ENERGY RECOVERY VENTILATION CUTS COSTS AT ROCKHAMPTON GRAMMAR

David Goodwin

Since the Air Change Energy Recovery Ventilation system was successfully trialled at the Rockhampton Berserker Street Special School in 2003, consulting engineers impressed by the results, decided to use the units in one of the largest schools in the region. (*Celsius* reported on the trials in October's 2004 issue).

The Rockhampton Grammar School is a major co-ed day and boarding school with 1115 students from prep to year 12. With the introduction of the Air Change Energy Recovery Ventilator (ERV), the school has been able to halve the number of air conditioners it needed in the past, reducing installation and running costs.

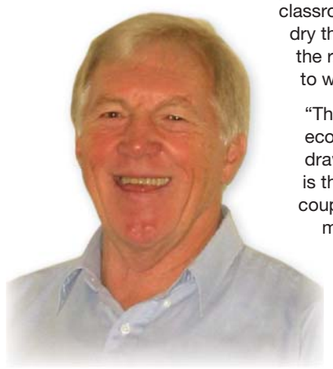
The Built Environment Research Unit, a division of the Queensland Public Works, originally contacted Air Change's managing director, John Urch in 2003 to see if his enthalpy heat exchanger could be designed into a unit suitable for up to 350 L/s to fit into a classroom wall.

Subsequent trials proved the power bills in the trial classrooms with one ERV and one air conditioner, decreased by up to 50%, compared with the cost of running two air conditioners and fresh air fans.

"In rooms that had two or three air conditioners and two fresh air fans running, noise levels were unacceptably high. The Air Change ERV noise levels are a quiet 47 dBA at high speed and 44 dBA at medium speed," Urch told *Celsius*.

"Our Air Change Energy Recovery Ventilator (ERV) brings fresh moist air from outside in through the enthalpy heat exchanger which reclaims energy from the return air, pre-cooling and de-humidifying the outdoor air in summer and pre-heating it in winter."

Urch said the biggest load on fresh air is the latent load. If you calculated the sensible and latent load, you saved about 10 kW on normal cooling in the Queensland area.



"If you introduce air into the classroom that is cool and dry the air conditioner in the room doesn't need to work as hard.

"The ERV unit is very economical to run and draws only 0.8 A. This is the equivalent of a couple of light globes. It meets the Australian ventilation Code 1668.2 and BCA codes and suits a classroom with 10 to 30 school children. It fits nicely in a wall aperture 660 mm wide by 758 mm high. Running costs are less than 2 cents an hour.

"Installing the unit is very simple and can be done in three easy steps. First, the casing is installed, and then the heat exchanger, dual fan cradle and the fresh/return air filter all slide into position in the casing. The plastic front grille clips on and is locked into place.

"Generally, one person can install the unit in less than an hour. The accessibility of all parts internally makes it ideal for servicing from inside the room," Urch said.

Grant Anderson and David Wagstaff of Bassett Consulting Engineers who designed the Rockhampton Grammar School's air conditioning project, were informed by Q Build they were trialling Air Change ERV's in 2003.

"We were lucky enough to have a look at the Air Change ERV unit at the Berserker special school in Rockhampton and Q Build gave us the various test readings, which indicated we could halve the number of air conditioning units on the next two stages at Rockhampton Grammar," said Anderson.

"Before we heard about the Air Change ERV's, we had installed air conditioning in 20% of classrooms and laboratories at Rockhampton Grammar. On average there were two air conditioning units per classroom and three in larger classrooms and laboratories.

"We designed the system for 35°C dry bulb, 25.7° wet bulb days and the new units worked well on those days."

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It's time for an air change in Australian Classrooms

Wall mounted Energy Recovery Ventilator
100 to 350 l/s Outdoor air, adjustable

Every summer, parents and school principals are pressured into panic buying air conditioners!

But are they purchasing systems that meet BCA requirements of 12 l/s of fresh air per child?
Are schools able to pay for large ongoing energy bills?

Help schools make the right decisions for our kids' health and learning comfort before next summer!

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It's time to specify proven fresh air technology that halves the air conditioning load and running costs.

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ENERGY RECOVERY VENTILATION CUTS COSTS AT ROCKHAMPTON GRAMMAR CONTINUED

Grant Anderson, David Wagstaff and Trevor McMaster

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Trevor McMaster is the air conditioning contractor who won the tender to install air conditioning and Air Change units at Rockhampton Grammar. He has worked in Rockhampton since 1980 and is the principal of Trevor McMaster Refrigeration.

“We had on average six mechanics working on the first stage of the project and installed 16 Air Change ERV’s and air conditioning units. Since then there have been another six classrooms fitted out with Air Change units and we have done that stage as well,” he said.

“It was finished at Christmas and ran during summer this year. The installation went well, and we have had no problems with the transportation of the ERV units from Sydney.”

Business manager of the Rockhampton Grammar School, Bob Skilling told Celsius last year the school had put so much air conditioning in their buildings last year, the power supply couldn’t cope.

An Air Change ERV with ceiling air conditioner

“We had to go around classrooms air conditioned in 2003 and where we had two or three units we had to turn one off,” he said.

“In those rooms where we installed a single Air Change ERV and an air conditioning unit, we didn’t need to turn off any units .

“There were one or two days where the temperature was extremely high this summer, but generally the temperature was between 32° and 36°C and average humidity between 50% and 65%.

“We run a mixture of split systems in the classrooms, with Daikin, Mitsubishi Electric and York units installed since 2003,” Skilling said.

“Having only one air conditioner and the Air Change unit is a more efficient way and certainly cheaper. The cost of air conditioning a classroom was about $15,000 a room but with only one air conditioner and the Air Change ERV, it’s only costing about$10,000.”

Bob Skilling had considered retrofitting Air Change units into the rooms with two air conditioners, however due to the problem of their removal and replacement with a slightly larger single air conditioning unit, he thought the additional cost would not be worth the energy saving.

The school is considering trialling one of the existing smaller units combined with the Air Change ERV which would be able to handle the 32°C days, according to Grant Anderson.

“The school will need to monitor the results, and if successful, it will save on additional installation costs,” he said.

Bob Skilling said there were no negative comments in terms of humidity and temperature, by teachers or pupils, from classes where the Air Change ERVs were running.

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