TM4® SUMO™ Family
Motor / Inverter Systems
TM4® SUMO™ LD
Motor / Inverter System

Features
- Peak power: Up to 250 kW
- Peak torque: Up to 1,200 Nm
- Max operating speed: 7,000 RPM

Benefits
- High torque/low speed internal permanent magnet motor and inverter combinations
- Designed and validated as per axle mount requirements
- Seamless integration into Dana axles (example: eS9000r, eS6200r)

Ideal for Light Commercial Vehicles, Mini Buses, Medium-Duty Trucks, Medium Buses, and in e-Axles for Heavy-Duty Trucks.
TM4® SUMO™ LD Motor / Inverter System

The TM4 SUMO LD systems are designed to interface directly with standard rear differentials and/or gearboxes and/or e-Axles. It makes this series perfect for light commercial vehicles and light bus platforms.

Motor Features
- 3-phase permanent magnet motor
- High torque and power density
- Low electro-magnetic audible noise
- Low-cogging and ripple torque for better NVH
- Thermal protection

Standards
- Operating voltage: 300–750 Vdc
- System protection: IP 6K9K
- Shock and vibration standards: GMW3172 Sprung masses
- Max coolant inlet temperature: 65°C
- Coolant type: 40/60 water-glycol
- Toxic materials and flammability: ROHS, ELV, UL94-V0
- External corrosion resistance: Salt mist, chemical products

Inverter Features
- 3-phase high voltage inverter
- Variable switching frequency
- Reflex™ gate driver technology for high power and current densities
- EMI Filter
- Best-in-class power density

### SYSTEM

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>Peak power</th>
<th>Continuous power</th>
<th>Peak torque</th>
<th>Continuous torque</th>
<th>Max operating speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>TM4 SUMO LD HV800</td>
<td>250 kW</td>
<td>120 kW</td>
<td>800 Nm</td>
<td>380 Nm</td>
<td>8,600 RPM</td>
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<tr>
<td>TM4 SUMO LD HV1000</td>
<td>240 kW</td>
<td>120 kW</td>
<td>1000 Nm</td>
<td>520 Nm</td>
<td>4,700 RPM</td>
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<tr>
<td>TM4 SUMO LD HV1200</td>
<td>200 kW</td>
<td>100 kW</td>
<td>1200 Nm</td>
<td>520 Nm</td>
<td>3,750 RPM</td>
</tr>
</tbody>
</table>

600 Vdc, 30 seconds, 45°C
Specifications are subject to change.

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Application Policy
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TM4® SUMO™ MD
Motor / Inverter System

Features

- Peak power: Up to 265 kW
- Peak torque: Up to 3,255 Nm
- Max operating speed: 3,700 RPM

Benefits

- High torque/low speed permanent magnet motor and inverter combinations
- Designed to interface with standard differentials and/or gearboxes and/or e-axles
- Seamless integration into Dana products

Ideal for Class 2 to 6 Commercial Vehicles, Light to Medium Bus Platforms and Off-Highway Applications.
TM4® SUMO™ MD Motor / Inverter System

The TM4 SUMO MD systems are designed to interface directly with standard rear differentials and/or gearboxes and/or e-Axles. It makes this series perfect for class 2 to 6 commercial vehicles and light to medium bus platforms.

Motor Features
- Proven permanent magnet technology for optimal efficiency
- Outer rotor topology for maximum torque density
- Low electro-magnetic audible noise
- Low-cogging and ripple torque for better NVH
- Four-quadrant operation
- Double-ended shaft option
- Thermal protection

Inverter Features
- 3-phase or 6-phase high voltage inverter
- Variable switching frequency
- ReflexTM gate driver technology for high power and current densities
- EMI Filter
- Best-in-class power density
- High efficiency

Standards
- System protection: IP 6K9K
- Automotive components: AEC-Q100/ AEC-Q101/AEC-Q200
- Electromagnetic compatibility EMC: Main automotive intl standards
- Shock and vibration standards: GMW3172 Sprung masses
- Max coolant inlet temperature: 65°C
- Coolant type: 40/60 water-glycol
- Toxic materials and flammability: ROHS, ELV, UL94-V0
- External corrosion resistance: Salt mist, chemical products

