

Integrated layer Alternator Generator

Integrated Layer Alternator consists of cylindrical stator coil, strong magnet cylindrical layer rotor, shaft, stator, stator mounted back plate and two number of bearings.

Stator mounted Back plate: Stator mounted Back plate made of Aluminum or non-magnetic Alloy. Cannot be used iron base metal, as magnets in cylindrical layer rotor is so strong. It needs to rotate freely with strong magnetic field action.

Depend on size and capacity of Alternator, Stator mounted Back plate size will be different. In my test model, using 12mm thickness and 68 mm diameter with 12mm diameter hole through at the center of plate.

Shaft: This shaft can be made of some grade of steel. Shaft diameter size will be changed depend on Design and size of Integrated Layer Alternator. In my model design, use 12mm diameter and length (90mm) at the one end of shaft can be threaded to be mounted on some application items.

Stator Coil: The number of turns of wire in each coil is used to control speed of Integrated Layer Alternator. If number of turns is more to increase voltage at low rotation speed (RPM). But output Amp is less. Depend on wire gauge and number of turns, coil resistance can be changed. If fewer turns of lower number gauge of wire, coil voltage decrease at same speed.

In my test design, use 20 AWG (0.8mm) and number of turns per coil is 65 turns. Coil Resistance is 1 Ohm for 3 coil series in star connection.

Cylindrical layer rotor: Cylindrical Layer rotor is made of aluminum, cast iron, mild steel or alloy. Cylindrical Layer rotor consist of integrated cylindrical magnet slot layer. Strong magnetic flux passed each other in rotor slot. Outer rotor has 12 numbers of slots which each other 30 degrees apart from center. In each slot fitted with north pole x 6 and south pole magnet x 6 bars alternately. Inner rotor also has 12 numbers of slots which each other 30 degrees apart from center. In each slot fitted with magnet bar same orientation. Between outer rotor and inner rotor has cylindrical slot for stator and center of rotor has two bearings at each end side.

Quantity of Magnets is depended on design Diameter of rotor and power out-put, will be different number. In my test design Diameter is 100mm (Figure-1)

Casting Stator coils together with stator mounted back plate and shaft.

Fit the shaft to back plate through center hole tightly with stud screw. Lay stator coils along cylindrical surface of molding part together with back plate and shaft. Each coil 40 degree apart from center and 3 coil series in 120-degree. 3 wires twisted and soldering together in star connection. Make casting together coils, back plate and shaft with metal poly putty, as shown in figure (2). In my design diameter of stator assembly is 84 mm (external) and 67 mm(internal). Other tail end of wires will be emerged out wiring from exit hole of back plate.

Assembly the parts of Integrated Layer Alternator Generator

Fit Cylindrical Layer rotor to the shaft of stator. Stator will be in cylindrical slot of rotor. Two bearings will be on shaft of stator and Cylindrical Layer rotor can be rotated freely in low torque. Fit snap ring at shaft groove. Rotor cannot be slipped out from shaft. Cylindrical Layer rotor can be rotated smoothly on shaft of stator. Cylindrical layer rotor and stator's gap is depended on design.

See figure (3).

How it works

Integrated cylindrical magnet layer rotor has strong magnetic flux passed each other between internal magnetic layer and Magnetic flux induce stator coil.

Rotation of rotor sweeps the magnetic flux across the coils, producing Alternating voltage and current in them depend up on speed of rotation (RPM).

(Figure-3) This sectional view shows the rotating part shown rotor. Integrated layer rotor rotates together with bearing on shaft of stator. Stator and shaft are fitted parts in another section and two bearings and integrated magnet layer are moving parts together with rotor.

There are 12 magnet bars on each inner wall of integrated layer rotor. Each magnet bar is slotted into individual holder. Total magnet bars 24 pieces and 12 magnets slotted in each wall of rotor slot.

Each magnet bar has north and south pole. Pole are arranged alternately, so that north magnetic pole bar face to south magnetic pole bar and stator's coil is between these two magnet layers of rotor.

CLAIMS

Advantage of Integrated layer Alternator Generator design

- 1/ Integrated layer Alternator Generator is distinguished with other type of magnetic Alternator or Generator.
 - 2/Conventional magnetic Alternator or genitor has single surface magnetic flux induce the coils to produce voltage and current.
 - 3/ If compare other Disc type two surface magnetic flux type, integrated layer Alternator Generator is more efficient because radial flux induce, compact design, can, simple design in safety and can fit and assembly strongest magnet bar into slot one by one without harm.
- Integrated Layer Alternator Generator has two cylindrical surfaces magnetic flux, which stronger induce the coils to produce more current and voltage.
- 4/Can accumulate more strong radial magnetic flux to produce current and voltage of stator.
 - 5/Magnetic flux induces upper and lower surface of each stator coil.
 - 6/ Reduce Torque and achieve more power.
 - 7/Reduce of weight and size in same power.
 - 8/Provide flexibility in design so that any size can be used to provide power.