reached all corners of the room. The low running cost, cool dry air and quiet efficiency of the fans mean that the architect and family have the best conditions imaginable for their retreat.



## AUSTRALIAN SUBMARINE CORPORATION PTY LTD

Adelaide, South Australia, Australia

### Challenge

To provide cool fresh air into confined spaces when construction work is being carried out.

### Solution: Climate Wizard stand alone cooling

The nature of ship construction is such that a portable cooling system was required to bring fresh outside air to the work spaces, where welding was often being carried out. Climate Wizard presented the obvious answer with cool 100% outside air. The supply plenum was specially adapted to allow the fitting of flexible supply ducts that were then introduced as and when necessary.



## BADGE CONSTRUCTIONS

Adelaide, South Australia, Australia

### Challenge

To provide and to pre-cool all the outside air requirements of a new office complex built for Badge Constructions in metropolitan Adelaide, South Australia, Australia.

### Solution: Climate Wizard pre-cooling

Climate Wizard was installed in conjunction with a high efficiency, natural gas powered refrigerated air conditioning system, as the client needed heating as well as cooling to cope with the extremes of winter and summer. A high proportion of outside air was utilised to make full use of the very efficient cooling provided by Climate Wizard in the long hot summers of Adelaide. Typically under these circumstances, Climate Wizard operates at a Coefficient of Performance (COP) in excess of 15 (EER of 51.15), making it a super cost effective way of cooling the outside air required by the refrigerated system.



## SA WATER BOLIVAR PUMP STATION

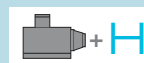
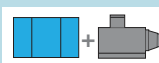
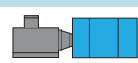
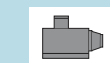
Adelaide, South Australia, Australia

### Challenge

To limit the internal temperature of the building that houses multiple pumps for the city waste water reticulation system.

### Solution: Climate Wizard stand alone cooling

The pump station was originally constructed without any traditional air conditioning, however, with increased load and upgraded systems, cooling became a necessity to permit the pumps to run efficiently. Multiple Climate Wizard air conditioners were manifolded together and the air then directed via fabricated ducts to the pump room several floors below. Climate Wizard was chosen for its high efficiency in the hot dry climate of South Australia and its very low operating cost, as the facility operates all day, every day.







### COMMERCIAL OFFICES

67 Greenhill Rd, Adelaide SA, Australia

#### Challenge

To reduce the load on the existing chilled water plant, which prior to the installation was at capacity. To deliver better conditions to the tenanted spaces of the building and to reduce greenhouse gas emissions, through the introduction of an increased quantity of outdoor air treated by the Climate Wizard.

#### Solution: Climate Wizard supplementary cooling

The upgrade works retained the existing air handling units and chilled water infrastructure, thereby reducing retrofit costs of the installation. Since the upgrade, operational efficiency of the air conditioning plant was increased. The project achieved greater than the targeted energy savings, by reducing annual energy usage by 22% and gas usage by 46% compared to figures prior to the upgrade. An estimated 21 kg CO<sub>2</sub>-e/m<sup>2</sup> p.a. of greenhouse gas emissions have been saved through the upgrade works at the building. The installation enhances the quality and health of the environment for building occupants.



### ROXBYS DOWNS COUNCIL OFFICE

Roxby Downs, South Australia, Australia

#### Challenge

To increase the comfort level of the Council buildings and the cooling capacity of the air conditioning plant for the Council buildings.

#### Solution: Climate Wizard supplementary cooling

Roxby Downs is a city located in a very hot part of 'outback' Australia. In this project the existing HVAC installation for the Council buildings was under capacity and had inadequate outside air due to expansion of their activities, but the existing plant was still in good condition.

Installing six Climate Wizard model CW-H15 air conditioners increased the installed cooling capacity to easily cope with the load, even in 45 °C (113 °F) summer heat. The increased outside air component provided much needed additional ventilation and has dramatically improved comfort levels in the Council buildings.



### ROBINVALE MAIN PUMP STATION, CONTROL ROOM

Victorian Water Authority, Robinvale, Victoria, Australia

#### Challenge

To maintain cool dry conditions in the control room of the main pump station.

#### Solution: Climate Wizard stand alone cooling

Robinvale is situated in the mid-North of the state of Victoria, in Australia, where summer temperatures can often exceed 40 °C (104 °F). One Climate Wizard air conditioner maintains the control room temperature as required from its locally mounted wall control. Room humidity is quite low as the Climate Wizard does not add any moisture into the room.



### ACTION FORD DEALERSHIP

Johannesburg, South Africa

#### Challenge

To provide economical cooling to the offices of a new Ford dealership.

