

“Things That Whine In the Night”

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No, we’re not talking about the teenage girl who doesn’t want to do her chores, but that annoying sound from the neighbor’s air conditioner. Poorly designed or inadequately maintained air conditioners can not only be energy-inefficient, but can easily create noise levels more than four times the ambient.

Self-contained units, such as window air-conditioners, are generally inexpensive and not built to last many years. They have a much lower cooling capacity than installed systems and, unless they are really “on the way out,” are not objectionably loud.

We concentrate this discussion on the larger residential systems, often described as “central air,” consisting of two basic units: The air-cooled compressor that sits on a base outside of the building (or on the rooftop or within a larger building) and the evaporator/air circulator within the building. These two units are connected by piping, and the coolant flows between them in gaseous or liquid state.

Noise complaints almost always concern the compressor unit, specifically:

- Lack of appropriate vibration isolation (for units installed on or within a building). This is usually typified by low frequency noise within the building – sometimes far away from the source of the vibration.
- Noise radiating from piping. This may be mid and low-frequency noise heard within the building.
- Compressor noise and vibration, often resulting in vibration of the metal shell surrounding the unit which increases radiating surface area. This is the sound heard by neighbors, as is
- The cooling fan/motor assembly for the compressor.¹

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An experienced sound control professional can generally pinpoint the problem(s) with an on-site inspection and frequency analysis, and recommend remedial steps which need not be expensive. In one recent instance, the simple replacement of a fan blade on a brand new compressor unit from a major manufacturer reduced the noise level by 12 decibels – more than cutting the perceived noise level in half. It is interesting to note that the manufacturer and dealer staunchly maintained that the noisy unit was “acceptable” until they finally capitulated. After weeks of stalling, the cost of the “upgrade” was less than \$200.

But how loud is too loud?

Most residential complaints come from smaller systems serving single and multi-unit residences. In a study at a condo development in southwest Florida earlier this year, we determined that the “average” sound level produced by unit air conditioners was below 70dBA, when measured 3’ from the exterior (compressor) unit. Complaints were common when the level exceeded 75dBA – or a pure tone was present.

This prompted us to develop the following simple covenant for the complex:

“Sound levels from unit air conditioners shall not exceed 72dBA when measured at any point within 3’ of the exterior enclosure. A 5dB penalty shall apply where a pure tone, evident in frequency analysis, is detected.”

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