

Archimedes wind turbine generator

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Unlike larger, more traditional domestic wind turbines, Dutch firm Archimedes's says its Liam F1 Mini Urban Wind Turbine can generate up to 1,500 kWh of free wind energy per year in near silence, making it "ideal for urban installations". Most domestic-scale wind turbines make a similar amount of noise as ambient air, which is about 6 decibels. To put that into perspective, larger turbines make around 35 to 45 decibels, roughly as loud as a fridge.

Archimedes claims its new turbine is "silent"; it will likely generate comparable, if not lower, noise levels than typical small turbines. This near-silent operation is made possible by its conical design, which can be mounted on most roofs without the need for large mounting masts. Archimedes recommends installation in cities due to the larger wind turbulence typically found there.

"The Archimedes windmill is a new type of wind turbine comprising three circular blades wrapped around one another and then expanded. This creates a three-dimensional conical turbine, similar to elongated shells found on the beach," says Rinus Mieremet, inventor of the Archimedes wind turbine.

The 1.5-meter diameter (and smaller 0.75-meter model) turbine is also helical, producing the turbine with an integrated wind vane to help it face incoming wind automatically.

According to Archimedes, these design features guarantee optimal turbine performance in wind conditions. This is especially true at lower wind velocities below around 5 meters per second. This is key to making wind turbines, especially small-scale ones, viable for energy generation.

For emergency or maintenance purposes, an electric brake is installed at the back. The company says that performance remains the same even with dirt, snow or rain. It can also handle turbulent air.

The turbine is bat and bird friendly, a common criticism of wind turbines. The impact of wind turbines on nature, even small ones, can be a serious consideration, especially if located near a major migration path.

Typically, smaller wind turbines require at least 5 to 6 m/s to generate enough power to justify their cost. Wind quality is also important, with obstacles like trees or other buildings limiting where domestic-scale wind turbines can be installed on a roof or location.

In some circumstances, especially in the UK, listed building status or locations in conservation areas can also restrict, or outright prevent, the installation of wind turbines—especially tall mast-mounted systems.

Smaller, more inconspicuous wind turbines are therefore much better suited to urban environments like high-rise buildings or suburban housing estates. However, due to their small size, most domestic-scale wind



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turbines tend to have relatively small outputs, typically running from 1kW to 25kW, depending on size.

A 'mini' 1kW turbine might be able to churn out 800kWh per year. Moving up the scale, a 'small' 2.5kW version might produce 3,500kWh, while a 'medium' 6kW installation on a good site could produce up to 9,000kWh per year.

With this in mind, the Liam F1 Mini Urban Wind Turbine comfortably falls within the 'micro' to 'small' range. But what makes it unique is its interesting design and colour customisation options, which help it blend into the background.

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Web: <https://www.sumthingtasty.co.za/contact-us/>

Email: energystorage2000@gmail.com

WhatsApp: 8613816583346

