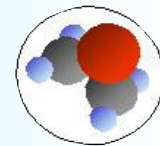


CARBON CONCEPTS LIMITED

GENERATOR BROCHURE

March 2006

www.carbonconcepts.co.uk



The Generators

Carbon Concepts and Durham University have developed a range of high performance, permanent magnet, axial flux generators that are optimised for wind and water turbine applications. We have built and tested generators with ratings 1.5 and 2.5 kW, and are currently building a 5.0 kW machine. There is even a very small generator rated at 200W. The prototype has demonstrated its robust electrical and mechanical design, having run outside for almost a year, driven by our development [wind turbine](#). Besides our own bench testing, production specification machines are now running on test beds at Durham.

The 5.0 kW generator uses more advanced coils and magnets than the smaller versions, allowing it to be close to the dimensions of the 2.5 kW machine.

We are pleased to announce that the generators are now available for general sale.

Technical Specification

- Greater than 90% efficiency
- three phase output
- brushless
- Neodymium-Iron-Boron permanent magnets
- axial flux configuration
- iron-less stator construction
- output voltages available to suite:
 - battery charging
 - mains connection
 - direct heating
- high quality materials (with the exception of the flux rings, all mechanical parts are stainless steel or composites).
- 590 mm and 490mm diameter (2.5 kW and 1.25 kW generators)
- 60 and 35 kG mass (2.5 kW and 1.25 kW generators)
- All electrical conductors are fully potted in epoxy resin

Features

- Optimised for speeds typical of small turbines (generally less than 1000 rpm)
- Easily adapted to other ratings
- Bearings are fully sealed and lubricated for life
- Only one moving part
- Easy to match to customers' specific requirements
- No "cogging torque" to inhibit start-up
- Low mass
- Switchable coil configuration to suite application
- Can be used in geared and direct drive applications
- May be mounted at the top or the base of the tower
- Drive shaft at both ends of generator
- Choice of vertical or horizontal installation
 - Direct or remote rotor mounting
 - Standard key drive



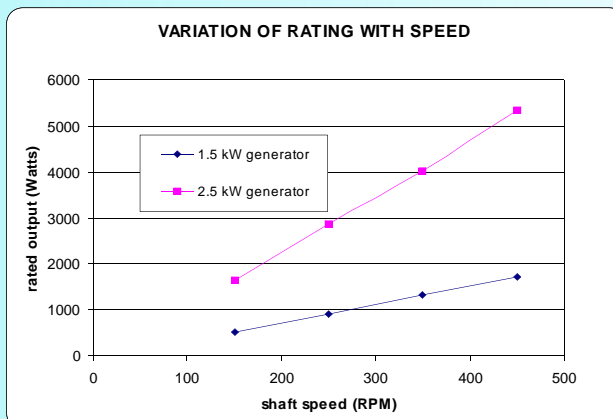
Most standard features can be adjusted to accommodate customers' requirements.

Ratings

The ratings of these generators depends on the speed at which they operate. We have nominally rated the first two at 2.5 kW at 250 RPM, and 1.25 kW at 300 rpm. The variation of rating with power is illustrated in the graph.

A major benefit of our unique, simple design, is that we can easily adjust the specification to match the requirements of individual customers.

This is a critical advantage in the alternative energy sector, where the speed - rating profile of any two turbines is rarely the same.



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