#### Solution: Climate Wizard stand alone cooling

The new Ford dealership, located in the prestigious suburbs of Johannesburg, South Africa, required high quality cooling for their staff and customers.

Three Climate Wizard air conditioners were installed and ducted to the main administration offices and executive suite. Particular attention was given to the need for adequate outside air within the offices due to the proximity of the service workshops.

# FACTORIES / MANUFACTURING FACILITIES



## KUROGANE KOSAKUSHO LTD

Kyoto, Japan

### Challenge

The earthquake and tsunami of March 2011, which resulted in the shutdown of most of Japan's nuclear powered electricity generating capacity, had the flow-on effect of creating pressure to reduce industry energy consumption, including that used for air conditioning.

### Solution: Climate Wizard supplementary cooling

Kurogane Kosakusho chose to install Climate Wizard to provide half their factory cooling requirements, allowing them to switch off half of the Packaged Air Conditioners (PACs) and make operational energy savings of around 37% over the summer period.



## WILSON TRANSFORMERS

Melbourne, Victoria, Australia

### Challenge

Wilson manufactures electrical transformers for the electrical power distribution industry and ensuring the quality of manufacture is a critical part of their reputation as a top supplier. They required an economical way to provide cooling comfort to their workforce and to pressurise the buildings, so that airborne dust and contaminants did not compromise quality.

### Solution: Climate Wizard hybrid cooling

Climate Wizard was chosen as it met the key requirements and did not add any additional moisture to the conditioned space. Twelve Climate Wizard model CW-H10 air conditioners were installed on the building and controlled through a Building Management System (BMS) that monitors the key areas of production. To meet the winter heating requirements, an in-line hot water heating coil was fitted in the supply duct. Climate Wizard's powerful supply fan easily copes with the additional duct loads, without losing any air supply volume, thus ensuring that the full design heating and cooling capacity is available at all times.



## TSUCHIYA MANUFACTURING

Jakarta, Indonesia

### Challenge

To provide quality economical ventilation and cooling for a plastic injection moulding facility in the tropical climate of Indonesia.

### Solution: Climate Wizard stand alone cooling

Twelve Climate Wizard model CW-H15 air conditioners were installed along one wall of the moulding facility with the cold air being discharged at operator height and directed across the work area.

On the opposite side of the facility, extraction systems were installed to promote the flow of air across the work area and then to outside. The installation achieved the objective of concentrated cooling in the work area without the need to treat the whole building.



## TRI TOOL INC.

California, USA

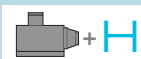
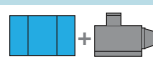
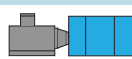
### Challenge

To provide cooling to a large machine shop where airborne fumes were generated as part of the machining process, prohibiting the use of recirculated air conditioning.

### Solution: Climate Wizard stand alone cooling

The high cooling load from solar and internally generated heat required a large cooling capacity. This was provided by installing a single Climate Wizard model CW-160 air conditioner that delivers 11,800 L/s (25,000 cfm) into the machine shop via ducts arranged internally, across one wall of the building. Exit paths for the warmed air were installed on the opposite side of the building, allowing the fresh cool air to purge away the contaminated air from the processes.

The CW-160 operates with a COP of around 8.0 (EER = 27.3) in summer.





# WAREHOUSES / FOOD PROCESSING PLANTS



## FAZION PASTA FACTORY

Verona, Italy

### Challenge

To provide localised cooling to employees in the work areas of a very hot, food production facility.

### Solution: Climate Wizard as localised stand alone cooling

The factory has many very large continuous baking ovens for pasta, operating 24 hours a day, and the heat load is very high within the building. Applying Climate Wizard as spot cooling to the area immediately around the common work areas provided pleasant conditions.



## MITOLO OLIVE OIL PROCESSING PLANT

The Riverland, South Australia, Australia

### Challenge

To maintain steady, cool, dry conditions during the extreme summer heat, while minimising the cost of energy.

### Solution: Climate Wizard stand alone cooling

Installation of four Climate Wizard 15 kW (4.2 ton) indirect evaporative air conditioners and strategic insulation of the north and west walls, provided a solution that met the client's needs to maintain the product space at around 23 °C (73 °F). The efficient operation of Climate Wizard meant that no upgrade of electricity supply was necessary.



## AIMIA FOODS

Haydock (Lancashire), UK

### Challenge

Aimia Foods needed an energy-efficient air conditioning solution that didn't add moisture, with the aim of minimising moisture content in its packaged goods.

