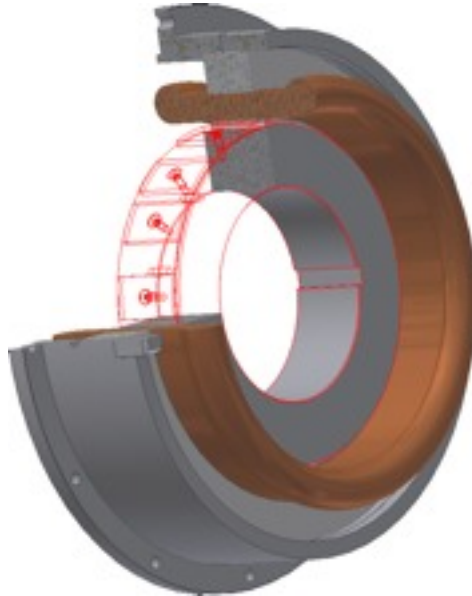


Permanent Magnet Generators (PMG)

What is a PMG?

A permanent magnet generator is a synchronous generator in which the excitation coil, normally in the rotor, has been replaced by a system made up of permanent magnets which provide a constant excitation field.



It is used in those cases in which it does not matter if the voltage drops a certain degree or when electronics are applied to the output of the generator.

The electronics can convert a voltage range into continuous voltage of a constant value.

How does it work?

The operation of the PMG differs greatly from a normal synchronous generator. In a normal generator, voltage is controlled by means of excitation. In a PMG, excitation is constant which is why, when the generator is charged, voltage drops without the option to regulate.



What applications does it have?

The PMGs manufactured by Obeki are used, for example, to feed the regulators which act in the excitation of large synchronous generators. The main benefit in these cases is that when there is a short-circuit in the large synchronous generator, they are capable of supplying the energy necessary to the regulator so that it can overexcite the generator and

What is it used for?

maintain the voltage sufficient time so that the protections can start.

Another important use for our generators is wind power generation. By means of Obeki wind turbines, brushes and differential systems are eliminated, saving on maintenance, space and price.

What advantages does it have?

The main advantage is its simplicity. The manufacturing and assembly of the rotor is cheaper if magnets are used. They do not need maintenance because they do not have brushes. The mechanical consistency of a PMG is superior, in addition to not needing systems for its excitation. By eliminating the excitation, energy savings of 20% can be had by simply using magnets. By being an energy source which is independent from the generator, it can serve to supply energy to auxiliary systems of the main generator.

What are the magnets like?

The magnets used by Obeki are cutting edge to ensure their optimum operation. Normal magnets, when the magnetic circuit that surrounds them, lose their magnetization, while those used by Obeki maintain them, which is why the rotor can be separated from the stator without the fear of losing magnetic properties. The magnets used by Obeki, depending on the



type, are capable of working at up to 140°C, 80°C magnets being the standard.

Obeki uses Neodym Cobalt magnets since they have the best properties.

In the case of wind turbines, the magnets can be a problem since they generate reluctant pairs which do not allow for the start-up of the generator at low wind speeds. Obeki configures the generators to eliminate this effect.

What is the voltage supplied by the PMG like?

The wave shape generated by the PMG can almost be sine depending on the intended use. The construction shape of the rotor where the magnets are placed are of great influence. Obeki manufactures PMGs with low harmonic levels, a single magnet per pole, inclining the slots of the stator, etc., or of a greater harmonic level, simple construction, lesser cost. The selection of one or

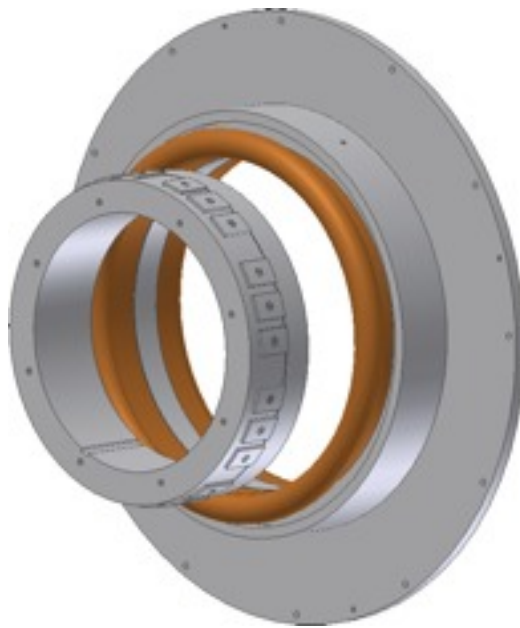
another depends on the client's specifications.

What voltages does it provide?

The voltage supplied depends on the magnets, the coil and the revolutions. Obeki precisely calculates the output and adapts it to the client's needs, capable of supplying different PMGs at the same voltage for different speeds. Obeki manufactures PMGs from 200 rpm to 3600 rpm.

How so I adapt it to my machine?

To ease its clients' work, Obeki adapts them to their needs. Obeki manufactures the PMGs so that they can be connected to the attachment the client needs.



Obeki configures its PMG to assure their optimum operation, simplicity in assembly and construction to provide a simple, robust, reliable, stable, adaptable and profitable product to its clients.