J.D ENGINEERING WORKS

POWER GENERATION

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About Us

J.D Engineering works, **Manufacture Permanent Magnet Generators, AC Alternators,BLDC MOTORS, Electric Motors, PMG Wind & Hydro Turbine**. Mr. Gurdavinder Singh, Founder & CEO of Power Gold, and the team has a combined experience of over 40 years in working with Permanent Magnet Alternators. Mr. Singh is enthusiastic to bring the technical advancements to India and intends to accelerate the industrial progress of the country.

J.D Engineering is a leading manufacturer of Permanent Magnet Alternators and Generators. Located in the suburbs of Hari Nagar in Delhi, India, it works towards designing and manufacturing innovative and reliable solutions for power generation, transmission and control in the industrial, renewable energy sectors.

Established in 1979J.D Engineering has come a long way to be the leading manufacturer of ac alternators, generators, electric motors, pmg wind and hydro turbine which find applications in renewable energy systems like wind technologies, hydro-turbines, generator sets, machines etc. Its focus has always been to innovate products that not only solve the problems of efficiency in power generation and transmission but also keep the environment clean and green. Fueled by the leading minds and people of the industry.

J.D. Engineering Works, the world-leading specialist in industrial ac alternators, Generators, PMG wind and Hydro Turbine, designs and manufactures highly innovative eco-technological solutions to serve the industrial and large-scale commercial sector markets. We make effective use of the Godets Machines to manufacture quality products. These products are manufactured to satisfy the need of our clients. In addition, the range of choices that we supply help our clients to make choice and select the product that would suit their requirement.

We are a customer centric company and we give utmost importance to deliver defect free products to the clients. The determined efforts as well as skills of our employees also make us competent to assure complete level of satisfaction to our esteemed patrons resulting in enduring relations with them. We strictly follow ethical business policies, customer centric approach and keep up a level of transparency in all our business dealings that supports us in maintaining the faith of our customers on us.

PERMANENT MAGNET GENERATOR

WHAT IS A PERMANENT MAGNET GENERATOR?

A permanent magnet generator is a device that converts mechanical energy to electrical energy. In this device the rotor windings have been replaced with permanent magnets. These devices do not require a separate DC supply for the excitation circuit or do they have slip rings and contact brushes. These machines are superior alternatives to traditional induction motors that can be coupled with turbines, diesel generators and used for hybrid vehicles. Another major advantage is that these machines does not require any specific work environment and hence can be used in wind and water machines.

The PMG can be a DC voltage machine with brushes and rotary collector or much more frequently an AC synchronous multiphase machine whereas the stator and rotor magnetic fields are rotating at the same speed. This eliminates the excitation losses in the rotor, which otherwise typically represent 20 to 30 percent of the total generator losses. The reduced losses also give a lower temperature rise in the generator, which means that a smaller and simpler cooling system can be used.

Considering a permanent magnet DC generator then the inductor will be found at the stator with an array of permanent magnets. But in case of an AC generator the inductor is located at the rotor with an assembly of permanent magnets.

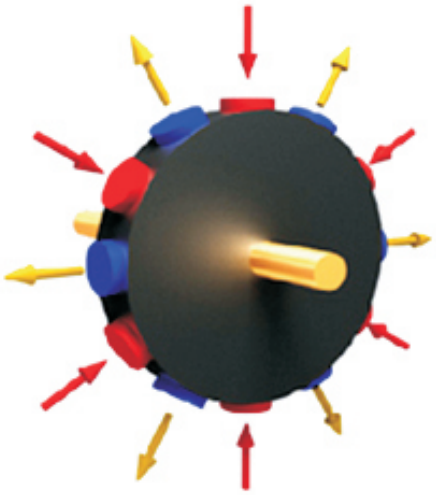
A PMG reduces loses in the rotor by 20 to 30 percent. Thus we get a much cooler system. This temperature reduction also reduces the temperature of the bearings and hence improves the reliability and the lifetime of the bearings. Recent developments in PMG technology have been made possible by a significant improvement of the magnetic materials during the past decade. A little piece of Neodymium Boron Iron (NeFeB) is 10 times stronger than the traditional ones made from ferrite magnate. Thus with further research we can improve the strength and reliability of these devices.

The demand for these devices is increasing day by day. With the increasing cost of electricity people are looking for an alternate source of energy and the permanent magnet generator perfectly fits in that place.