### Solution: Climate Wizard stand alone cooling

The chosen approach saw Aimia Foods replacing its existing air conditioning system with Climate Wizard. The new Climate Wizard system supplies air at near refrigerated temperatures, but with no refrigerant gases and no compressors. This type of highly-specialised solution is critical to moisture sensitive areas, as well as delivering big reductions in energy use.



## FOOD PROCESSING PLANT

Mexicali, Mexico

### Challenge

The intense heat of Mexico in summer combined with a modern manufacturing facility that required a high proportion of outside air, provided a challenge to economically pre-cool large volumes of intake air prior to its introduction to existing air handling systems.

### Solution: Climate Wizard pre-cooling

Summer temperatures well above 40 °C (104 °F) meant that a large proportion of the existing air handling unit (AHU) capacity was employed in pre-cooling the outside air and not addressing the internal machine and solar heat load. The addition of a Climate Wizard model CW-160 air conditioner to pre-cool 11,800 L/s (25,000 cfm) at a very high coefficient of performance compared to the existing plant, very significantly reduced the operating energy costs. The addition also provided up to 320 kW (1,092 kbtu/hr) of extra sensible cooling capacity, should that be needed to meet future heat loads.

# WAREHOUSES / FOOD PROCESSING PLANTS (CONTINUED)



## BAROSSA BOTTLING SERVICES

Nuriootpa, South Australia, Australia

### Challenge

To cool the Barossa Bottling Services bottling hall and preparation areas, located in the heart of the Barossa Valley in South Australia, the area subjected to the summer heat that produces world class grapes and wine.

### Solution: Climate Wizard stand alone cooling

The facility operates for extended hours during the season, with equipment and necessary outside air transfer making working conditions extremely severe. Multiple Climate Wizard air conditioners were installed to cool the work areas and to bring in cool outside air without the extreme heat of the past.

# PUBLIC SERVICES



## BANNER ESTRELLA HOSPITAL

Phoenix, Arizona, USA

### Challenge

Banner Estrella Hospital is a busy medium sized hospital that provides 24 / 7 care for the community. Part of the facility includes extensive kitchens that provide meals for patients and staff. Large kitchens have large amounts of air exhausted from cooling appliances and make-up air is often drawn from areas that are cooled by refrigerated plant. The hospital wanted to improve the quality of air introduced to the kitchens but to limit the operating costs of any new equipment required.

### Solution: Climate Wizard pre-cooling

Two Climate Wizard model CW-H15 air conditioners were installed to pre-cool the air that was introduced into the existing air conditioning system. By using Climate Wizard in this way the total cooling capacity was substantially increased at a very modest operating cost while improving the air quality in the building.

# PUBLIC SERVICES



## CHANDLER FIRE STATION

Phoenix, Arizona, USA

### Challenge

Fire trucks and other vehicles must be ready at all times for immediate response to emergencies. By necessity that means at times, the main building doors were to be kept open. In the summer heat of Arizona it is essential that the vehicles are kept in cool so that when dispatched, the fire crew steps immediately into a cool vehicle. For these reasons, providing high quality cooling at economical operating cost proved to be challenging.

### Solution: Climate Wizard stand alone cooling

The installation of a Climate Wizard model CW-H15 air conditioner and suitable ducting to deliver cool air around the stored vehicles, provided the required cooling capacity to meet an even more humid heat load in the Phoenix "monsoon" weather. With the constant supply of cool outside air, operating with the main doors open, proved to be just right for the flow through of cooling air.



## PARADISE VALLEY BUS MAINTENANCE FACILITY

Phoenix, Arizona, USA

### Challenge

The maintenance facility provides regular service to the municipality's fleet of busses, which means they come and go as service is completed, and during maintenance, it is often required to run the engine and exhaust the combustion gases. Direct evaporative cooling had been previously used, but was found not to be satisfactory due to the high temperatures in the work area and the increase in moisture, particularly in the Phoenix "monsoon" season.

### Solution: Climate Wizard stand alone cooling

The Paradise Valley facility management decided to install sixteen Climate Wizard model CW-H15 air conditioners with suitable ducting to cool the whole facility. The low temperatures achieved and the specific placement of the supply plenums provided a much cooler working environment with no additional moisture added to the air stream. Now, even during the "monsoon" season, the internal conditions are very comfortable. While this could have been achieved with refrigerated systems, the Climate Wizard installation did not require any change to their electrical supply system, was much less costly to install and operate.



# TELEPHONE EXCHANGE / DATA COMMUNICATION



## TELSTRA CORPORATION

Sebastopol, Victoria, Australia

### Challenge

Telstra is Australia's leading telecom provider and as part of that service, they have many thousands of telephone exchanges that require cooling during the summer. With the advent of fast communications and data transfer for commerce and national security, these systems are required to be exceptionally reliable and this is now reflected in the design of the support infrastructure.

