MAGNAPOWER GENERATORS

TYPICAL SPECIFICATION

GENERAL

The generator shall be manufactured by Marathon Electric Manufacturing Corporation and of the MAGNAPOWER design. It shall meet all requirements of NEMA MG-1, Parts 16 and 22, in design, performance and factory test procedures. The regulator shall be factory wired and tested with the generator.

CONSTRUCTION AND BEARINGS

Cast iron end brackets and fabricated steel frames shall be used. The unit shall be fully guarded per NEMA MG-1-1.25.4

Bearings shall be pre-lubricated, double shielded, ball type with provisions for adding and/or changing grease through extended supply and relief tubes. Minimum B-10 bearing life shall be 40,000 hours.

PMG EXCITATION SYSTEM

The generator shall be equipped with a permanent magnet generator and rotating brushless excitation system. The system shall supply a minimum short circuit support current of 300% of the rating (250% for 50 hertz operation) for 10 seconds. The rotating exciter shall use a three phase full wave rectifier assembly with hermetically sealed silicon diodes protected against abnormal transient conditions by a multi-plate selenium surge protector. The diodes shall be designed for safety factors of 4 times voltage and 2.5 times current.

INSULATION SYSTEM

For nominal voltages of less than 5000 volts the insulation system of both the rotor and stator shall be of NEMA class H materials or better. For higher voltages the insulation system of the stator shall be of class F materials or better and the insulation system of the rotor shall be class H materials or better. The stator winding shall be given a final coating of epoxy for extra moisture and abrasion resistance. The insulation system for the rotor and exciter shall be synthetic and non-hygroscopic. The rotor shall be layer wound with thermosetting 100% solids epoxy between each layer, plus a final coating of epoxy for moisture and abrasion resistance.

MAIN ROTOR

The main rotating field shall be of a construction, consisting of one piece laminations.

Dovetails, cross bolts and other pole to shaft connection means are not acceptable. The rotor core shall be shrunk fit and keyed to the shaft.

The rotating assembly shall be dynamically balanced to less than 2 mils - peak to peak - displacement, and shall be designed to have an over speed withstand of 125% of rated speed for 15 minutes when operating at stable rated operating temperature.

STATOR WINDING

The stator winding shall be of 2/3 pitch design to eliminate the third harmonic and shall incorporate a one slot skew to minimize slot harmonics. Windings shall be form wound and lashed at the end turns to provide superior mechanical strength.

TEMPERATURE RISE

The temperature rise of both the rotor and stator shall be measured by the resistance method and detector method respectively and shall be in accordance with the applicable sections of NEMA MG-1, Parts 16 and 22, for the type of service intended.

VOLTAGE REGULATOR

The voltage regular shall be a digital, microprocessor design with solid state voltage build-up. No voltage build-up relay or other relays are acceptable. The unit shall be encapsulated for humidity and abrasion protection. The voltage regulator shall include 1/4% regulation, true volts per hertz operation with adjustable cut in, loss of sensing continuity shutdown, over excitation shutdown, three phase RMS sensing, over voltage protection, and provisions for parallel operation.

In addition, the regulator shall include a stator current limiting circuit. This circuit shall limit current in all three phases, line to line and line to neutral faults to 300% of full load current to protect the generator against premature winding degradation and to ensure the proper coordination of system protective devices.

The voltage regulation shall be 1/4% from no load to full load and 5% frequency variation. Regulator drift shall be less than 1/2% per 72^{O}F (40^{O}C) ambient temperature change. The voltage regular shall be a static-type using non-aging silicon controlled rectifiers, with electro-magnetic interference suppression to MIL-STD-461C. Part 9, when mounted in the generator conduit box.

PERFORMANCE

Voltage dip shall not exceed _____% upon application of full continuous rated load with recovery to within 2% of rated voltage within ____ seconds.

The waveform harmonic distortion shall not exceed 5% total RMS measured line to line at full rated load. The TIF factor shall not exceed 50.

VENTILATION

The generator shall be self-ventilated and have a one-piece, cast aluminum alloy, unidirectional internal fan.

CONDUIT BOX

Load connections shall be made in the top mounted conduit box. The generator construction will allow connection to the load through the top, bottom or right side of the conduit box when facing the non-drive end.

On high voltage generators, the high voltage and low voltage sections of the conduit box shall be separated by a barrier.

The voltage regulator shall be mounted on the inside of the conduit box, in the low voltage section, allowing access to adjust the voltage regulator from the outside of the conduit box.

VERIFICATION OF PERFORMANCE

All performance testing shall be done in accordance with MIL-STD-705 and/or IEEE Standard-115.