UNIVERSITY OF MELBOURNE

A Vertiv Case Study

ABOUT THE COMPANY

Established in 1853, the University of Melbourne is a public-spirited institution that makes distinctive contributions to society in research, learning and teaching, and engagement. It is ranked among the leading universities in the world with international rankings of world universities consistently placing it as number 1 in Australia and 33 in the world.

Case Summary

Location: Australia

Vertiv Solution:

- Liebert® EC Fan Upgrade Service

Critical Needs: Melbourne University engaged Vertiv to assess the potential power savings gained with the installation of Liebert® EC fans. Tests were conducted prior to and after installation of these EC fans to monitor any changes or improvements in the power consumption.

Situation:

The University of Melbourne actively engages with all sectors to continue its progress towards innovative sustainability. The Sustainability Charter, which emphasizes the University's commitment to social responsibility, is the driving force behind the University's IT department engaging Vertiv's service team to upgrade its UPS (uninterrupted power supply) rooms. The upgrade seeks to reduce inefficiencies within the UPS room, which would minimize the University's carbon footprint and support sustainability goals.

The two UPS rooms support backup power to the University's IT server rooms. Both rooms house four legacy CRAC (computer room air-conditioning) units, which are still using dated technology.

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The Solution

After its assessment, Vertiv's service team installed EC Fans to the University's CRAC units. "EC" or Electronically Commutated fans have Permanent Magnet Motors (PMM), which are more efficient than AC motors as they use permanent magnets rather than induce a secondary magnetic field in the rotor. This energy-saving solution delivers airflow that is managed through the Liebert® iCOM Controls™ for optimal operating conditions. The ability to control fan speed decreases input power, resulting in efficiency gains.

The EC fans also use up to 70 percent less energy compared to traditional AC fans. This means not only better use of primary energy, but also a reduction in lost heat and a lower heat load on the whole system.

In addition to energy savings provided through reduced fan speed, EC plug fans are also more efficient than centrifugal blowers when operating at 100 percent fan speed. This is due to the difference in wheel design, and because direct drive systems eliminate belt losses.

The Outcome

The University conducted an assessment before and after the EC fan upgrades. The test was conducted in August and September 2015, over a period of seven days. Line recorders were set up to simultaneously monitor both the CRAC Power Consumption and the UPS input power consumption.

Mike Jerrard, Operations Lead at the University of Melbourne's IT Department, said: *"Initial results from the monitoring period show a reduction of input power of the entire CRAC unit by approximately 165 kWh, or 16%. We expect this to translate to a monetary savings of about $40 a week, $2,000 per annum. Based on the measurements, the total savings across the four units will be around 34,400 kWh a year."*

EC Fan supplied by EBM-ebm-papst

Original belt driven fan and motor

In addition, UPS power consumption was also measured, showing that the cooling load did not change. This meant the EC fan upgrades enabled the CRAC units to deliver the same cooling performance to the IT infrastructure, but with reduced input power consumption, and related cost savings.

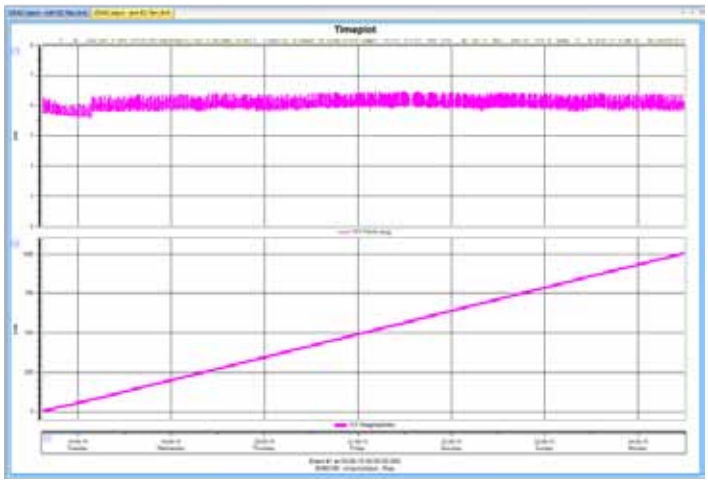
Ross Hammond, Director, Service and Project Management, Vertiv ANZ, says, *"The Vertiv service team understood how important sustainability is to the University of Melbourne, as they saw how each department proudly displayed its power savings throughout the campus. Our team was keen to be a part of this high profile program at the University and we're keen to demonstrate real savings like the $2,000 annual savings on the University's electricity bill."*

Upgrading mid-aged equipment to a more energy efficient unit is a viable alternative in producing measurable electricity cost savings. Moreover, it also offers incidental cost savings such as belt replacement, service calls, maintenance costs, and server room upgrades, which make this solution very attractive.

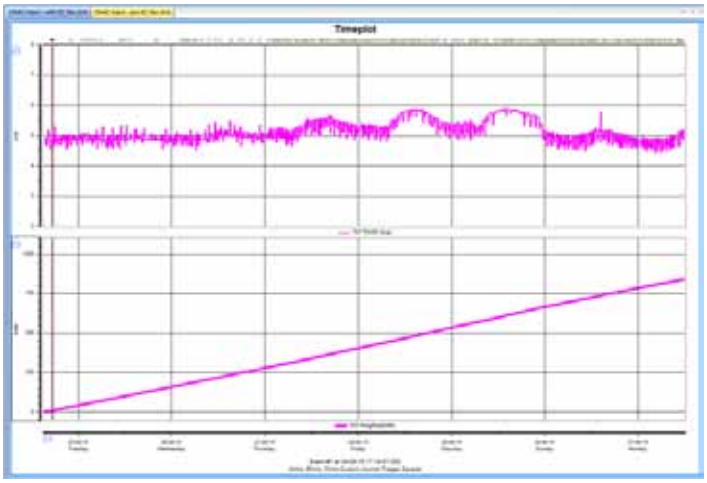
Upgraded computer room air conditioning unit PEX 245FA

In addition to energy savings, direct-drive EC fans do not require belt and pulley changes, and the fans themselves have a longer service life than conventional AC fans. The EC fan solution also enabled retention of the air humidifier, which was not possible with previous retrofit solutions.

Mike Jerrard, Operations Lead at the University's IT Department, said: *"We are extremely happy to proactively save energy with this simple, reliable technology, while increasing reliability of the machines at the same time. Furthermore, the ROI presentation made getting approvals very easy."*



CRAC Input Pre-EC-Fan
Average Power = 6.1 kW ------ Energy consumption = 1008 kWh
(for the 7 days below)



CRAC Input Post-EC-Fan
Average Power = 5.1 kW ------ Energy consumption = 843 kWh
(for the 7 days below), resulting in 20% energy savings per CRAC unit

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