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>Casing size</th>
<th>Phases</th>
<th>Peak power</th>
<th>Continuous power</th>
<th>Peak torque</th>
<th>Continuous torque</th>
<th>Max operating speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUMO MD HV1500-3P</td>
<td>L1</td>
<td>3</td>
<td>162 kW</td>
<td>100 kW</td>
<td>1590 Nm</td>
<td>680 Nm</td>
<td>3250 RPM</td>
</tr>
<tr>
<td>SUMO MD HV1800-3P</td>
<td>L1</td>
<td>3</td>
<td>170 kW</td>
<td>100 kW</td>
<td>1775 Nm</td>
<td>680 Nm</td>
<td>3250 RPM</td>
</tr>
<tr>
<td>SUMO MD HV2200-3P</td>
<td>L2</td>
<td>3</td>
<td>215 kW</td>
<td>145 kW</td>
<td>2430 Nm</td>
<td>1275 Nm</td>
<td>2700 RPM</td>
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<tr>
<td>SUMO MD MV2500-6P</td>
<td>L2</td>
<td>6</td>
<td>230 kW</td>
<td>115 kW</td>
<td>2500 Nm</td>
<td>1140 Nm</td>
<td>3000 RPM</td>
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<tr>
<td>SUMO MD HV2100-6P</td>
<td>L1</td>
<td>6</td>
<td>250 kW</td>
<td>130 kW</td>
<td>2150 Nm</td>
<td>685 Nm</td>
<td>3500 RPM</td>
</tr>
<tr>
<td>SUMO MD HV3000-6P</td>
<td>L2</td>
<td>6</td>
<td>235 kW</td>
<td>145 kW</td>
<td>3100 Nm</td>
<td>1055 Nm</td>
<td>3000 RPM</td>
</tr>
<tr>
<td>SUMO MD HV2400-6P</td>
<td>L1</td>
<td>6</td>
<td>240 kW</td>
<td>120 kW</td>
<td>2300 Nm</td>
<td>605 Nm</td>
<td>3500 RPM</td>
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<tr>
<td>SUMO MD HV2200-6P</td>
<td>L2</td>
<td>6</td>
<td>255 kW</td>
<td>190 kW</td>
<td>2355 Nm</td>
<td>990 Nm</td>
<td>3700 RPM</td>
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<tr>
<td>SUMO MD HV2600-6P</td>
<td>L2</td>
<td>6</td>
<td>265 kW</td>
<td>155 kW</td>
<td>2760 Nm</td>
<td>970 Nm</td>
<td>3800 RPM</td>
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</tbody>
</table>

600 Vdc, 30 seconds, 45°C / 1350 Vdc, 30 seconds, 45°C
Specifications are subject to change
TM4® SUMO™ HD Motor / Inverter System

Features
- Peak power: Up to 350 kW
- Peak torque: Up to 3,500 Nm
- Max operating speed: 3,400 RPM

Benefits
- High torque/low speed permanent magnet motor and inverter combinations
- Designed to interface with standard differentials and/or gearboxes and/or e-axles
- Seamless integration into Dana’s products

Ideal for Heavy-Duty Platforms, Commercial Vehicles and Off-Highway Applications.
TM4® SUMO™ HD Motor / Inverter System

The TM4 SUMO HD systems are designed to interface directly with standard rear differentials and/or gearboxes and/or e-Axles. Its direct drive/gearless approach makes it the perfect match for any heavy-duty platforms and commercial vehicles applications.

