

Retrofitting a ventilation system with FanGrid

Sky-high savings

Completely replacing old ventilation systems is time-consuming and costly. However, the fan retrofit project at a high-rise building in Dubai shows that there is huge potential for energy savings with EC fans arranged as a FanGrid and a demand-based control system.

The Swiss Tower is a 40-story high-rise building in Dubai that houses offices and luxury apartments. The building is constantly supplied with fresh, cooled air from a total of four air handling units (AHUs). The aim of the retrofit was to use energy-efficient fans and set up a demand-oriented control concept to reduce energy costs and increase the service life of the system.

An efficient complete solution

Thanks to the "matrixAir+ EC" solution from Qey, a company from Dubai, it was possible to install the new fans quickly and easily. This fan package, consisting of fan terminal boxes, fan bulkheads, control panels and RadiPac fans with EC technology from ebm-papst, was delivered as a complete solution. The compact design and low weight of the RadiPac compared to a single large AC fan ensured that the replacement was easy. A total of 26 RadiPac were installed as a FanGrid in the intake and outlet section of the four AHUs. This redundant design increases the reliability of the system and provides greater operational reliability. The service life of the system is also extended by operating several small EC fans at partial load as required instead of a large AC fan constantly at full load, as was previously the case. The air also flows through upstream and downstream components, such as filters or heat exchangers, more evenly. This leads to more efficient heat transfer and air filtering, in turn reducing the operating costs of the system. In addition, the RadiPac EC fans have a high motor efficiency level of over 90%, contributing to significant energy savings compared to conventional AC motors.

Demand-based fresh air supply

The second part of the retrofit involved upgrading the control system. Thanks to the security scans at the inlet and outlet, data was available on the building's capacity utilization according to the time of day. In cooperation with Taka Solutions, Qey used this data to determine the air flow requirements depending on the time of day and programmed a schedule for optimized control of the building ventilation using a software specially developed for retrofit projects. The RadiPac RS485/MODBUS RTU interface provides the perfect conditions for this, as it enables the fans to be controlled according to requirements while also allowing the operating data of each individual fan to be monitored. These measures resulted in a reduction in energy consumption by more than 60%.

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Fig. 1: The Swiss Tower is a 40-story high-rise building in Dubai.



Fig. 2: A total of 26 RadiPac were installed as FanGrid in both the supply and exhaust air section of the four AHUs.

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Images	ebm-papst
Characters	approx. 2,900, including headings and sub-headings
Tags	EC technology, centrifugal fan, energy savings, RadiPac, MODBUS RTU, monitoring, FanGrid
Link	www.ebmpapst.com/retrofit

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About ebm-papst

The ebm-papst Group, a family-run company headquartered in Mulfingen/Germany, is the world's leading manufacturer of fans and drives. Since the technology company was founded in 1963, it has continuously set the global industry standard with its core competences in motor technology, electronics, digitization and aerodynamics. With over 20,000 products in its portfolio, ebm-papst provides the best energy-efficient, intelligent solution for virtually every ventilation or drive-engineering task.

In fiscal year 2021/22, the "hidden champion" generated revenues of € 2,288 billion. The group employs roughly 15,000 people at 29 production sites (in Germany, China and the USA, to name but a few) and in 51 sales offices worldwide. ebm-papst sets the benchmark with their fan and drive solutions which are used in almost all industries, such as ventilation, air conditioning and refrigeration, heating, information technology, mechanical engineering, household appliances, intralogistics and medical engineering.

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