### Solution: Climate Wizard pre-cooling

The air conditioning design for this exchange makes use of economiser operation when appropriate in the shoulder seasons and the Climate Wizard provides the first stage of cooling as the summer heat builds. The refrigerated second cooling stage will then come on line as required, while the Climate Wizard continues to provide its full cooling capacity.



## BROADCAST AUSTRALIA

Mount Lennard, Western Australia, Australia

### Challenge

To supplement the existing fresh air cooling system that was proving inadequate on very hot days, leading to equipment failures, by providing mechanical cooling to the radio and television transmitters that operate 24 / 7 in outside temperatures that can regularly rise as high as 45 °C (+ 113 °F).

### Solution: Climate Wizard supplementary cooling

Climate Wizard was installed as supplementary cooling to boost the cooling effect of the existing fresh air mechanical ventilation systems. Cooled Climate Wizard air was ducted directly to the problem hot-spots within the building in order to avoid equipment shutdowns on very hot days. Due to the remote territory and lack of reticulated water, the system was designed to operate year round on rainwater harvested and stored on site.



## BROADCAST AUSTRALIA

Mount Lofty, South Australia, Australia

### Challenge

To reduce air conditioning energy consumption by providing cooling to radio and television transmitters that operate 24 / 7 with outside temperatures that can regularly exceed 40 °C (104 °F).

### Solution: Climate Wizard supplementary cooling

The building has the characteristics of a large data centre, where there is a continuous internal equipment heat load that must be removed by mechanical cooling to ensure a very high degree of equipment functional reliability.

Climate Wizard was installed as supplementary cooling to reduce the air conditioning energy consumption. The concept was for the Climate Wizard to carry the base load of the equipment heat gain and the solar load, while the refrigerated systems would be retained to provide extreme heat-event cooling capacity and as a backup system for safety. With the introduction of Climate Wizard, the refrigerated systems are rarely called upon and for most of the time, they remain idle. The energy consumption has been significantly reduced, which has led to the customer considering similar installations in other parts of the country.



## COMMTEL IT RACK MANUFACTURING FACILITY

Melbourne, Victoria, Australia

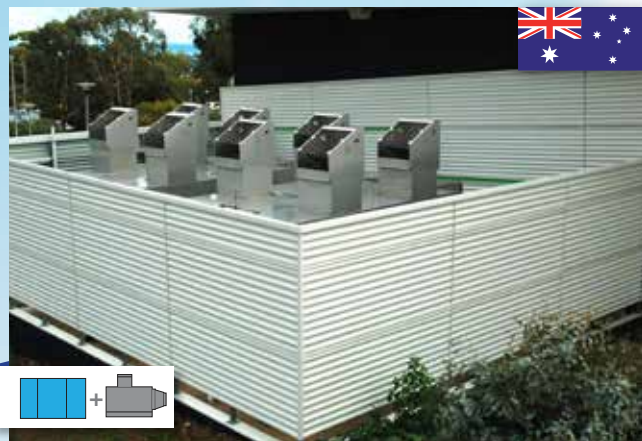
### Challenge

To provide cooling for a telecommunication rack manufacturing facility. The site has a limited amount of power available, which made refrigerated air conditioning an unattractive option. Furthermore, they could not use direct evaporative cooling due to the sensitivity of their electronic equipment to the added moisture from those systems.

### Solution: Climate Wizard stand alone cooling

Climate Wizard air conditioners were installed within the main warehouse and the exhaust air was ducted through the roof. The cool supply air is ducted into the workshop facility above the working areas. The hot air from the communications racks is then relieved through the ceiling vents directly above the racks. This minimises the amount of hot air recirculation back into the room and helps maintain design room conditions throughout the summer.

# DATA COMMUNICATION (CONTINUED)



## FLINDERS UNIVERSITY DATA CENTRE

Adelaide, South Australia, Australia

### Challenge

Flinders University Bedford Park campus had an existing data centre with a raised floor computer room air conditioning (CRAC) system that was in need of expansion, while also coping with redundancy.

### Solution: Climate Wizard high volume supplementary cooling

Two high volume Climate Wizard model CW-80 air conditioners were selected to handle a majority of the IT load while catering to the anticipated future load and providing adequate redundancy. The CW-80 air conditioners are the first stage of cooling to take advantage of the high energy efficiency, and the CRAC units are in service to provide back-up in extreme weather conditions.

# SUPERMARKETS



## WESTFIELD SHOPPING CENTRE

Adelaide, South Australia, Australia

### Challenge

To provide energy savings for the air conditioning plant at Westfield Westlakes Shopping Centre, Adelaide, South Australia.