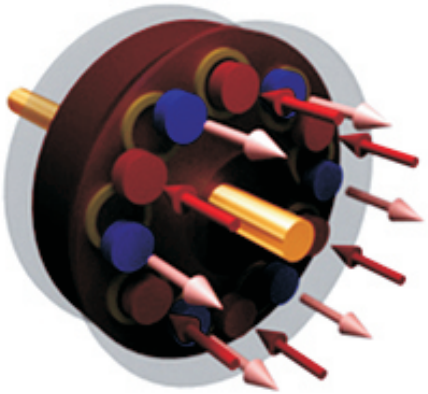
These devices do not use any environmental resources to produce energy and thus are environment friendly. Besides no wastage or by products is generated from these device in the process of energy generation. Environment experts recommend the use of permanent magnet generators as these can reduce the impact of pollution by up to 50%.

PERMANENT MAGNET GENERATOR

KINDS OF PERMANENT MAGNET GENERATOR



Radial



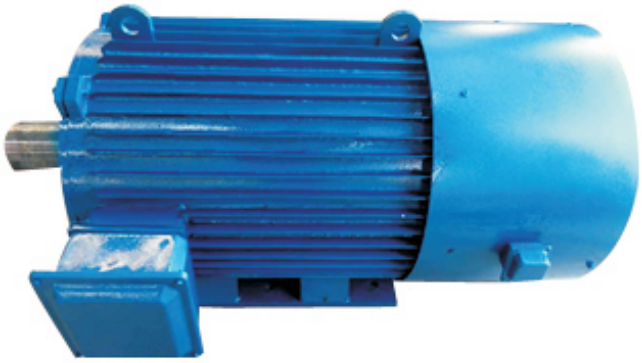
Axial

RADIAL FLUX PERMANENT MAGNET GENERATOR

Description	Parameter
RPM	1000
Volts	220/440
Frequency	50
Pole	6
Insulation	H Class
Working Temperature	-40 deg 80deg
Minimum Efficiency	93%

***Starting Torque 3NM**

USED FOR THE GENERATION OF ELECTRICITY



Description	Parameter
RPM	190
Volts	220/440
Frequency	50
Pole	32
Insulation	H Class
Working Temperature	-40 deg 80deg
Minimum Efficiency	94%

***Starting Torque 3NM**

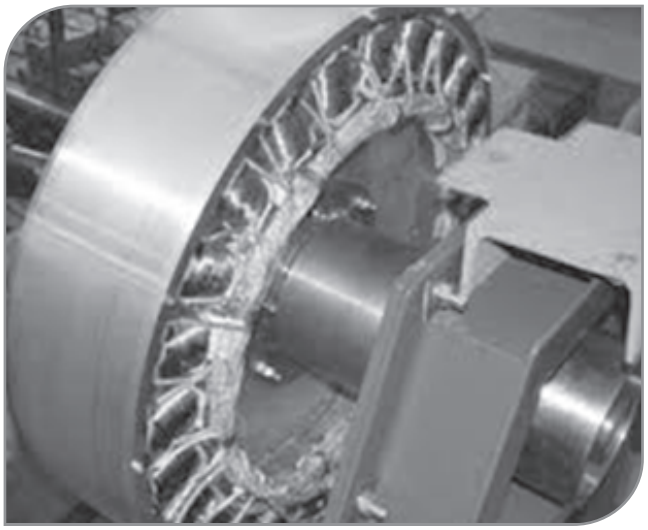
CAN BE USED AS:-

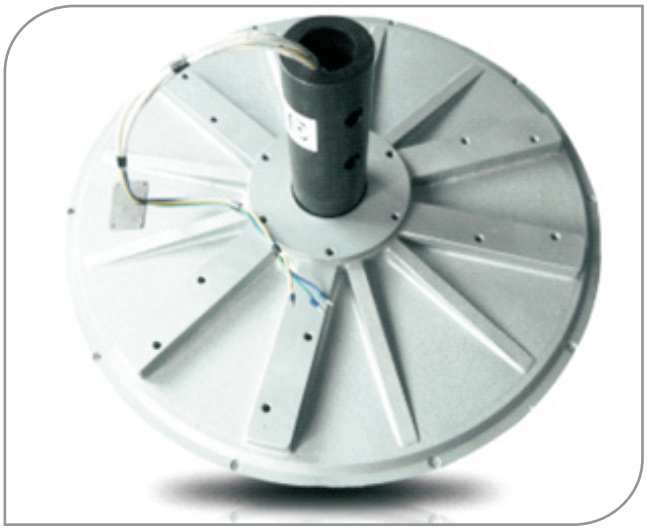
WIND TURBINES

HYDRO TURBINES

AXIAL FLUX PERMANENT MAGNET GENERATOR (100 kw)

