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.

Brief Description of Drawings

Figure 1/ shows Sectional Side View/ Stator mounted Back plate: Stator mounted Back plate made of Aluminum or nun-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.

Figure 1/ Sectional Side View /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 be mounted on some application items.

Figure 1/ Sectional Side View/ 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.

Figure 2/ Front View And Sectional Side View /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 rotter 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.

Figure1/Sectional Side View/Casting Stater coils together with stater mounted back plate and shaft:

Fit the shaft to back plate through center hole tightly with stud screw. Lay stater 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. 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.

Figure 3/ 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.

Since strong magnet Neodymium magnet invented, many field of electronic products and other products use strong magnet for their applications. But the strongest magnets are used on electric devises are still limited. Because the stronger magnetic field is more holding any iron base metal and even aluminum and alloy.

Example of small wind turbine without gears, it has strong permanent magnetic rotor. Rotor design is either inside stator or outside stator. Both use either air core or non-magnetic core although magnetic flux is too strong, it can be spin lightly and EMF produce AC current. Stater coils keep on changing it's current by flux of magnet north and south pole passing.

If one group of magnetic flux is outside stator coils and at the same time another group of magnetic flux is inside same stator coils, it can accumulate more magnetic flux to pass coils and more efficient power can be produced by low torque and spinning.

That is my key idea and how to design it above described.

If compare example of bicycle of dynamo, It has permanent magnet and stator inside. Cycling it produce electric and light on. That experience in our childhood, but we notice that cycle more hardly to accelerate, we feel some of thing is pull back our cycling force. We know that why it happens so. Moment of stator produce electric by magnetic flux of permanent magnet, coil itself also reluctances electromagnetic field produce around stater core, it's core become like electromagnet. Although that electromagnet can induce coils to produce volt and current as well as It's action affect holding to permanent magnet that cause need more paddle power to produce electric.

In my design this action of effect is very low, can be span freely.

CLAIMS

Advantage of Integrated layer Alternator Generator design

Claim 1: Integrated layer Alternator Generator is distinguished with other type of magnetic Alternator or Generator.

Claim 2: Conventional magnetic Alternator or genitor has single surface magnetic flux induce the coils to produce voltage and current.

Claim 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.

Claim 4: Can accumulate more strong radial magnetic flux to produce current and voltage of stator.

Claim 5: Magnetic flux induces upper and lower surface of each stator coil.

Claim 6: Reduce Torque and achieve more power.

Claim 7: Reduce of weight and size in same power.

Claim 8: Provide flexibility in design so that any size can be used to provide power.