### Solution: Climate Wizard custom design

Due to the large quantity of outside air required for the mall, a custom built Climate Wizard high volume model CW-60 air conditioner was supplied to pre-cool the outside air requirements for the Target retail space. The CW-60 supplies 4,400 L/s (9300 cfm, 15,800 m3/k) of air into the plant room where two chilled water air handling units take the pre-cooled air and supply it into the Target shop floor. The CW-60 decreases the load on the chilled water plant and increases the energy efficiency of the entire system.

# PLANT PROPAGATION / GREENHOUSE



## CURTIN UNIVERSITY

Perth, Western Australia, Australia

### Challenge

To hygienically cool specialist greenhouses.

### Solution: Climate Wizard stand alone cooling

Seed propagation trials require specific temperatures and humidity and Climate Wizard was able to provide this, even during the hot summers experienced in Perth, Western Australia. The Climate Wizard air conditioners are controlled via a programmable controller that aims to simulate the natural conditions required by the seedlings, but away from contaminants and any undesirable influences. The coolers slightly pressurise the greenhouses, and that pressure does not allow external airborne particles to enter.



## DEPARTMENT OF AGRICULTURE

Perth, Western Australia, Australia

### Challenge

To provide controlled growing conditions for wheat trials.

### Solution: Climate Wizard stand alone cooling

The department research facility conducts trials on different strains of wheat, growing it in controlled conditions that reflect different environments around the world. Climate Wizard air conditioners provide steady temperature control even during the hot summers, where previously the only option would have been expensive refrigerated systems.



# EDUCATIONAL FACILITIES



## BOORT REGIONAL SCHOOL

Central Victoria, Australia

### Challenge

To provide an air conditioning system that was consistent with the Government's aim of building a modern school that was environmentally responsible in terms of emissions and energy conservation.

### Solution: Climate Wizard stand alone cooling

The Victorian Education Department wanted to have air conditioned classrooms in the new school but wanted the installation to meet tight guidelines of sustainability. Climate Wizard was chosen because of its ability to meet the required classroom conditions during the hot summer, but also to consume only a fraction of the energy that other refrigerated systems would have consumed.



## UNIVERSITY OF ADELAIDE LEARNING HUB

Adelaide, South Australia, Australia

### Challenge

To provide exceptionally comfortable conditions to the Learning Hub, visited by over 3,000 students daily, in the extreme heat of summer in Adelaide.

### Solution: Climate Wizard custom design

The University of Adelaide's Learning Hub can maintain a comfortable 22 °C (71.6 °F) with a pleasant breeze despite outside temperatures frequently hitting over 35 °C (95 °F) and peaking at 45 °C (113 °F). The solution keeps the 10,500 m<sup>2</sup> (34,448 ft<sup>2</sup>) facility cool with 100% fresh air. This installation of eleven Climate Wizard High Volume Modules (HVM) uses zero CFCs or other harmful refrigerants.

This installation is most likely the largest single indirect evaporative project in the world today, with a design cooling capacity of 465 kW, when the outside air temperature is 45 °C (113 °F).



## STUDENT FACILITY ON PULTENEY STREET

Adelaide, South Australia, Australia

### Challenge

To reduce energy usage and to reduce the wear and tear on the plant by providing cool dry fresh air to the refrigerated cooling system.

### Solution: Climate Wizard pre-cooling

Installation of two Climate Wizard 10 kW (2.8 ton) air conditioners directly connected to the air handling unit in the basement of the building. The high efficiency of Climate Wizard allowed the consultant to downsize the refrigerated system capacity, saving both energy and capital cost.



## AUSTRALIAN NATIONAL UNIVERSITY FORESTRY COMPLEX

Canberra ACT, Australia

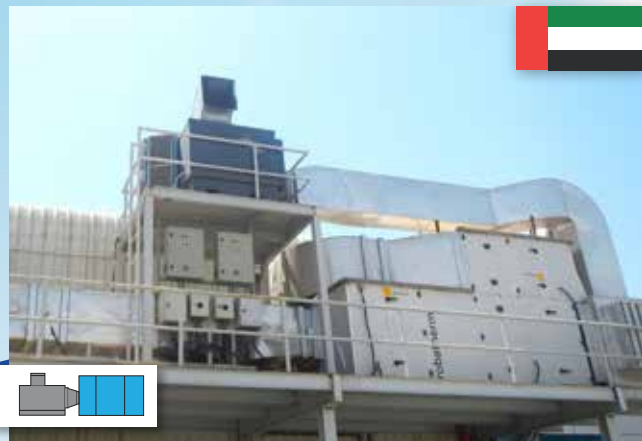
### Challenge

To cool a new student lecture complex and learning centre with environmental charter at the forefront of their architect's brief. The facility is nestled in the green leafy scrub land that abounds around the nation's capital. It is a fact that in enclosed buildings CO<sub>2</sub> build-up can cause drowsiness and inattention, and this was undesirable for a learning centre.

