

ECFanGrid Benefits

» EFFICIENCY

Typically 40% of a commercial buildings energy use comes from heating, ventilating and cooling with 50% of the HVAC energy consumption coming from fans. The move from AC to EC fans in newer projects, has been significant due to their numerous advantages over their AC comparisons. EC fans can operate outside of their preferred operating range and still maintain a high efficiency, have reduced noise operation when speed controlled and the integrated motor and electronic makes for a compact design. Rosenberg EC fans also have built in controls and monitoring capabilities, enabling users to interrogate alarm outputs for fan faults, allowing individual problems to be addressed before total failure of the AHU. Savings as a result of moving from AC to EC occur from both improved motor efficiency and optimising system design.

» REDUNDANCY

ECFanGrids provide superior reliability as a result of their inherent redundancy. If one fan fails, only that portion of the airflow is lost, unlike single fan systems where the entire air handler goes offline. Moreover, the loss of airflow from one plug fan can be offset by increasing the speed of the remaining fans; this can be achieved automatically in conjunction with the building's BMS system. It allows for the facilities management team to plan for the downtime to suit the need of the building, for example, when the demands on the AHU are lowest.

» FLEXIBILITY

The number of plug fans in each ECFanGrid system can vary according to the airflow requirements. For example, in a wall of 9 fans in a 3x3 configuration where only 7 fans may be required for normal operations to deliver the designed duty, the 8th and 9th space can be blanked off with a plate. If the demands on the AHU increase through building expansion for example, the blanking plates can be removed and 1 or 2 fans added to the grid to meet the new requirements.

» EASE OF INSTALLATION

ECFanGrids are ideally suited for retrofit AHU projects, particularly where a single large radial fan is being replaced. It is often the case that buildings have expanded around an AHU over its years of operation. This can make the extraction of the old fan problematic but the install of the new fan impossible without minor works to the fabric of the building. The ECFanGrid, due to its smaller component size, can be walked through standard pedestrian doorways by no more than two operatives: a significant factor in maintaining a tight replacement schedule and reducing costs when compared to alternatives. The use of plug fans, where time and space is an issue, risks the least downtime and offers the best opportunity for a rapid return to normal system operation.

» EASE OF MAINTENANCE

Unlike a traditional belt drive unit which covers a large floor space, the ECFanGrid is completely free of the floor. This means that maintaining the hygiene of the AHU is quicker, simpler and more effective. No dust is released into the supply air as there are no belt drives to degenerate over time. Furthermore, component failure is quickly dealt with due to the modular nature of the ECFanGrid.

» NOISE ATTENUATION

Case studies show that sound is not an issue when using an ECFanGrid, on the contrary there will be more possibilities to significantly lower noise. When using an ECFanGrid there are two major advantages to attenuate noise. First, the noise spectrum of smaller impellers contains higher frequencies, thus the wave lengths are shorter, allowing for the use of shorter attenuators. Second, the required length of the fan section in a typical air handling unit, using a single large radial fan can be reduced dramatically – in some cases up to 50%.

A Rosenberg ECFanGrid consists of EC fans operated in parallel.

EC fans. The volume flow is multiplied proportionally to the number of fans the number of fans, while the pressure ratios remain constant.

The EC fans used are not only highly efficient, but as a perfectly matched unit (electronics, motor & impeller) they enable simple plug & play solutions for your ventilation requirements.

The ECFanGrid Retrofit System is a complete system for retrofitting, for example, belt-driven or direct-driven fans in existing installations. The system, which can be adaptively adjusted to the housing dimensions includes all the parts required for the conversion: fans, control cabinet, sheet metal parts and screws.

www.ECFanGrid.com



MOBIL

Fits through any door, every staircase and elevator

ADAPTABLE

Fits into all existing AHU systems, absolutely manufacturer-independent

REDUNDANT (FAIL-SAFE)

Remaining fans automatically compensate for fan failure the failure of a fan automatically

ALL INCLUSIVE

System is mechanically complete - fans, control cabinet, louvers, screws



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ECFanGrid

RETROFIT SOLUTIONS



Now Available from HVAC Depot

Installation example

Supply and extract air system of an airport reception hall

Project overview

- Supply and extract air for part of an airport reception hall
- Air volume: 50,000 m³/h case
- Replacement of two belt-driven centrifugal fans with forward-curved impellers

Measures and advantages

- Retrofit of redundant, parallel-operated EC fans as ECFan Grid 3x3 including the control cabinet
- More efficient and uniform flow to downstream components (filters, heat exchangers) • Highest hygiene requirements due to floor-free mounting • Belt drive maintenance not required

Key figures / evaluation

Total amount of air:	100.000 m³/h
Electr. power consumption:	54 kW
Investment costs: CO	39.870 AUD
-Savings:	40 t / year
Payback:	2,3 years

The old system could be renewed within 5 days. Due to the simple integration into the existing building control system and the associated demand-oriented control, further savings potential can be expected. Savings potential can be expected.

Installation example

Supply air system of an office building

Project overview

- Supply air for an office building
- Air volume: 27,800 m³/h
- Replacement of a twin belt drive fan with backward curved impeller

Measures and advantages

- Retrofitting redundant, parallel-operated Advantages EC fans as ECFanGrid 2x3 including the control cabinet
- Easy insertion in confined spaces
- Elimination of the filter stage downstream of the belt drive
- » Operating point reduction = further energy saving
- Belt drive maintenance not required

Key figures / evaluation

Total amount of air:	27.800 m³/h
Electr. power consumption:	19 kW
Investment costs:	10.366 AUD
CO₂-Savings:	13 t / year
Payback:	3,1 years

The old system was replaced within 2 days. The main focus was on redundancy, because in the past summer the system failed completely due to a motor defect and the building was no longer cooled. This is impossible in the future!

» ECFanGrid is a multiple fan array designed to improve reliability, flexibility and efficiency in new or existing ventilation systems.

Continuous and consistent airflow is essential to virtually every facility, making under-performing or unreliable fans simply unacceptable. In addition to reliability concerns, inefficient fans can be a building's biggest energy consumer. Given the increasing cause for environmental concern, designers should look to select EC plug fans which will not only provide the necessary reliability, but also provide optimum efficiency and environmental benefits.



Inefficient belt driven fan, as installed in most of the older air handling units



In most fan systems a single fan is selected for the required system and various methods of control are also installed to meet other operating points defined by the system duty such as dampers or variable pitch blades.

In some instances, it is advantageous to use more than one fan in a system, for example when it is necessary for the required operating range of the system to include multiple plug fans running closer to their peak efficiencies, instead of one large fan controlled over a wide operating range.



Multiple fans for capacity control may be more economical if the cost of operation is critical. By running fans in parallel, when one motor fails, only a portion of the airflow is lost, unlike single fan air handlers.

Efficient ECFanGrid as retrofit solution for the replacement of e.g. older belt driven fans. The ECFanGrid Retrofit KIT includes all mechanical parts: fans, cabinet, grid and screws.

An ECFanGrid consists of several modular backward curved centrifugal fans or plug fans arranged in a grid construction offering numerous advantages over conventional technology. It is equally suitable for new projects and as a replacement for large single fans in retrofit air handling units. In addition to being compact and flexible, the ECFanGrid is easy to clean, replace and maintain while expelling low noise and delivering uniform air stream. A uniform air stream improves the efficiency of other downstream components, for example, a thermal wheel.