Specification

Futureenergy, 48V 1kW Permanent Magnet Generator

Prepared By

D. Nangle, November 2016
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Dimensions

FE 1 KW PMG Overall Dimensions
See specification for electrical details

[Diagram of the FE 1 KW PMG with various dimensions and notes for mounting and keyway options]
### Specification

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Rated Power</td>
<td>1 kW (@ 6.4 ohms load)</td>
</tr>
<tr>
<td>Nominal RPM</td>
<td>800 RPM</td>
</tr>
<tr>
<td>Line / Line RMS Open Voltage</td>
<td>68.3V*</td>
</tr>
<tr>
<td>Nominal Line Current</td>
<td>10 Amps**</td>
</tr>
<tr>
<td>Maximum Current (100% Duty Cycle / Air Cooled 20°C)</td>
<td>20 Amps</td>
</tr>
<tr>
<td>Configuration</td>
<td>3 Phase, Star wound AC output</td>
</tr>
<tr>
<td>Line / Line Winding Resistance</td>
<td>0.36 Ohms</td>
</tr>
<tr>
<td>Nominal Self Inductance</td>
<td>0.7776 mH</td>
</tr>
<tr>
<td>Maximum Over-Load Power</td>
<td>1.5 kW</td>
</tr>
<tr>
<td>Efficiency</td>
<td>92 %</td>
</tr>
<tr>
<td>Maximum Cogging Torque (Excluding Shaft Seals)</td>
<td>&lt; 0.5 Nm</td>
</tr>
<tr>
<td>Duty @ Nominal Power</td>
<td>100%</td>
</tr>
<tr>
<td>Insulation Class</td>
<td>H</td>
</tr>
<tr>
<td>Mounting</td>
<td>Any</td>
</tr>
<tr>
<td>Shaft Material</td>
<td>Stainless Steel</td>
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<tr>
<td>Magnet Material</td>
<td>NdFeB</td>
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<tr>
<td>Shell Material</td>
<td>LM25 Aluminium</td>
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<tr>
<td>Protection</td>
<td>IP54</td>
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<tr>
<td>Poles</td>
<td>12</td>
</tr>
<tr>
<td>Winding code</td>
<td>P123-T20-W1.5</td>
</tr>
</tbody>
</table>

* DC Voltage requires an additional bridge rectifier

** Voltage and current will depend on connected electrical system. For example; a system charging 48V battery bank will reduce generator voltage to the battery charge voltage and increase current. Values quoted assume fixed resistance loads.
Graph: Power vs RPM @ Load Resistances (Ω)
Graph: Terminal Voltage vs RPM @ Load Resistances

Terminal Voltage v RPM at load resistance

- Green line: 1
- Red line: 10
- Blue line: 2.8
- Pink line: 4.6
- Purple line: 6.4
- Cyan line: 8.2
Graph: DC Load Voltage vs RPM @ Load Resistances

DC Load Voltage v RPM at load resistance

- Green: 1
- Blue: 10
- Purple: 2.8
- Pink: 4.6
- Cyan: 6.4
- Teal: 8.2

[Graph showing the relationship between DC Load Voltage and RPM for different load resistances.]
Graph: DC Load Current vs RPM @ Load Resistances

DC Load Current v RPM at load resistance

- Green line: Load Resistance 1
- Blue line: Load Resistance 10
- Purple line: Load Resistance 25
- Pale Green line: Load Resistance 4.6
- Aqua line: Load Resistance 6.4
- Cyan line: Load Resistance 8.2

DC Current/Amp vs RPM
Graph: Open RMS L/L Voltage vs RPM

Open Line / line Voltage With No Load

![Graph: Open RMS L/L Voltage vs RPM](image)
Graph: Open DC Voltage vs RPM
Graph: Fundamental Frequency vs RPM
Graph: Efficiency vs Current @ 750 RPM Constant
Graph: Cogging Torque