### Motor Features
- Proven permanent magnet technology for optimal efficiency
- Outer rotor topology for maximum torque density
- Low electro-magnetic audible noise
- Low-cogging and ripple torque for better NVH
- Four-quadrant operation
- Double-ended shaft option
- Thermal protection

### Inverter Features
- 9-phase high voltage inverter
- Variable switching frequency
- ReflexTM gate driver technology for high power and current densities
- EMI Filter
- Best-in-class power density
- High efficiency

### Standards
- System protection: IP 6K9K
- Automotive components: AEC-Q100/AEC-Q101/AEC-Q200
- Electromagnetic compatibility EMC: Main automotive intl standards
- Shock and vibration standards: GMW3172 Sprung masses
- Max coolant inlet temperature: 65°C
- Coolant type: 40/60 water-glycol
- Toxic materials and flammability: ROHS, ELV, UL94-V0
- External corrosion resistance: Salt mist, chemical products

### Specifications

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>Phases</th>
<th>Peak power</th>
<th>Continuous power</th>
<th>Peak torque</th>
<th>Continuous torque</th>
<th>Max operating speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUMO HD HV2700-9P</td>
<td>9</td>
<td>250 kW</td>
<td>195 kW</td>
<td>2700 Nm</td>
<td>2060 Nm</td>
<td>3375 RPM</td>
</tr>
<tr>
<td>SUMO HD HV3400-9P</td>
<td>9</td>
<td>250 kW</td>
<td>195 kW</td>
<td>3400 Nm</td>
<td>2060 Nm</td>
<td>2450 RPM</td>
</tr>
<tr>
<td>SUMO HD HV3500-9P</td>
<td>9</td>
<td>370 kW</td>
<td>260 kW</td>
<td>3445 Nm</td>
<td>1970 Nm</td>
<td>3400 RPM</td>
</tr>
</tbody>
</table>

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TM4® SUMO™ HP
Motor / Inverter System

Features
- Peak power: Up to 220 kW
- Peak torque: Up to 915 Nm
- Max operating speed: 2,800 RPM

Benefits
- High power permanent magnet motor/generator and inverter combinations
- Seamless integration into Dana’s products
- Control algorithms optimized for parallel hybrid or generation applications.

Ideal for High-Power Applications.
The TM4 SUMO HP consists of electric powertrains dedicated to high-power applications. The first motor/generator and inverter combination of this line, the TM4 SUMO HP HV900, was purposely developed for series and parallel hybrid configurations; it can be coupled to diesel engines, multi-speed gearboxes or integrated to axles for ultra-low floor buses.

**Motor Features**
- Proven permanent magnet technology for optimal efficiency
- Outer rotor topology for maximum torque density
- Low electro-magnetic audible noise
- Low-cogging and ripple torque for better NVH
- Four-quadrant operation
- Double-ended shaft option
- Thermal protection

**Inverter Features**
- 3-phase high voltage inverter
- Variable switching frequency
- ReflexTM gate driver technology for high power and current densities
- EMI Filter
- Best-in-class power density
- High efficiency

**Standards**
- System protection: IP67/IP 6K9K
- Automotive components: AEC-Q100/AEC-Q101/AEC-Q200
- Electromagnetic compatibility EMC: Main automotive int'l standards
- Shock and vibration standards: GMW3172 Sprung masses
- Max coolant inlet temperature: 65°C
- Coolant type: 40/60 water-glycol
- Toxic materials and flammability: ROHS, ELV, UL94-V0
- External corrosion resistance: Salt mist, chemical products

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>Mode</th>
<th>Phases</th>
<th>Peak power</th>
<th>Continuous power</th>
<th>Peak torque</th>
<th>Continuous torque</th>
<th>Max operating speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUMO HP HV900-3P</td>
<td>Generator</td>
<td>3</td>
<td>220 kW</td>
<td>160 kW</td>
<td>915 Nm</td>
<td>624 Nm</td>
<td>2800 RPM</td>
</tr>
<tr>
<td>SUMO HP HV900-3P</td>
<td>Motor</td>
<td>3</td>
<td>205 kW</td>
<td>150 kW</td>
<td>965 Nm</td>
<td>745 Nm</td>
<td>4000 RPM</td>
</tr>
</tbody>
</table>

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