Mobile Inverters and Motors
For Hydraulic Implements, Vehicle Traction and Vehicle Auxiliary Applications

Parker

ENGINEERING YOUR SUCCESS.
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Parker Hannifin

The global leader in motion and control technologies

A world class player on a local stage

Global Product Design
Parker Hannifin has more than 40 years experience in the design and manufacturing of drives, controls, motors and mechanical products. With dedicated global product development teams, Parker draws on industry-leading technological leadership and experience from engineering teams in Europe, North America and Asia.

Local Application Expertise
Parker has local engineering resources committed to adapting and applying our current products and technologies to best fit our customers’ needs.

Manufacturing to Meet Our Customers’ Needs
Parker is committed to meeting the increasing service demands that our customers require to succeed in the global industrial market. Parker’s manufacturing teams seek continuous improvement through the implementation of lean manufacturing methods throughout the process. We measure ourselves on meeting our customers’ expectations of quality and delivery, not just our own. In order to meet these expectations, Parker operates and continues to invest in our manufacturing facilities in Europe, North America and Asia.

Electromechanical Worldwide Manufacturing Locations
Europe
Littlehampton, United Kingdom
Dijon, France
Offenburg, Germany
Filderstadt, Germany
Milan, Italy

Asia
Wuxi, China
Chennai, India

North America
Rohnert Park, California
Irwin, Pennsylvania
Charlotte, North Carolina
New Ulm, Minnesota

Local Manufacturing and Support in Europe
Parker provides sales assistance and local technical support through a network of dedicated sales teams and authorized technical distributors throughout Europe.

For contact information, please refer to the Sales Offices on the back cover of this document or visit www.parker.com
Mobile Applications

Overview

Electro-Hydraulic Actuation

Frequency-controlled electro - hydraulic pump systems for hydraulic implement control

Parker mobile inverters and motors provide frequency control of mobile hydraulic pump systems, particularly in the control of on-vehicle hydraulic implements. Typical vehicle systems include:
- Construction machinery
- Aerial lift trucks
- Truck-mounted cranes
- Intermodal handling equipment
- Mining equipment

Electric motor-inverter systems used in conjunction with hydraulic pumps and an onboard battery system offer a number of benefits; significant fuel savings can be achieved, equipment can be operated with the internal combustion engine off and the kinematics of the hydraulic implements can be used to recharge the battery system.

Electric and Hybrid-Electric Vehicle Traction

Permanent magnet motors and inverters for drivetrain applications

In vehicle systems, power density is a key design factor. The torque density and speed capabilities of Parker permanent magnet AC (PMAC) motors, combined with a voltage-matched inverter, provide the speed and torque required to achieve breakthrough performance in a variety of vehicle platforms:
- Large Goods Vehicles
- Motorcycles and scooters
- Light commercial vehicles
- Watercraft
- Personal recreational vehicles

With design teams on multiple continents, Parker has the expertise to provide the optimal motor for the required power. Where overall size and weight are not significant design factors, Parker can also provide high efficiency AC induction motors in combination with our inverter systems.

Vehicle Auxiliary Systems

Motors and inverters for onboard pumps, fans, compressors

In addition to vehicle propulsion, there are numerous systems that are traditionally reliant on the internal combustion engine for power, such as:

Power steering
- Compressors for climate control
- Air compressors for braking
- Cooling fans

By decoupling these systems from the engine, and implementing battery-fed electric motor systems, the vehicle operator can achieve efficiency improvements from the engine, or be able to reduce the size of the engine. Parker can assist with the development of motor-inverter systems to operate vehicle auxiliary systems across of range of battery voltages and control systems.
System Examples

**Drivetrain / Traction**

**Description**

Parker offers complete solutions or sub-systems for a wide range of drivetrain and traction applications. High performance IGBT-based inverters provide maximum versatility, offering compatibility with PMAC or induction motor designs. Parker’s inverter/motor combinations are pre-engineered for the highest efficiency and performance, minimizing losses both during motoring and power regeneration, providing maximum vehicle range. Whether applied to series- or parallel-hybrid, or all-electric designs, you can rest assured that Parker has a reliable solution.

