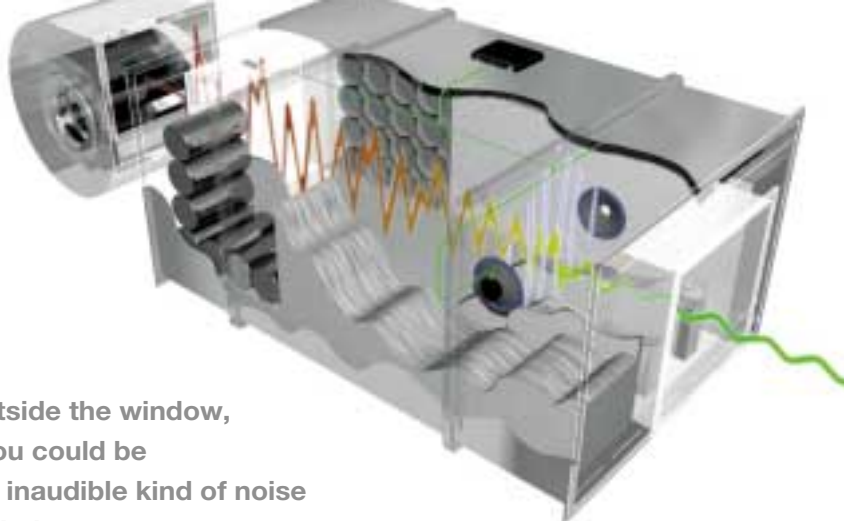


The silence of the fans



If your idea of a noisy office is loud traffic outside the window, ringing telephones and heated discussion, you could be overlooking another, more pervasive, almost inaudible kind of noise that may be causing bigger waves in the workplace.

Surprisingly, rather than keep you awake, some of that noise in the office is more likely to be putting you to sleep. Barely audible low-frequency noise – emanating from air-handling units – is a constant irritant to some people. You have to concentrate hard to hear it, but it is there. With your brain battling hard to concentrate on what you are doing, underlying noise of this kind can trigger a battle of wits that can make you feel very weary.

The effects of this sort of ambient noise pollution are only just beginning to be understood. It is the focus of huge amounts of research at the moment, particularly in Sweden. And ABB is on the leading edge of research to invent an advanced silencer system to cut out the noise in office and building heating, ventilation and air conditioning systems.

To date, silencer systems have tended to be heavy pieces of equipment, depending mostly on using fibrous sound muffling material. The higher the frequency of noise the more of this fiber needs to be used. Since it is packed into the system it will often block the air flow channels, leading to a loss of pressure in the air unit and therefore reduced performance. Another disadvantage is that traditional methods can do nothing about low-frequency noise.

ABB has now developed an advanced silencer that not only reduces high-frequency noise with less dampening

material but also for the first time offers a way to get rid of low-frequency noise.

The new silencer takes an active approach to attacking low-frequency noise. This involves a microphone fitted ahead of the silencer unit that records the low-frequency sound. The sound is then fed into a controller, where the phasing of the sound waves is manipulated digitally. The controller kills the low-frequency sound by producing a precise opposite of the sound wave formation.

A second microphone, fitted downstream of the silencer, is used to monitor that the sound has been cleaned up. The system is the first to offer a way to eliminate sounds below 150 hertz.

Higher-frequency sounds are tackled using dissipative dampening techniques.

The difference here is that fibrous material is replaced by a plastic muffling material. This is less bulky, meaning that dampening is achieved with a lower pressure drop than at present. A further benefit of using the plastic material is that no micro-fibers are blown into the air – a particularly important feature for units used in clean environments like hospitals, laboratories and clean rooms.

The advanced silencer, which will be marketed beginning in autumn 2001, is designed to work with the latest air units made by ABB but can be retrofitted to older systems already installed in buildings. It is supported by a mass of Web material and software to help operators achieve maximum efficiency.

