

Inventor: andreas@fetura.at, Patent No. 4635055

innovative motor - generators

In the following, the new generators and the machine arrangement, as well as the requirements and the physical possibilities and limits, are presented simply with calculation examples and explanations.

All inventions of the system are covered in a Patent No. 46350553.

The generators can be used almost without restriction; they can be started in several ways. The most important feature of the machine arrangement is able to operate without a grid connection, whereby no operating resources are required.

An application in the area of critical infrastructure specifically would be optimal.

These special new machines function in a system arrangement of a motor and generator(s).

This system is based on the division of labor within a machine.

More work is therefore performed within a given constant time.

Due to its novelty, one must not only understand the concept but also calculate some examples to recognize the benefits and also the limitations.

Laws of Physics are not violated.

At the End you find, the strict requirements listed, so that the law of conservation of energy is not violated.

Experience has shown that experts initially have difficulties with completely new concepts, as they have to overcome ingrained ways of thinking.

This is exactly where mathematics and some calculation examples help.

Inventor: andreas@fetura.at, Patent No. 4635055

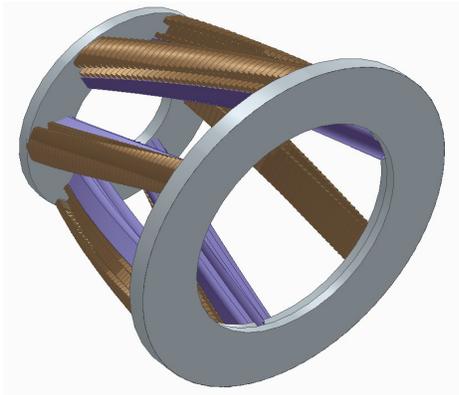
The New Motor Concept:

The motor does not have a conventional motor shaft, but rather a rotor body with opposing, different diameters (Figure 1).

The motor has only one direction of rotation.

The stator runs conventionally on the outside (3-phase rotating field).

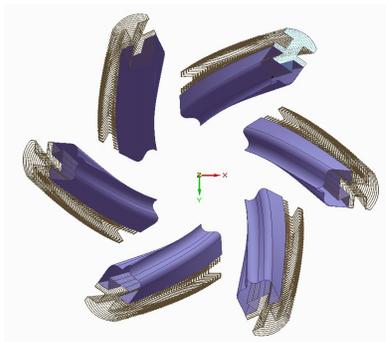
Figure 1



graphic: Ing. Michael Filzmaier

Pole formation like a squirrel-cage rotor; laminated cores with DC power supply are within the rotor strands (Figure 2).

figure 2 (graphic: Ing. Michael Filzmaier)

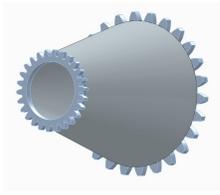


Inventor: andreas@fetura.at, Patent No. 4635055

Mechanical Power Transmission:

For mechanical power transmission (Figure 3), a spur ring gear is attached to the required side.

Figure 3 (graphic: Ing. Michael Filzmaier)



On the opposite side of the spur ring, the cables for the DC power supply for pole formation are passed through (e.g., slip rings).

See Figure 2, winding around the schematically represented electrical steel sheets.

Internal Air Cooling:

As can be seen in Figure 2, lamellae (wings) for the application of ambient air are attached to the inside of the rotor strands (in purple); however, these can be designed variably depending on the solution of the N-, S-pole connection.

This results in one direction of rotation and efficient cooling during operation, as cold air is sucked in at the small diameter and warm exhaust air is blown out at the large diameter.

Challenges:

- The bearing (constant air gap)
- It has only one direction of rotation

Inventor: andreas@fetura.at, Patent No. 4635055

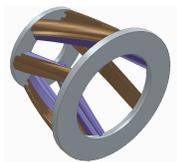
Advantages:

- Rotating field is used optimally
 - (Without turbulence - Lorentz forces and heat input on a central motor shaft are eliminated)
 - Efficient cooling
 - Direct, optimal mechanical power transmission from the rotor body
 - A transmission directly from the motor is possible without a gearbox! (Figure 4)
-

The Machine Arrangement

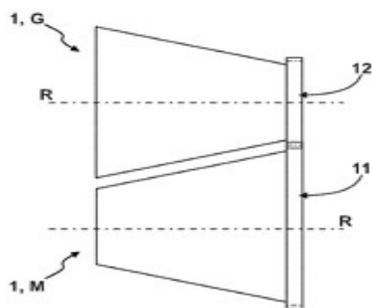
It makes no sense to directly couple motors with different speeds. Until now!

Motor Version (M): The ring gear is at the large diameter, cables and exciter at the small diameter.



Generator Version (G): Here the ring gear is at the small diameter and the cables at the large diameter.

This machine arrangement enables the direct mechanical connection of the rotors.



Inventor: andreas@fetura.at, Patent No. 4635055

But also from two motors with different speeds, as no gearbox is required! It is therefore possible to connect a motor with a low speed and higher torque directly to a generator with a high speed and low torque, translated via the rotors. In 1:3 gearing which enables the use of more low torque outputs.

Calculation Example:

It is essential to combine a motor with high torque and low speed into a high-speed configuration.

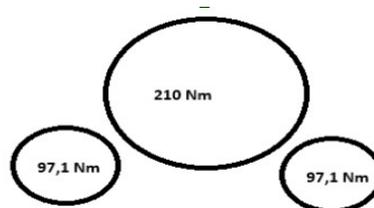
Easily implemented by adjusting the pole pairs; i.e., 12 poles at 500 rpm to 4 poles at 1500 rpm.

If you take a **motor with 210 Nm at 500 rpm**, you can split the 210 Nm like in a transfer case.

Use only **194.2Nm for two generators** together and

15.8 Nm of **residual energy remains** at the motor (partial load).

Energy conservation works!



The work performance of the generators is increased within the working time of the motor.

The generators simply work more in the same constant time.

Inventor: andreas@fetura.at, Patent No. 4635055

Second Application:

Short-term UPS System

1. Extremely robust, mechanical-electrical uninterruptible power supply system.

This can be used to smooth voltage fluctuations.

2. But also as boost system to be able to charge batteries quickly.

One of my motors can be used as a flywheel by switching it to a de-energized state; the stored kinetic energy (rotation) can be used via a magnetic coupling to briefly operate a stronger generator.

Roughly speaking, approx. 90 kW can be generated from 11kW for a short period of time.

3. Or you could use such a configuration in a car. 1 motor and two generators for standard use, and one big generator as UPS System for short time boost power. I think 80kW short time boost would be realistic.

I'm sure you can have fun with the math.

AP - inventor