**Drivetrain/ traction benefits**

- Optimised system design with PMAC or AC induction motors
- Improved speed performance through flexible motor control- resolver, encoder, or sensorless
- Integration into vehicle control system via CAN communications
- Maximum performance and power density through flexible liquid and air cooling

This illustration shows a typical series-hybrid traction system. The internal combustion engine (ICE), which may be a traditional petrol or diesel design, or a gas turbine, drives the Parker PMAC generator, which produces alternating current (AC). The generator output is then converted to direct current (DC), used to keep the batteries charged. The battery bank can allow operation with the ICE offline, and also absorbs regenerative energy during braking. A Parker battery management system coordinates charging and discharging while monitoring crucial battery parameters. The traction inverter produces variable frequency alternating current which is used to power the traction motor, which in turn drives the wheels of the vehicle. The system is managed by a central controller over Parker IQAN or other means of communication.
**Electro-Hydraulic Pump (EHP)**

**Description**

The combination of Parker's experience and expertise in hydraulics with high efficiency electric motors and inverters results in a comprehensive offering of “EHP” systems; hydraulic pumps driven by speed-controlled electric motors. Especially suited to utility and commercial vehicles, the EHP allows implements to be driven electrically, reducing load on the vehicle’s main engine. In cases where the vehicle is stationary during operation, idling can be eliminated, resulting in reduced fuel consumption and emissions. Vehicles using implements while in motion can benefit from less load on the engine possibly allowing a smaller, more efficient engine to be used.

**Electro-hydraulic Pump (EHP) benefits**

- Fuel savings from reduced idling
- Reduced emissions
- Quiet operation
- Reduced load on ICE

This illustration shows a typical EHP system that is used to power a hydraulic implement. The AC motor driving the pump is powered by the battery bank through an efficient Parker mobile inverter. In this particular system, the batteries may be charged from the mains supply while the truck is out of service, or by running a small combustion engine or turbine if recharging is not available. The advantages of the EHP based system include fuel savings and reduced emissions, as an oversized combustion engine does not need to run continuously while the hydraulics are in use. When used in new applications, since the combustion engine is not relied upon to power the hydraulics, a smaller and more fuel efficient engine can be used. For a retrofit application, periods of engine idling can be reduced or even eliminated, reducing fuel consumption.
Mobile Inverters and Motors
MC Series

MC Series
Low Voltage Mobile Inverters

Description
Parker’s MC Series Mobile Inverter range provides high performance and functionality in a compact package for mobile motor control applications from 24 to 96 VDC. Compatible with multiple asynchronous motor manufacturers, the MC series settings can be optimized with supplied configuration software. Each inverter provides system control capabilities such as analogue and digital inputs and outputs, contactor coil drivers and proportional valve drivers.

Product Features
- Advanced field oriented vector control
- Auto-configuration of typical induction motors
- Customization possible (firmware)
- High efficiency cold plate heat sink design
- IP65 protection class
- Motor temp sensor input
- Encoder supply output (5 V)
- AB encoder input
- Dual, configurable throttle inputs
- Configurable CAN communication
- Parker IQAN compatible
- Ability to control vehicle control tasks separately from motor control
- 5 configurable coil drive outputs
- 2 configurable digital outputs
- 2 Analogue inputs
- 6 Digital inputs
- Powerful MC configuration utility for system design and diagnostics

<table>
<thead>
<tr>
<th>Model</th>
<th>MC C</th>
<th>MC D</th>
<th>MC E</th>
<th>MC F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage</td>
<td>24/80 VDC</td>
<td>24/48 VDC</td>
<td>24/80 VDC</td>
<td>24/96 VDC</td>
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<tr>
<td>Max 2 min current</td>
<td>140 - 250 Arms</td>
<td>200 - 350 Arms</td>
<td>350 - 500 Arms</td>
<td>450 - 800 Arms</td>
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<tr>
<td>Max 2 min power</td>
<td>5.1 - 7.1 kVA</td>
<td>5.7 - 19.6 kVA</td>
<td>16.6 - 32.4 kVA</td>
<td>25.4 - 60.6 kVA</td>
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<tr>
<td>Switching freq (Induction)</td>
<td>2.0 - 4.0 kHz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>1.7 kg</td>
<td>2.8 kg</td>
<td>4.1 kg</td>
<td>6.8 kg</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-40 °C to 50 °C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40 °C to 95 °C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection</td>
<td>IP65</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control type</td>
<td>Speed or Torque control for Induction (for PMAC, consult your local Parker sales office)</td>
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<td></td>
<td></td>
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<tr>
<td>Feedback</td>
<td>Quadrature encoder</td>
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<tr>
<td>Communication protocol</td>
<td>CANopen, serial</td>
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</tr>
<tr>
<td>Cooling</td>
<td>Air-cooled</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Certifications</td>
<td>UL recognized component per UL583, EMC: designed to EN12895, Safety: designed to EN1175, CE marked to EN 61800-5-1 (Safety, Low Voltage Directive)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Accessories and Dimensions

