

Munters' DryCool™ technology puts Australian hospital's energy costs under the knife

Australia's Cairns Base Hospital is not only the primary health care facility for the city of Cairns and its immediate surroundings, but also serves as the tertiary referral medical center for the tropical region of North Queensland. The hospital provides all major health services including general medicine, mental health, pediatrics, surgery, and women's health, as well as over 30 additional subspecialties and outreach services for the remote and rural areas. Due to the compounded effect of the hospital's waterfront location, humidity and temperature control is critical for their facility that treats over 35,000 patients a year. To ensure, a healthy, sterile, and comfortable surgical environment, while remaining energy and cost-efficient, Cairns Base hospital contracted the services of Trane Australia and Bob Norris of Ecology Engineering to evaluate their existing operating rooms's energy performance and air quality.



The hospital serves a growing population of over 138,000, while its eight operating theaters cater for up to 100+ lists per week.

CASE STUDY: Cairns Base Hospital



BENEFITS

- Temperature and humidity control and stability
- Ability to maximize site recovered reheat
- Minimizes condensation and humidity in the ductwork, allowing ventilation ducts to be dryer and healthier
- Provides cool and comfortable air
- Provides substantial baseline savings on energy cost, system downsizing and upgrades

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*“Best installation
under \$1 million
in Australia”*

by *Climate
Change News*



Diagnosis and Procedure

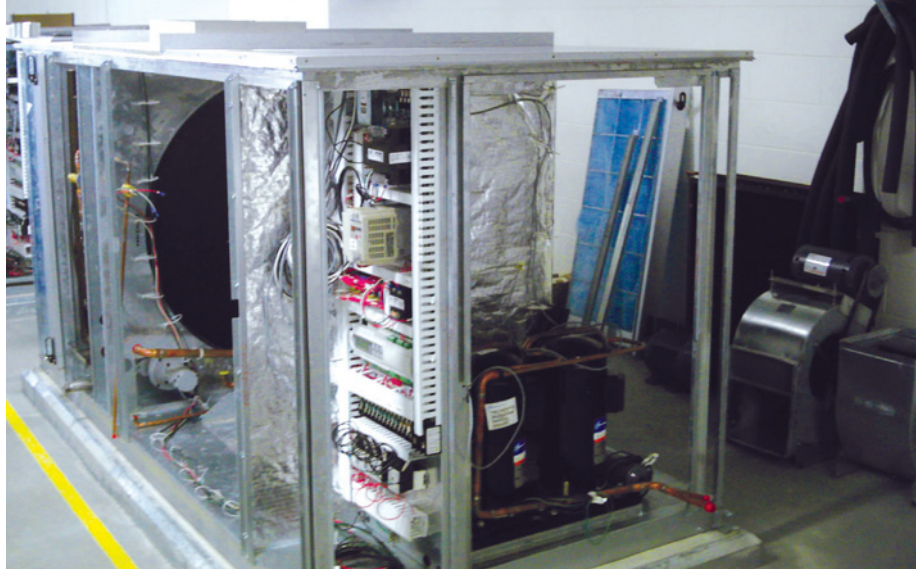
Engineers found the original control system for the eight operating rooms utilized a humidistat to control humidity. This type of conventional system's heater does not remove moisture, but instead alters the temperature to achieve a simulated humidity adjustment. This causes the room thermostat to power a chilled water valve to provide moisture removal and simultaneous cooling to balance out the heat input. Setups such as these commonly use an inconsistent output load on the working space or a constant off coil air temperature set point that reheats to maintain a fixed temperature. Either method requires a reheating stage and results in costly energy overuse.

As the solution to update the hospital's existing mixed return air system consisting of three chilled water air handling units (AHUs), the engineering services team integrated three of Munters' DryCool™ units to ensure effective and efficient heating and cooling.

The DryCool™ unit uses only two stages of cooling and two stages of humidity control activated by two compressors and a desiccant DryCool™ unit rotor. The hospital's original AHUs were connected to the new DryCool™ units to pre-condition the outside air and open a chilled water valve to compensate for necessary cooling, should the DryCool™ unit turn off. As a split



Left: The advanced DryCool™ desiccant system installed at the hospital demonstrates energy savings from cooling and effective reheat. Below: An open DryCool™ unit before complete installation.



system, the air cooled condensers were placed outside and connected to the units built inside the hospital's plant rooms. By incorporating the advanced desiccant system, a free reheat was created. Pre-cooling was conducted by a fresh air direct expansion system running on

small compressors and speed controlled condenser fans. This allowed the wasted heat from the condenser to regenerate the DryCool™ unit rotor as it dried to absorb the reheat effect and in result, reclaim that energy.



The DryCool™ system for the operating theaters was installed in the hospital's plant rooms.

The result

There was not only a noticeably improved energy performance that effectively controlled humidity and temperature in the surgical environments, but also a power reduction in overall electrical load for the hospital's operating rooms that contributed to a substantial amount of energy saving costs. An energy performance contract indicated savings on ventilation humidity control and reheat to be a 2.5 year payback. This project is one of many that prove the DryCool™ technology is the leading solution on the market in comparison to conventional mixed return air systems. The DryCool™ technology is available globally, including over 8,000 installations in the United States and approximately 100 in Australia.

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