



No alternative to energy-efficient fans:

Controlled home ventilation for new buildings and renovation

Improving the energy efficiency of appliances and products in all sectors has significant economic and environmental benefits. Therefore, Minimum Energy Performance Standards (MEPS) are implemented in Australia and New Zealand to reduce greenhouse gas emissions and energy demand in both countries, and to help save consumers and businesses on running costs over the life of the products they choose to use.

Naturally, implementing the required energy efficiency means higher costs for the home builder, regardless of whether it is a new building or a renovation. However, "environmentally compatible" does not necessarily have to mean "expensive" in the long run. Firstly, the financial "energy-saving premium" will in time pay for itself – regardless of future energy prices. Secondly, good insulation and ventilation enhances the general comfort of the house, and the increase in the value of the property should also not be neglected.

The decisive component: the fan

Home ventilation systems with heat recovery are especially suitable for low-energy and passive houses, but they are also employed in the renovation of older buildings. For apartments and single-family homes, central systems are usually employed. The fans for the fresh air and exhaust air form the 'heart' of the system. They are required to work reliably and energy-efficiently as such ventilation systems are usually in continuous operation. Moreover, it is essential for low-noise and low-vibration motors and fans to be used. Because the ventilation ducts are routed throughout the building, droning motors would cause significant noise disturbance.

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Figure 1: Energy-efficient and low-noise centrifugal fans for air flows up to 400 m³/h



The right drive: unbeatable EC technology

The drive employed is a key criterion when selecting the right fan. Today, "asynchronous motors" are still employed to drive fans in ventilation and climate control systems. These AC motors are of a straightforward design and are powered directly from the A/C or three-phase current supply. Neither mechanical collectors nor electronics are needed to power the armature. They are robust and reliable, but they have one decisive drawback: depending on the design, they are only able to achieve an efficiency rating of about 50%. The efficiency describes the relationship between the achieved mechanical output and the electrical input. In other words, it is a measure of the energy efficiency of a drive. Modern EC drives, specially developed by motor and fan specialist ebm-papst for use in home ventilation systems, perform substantially better in this respect, which is due to the way they work.

On the EC motor, a magnetic rotor synchronously follows an electronically generated rotating field. EC motors are direct current motors that are straightforward to control. They work with an efficiency of up to 90%. Operating costs are reduced, the climate control solution pays for itself relatively quickly and significantly less CO₂ is created from the very first minute of operation, reducing the impact on the environment. At the same time, the drives are also remarkably quiet (Fig 2). The key to this is the especially low-noise commutation.

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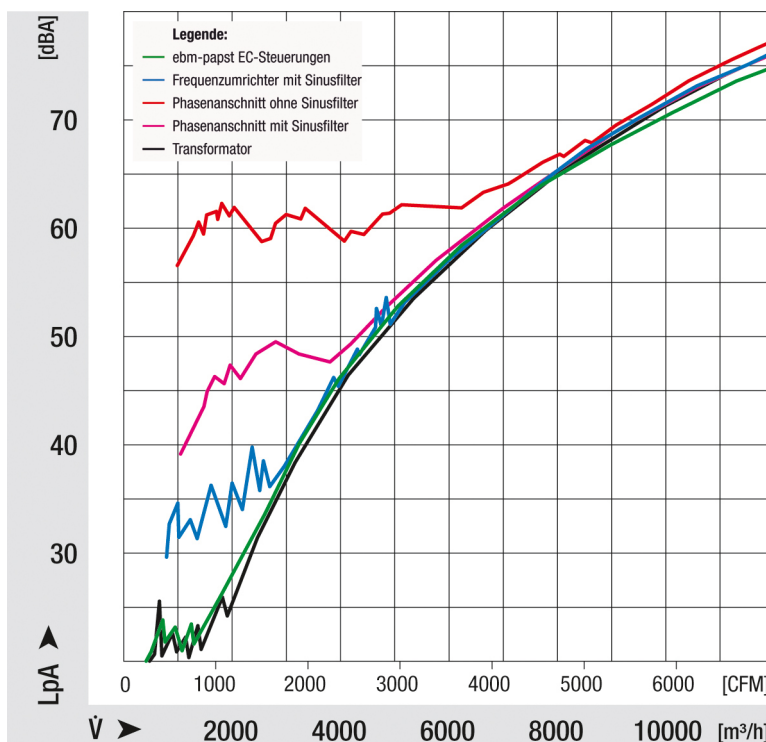


Figure 2: Noise behavior of different types of motor in comparison (green: ebm-papst EC motor / rest: AC motors with different types of control systems)



The right blade geometry

Apart from the motor, the geometry of the blades is an important factor when choosing the right fan. For home ventilation systems, centrifugal fans are employed, where a distinction has to be made between forward and backward curved blades. In home ventilation systems, forward curved centrifugal fans are predominantly employed. Here, the relationship between the power input, speed and airflow is approximately linear. That means that the airflow can be calculated using the speed and current draw, and the airflow can be controlled without an air volume sensor. The electronics integrated in the EC motor take care of these additional control functions. The sensorless airflow control also creates further advantages. This means that there is no reduction in airflow caused by contaminated filters. Moreover, the regulation of the airflow is more straightforward when the system is set up, which is an additional cost factor that should not be underestimated.

More information on EC technology - including training videos - can be found here: http://www.ebmpapst.com.au/en/ec_technology/ec-technology.html

About ebm-papst

We are the leading global manufacturer and supplier of fans, blowers and air moving products. We provide a unique range of air movement or specialist drives products. Our motor technology, engineering and logistics expertise will add value to your business.

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