MAGNAPLUS® GENERATORS

TYPICAL SPECIFICATION

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

CONSTRUCTION AND BEARINGS

The unit shall be fully guarded per NEMA MG-1-1.25.4 as a minimum. Optional drip covers can be requested to meet requirements for IP-22 and IP-23 on stock units. Other ratings are available as special build-up designs and should be requested from the factory.

Cast iron end brackets with bearing bores machined for an O-Ring to retard bearing outer race rotation and fabricated steel frames shall be used.

Bearings shall be pre-lubricated, double shielded, ball type, single row conrad, C3 fit. Minimum B-10 bearing life shall be 100,000 hours for single bearing units.

The grease utilized shall be Polyrex EM or equivalent.

EXCITATION SYSTEM

The rotating exciter shall use a three phase, full wave rectifier assembly with hermetically sealed silicon diodes. The diodes shall be designed for safety factors of 5 times voltage and 3 times current.

OPTIONAL PMG EXCITATION SUPPORT SYSTEM

The generator shall optionally be equipped with a 300/250 Hz permanent magnet generator excitation support system. The optional PMG excitation support system shall be mounted outboard of the bearing. The system shall supply a short circuit support current of 300% of the rating for 10 seconds.

INSULATION SYSTEM

The insulation system of both the rotor and stator shall be of NEMA Class H materials or better and shall be synthetic and non-hygroscopic. The stator winding shall be given multiple dips and bakes of varnish, plus a final coating of epoxy for extra moisture and abrasion resistance. 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 construction shall consisting of one piece, four pole laminations. Dovetails, cross bolts and other pole to shaft connection means are not acceptable. All units shall incorporate amortisseur windings to facilitate parallel operation and application to voltage distorting loads. In addition, the amortisseur winding and field pole coil supports may be integrally die cast with the rotor laminations to form a unitized rotor core. 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 random 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 shall be in accordance with the applicable sections of NEMA MG-1, Parts 16 and 22, BS-5000, or C.S.A. C22.2, for the type of service intended.

VOLTAGE REGULATOR

The SE350E voltage regulator, supplied with our standard units and excitation system, shall have 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 regulator shall include 1% regulation; volts per hertz operation, over excitation shutdown, stability adjust and built in voltage adjustment.

Optional voltage regulator shall be PM500 voltage regulator, as supplied with optional PMG excitation support system, shall have solid state voltage build-up. The unit shall be encapsulated for humidity and abrasion protection. The regulator shall include 1/2% regulation; volts per hertz operation, over excitation shutdown, stability adjust and built in voltage adjustment.

Optional voltage regulator shall be DVR2000E+ voltage regulator and optional PMG excitation support system 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 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.

PERFORMANCE

The voltage regulation, with standard excitation supplied, shall be 1% from no load to full load and 5% frequency variation. Regulator drift shall be less than 1% per 72°F (40°C) ambient temperature change. The voltage regulator shall be a static-type using non-aging silicon controlled rectifiers, with electromagnetic interference suppression to commercial standards.

The voltage regulation, with optional PMG excitation support system, and DVR2000E voltage regulator, shall be 1/4% from no load to full load and 5% frequency variation. Regulator drift shall be less than 1/2% per 72°F (40°C) ambient temperature change. The voltage regulator shall be a static-type using non-aging silicon controlled rectifiers, with electromagnetic interference suppression to MIL-STD-461 C, part 9, when mounted in the generator conduit box

The voltage regulation, with optional PMG excitation support system, and PM300 voltage regulator, shall be 1% from no load to full load and 5% frequency variation. Regulator drift shall be less than 1% per 72°F (40°C) ambient temperature change. The voltage regulator shall be a static-type using non-aging silicon controlled rectifiers, with electromagnetic interference suppression to commercial standards.

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 for high volume, low noise air delivery. Air flow shall be from opposite drive end through generator to drive end. The exciter shall be in the air flow.

CONDUIT BOX

Load connections shall be made in the top conduit box. The generator construction will allow connection to the load through either side of the conduit box.

VERIFICATION OF PERFORMANCE

All certified performance and temperature rise test data submitted by the generator manufacturer are to be the result of the actual test of the same or duplicate generators. Temperature rise data shall be the result of loaded, rated power factor heat runs at the rated voltage and hertz. All performance testing shall be done in accordance with MIL-STD-705 and/or IEEE Standard-115.