FNS60C electric vehicle inverter (EV Inverter) is a motor controller for electric vehicles. This electrical device converts electricity between a DC (Direct Current) circuit on battery side and AC (Alternating Current) on electric motor side. EV inverter controls the operation of the electric motor (an example: start/stop, forward/reverse rotation, selecting and controlling the speed, modifying or limiting the torque) and protecting against faults and overloads.

FNS60C is designed to work with Surface Permanent Magnet Synchronous Motors (SPMSM) and Interior Permanent Magnet Synchronous Motor (IPMSM).

MAIN FEATURES

• Nominal output power: 43 kW / 75 kW / 100 kW
• Battery voltage:
  ◦ 300÷400 V\text{DC} for 43 kW inverter
  ◦ 500÷650 V\text{DC} for 75 kW and 100 kW inverters
• Up to 250 A continuous current
• Field-oriented control (FOC) with MTPA (maximum torque per ampere) and U/f linear control
• Switching frequency: 5 kHz and 10 kHz
• Control circuit nominal supply: 12 V\text{DC}
• Position sensor: resolver or absolute encoder SSI 5V RS422
• Digital inputs: 4 general purpose digital inputs and 1 fast digital input
• Digital outputs: 2 general purpose digital outputs and 1 special purpose digital output
• Analog inputs: 1
• Communication interfaces/protocols:
  ◦ CANOpen: CAN 2.0b 125 kbit/s
  ◦ Modbus RS-485
• Easy to use HVBI connector system (Amphenol Pcd)
• Protections: over-current, under/over-voltage, temperature of EV inverter and electric motor
• Cooling system: mixture of 50% water and 50% glycol
• IP 67
Technical data

<table>
<thead>
<tr>
<th>Inverter type</th>
<th>Nominal output power</th>
<th>Supply voltage $U_{DC}$</th>
<th>Output voltage and frequency</th>
<th>Output nominal current</th>
<th>Overload current (60 sec.)</th>
<th>Weight</th>
<th>Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>FNS60C_P043U350W</td>
<td>43 kW</td>
<td>300 ÷ 400 $V_{DC}$</td>
<td>0 ÷ 0.68 $U_{DC}$ $V_{RMS}$</td>
<td>100 $A_{RMS}$</td>
<td>150 $A_{RMS}$</td>
<td>12 kg</td>
<td>A</td>
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<tr>
<td>FNS60C_P075U600W</td>
<td>75 kW</td>
<td>500 ÷ 650 $V_{DC}$</td>
<td>0 ÷ 500 Hz</td>
<td>100 $A_{RMS}$</td>
<td>200 $A_{RMS}$</td>
<td>13 kg</td>
<td>B</td>
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<tr>
<td>FNS60C_P100U600W</td>
<td>100 kW</td>
<td>500 ÷ 650 $V_{DC}$</td>
<td>0 ÷ 500 Hz</td>
<td>150 $A_{RMS}$</td>
<td>250 $A_{RMS}$</td>
<td>13 kg</td>
<td>B</td>
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</table>

Mechanical drawings

Connectors

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
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</thead>
<tbody>
<tr>
<td>DC+, DC-, U, V, W</td>
<td>HVBI Amphenol</td>
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<tr>
<td>Connector socket</td>
<td>1-776163-1 Ampseal</td>
</tr>
<tr>
<td>Resolver socket</td>
<td>RT00128PN03 Amphenol</td>
</tr>
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</table>

About TWERD Power Electronics

TWERD Power Electronics is a Polish manufacturer of advanced power electronic systems: frequency converters and complete cabinet-built drives, inverters for renewable energy sources (photovoltaic, wind and hydroelectric), electric vehicle’s inverters and battery chargers, power supplies for electrophoretic coating lines.

We have experience of over 25 years with power electronics!