### Solution: Climate Wizard stand alone cooling

Natural illumination and cooling was chosen for the majority of the design. Climate Wizard was chosen because it has no synthetic refrigerants or CFCs, uses only water and a very small amount of electrical power to produce high quality, fresh cool air without adding any additional moisture to the conditioned air. Multiple Climate Wizard air conditioners supply all the cooling for the lecture theatres and student facilities within the complex.

# PRINTING INDUSTRY



## PRIMETECH FZCO

Dubai, UAE

### Challenge

This fully automated plant, using German technology for finished cylinder/rollers used for the 'flexible printing process', uses large quantities of energy for the air conditioning equipment operating in arduous ambient conditions that are often higher than 45 °C (113 °F). The client needed to reduce the energy consumption. The fresh air volume requirements were relatively high due to treatment process that includes Chromic acid.

### Solution: Climate Wizard pre-cooling

The air conditioning system used previously comprised of air handling units with DX type condensers. Four Climate Wizard CW-H15 air conditioners were directly coupled to four of the air handling units (AHUs) outside air input connections.

This resulted in 25% savings in power as demonstrated by energy monitoring hardware in association with climate sensors to compare the performance with and without Climate Wizard air conditioners. Since then, the parent company of Primetech FZCO has made it mandatory to use the Climate Wizard for any of their fresh air handling systems including stand alone requirements for their Blown Film cooling applications.

# LEISURE CENTRES



## ROXBY DOWNS LEISURE CENTRE

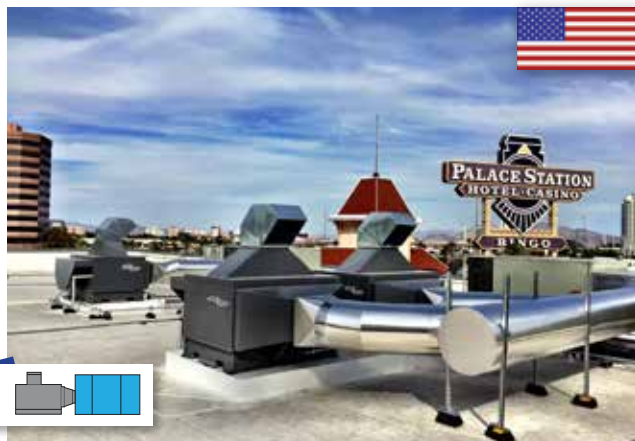
Roxby Downs, South Australia, Australia

### Challenge

To provide low energy consumption cooling to the leisure centre complex. The complex has a limited power supply capacity, so the solution needed to be very efficient, but still provide full comfort when the centre is fully occupied.

### Solution: Climate Wizard stand alone cooling

Twelve Climate Wizard air conditioners were installed under the main roof, within the plant room and connected to a manifold and ducts to each zone. A Building Management System (BMS) provides flexibility of control and zone selection. In normal operation, the system operates at a Coefficient of Performance (COP) of around 20 (EER 68.4), compared to the originally proposed alternative refrigerated system, which had a COP of about 3.2 (EER 10.3).



## PALACE STATION CASINO

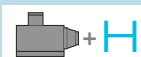
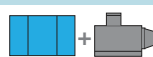
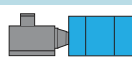
Las Vegas, Nevada, USA

### Challenge

Palace Station Casino is one of the premier casinos in Las Vegas and caters to wide spectrum of patrons, providing entertainment and fine dining. With the summer heat and the internal heat loads cooling sufficient outside air to maintain freshness within was always going to be a costly challenge.

### Solution: Climate Wizard pre-cooling

Climate Wizard performs particularly well in high temperature conditions, found on the roof tops of Las Vegas, so the casino management decided to install a trial of six Climate Wizard model CW-H15 air conditioners to provide a high volume of pre-cooled air directly to the air handling units (AHU), serving a particular section of the building. The effect was so spectacularly successful in improving the inside conditions at an extremely low operating cost, that the casino immediately installed a further twelve Climate Wizard CW-H15 model air conditioners to replicate the installation in other sections.







### AYERS ROCK RESORT

Ayers Rock, Northern Territory, Australia

#### Challenge

To reduce the load and wear and tear on the main air conditioning plant and to reduce their energy consumption.

