

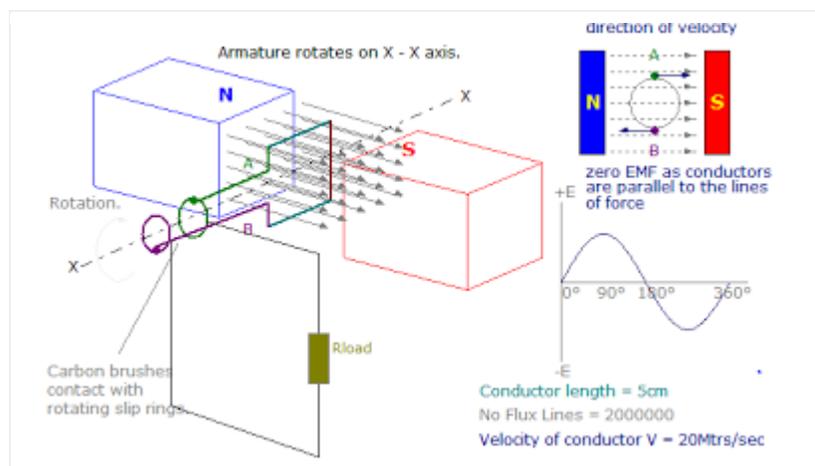
INTRODUCTION TO DC GENERATOR

GENERATOR is machine that converts mechanical energy to electrical energy.

DC generator or direct current generator generates a voltage when speed and flux are met. This machine is called a unidirectional (*dynamo*). It consists of the same basic elements as a simple AC generator like the multi-turn coil rotating uniformly in a magnetic field .

The output of which is a series of emf pulses, all in the same positive direction resulting in an average EMF developed across the load. Increasing the number of coils thereby smoothen the output providing more pulses at each revolution.

The generated voltage depends upon the number of poles and armature winding turns. It has armature with iron core and air gap which is uniform the vicinity of the center of the pole and which becomes larger as the pole tips are approached. This construction gives a uniform flux distribution under the main parts of the pole face with a reduction in the flux at pole tips. To produce an emf the conductor must cut the magnetic lines of force. The single coil is connected to two copper segments by carbon brushes. As before the output *electromotive force* is a result of the coil cutting across the lines of *magnetic flux*. With any inductive machine an emf will only be generated while the lines of flux are being cut. Stop the rotation at any angle and the output falls to zero.

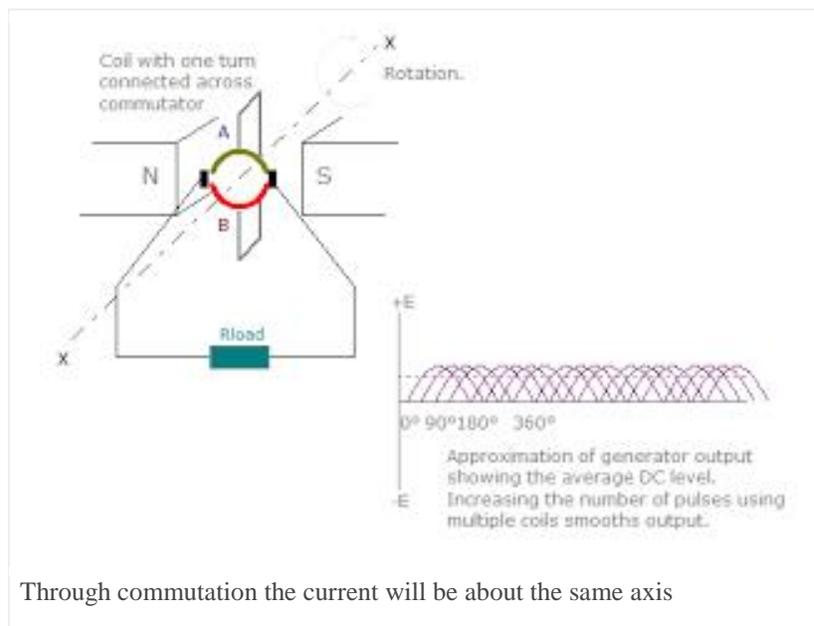


AC generator has an alternating current a sinusoidal wave

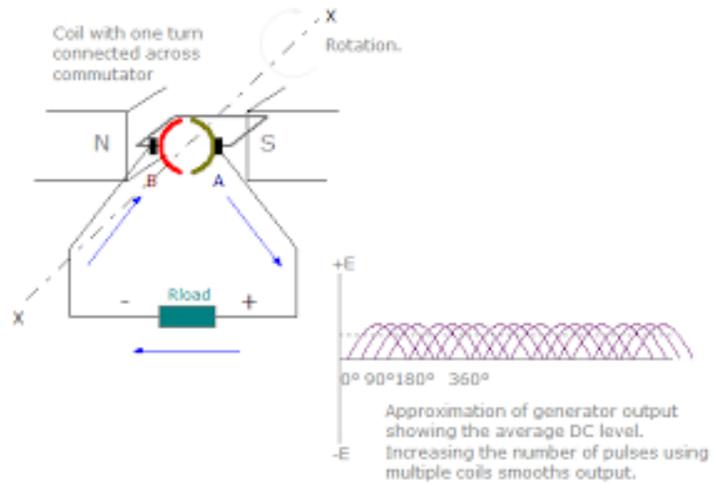
This is not the same as adding more turns to a single coil, which would increase the emf output. The main difference between the DC generator and the AC generator is in their connections to the armature coil, where a commutator is now used .

A *commutator* is a combination of a rotating split-ring and stationary metal brushes that reverses the polarity of the coil with respect to the external circuit, so that the negative half of the AC signal is reversed and made positive. The result is a pulsating direct emf which rises and falls but never changes direction .

This pulsating emf can be smoothed out or become less pulsating until almost straight by using more than one coil rotating about the same axis, or by other electrical techniques



Through commutation the current will be about the same axis



Generators are classified in terms of the field excitation and its connection to armature windings. Self -exited generators can only build-up its voltage when all the requirements are satisfied.

Source : <http://www.engineermaths.com/2010/11/introduction-to-dc-generator.html>