

Australian-designed Heat Exchanger An International Breath of Fresh Air

Significant advancements in air conditioning technology are comparatively rare but eight years ago an Australian company developed a radical, highly-functional, air-to-air heat exchanger that is now marketed internationally.

Late last year, Air Change won the National Award for the AIRAH Excellence for HVAC (it had previously been the Queensland Winner of this award in 2003). Prior to this, for two consecutive years, Air Change won the SEDA (Sustainable Energy Development Authority) Green Globe awards, for the heat exchange technology incorporated into its units.

John Urch believes large amounts of outdoor air are the key to significant improvements of indoor air quality.

The system delivers up to 100% outdoor air and incorporates a counterflow Enthalpy heat exchanger that will reclaim up to 75% of the energy from the exhaust stale air, therefore saving up to 75% of the cost to heat or cool outdoor air delivered into the theatre.

The roof-mounted cabinets are constructed of 50 mm BHP Colorbond-polyurethane sandwich panels and have purpose-built UV-treated polymer joiners to eliminate heat loss through the body of the unit. The cabinets also have extremely large access doors to ensure that all parts are accessible for servicing or replacement.

The system was installed by Shane Butters of Robert Mann Air-conditioning who remarked on the level of co-operation he received on the job: "It was one of the best managed projects I've been associated with and it was a pleasure to work on it."

Mr Butters said the Air Change system was selected because no other unit could offer a 100% continuous flow of fresh outside air.

"The Anita's Theatre seats 900 and there can be lots of performers on stage as well so we needed a minimum of 9,000 litres of fresh air a second and no cost was spared to achieve this."

John Comelli, the owner, designer and builder of the Anita's Theatre complex, is a perfectionist and sought expert advice before specifying the Air Change system.

"The audience capacity is 900 on 400 fixed and 500 moveable seats and it is equipped for movies, plays and live performances on a 290m³ stage. Already the Sydney Symphony Orchestra, the Australian Chamber Orchestra and the Wollongong Symphony Orchestra have performed here.

"Once we had trumpeter James Morrison and 114 teenage musicians on stage and, as usual, it was standing room only in the auditorium. For the comfort of both performers and patrons we needed air conditioning that provided as much fresh air as possible winter and summer. That's why we chose an Air Change system."

John Comelli was just 14 when in 1959 he migrated with his parents to Australia from Assisi in Italy. The family settled in the Illawarra region in NSW and John has remained there to today.

Mr Comelli first entered the field of business broking and when he later expanded into hotel broking he soon realised there was more money in buying and renovating pubs instead of just being the middle man. His hotel ventures have included the Palm Court, at Unanderra; the Corrimal Hotel; and



The proud owner of the beautiful Anita's Theatre at Thirroul, John Comelli, in front of the roof-mounted Air Change system.

Air Change incorporates its light-weight heat exchangers into a range of energy-efficient air conditioning and ventilation products offering the benefits of up to 100% outside air input.

The Managing Director and founder of the Air Change Group, John Urch, who has been involved with heat transfer and air conditioning for more than 40 years, is the brains behind the design and manufacture of the units. He invented this heat exchanger that provides the dual benefit of improved indoor air quality and energy saving and pioneered several types of counterflow air-to-air heat exchangers.

"While awaiting world-wide patent recognition for my unique, plastic-framed heat exchangers, we have been developing and manufacturing, in association with the industry, a growing range of advanced air-conditioning and ventilation products," he explained. "These units offer high efficiency, low energy consumption and unprecedented building-health benefits.

"The Group's products range from 100 L/s to 12,000 L/s, which indicates the adaptability of this heat exchanger for heat recovery applications."

All Air Change heat exchange equipment is made in Australia at the Group's 3,600 m² premises in Caringbah, NSW, with small metal ventilators outsourced to a local sheet metal fabrication firm.

"Conventional air conditioning systems, without inbuilt energy reclaim, have limited fresh air, and therefore continue to re-circulate stale or polluted air. On the other hand, the Enthalpy heat exchanger used by Air Change to exchange temperature and humidity through its moisture permeable walls, offers an economical method of providing total outdoor air with dramatically reduced energy costs.

