

Variable frequency drives push temperature and energy bills down at 5* hotel

Case Study



Company / Project

KEMPINKSI HOTEL MALL, DUBAI

Applications

HVAC

Global sales, service & application support network in over 80 countries

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Dubai hotel expects 25% energy reduction thanks to Eco HVAC Variable Frequency Drive.

The five star Kempinski Hotel Mall of the Emirates in Dubai is anticipating energy savings of up to 25% from its air conditioning system thanks to an installation of Eco variable frequency drives (VFD) from UK based Inverter Drives.

The Optidrive Eco HVAC range is specifically designed for use in HVAC Building Services applications and provides energy savings by varying the fan speed to control the output of air conditioning systems to meet changing demands during operation.

The unique Eco Vector motor control strategy continuously adjusts in real time to provide the most efficient operating conditions for the load, typically reducing energy consumption by 2 – 3% compared to standard AC drives – providing similar long term cost savings of selecting a higher efficiency without requiring changes to the previously installed equipment.

An energy audit commissioned by the hotel's senior management team following receipt of several high electricity bills proved that this was exactly what the hotel needed for its HVAC system.

The Kempinski Hotel - Mall of the Emirates, part of the World renowned Kempinski chain first opened in 2006. The central air conditioning system was built without VFDs and consideration of the potential energy savings that could be achieved. The climate within the hotel was controlled through a Building Management System with all Air Handling Units operating at fixed speed only. Any air flow control was achieved using adjustable dampers only.

With temperatures exceeding 40°C in Dubai during the summer, the air conditioning system plays a vital role in the whole experience offered by the hotel, and the running costs of the system represent a significant proportion of the overall operating costs of the hotel. It was therefore vital for management to find a way to improve the system control and efficiency in order to reduce outlay on electricity.

The company's engineering team put the contract out to tender and, following a number of meetings and a site visit with GI Tech, Inverter's sales partner in the UAE, it was confirmed that Inverter's Optidrive Eco HVAC variable speed drives were their preferred choice.

The Eco range has been specifically designed to provide precise motor control for fan and pump applications using IE2, IE3 and IE4 motors and can control all types of motor including AC Induction (IM) Motors, AC Permanent Magnet (PM) Motors, Brushless DC (BLDC) Motors & Synchronous Reluctance (SynRM) Motors.

Eighty three drives, varying from 2.2 Kw to 22 Kw, were installed in 43 AHU panels in various sections of the system - an installation that provided some challenging issues as **Ali Akhavan, Director at GI Tech, explains**, "During the initial site inspection we noticed a number of points which made us think very carefully before submitting our final recommendations. There was no space to install new panels in the majority of areas and the existing panels contained very little space for us to install any new units.

"As a luxury visitor destination, it was also vital that the work was completed during unsociable hours so as not to disturb guests."

Due to the space restrictions, GI Tech proposed dedicated Eco HVAC IP55 drives with built in RFI Filters. In addition to the advanced energy saving operation, the Eco range offers substantial advantages over other products in the market thanks to features including an in-built sleep mode with auto-boost, resonance avoidance, belt break detection and a number of elements designed to reduce audible noise levels.

The drives were mounted to a wall and fixed adjacent to each other, the side by side mounting allowing installation to be completed with minimum space requirements. Shielded cables were used from the existing panel to connect to the input and output terminals of the drive and back to the panel to ensure a high standard of EMC compliance was maintained. All of the cables were covered by individual cable conduits to ensure proper separation and earthing.

A changeover two way switch was installed at the input of the VFD to isolate power to the drive during bypass and maintenance. This allows the system to operate with fixed speed as originally intended, or with the VFD's operating, providing an ideal method for the energy saving possible to be easily compared.

Ali concludes, "The energy savings are so substantial that the hotel should see payback for the outlay of the VFDs, including all installation costs, within 14 months of the installation. The whole project was completed very smoothly considering the challenges we faced, thanks to

excellent support from the hotel management. Our customer is very happy that guests can stay cool without running up astronomical electricity bills.”

Optidrive Eco drives can be used in a number of HVAC Building Services applications including Stairwell Pressurisation, Fume Extraction and Fire Override and a manual control function can

easily be selected if required, allowing manual operation in the event of a control system failure.

To find out more contact your local sales partner to discuss your specific HVAC motor control requirements.



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