

Replacing blade pitch control in HVAC system



AC variable speed drives control HVAC air flow

Controlling air flow with ABB drives, instead of using variable pitch fans helped improve the reliability of the HVAC system in one of the City of London's architectural landmarks, the 55 Bishopsgate building.

The upgrade was needed because the fan impeller units had worn and were causing numerous breakdowns.

"Stiff components within the fan impeller units would cause the positioning actuator to come under severe strain, damaging drive gearing and burning out control boards within the actuator. On several occasions the actuator had to be replaced, at a cost of £800.

Spare parts were another concern as they were becoming hard to find and often had to be transported from continental Europe leading to severe downtime sometimes of up to eight months. With no air conditioning on

the affected floors, tenants were seeking refunds, as they were not receiving air conditioning as per contract.

The solution was to lock the impeller units in optimum flow position with two variable speed drives installed on each floor. These are able to match the airflow demand by varying the motor speed.

17 ABB variable speed drives, with IP54 enclosures, were supplied. These included 14 drives at 15 kW, one at 11 kW and two at 22 kW. All the installation work was performed out of hours over a number of weekends.

By controlling the air flow with ABB drives, instead of using the variable pitch fans, the reliability of the system has been improved and maintenance has been radically reduced. Controlling air flow with variable speed drives is also more efficient than using blade pitch, particularly at low speeds (see graph).

HVAC



The 55 Bishopsgate building is a city landmark, prominently located next to Tower 42, formerly the NatWest Tower.

Solved Problem

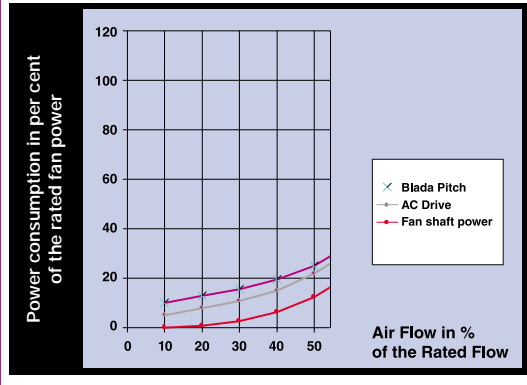
- The AC drives vary the motor speed to match airflow demand with the fan impeller units locked in an optimum position. Tenants receive a consistent quality of air conditioning.

Solution

- Maintenance costs have been dramatically reduced and reliability has been increased.
- Energy costs have been reduced following the fitting of the variable speed drives.
- Expensive actuator spares are no longer needed.

Case Notes

Using a variable speed drive is the most efficient ways of controlling air flow



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