STARTING TORQUE LESS THAN 1 NM





AXIAL FLUX PERMANENT MAGNET GENERATOR (15 KW) STARTING TORQUE LESS THAN 1 NM

Description	Parameter
RPM	190
Volts	220/440
Frequency	50
Pole	32
Insulation	H Class
Working Temperature	-40 deg 80deg
Minimum Efficiency	94%

Advantages of permanent magnet Generator/Alternator

They require very less maintenance since it doesn't have brushes and hence no need to replace them

- They are environment friendly and do not rely on the external weather to produce electricity
- They are small in size and hence require very less space compared to other types of generators.
- These permanent magnet generators runs for years and years without wear and tear and are very silent

USES OF PMG

- The Switch low-speed, direct-drive PMGs operate without any gearbox and fast-rotating parts, resulting in increased reliability and superior drive train efficiency. The typical speed range is between 10 rpm and 20 rpm.
- All generators can be designed with a segmented stator construction. This provides redundancy and makes it possible to repair the generator in the nacelle without full disassembly. Optionally, our generator design can use the generator bearing as a turbine main bearing to integrate the turbine brake system into the generator construction. Benefits are simplicity, fewer components, and therefore, higher reliability.
- With the rising cost of electricity, more and more people are looking for alternative sources of energy and permanent magnet generators fit the bill perfectly. These generators can also reduce the strain on the environment as 0these do not use any non-renewable sources of energy for producing electricity when coupled with renewable sources

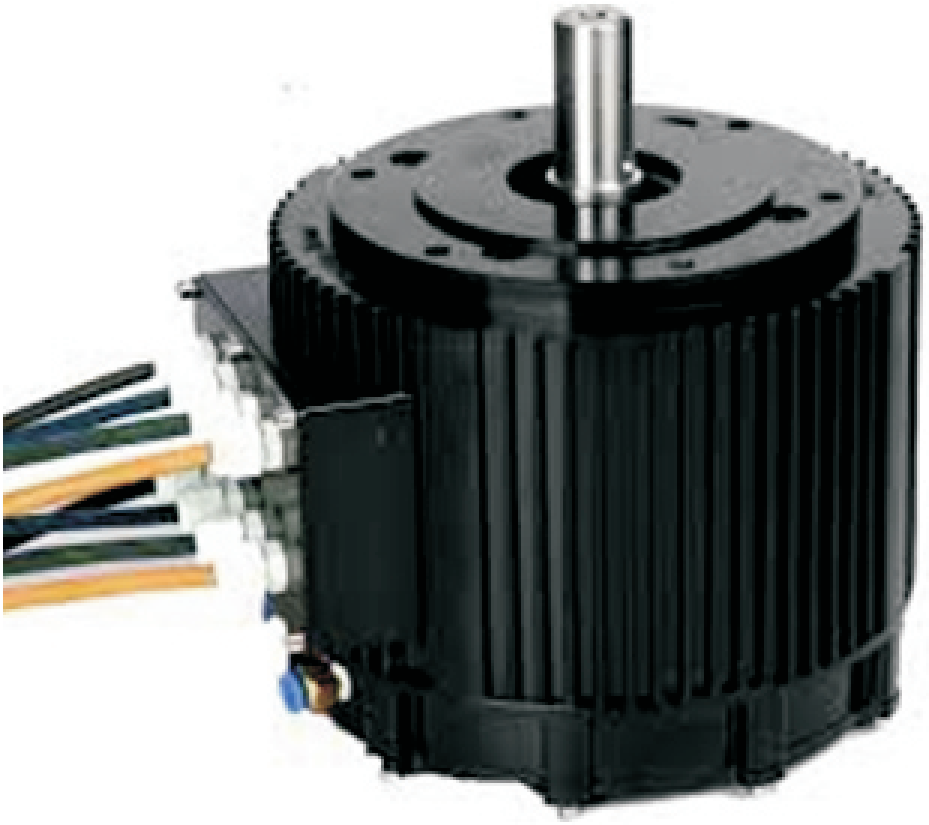
BLDC MOTORS

Brushless DC motor (also known as DC commutatorless motors, electronically commutated motors, AC synchronous motors or DC servomotors) are increasingly replacing brushed DC motors due to their "superior efficiency, long life, smooth torque delivery, and high speed operation." 1 Yet, in the past, their application has been limited due to the additional cost of the complex motor controller necessary to operate these motors. However, controller costs have been trending downward in recent years such that application of brushless dc motors is on the rise and expected to grow. 2 While they have been successfully applied in the automotive, HVAC, electronic, computer, semiconductor and medical industries, BLDC motors have long been used in industrial applications such as actuators, feed drives for CNC machines, industrial robots, extruder drives, among others.