"There is no cross contamination of air paths through the heat exchanger. Continuous, fresh, filtered air reduces or eliminates air-borne contaminants such as bacteria, smoke, fungal spores and dust."

Robert Mann Air-conditioning Pty Ltd, of Kirrawee in Sydney, has just completed the installation of an Air Change 82 kW reverse cycle rooftop-mounted system for the exciting new theatre and entertainment complex at Thirroul, north of Wollongong NSW.



The ornate 900 seat Anita's Theatre at Thirroul, named in honour of the owner's late wife.

the Harp Hotel, in Wollongong. He won awards for excellence in reconstructing these buildings.

He purchased the former Thirroul skating rink in Lawrence Hargraves Drive in June 2004.

"It was a disused shell and nothing more – just bare concrete floors, ceilings and walls – run down and filthy. But my wife Anita had a dream to provide the Illawarra with a classic small theatre. The position, near the railway station and in the centre of the Thirroul shopping centre was perfect so we bought it in June 2004 and began to plan.

"In the first stage of construction we built 11 street front shops on the corner block and then we started on the second floor theatre. Anita was able to incorporate all of her artistic ideas into this fully-integrated entertainment centre with large entrance foyers, box office, bar, projection and control room and stage area.

"The intricate art deco embellishments were sourced and adapted from everywhere but it was the painting that delayed the opening of the \$6-million theatre (more than \$1-million was spent on painting labour alone) and when it was officially opened on April 14 last year it was still incomplete.

"The 1,100m² of specially-cut and finished jarrah flooring is excellent for dancing and already a number of balls and the South Pacific Ballroom Championships have been held there. Even the toilet seats were machined from a single jarrah board," he added smiling.

The attention to detail is amazing. Even the intricate Italian tiling at the two foyer entrances has been perfectly aligned using lasers.



Insulated ducting takes 9,000 litres of 100% conditioned fresh air per second into the Anita Theatre during performances.

Mr Comelli says the Air Change air conditioning system has easily coped with every demand placed on it. "It is an excellent solution and is operating brilliantly," he added.

Air Change purpose-built the Thirroul theatre's system. To ensure the highest efficiency and quality, rooftop-mounted Danfoss scroll compressors are used. The unit also features automatic lock-out on power failure, low pressure control automatic reset and manual reset high pressure control. If one of the fan motors stop, the VSD will stop the compressors, preventing low or high pressure problems. The thermostat is connected via a terminal strip inside the electrical compartment.

The fans have three-phase direct-coupled motors, eliminating the perennial problem of pulley and belt adjustment and maintenance. The supply and exhaust air fan motors are controlled

with separate ABB VSD controllers with ramped starting to prolong their life and prevent start-up power amperage spikes. Airflow in the Air Change system is adjusted simply by a control knob.

Integration to a BMS system further lowers running costs by precisely controlling the power needed by the motor for the required load.

To prevent heat loss, the cabinets are assembled from insulated, coolroom-standard "sandwich" panels.

John Comelli's \$18-million Thirroul complex is far from complete. He's now building three levels of strata title apartments at the rear of the block and when these are finished work will start on another block of shops and apartments that will complete the project.

"Eventually I will probably sell everything except the theatre – that's Anita's legacy," he confided (Anita, John Comelli's beloved wife for 39 years, tragically died from cancer before her dream theatre, named in her honour, opened).

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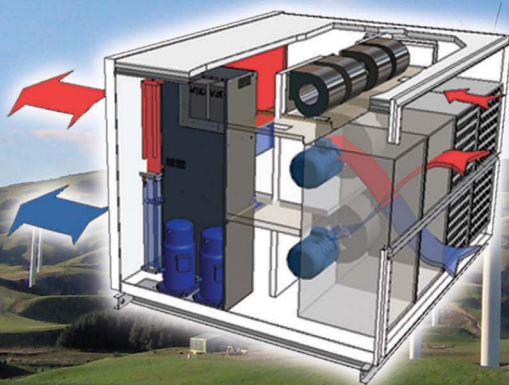


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