

---

WARRINGTON, UK, DECEMBER 8, 2011

# ABB drives and motors cut 4,000 MWh a year for Manchester Airport

A project to upgrade the air handling units (AHUs) at Manchester Airport with ABB low voltage drives and high-efficient motors is saving 4,000 MWh a year, as well as cutting CO<sub>2</sub> by over 2,000 metric tons a year.

The project involved replacing drives and motors in 95 AHUs throughout the airport's terminals 1, 2 and 3. Each AHU has a supply drive and motor and extract drive and motor, with motors ranging between 3 and 90 kW.

Andy Sheridan, Service Facilities Manager for Manchester Airport, says: "The airport has a commitment to achieve carbon neutrality by 2015. Together with our need to reduce costs and our environmental commitments, looking to improve the air handling in the terminals, was an obvious choice."

The airport already made extensive use of ABB low voltage drives in applications as diverse as baggage handling and pumping. "We generally use ABB drives now across the airport," says Sheridan. Paul Percy and his team at Massey Coldbeck recommended ABB drives and motors and installed all the drives for the airport energy saving project, as well as several other projects requiring drives.

Working with Craig Fuller and other members of the ABB Energy Appraisal Team, as well as ABB Drive Alliance member Quantum Controls, Sheridan carried out extensive trials on AHUs 48 and 49, which serve the Terminal 1 check-in hall. "Terminal 1 is some 50 years old," says Sheridan, "and the normal practice at the time was to oversize motors. By installing the latest ABB IE2 high efficiency motors and resizing them to a more suitable frame size, energy savings of five per cent can be realised."

The trial also installed ABB standard drives for HVAC on the two AHUs. To prove the savings, Manchester Airport's Engineering Team installed permanent half hourly energy meters and monitored the results over a six month period. By reducing the set point frequency from 50 Hz to 40 Hz, it was shown that savings of 50 percent could be made with no noticeable change in the airflows provided by the AHUs.

Calculated annual savings for the high efficiency motors and inverter drive elements of the scheme equate to approximately 4,000 MWh. "This saves around 2,200 tons of CO<sub>2</sub> a year," says Sheridan. "We have a target to reduce our CO<sub>2</sub> emissions by 27,000 tons a year, so this one application has reduced our emissions by 10 percent of our target, which for us are very compelling numbers."

The drives maintain the desired air flow by measuring the air flow in the supply air duct. A pressure difference sensor is connected directly to the supply fan drive's analogue input. The lower the air flow measured the faster the fan motor has to be rotated to reach air flow set point.

Another major element of the energy saving project was the use of energy saving dust filters on the AHUs. Says Sheridan: "The filters that we have installed are classed as energy efficient as they maintain the filtering that we get from standard filters but reduce the pressure drop within the units. This ensures we run the supply and extract fans at lower speeds but maintain the same air flow and filtration. We carried out field trials to ensure that the claims of the manufacturer were correct and we did see significant energy savings."

The ability of the ABB low voltage drives to communicate over BACnet with the airport's building management system (BMS) will allow the filters to be changed when needed, maintaining their efficiency

and contributing to energy saving. A relay is activated when the pressure difference over the supply air filter reaches a pre-set limit. This indicates that the filter has become clogged and requires cleaning or replacement.

Another drive function is used to detect faults in the pressure sensor or its wiring. If the pressure signal drops below 10 percent of its maximum value, a signal loss fault is triggered within the drive, whereupon the drive starts running at an average speed based on the last 10 seconds of operation.

Says Sheridan: “The ability of the ABB drives to use BACnet to communicate with our BMS was one of the key reasons for choosing them, as we knew we would be using these filters that could send signals back to a filter management system. Other drives could not meet this requirement so cost effectively.

“Once completed the system will alert the various facilities managers of any filters that require replacement, and will also e-mail our system maintainers directly so that they can carry out the necessary replacement works.”

**ABB (ABBN: SIX Swiss Ex) is a pioneering technology leader in power grids, electrification products, industrial automation and robotics and motion, serving customers in utilities, industry and transport & infrastructure globally. Continuing a history of innovation spanning more than 130 years, ABB today is writing the future of industrial digitalization with two clear value propositions: bringing electricity from any power plant to any plug and automating industries from natural resources to finished products. As title partner in ABB Formula E, the fully electric international FIA motorsport class, ABB is pushing the boundaries of e-mobility to contribute to a sustainable future. ABB operates in more than 100 countries with about 147,000 employees. [www.abb.com](http://www.abb.com)**



**Caption:** Upgrading the air handling units at Manchester Airport with ABB low voltage drives and high-efficiency motors is saving 4,000 MWh a year.

—  
**For more information please contact:**

**Layla Hewitt**  
**Marketing Communications**  
Phone: 01925 741517  
Email: [layla.hewitt@gb.abb.com](mailto:layla.hewitt@gb.abb.com)

**ABB Ltd.**  
Daresbury Park  
Daresbury  
Warrington WA4 4BT

**Emma Jenkinson**  
**Armitage Communications**  
Phone 020 8667 2218  
Email: [emma.jenkinson@armitage-comms.co.uk](mailto:emma.jenkinson@armitage-comms.co.uk)