#### Solution: Climate Wizard pre-cooling

Ayer's Rock (Uluru) is located in central Australia and subject to extreme heat for the summer months where it can get to 50 °C (122 °F) in the shade. The resort complex required large volumes of fresh outside for their function rooms, and they required an economical way to pre-cool this before it was introduced to the refrigerated system.

Climate Wizards now cool the 50 °C (122 °F) summer heat to a more manageable temperature before it is introduced to the various air handling units in the resort air conditioning systems. As all electricity is generated from diesel generators, the reduction in electricity consumption with the addition of Climate Wizard, contributes very significant savings to the owners.



### BOSCHENDAL WINE ESTATE, THE OLIVE PRESS

Cape Town, South Africa

#### Challenge

Boschendal Wine Estate built a beautiful multi-function venue called "The Olive Press" to host functions for up to 400 people. Due to South Africa's hot weather conditions, the owners were looking for a cost effective HVAC system that was able to cool their venue as efficiently as possible while also capable to be served by the existing power infrastructure.

#### Solution: Climate Wizard stand alone cooling

Due to the limited electrical power available and the large requirement of outside air for 400 people, Climate Wizard was by far the best solution than the alternative refrigeration air conditioners that would have needed a costly power supply upgrade.

Six Climate Wizard model CW-H15 air conditioners were installed on the hall and, as they deliver 100% outside air, they provide a fresh, cool and pleasant environment for large functions in the harsh summer conditions. Over the summer, the data loggers noted that during a 42 °C (107.6 °F) day the Climate Wizard air conditioners were providing air at 16° C (60.8 °F) and maintaining a comfortable 23 °C (73.4 °F) in the hall.



### WERRIBEE SPORTS COMPLEX

Werribee, Victoria, Australia

#### Challenge

To provide energy efficient air conditioning to a large new sports hall located in Werribee, Victoria, south west of Melbourne.

#### Solution: Climate Wizard high volume stand alone cooling

The high volume Climate Wizard model CW-80 air conditioner was proved to be the ideal solution due to its high cooling capacity, high airflow and small footprint. The CW-80 was able to fit onto their constrained plant platform on the roof, while having the capacity and airflow to maintain the hall at a comfortable condition during summer.



### ROXBY DOWNS GYMNASIUM

Roxby Downs, South Australia, Australia

#### Challenge

To maintain an acceptable temperature and conditions within the busy gymnasium complex during the extreme heat of a central Australian summer.

#### Solution: Climate Wizard stand alone cooling

The gymnasium has previously been cooled by direct evaporative systems that needed replacement and Climate Wizard air conditioners were chosen for their cooler supply air and no added moisture to the air stream, two factors that were particularly important for the gym.

# RESTAURANTS



## VENITA RHEA'S RESTAURANT

California, USA

### Challenge

Successful restaurateurs were looking for additional cooling at minimum operating cost during the hot summers experienced in California.

### Solution: Climate Wizard pre-cooling

This low-cost extra cooling was provided by Climate Wizard that delivers the first stage of cooling to the zone. The existing Packaged Air Conditioners (PACs) only start up when the need arises. At all times Climate Wizard provides outside air to keep the restaurant fresh and pleasant. The installation was retrofitted adjacent to the PACs on the roof and with separate ducting directly to the conditioned space, which meant a quick and easy installation, with no disruption to business. The initial Report\* on the first three months of operation during the summer of 2012, indicated a measured energy saving for air conditioning of 71%, compared to a similar period prior to the installation of Climate Wizard.

\*Report: "Evaporative Retrofit Components for Roof Top Packaged Air-conditioning Units. PG&E ET Project Number ET12PGE3181"



## MCDONALD'S "GREEN STAR AWARD" RESTAURANT

Kilsyth, Victoria, Australia

### Challenge

To achieve the first Green Star rating amongst restaurants in Australia.

### Solution: Climate Wizard pre-cooling

Many energy conservation measures were undertaken by McDonald's Restaurants in achieving a design that was awarded the first Green Star rating for a restaurant in Australia. Climate Wizard was an integral part of the design, as it pre-cooled all the outside air introduced to make up that extracted by the kitchen exhausts. Climate Wizard air conditioning has been installed in more than fifteen McDonald's Restaurants across Australia, delivering comfortable conditions for the kitchen staff and the clients, and providing savings on running costs.



## MCDONALD'S RESTAURANT

Blackwater, Queensland, Australia

### Challenge

To cool a fast food restaurant, where the kitchen heat often adds to that from the scorching sun, making conditions inside bordering on unbearable, to maintain a cool comfortable experience for customers.

### Solution: Climate Wizard stand alone cooling

The usual solution is to increase the size of the refrigerated air conditioners to compensate for the large amounts of expensively cooled air that is extracted from by the kitchen exhaust hoods. In Blackwater, and in many other installations since, Climate Wizard has been installed to provide the fresh air that is extracted by the exhaust hoods.

