

Kato Engineering

PMG Pilot Exciter



Advantages of a permanent magnet generator:

- Provides an economical and simple means of reliable, responsive and stable input power to the voltage regulator
- Supplies continuous power to the exciter through the voltage regulator to maintain up to 300% short-circuit current from the alternator during a fault condition
- Provides full exciter power, regardless of alternator voltage, for motor starting and is a separate voltage source for use external to the generator set, such as a tachometer and relay options
- Reduces the effects of both conducted and radiated electromagnetic interference (EMI). With an EMI filter, the PMG and a Kato voltage regulator will meet the emissions requirements of Mil-Std. 461C, Part 9, Class C2
- Enhances manual voltage control regulation as the PMG provides a more stable power source to the manual control

How the PMG Works

Figure 1 illustrates a typical application of a PMG pilot exciter. The PMG exciter provides input power to the voltage regulator on a brushless revolving field generator to help maintain rated output voltage during sudden load changes. The PMG is a separate power source for the voltage regulator. In the event of a sudden load change due to a motor starting application or even a sudden short-circuit condition on the generator output, the PMG will supply rated voltage to the regulator. This will force the generator into saturation and supply the necessary output current to start the motor or clear the fault condition. The generator will produce up to 300% or more short-circuit current during a three-phase fault condition. This is normally more than enough current to trip a properly sized circuit breaker. The PMG, when used as regulator power, sharply reduces system conducted RFI. If the PMG is used in conjunction with a Kato EMI filter pack and a Kato voltage regulator, this system will meet Mil-Std. 461C, Part 9, Class 2.

A revolving field brushless generator obtains excitation from a direct-connected brushless exciter. The voltage regulator regulates the generator output voltage by automatically regulating the DC current fed to the exciter field. The constant output voltage from the PMG pilot exciter is fed to the brushless exciter field. When the generator rotor begins to turn, the PMG rotating magnetic field produces voltage in the PMG stationary armature winding. The output voltage from this PMG armature winding is then used to power the voltage regulator.

The rotating permanent magnet field assembly is mounted on the generator shaft. As shown in Figure 2, the PMG armature is mounted outboard for easy removal. Typically both the PMG and the exciter are mounted in the same frame. The PMG will provide constant power to the voltage regulator through a wide range of transient conditions. The only external input required is rotational energy from the prime mover.

Figure 1

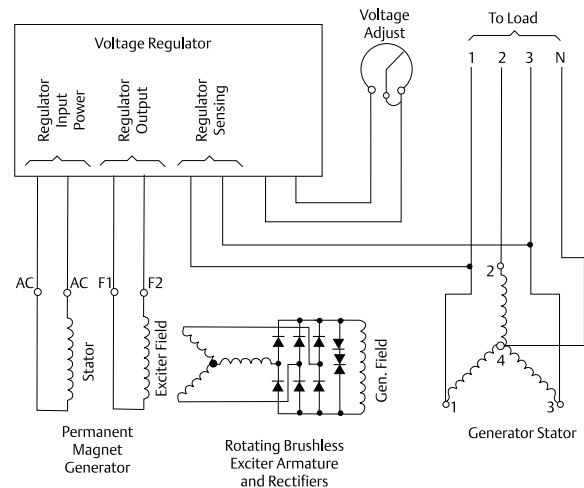
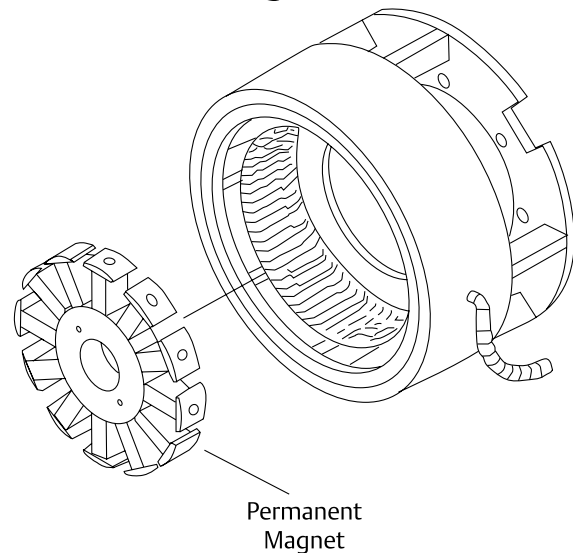


Figure 2



Kato Engineering
P.O. Box 8447
Mankato, MN 56002-8447 USA
(507) 625-4011 / Fax (507) 345-2798
www.kato-eng.com