Permanent Magnet Type DC Generator

The permanent magnet type of DC generators basically means they use permanent magnets to directly provide the magnetic flux that is needed for voltage generation.

This type is not used much as it is hard and not cost effective to make large permanent magnets enough to produce a considerable output. Using permanent magnets is also not favoured as it lacks the ability to vary the magnetic field that is needed for the ability to control the generator output.

As such the common uses for these types of generators are limited to those where constant lower output is acceptable. Some of its common uses are electrical tachometers, hand operated insulation testers and primary exciters for larger alternators.

Advantages of Permanent Magnet Generator :

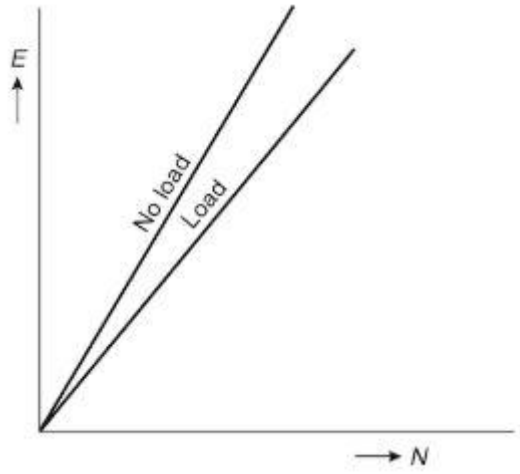
1. They are used in motor to create a magnetic field without the use of the application of the electricity and hence nearly free electricity is produced by use of these in the motor.
2. They are permanent magnet generators are very simple to build and requires very less maintenance since it doesn't have brushes and hence no need to replace them.
3. The permanent motor produces electricity continuously without the need of the magnetizing the magnets used in stator to produce the magnetic field inside the motor.
4. The permanent magnet generators are environment friendly and do not rely on the external weather to produce electricity.
5. The permanent magnet generators are small in size and hence requires very less space compared to other types of generators.
6. The permanent magnet generators run for years and years without wear and tear and are very silent.

Disadvantages of Permanent Magnet Generator:

1. The permanent magnet motor cannot be stop and start with ease.
2. The magnetic flux remains constant and hence external force is required to start it running.
3. The permanent magnet generators are difficult to regulate.
4. A very big size permanent magnet is required for generating a high torque in the permanent magnet generators as compared to the size of the electromagnet required for producing same torque.

Load Characteristics

As flux Φ_B is constant, the load characteristic is almost identical to the no-load characteristics. The graph below shows the relation of emf E with speed N:



If a sensitive voltmeter is used, i.e. one requiring negligible current, generator output will be so small that the armature drop (I_aR_a) will be negligible. The load terminal voltage is nearly equal to the generated e.m.f E_g.

$$E_g = V$$