Finding the right balance

With legislation and regulations surrounding fan motors becoming ever more stringent, there is concern that end users the environment could be affected. Andrew Saxon explains

With the non-domestic sector contributing to 38 per cent of the UK’s carbon emissions, energy-using products installed in commercial, industrial and public sector premises have recently come under close scrutiny, particularly through the ErP (Energy-related Products) Directive.

The ErP Directive aims to make energy consuming products more environmentally sound, ultimately helping the EU to achieve its 20-20-20 target to reduce energy use by 20 per cent and increase the share of renewable energies by 20 per cent by 2020.

Electrically driven fan motors have become an area of focus within the ErP Directive. The first stage, starting in January 2013, will see fans with an input power ranging from 125W to 500kW having to meet specific efficiency values. Then, from January 2015 a second stage with higher efficiency values will be introduced.

Huge implications

Of course, with a fan motor being an integral part of air curtains, fan coils, fan convectors etc. these changes have huge implications for the industry. Although fan coils have earned an enviable reputation for providing reliable, cost-effective air conditioning throughout thousands of commercial buildings, it has long been recognised that the technology needed to move on in terms of energy efficiency, as of course has been the case with many HVAC products.

And, in line with Part L2 of the Building Regulations, manufacturers have made big improvements. The 2010 Part L2A and Part L2B documents rate the fan efficiency of FCUs in relation to their specific fan power (SPF)1, stating that this should not exceed 0.69W/ls-1 when measured as the rating-weighted average of the installation2.

Traditionally FCUs incorporated two-pole AC fan motors, which have an inefficient SPF of 0.9W/ls-1 or higher. A more efficient approach has been the use of four-pole AC fan motors, which have SPF ranging between 0.5 and 0.75W/ls-1, but a better solution is the modern electronically commutated (EC) DC motor.

EC FCUs are more efficient than conventional AC FCUs, and the air volume can be more readily altered in line with cooling/heating demands. This makes them much more efficient – claims suggest they use up to 70 per cent less energy than typical 2-pole AC products, and will also operate for twice as long, resulting in lower maintenance costs.

However, even EC motors have had to become more efficient in line with the ErP Directive. Since June 2011 IEC motors have had to comply with the requirements of Directive (2009/64/EC) and have needed an efficiency class of at least IE2 – with IEC motors of a lower efficiency class no longer being allowed to be marketed within the EU.

While we understand that it is essential for all parts of the commercial sector to contribute to the reduction of carbon emissions, and that the importance of improving fan motor efficiency cannot be denied, it is also essential for the changes to be sensible, balanced and cost-effective, enabling all parties to benefit.

Our primary concern is that because the most energy efficient fan motors demanded by the ErP Directive are more expensive, this could have serious implications for manufacturers, end users and – ironically – the environment.

For manufacturers, the cost implications are two-fold. Firstly, they will be buying a more expensive component, and secondly, because they are essentially adding a different technology to their product that will perform differently there will be costly modifications and testing/approval procedures to undertake.

Very tight margins

Manufacturers can of course choose to absorb these additional costs, but this will be difficult for those already working to very tight margins. In reality, the cost is more likely to be passed onto customers through product price increases.

Our fear is that when faced with additional costs customers looking to retrofit products will decide not to invest and will instead keep their old, inefficient air conditioning systems – especially during these economically difficult times – so efficiency levels won’t improve and carbon emission reduction targets won’t be met.

We can of course talk about payback periods and how a more efficient fan motor will quickly pay for itself in terms of energy savings, but in many cases FCUs are bought by a landlord – who doesn’t pay the energy bills and won’t therefore see any monetary benefit.

We are seeing the requirements for fan motors becoming ever more stringent, and while we understand this is necessary, the approach does need to be a sensible, balanced one that takes the added cost into consideration. We know that many of our customers want to reduce their energy usage and carbon emissions by investing in modern FCUs, but the higher cost associated with energy efficient components will put these products out of reach for many, especially in the current economic climate.

References

1) A measure of power in Watts required to create an airflow of one litre per second.
2) Calculated by adding the product of the power supplied and the SPF for each fan coil unit in the installation, and dividing by the sum of the power supplied for all the fan coil units in the installation.

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