

## The advantages of multiple fans in parallel vs. a single fan in ventilation systems

Given the increasing cause for environmental concern, designers should be looking to integrate EC fans into new and existing ventilation systems. Integrating multiple fans into a ventilation system can prove beneficial for a number of reasons discussed below.

### 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. Selecting EC plug fans which will not only provide the necessary reliability, but also provide optimum efficiency and environmental benefits. Savings as a result of moving from AC to EC occur from both improved motor efficiency and optimising system design. There is potential to achieve greater efficiency when the system's operating range includes multiple plug fans running closer to their peak efficiencies, instead of one large fan controlled over a wide operating range.

### Redundancy

Continuous and consistent airflow is essential to virtually every facility. Running fans in parallel allows for redundancy which is designed to improve reliability and consistency. For example, if one fan fails within the *ECFanGrid* (multiple fan wall from Axair Fans), 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 management system.

### 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. Plug fans can be walked through standard pedestrian doorways by no more than two operatives: a significant factor in maintaining a tight replacement schedule, reducing costs and downtime.

### 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*. For example, a single fan module could be replaced and the AHU back online within an hour of being shut down.

## Noise Attenuation

Case studies show that there is the potential 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%.

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