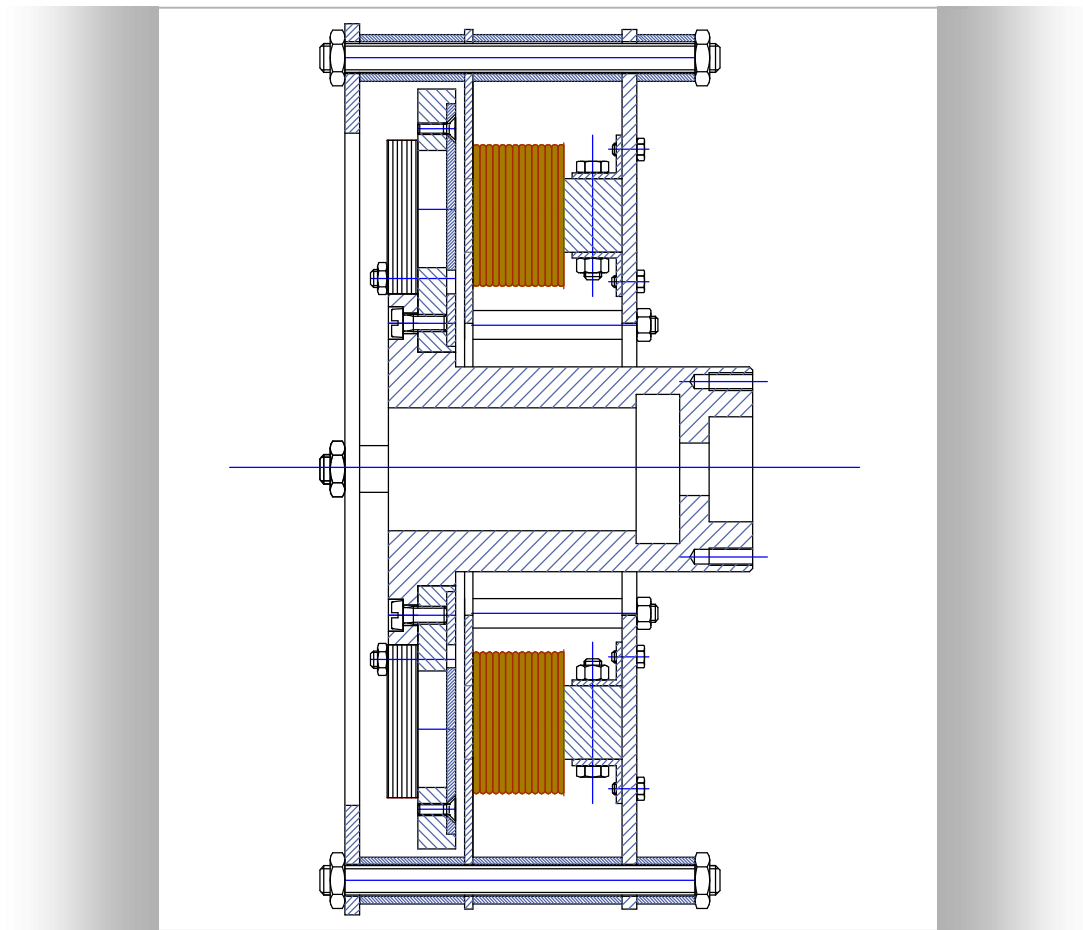


AXIFUS

What

AXIFUS is a disc or pancake axial flux permanent magnet generator with a U-shaped stator, which is specially designed to have a simple, light and robust construction with a high efficiency and a controlled output voltage over a wide speed range. Measurements on the prototype (see picture) show a maximum power output of about 4 kW by a speed of 3600 rpm and an active weight of 9.3 kg.

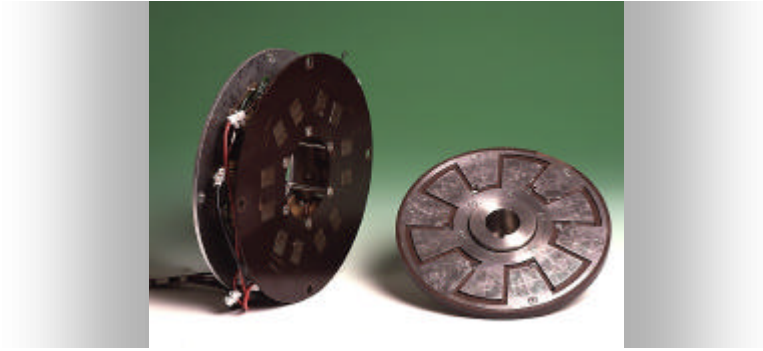


Cross-sectional view of AXIFUS

How

Because of the use of standard materials and the simple mechanical construction of the specific parts, AXIFUS is very well suited for the production of small series. The assembly is light and robust.

In its most simple design the machine consists of a disk shaped rotor and stator coupled by an axial magnetic field. The rotor is composed of permanent magnets to create a magnetic flux, of the necessary magnetic material to close the flow lines and of flux distribution plates to prevent torque pulsation. The stator is made up of standard magnetic U-cores wound with electric coils that are clasped tightly between two discs.



Stator and rotor of AXIFUS

Several variants on this design are possible: 3 or 4-phase machines, specially shaped permanent magnets, flux divide plates attached to the stator instead of the rotor, twin types of machines, switched reluctance machines.

AXIFUS always works with an electronic converter that takes care of a stable sinus-shaped output voltage when working in generator-mode and that serves as motor control when working in motor-mode. The converter can be build in a modular way, which makes it for instance possible to integrate the necessary software to connect several generators in parallel to the grid. Also special safety and alarm functions can be integrated in these modules.

Advantages

- Simple, light and robust construction.
- High energy density.
- Controlled output voltage over a wide speed range.
- Usable at different frequencies.
- High power to weight ratio.

Possible applications

- Power generation by low speed energy sources such as wind and water.
- Hybrid electric vehicles.
- Integrated starter generator.
- Mobile generating sets.

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