Climate Wizard can cool this fresh air far more efficiently than a refrigerated system and that means great savings for the operators. It also means that when it is time to replace the refrigerated system, a smaller refrigerated system can be installed together with Climate Wizard, while keeping the capital cost about the same, as would be the case if one large refrigerated system was used. The result has been an immediate saving of over 10% in running cost and a very short payback on the new installation.



## EXKI RESTAURANT

Brussels, Belgium

### Challenge

A new organic food restaurant chain in Belgium had their own mandatory fresh air requirements.

### Solution: Climate Wizard stand alone cooling

Two Climate Wizard model CW-H10 air conditioners were installed on the roof with a long duct diffusing the fresh air all along the restaurant and the mezzanine. Installing the Climate Wizard air conditioning was in line with the environmental ethics of the restaurant. The customers enjoy the fresh cool air delivered by the Climate Wizard air conditioners during the hot summer days.



# WINERIES / BARREL STORAGE HALLS

## Supercool

Traditionally, winemakers preferred to store wine in a cool 16 °C to 18 °C (60.8 °F to 64.4 °F) environment. While mechanical cooling can maintain the required temperature for maturing premium wines, it is expensive to operate and has the disadvantage that it dehumidifies the air, which in turn leads to substantial evaporation of wine from the barrels. Attempts to re-humidify the air adds significant load to the refrigerated cooling system which becomes extremely inefficient.

Climate Wizard Supercool is an ideal solution for cooling wine barrel halls, meeting the exact temperature and humidity requirements at a fraction of the running cost of conventional systems.



### YANGARRA WINERY BARREL STORE

McLaren Flat, South Australia, Australia

#### Challenge

To maintain this premium wine barrel store at an acceptable low temperature, but with a high humidity level.

#### Solution: Climate Wizard Supercool Winery configuration

Climate Wizard Supercool proved to be the ideal solution, as the temperature of supply air neared that of a refrigerated system, but without removing any of the moisture in the air. This air was further cooled and the moisture level further increased by passing the air through the direct evaporative portion of the Climate Wizard Supercool.

The result was very cold air at a high humidity – the two key requirements of the winemakers. The overall system was controlled using a basic programmable controller (PLC) with inputs from remote temperature and humidity sensors. The PLC controlled the water circulating pump in the direct evaporative cooler to regulate the humidity, and the fan motor speed and pumps in the Climate Wizard Supercool to regulate temperature.



### PETER LEHMANN WINERY BARREL HALL

Barossa Valley, South Australia, Australia

#### Challenge

To provide cooling for three wine barrel halls, located in the Barossa Valley, and to maintain low temperatures and high humidity throughout the harsh Australian summer.

#### Solution: Climate Wizard Supercool stand alone cooling

Climate Wizard Supercool utilises a direct evaporative stage after the indirect evaporative stage to cool up to a further 4 °C (7.2 °F) while increasing the moisture content of the supply air to 90% RH. In this way, only evaporative processes are used to provide a supply air temperature of 10 °C (50 °F) and to maintain the barrel hall at 16 °C to 18 °C (60.8 °F to 64.4 °F) with an internal RH of 60% to 80%.



### SHAW & SMITH WINERY BARREL HALL

Adelaide Hills, South Australia, Australia

#### Challenge

To provide energy efficient cooling for a brand new wine barrel hall in the Adelaide Hills, and to maintain the strict low temperature and high humidity conditions that are required for barrel hall applications.

#### Solution: Climate Wizard Supercool stand alone cooling

The winery barrel hall was built with energy efficiency in mind, having an R5 insulated structure. The energy efficient Climate Wizard Supercool was the perfect fit. Two Climate Wizard Supercool air conditioners were installed to maintain the hall at a low 18 °C (64.4 °F) and 60% to 80% RH, while providing good air distribution throughout the hall.

# Seeley International

Seeley International is Australia's largest air conditioning and ducted gas heating manufacturer and a global leader in developing ingenious, energy-efficient cooling and heating products.

**Our vision is to lead the world in creating climate control solutions which continue to be highly innovative, of premium quality and inspirational in their delivery of energy-efficiency.**

But it's more than just a vision... it's a way of life!

A commitment to innovation and excellence is at the heart of all that we do. Our success in delivering on that commitment has been recognised by our many awards and our expanding global presence. Seeley International now exports to well over 120 countries. Not bad for a company that started out in 1972 in the garage of its founder and Executive Chairman, Frank Seeley AM FAICD, who was named South Australian of the Year for 2011!



climatewizard.com



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