FEATURES

Despite the need of a complex motor controller, the simplicity of construction of BLDC motors offers several inherent advantages not provided with brushed DC motors in terms of low inertia high torque and a very wide speed range. Constructed in an inside-out3 configuration with a rotor consisting an array of permanent magnets and a stationary armature that's excited by an electronic commutation controller, BLDC motors exhibit better heat dissipation, improved efficiency and greater power density than brushed DC motors. Their compact size, reduced weight and high speed range is thanks to the lack of brushes and a mechanical commutator. To provide the position feedback required in industrial servo applications, BLDC motors have an encoder (optical or Hall Effect) that measures the rotor's position. The feedback signal, generated by the encoder, is used by the motor controller to produce input signals to excite and electronically commutate the armature current such that the armature's magnetic field rotates with the rotor following along in synchronism. 4 Additional advantages of BLDC motors include:

- Longer service life due to a lack of electrical and friction losses.
- Virtually maintenance-free due to a lack of brushes and mechanical commutators.
- Reduced EMI and noise because of the elimination of ionizing spikes from brushes.
- More suitable for hazardous environments (dirt, oil, grease and other foreign matter) since they can be completely sealed.
- Operational characteristics that include (1) high speed, short index moves, (2) heavy loads, high torque control, (3) short duty cycle moves and (4) high accel/decel capability. 5



	Symbols	Units	Type					
			57BL60L2	57BL60L4	57BL120L2	57BL120L4	57BL180L2	57BL200L4
		mm	57	57	57	57	57	57
Long	L1	mm	54	54	82	82	120	120
Input power	Un	VDC	24	48	24	48	24	48
Rated power	Pn	W	60	60	120	120	180	200
Phase number	P		3					
Rated speed	Nn	RPM	4000	4000	4000	4000	4000	4000
Max. speed	Np	RPM	5000	5000	5000	5000	5000	5000
Rated torque	T	mNm	145	145	290	290	430	480
Max. torque	Tmax	mNm	300	300	600	600	860	960
Rated current	I	Arms	3.2	1.6	6.3	3.1	10.3	5.6
Max. current	Imax	Arms	6.5	3.3	13	6.5	20.6	10.2
Voltage constant±5%		Vrms/Krpm	2.8	5.6	2.75	5.5	2.7	5.4
Torque constant±5%		Nm/Arms	0.046	0.09	0.046	0.09	0.046	0.09
Moment of inertia		10^-4kgm^2	0.167	0.167	0.293	0.293	0.471	0.471
Resistance±10%（25℃）	R	Ω	0.3	1.05	0.15	0.54	0.08	0.28
Inductance	L	mH	0.32	1.25	0.16	0.64	0.12	0.45
Sensor	Hall							
Ins.class	E							
Protective rating	IP40							
Operating temperature	0~+50 ℃ (storage temperature -20~+60℃)							
Operating RH	85% RH or below (noncondensing)							
Operating environment	Outdoor (no direct sunlight), no corrosive gas, no flammable gas, no oil mist, no dust							
Altitude	1000m or below							

Industrial Applications

For industrial applications, brushless DC motor are primarily used in servo, actuation, positioning, and variable speed applications where precise motion control and stable operation are critical for the satisfactory operation of the manufacturing or industrial process. They are commonly used as:

- Linear motors
- Servomotors
- Actuators for industrial robots
- Extruder drive motors
- Feed drives for CNC machine tools

LINEAR MOTORS

Linear motors produce linear motion6 without the need of a transmission system, such as a ball-and-lead screw, rack-and-pinion, cam, gears or belts, that would be necessary for rotary motors. Transmission systems are known to introduce less responsiveness and reduced accuracy. Direct-drive linear motors do not exhibit these shortcomings. In their simplest form, linear motors are essentially "unrolled rotary motors in which the poles of the stator have been laid in the direction of travel." 7There are many types of linear motors, ranging from stepper motors, dc brushed & brushless motors and AC synchronous motors. BLDC linear servomotors consist of a slotted stator with magnetic teeth and a moving actuator, which has permanent magnets and coil windings. To obtain linear motion, the motor controller excites the coil windings in the actuator causing an interaction of the magnetic fields thereby producing linear motion. As direct-drive linear motors, BLDC motors have the added advantages of maintenance-free operation with no mechanical connections, hysteresis or pitch cyclical error. 8

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Corp. Office : BE-343, Street No. 2, Hari Nagar,
New Delhi -110064, INDIA

Mob +91-9873699384, 9811429384

E-mail- rupamsingh070@gmail.com
rupam@permanentmagnetgenerators.in

Web: www.permanentmagnetgenerators.in