



thinair

THINAIR102

Innovative single blade design.
Quiet, efficient and affordable
domestic wind power.

Introducing Thinair 102

Until recently, reliable turbines for small scale wind power generation have not been available. Existing household wind power generation was limited to turbines built, installed, and maintained by enthusiasts.

Powerhouse Wind's engineers started with a different approach. We applied our experience in designing high-volume, mass-market consumer products to designing and manufacturing a wind turbine purpose-built for use in a domestic environment. The result? The Thinair 102 turbine; reliable, simple and elegant.

Generating 3250kWh to 5200kWh per year* the Thinair 102 delivers all or most of the energy requirements of a well-designed, energy-efficient home quietly, reliably, and best of all sustainably.

*On sites with average wind speeds of 5-6m/s

On-grid or off-grid: the choice is yours

If you are not connected to the electricity grid, your Thinair102 can store generated energy in batteries . An inverter can then convert this battery-stored energy into a standard AC electricity supply to power your house.

Or, by consulting with your local energy provider, you may be able to connect your Thinair 102 to the grid using a grid-connect inverter. This enables you to feed the energy generated by your Thinair 102 into the electricity grid, and draw energy back from the grid when you need it. In effect you use the grid like a large battery, storing excess energy to be used when required.

Whichever option you choose, Powerhouse Wind can supply you with a complete solution including the Thinair 102 turbine, tower and inverter.

Is Thinair for me?

The Thinair 102 is purpose-built for deployment in rural or semi-rural locations with a minimum section size of around 0.4 hectares (1 acre). The Thinair's unique design makes it perfect in turbulent wind conditions such as those found around buildings and trees in a domestic environment.

TAKE A
LOOK AT
THINAIR'S
UNIQUE
DESIGN
BENEFITS

INNOVATIVE
HUB DESIGN

UNIQUE
SINGLE BLADE

QUIET AND
RELIABLE

SLEEK
MINIMALIST DESIGN

Revolutionising domestic Wind Power

Its sleek, minimalist design makes the Thinair a visual asset complementing any environment.

It delivers all, or most, of the energy requirements of an energy-efficient home.

INNOVATIVE HUB DESIGN

The patented “teetering hub” design maximises energy generation allowing the blade to auto-adjust to an optimal angle through a full range of wind speeds.

The teetering mechanism minimises wear-and-tear on the hub, housing and blade, and protects the blade from damage in strong winds - delivering greater reliability.

Integrated electronics provide automatic load generation balancing and sophisticated monitoring and reporting.

UNIQUE SINGLE BLADE

Delivers significantly quieter operation without sacrificing generation capacity.

The single blade lowers manufacturing costs, delivering a more affordable solution.

Hi-tech, carbon-fibre construction combines strength and durability - resulting in lower blade weight and greater efficiency in variable wind.



Thinair 102 Specifications

Turbine type.....	Horizontal axis, patented “teetering hub”, down wind, stall regulated
Rotor diameter.....	3.6m
Swept area.....	10.2m ²
Number of blades.....	1
Blade material.....	Carbon/glass fibre epoxy hybrid
Rated power.....	2kW
Rated wind speed.....	10m/s
Cut in wind speed.....	3.5m/s
Cut out wind speed.....	20m/s
Rated rotation speed.....	370rpm
Rotation speed range.....	60-400rpm
Alternator.....	Permanent magnet, axial flux, 3 phase, direct drive
Inverter input.....	200-400V DC
Annual energy output at.....	3250kWh
5m/s (average wind speed)	
Control system.....	Powerhouse Wind electronic control
Turbine top of tower weight.....	70kg
Minimum recommended.....	8m
tower height	

The Thinair difference

The first thing people ask when they see a Thinair turbine is, “why a single blade?”

The answer is key to understanding the unique benefits that Thinair’s innovative and patented, single-blade, “teetering hub” design offers.

Traditionally, wind-turbines are constructed with multiple blades. Large commercial wind-turbines include complex and expensive mechanisms that enable blade angles to be varied to maximise energy production and protect blades from damage in heavy winds.

These mechanisms are too expensive for domestic wind-turbines. As a result domestic turbines generally have fixed-angle blades that are less efficient at harnessing the power of the wind and make the turbines more prone to stress and damage.

The patented “teetering hub” design of the Thinair turbine, by contrast, allows it to automatically adjust the blade’s angle according to changes in wind-speed. This innovation provides efficient operation in all wind conditions from the lightest breeze to strong gusts and automatically protects the Thinair from stress and damage, allowing its single blade to swing into a safe position in extreme wind conditions.

How it works



Blade in normal operation mode.



Teetering hub changes blade angle to maximise generation from wind gusts.



Hub teeters 90 degrees to protect the blade in storm conditions.

About Powerhouse Wind

The Thinair 102 is the work of Powerhouse Wind, a team based in Dunedin, New Zealand, in the heart of the Roaring 40's. We combine a wealth of product design, engineering and manufacturing experience with an innovative design philosophy.

We are passionate about the potential household wind generation offers for a sustainable world and are committed to our vision to build the best home-scale wind turbine in the world.

THE PRINCIPALS:

Wayne O'Hara,

Wayne comes to Powerhouse Wind with over 20 years of product design engineering experience. He has worked at some of New Zealand's most respected companies including Tait Electronics and Fisher & Paykel where he was part of the engineering team responsible for the innovative DishDrawer. Recently Wayne returned from Cambridge (UK), where he worked for international consulting firm Team Consulting, to start Powerhouse Wind.

Richard Butler,

A graduate of Auckland University, Richard brings a passion for combining electronics with innovative mechanical engineering – particularly in the renewable energy field. Richard trained as an electronics engineer and joined Fisher & Paykel where he held numerous roles including Electronics Manager, Technical Functions Manager and Engineering Manager. Richard was also part of the DishDrawer team.

Bill Currie,

Bill has a strong personal interest in a great wind turbine solution, he lives in an off-grid house and has a long standing interest and belief in local energy solutions. After mechanical engineering training, Bill worked for New Zealand Electricity for 4 years. Following some time working overseas, Bill did an MBA at Otago University, including a project for Fisher & Paykel Appliances which evolved into 18 years of employment with the company. He worked in a number of roles starting with design engineering on the DishDrawer team, and concluding with responsibility for Engineering Services for all sites.

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GENERATING THE FUTURE

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