MC Configuration Manager Software
- PC-based programming
- System monitoring
- System diagnostics
- Adjust system variables and programmable parameters
- Online or offline use
- Windows XP/Vista/7 compatible
- Includes USB adaptor

Dimensions [mm]

**MC C**
- 140 x 129
- 5.5 x 5.5
- 7.5 x 60.5

**MC D**
- 155 x 140.4
- 7.3 x 60.5
- 7.3 x 40.4

**MC E**
- 145 x 145
- 80 x 80
- 10 (6.4)

**MC F**
- 275 x 255
- 102 x 80
- 10 (6.4)

Additional Accessories
Please consult your local Parker sales office for information on additional accessories required for the integration of MC Series inverters into vehicle systems. Accessories include contactors, feedback devices and connection cables and mounting hardware.
MA3 Series

High Voltage Mobile Inverters

Description
MA3 Series inverters combines high performance and motor control with intelligence control functionality. Suitable for either PMAC or AC induction motors, it also offers the flexibility of several feedback options. Speed and torque points can be adjusted instantaneously and performance algorithms optimized to the vehicles needs. On-board digital communications with multiple protocols comes standard, along with a USB programming port. The rugged cast aluminum housing integrates a proprietary cooling configuration and necessary environmental protection for the toughest mobile applications.

Product Features
- Environmentally sealed cast housing
- Regenerative braking
- Suitable for induction and servo motors
- Full programmability
- Compatible with choice of feedback devices
- 4 analogue and 6 digital inputs/outputs
- CAN communications
- Mini USB programming port
- Beaded hose barb coolant connections

<table>
<thead>
<tr>
<th>Description</th>
<th>MA3-40</th>
<th>MA3-60</th>
<th>MA3-80</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Operating Range</td>
<td>205 - 400 VDC</td>
<td>310 - 600 VDC</td>
<td>410 - 800 VDC</td>
</tr>
<tr>
<td>Nominal Voltage</td>
<td>320 VDC</td>
<td>480 VDC</td>
<td>640 VDC</td>
</tr>
<tr>
<td>Peak Current Output</td>
<td>225 A</td>
<td>325 A</td>
<td>400 A</td>
</tr>
<tr>
<td>Continuous Current Output (A)</td>
<td>130 A</td>
<td>185 A</td>
<td>225 A</td>
</tr>
<tr>
<td>Peak Power</td>
<td>93.5 kW</td>
<td>135 kW</td>
<td>160 kW</td>
</tr>
<tr>
<td>Continuous Power</td>
<td>54 kW</td>
<td>77 kW</td>
<td>93.5 kW</td>
</tr>
<tr>
<td>Switching Freq (PMAC)</td>
<td>4.0 kHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switching Freq (Induction)</td>
<td>2.0 - 4.0 kHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td>97 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control Voltage Range</td>
<td>7 to 32 VDC</td>
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</tr>
<tr>
<td>Max Control Current @7 V</td>
<td>8 A DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min Control Current @32 V</td>
<td>0.7 A DC</td>
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<td></td>
</tr>
<tr>
<td>Max Inrush Current (50 ms max)</td>
<td>18.9 A DC</td>
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</tr>
<tr>
<td>Weight</td>
<td>5.9 kg</td>
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</tr>
<tr>
<td>Operating Temperature</td>
<td>-40 °C to 55 °C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40 °C to 85 °C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection</td>
<td>IP65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control Type</td>
<td>Speed/Torque</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feedback</td>
<td>Resolver</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication Protocol</td>
<td>CANopen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooling Options</td>
<td>Water/Glycol or Hydraulic Oil</td>
<td>(Alternate cooling configurations available. Contact your local sales office)</td>
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</tr>
<tr>
<td>Flow Rate max (min)</td>
<td>7.6 lpm (3.8 lpm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max Pressure</td>
<td>2.07 bar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max Inlet Temperature</td>
<td>55 °C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Certifications</td>
<td>CE certified (UL pending, consult your local Parker sales office)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Accessories and Dimensions

DSE Lite Software
For inverter setup and tuning, DSE Lite is an easy-to-use software tool with straightforward function block programming and an intuitive user interface. In addition to supporting user-defined configurations, it offers real-time monitoring and performance charting. An on-line help function is available for the various drive function blocks. DSE Lite is compatible with Windows XP™ and Windows Vista™ operating systems. DSE Lite is available for download free of charge from www.parker.com/ssd
GVM Global Vehicle Motor and Generator

Exceptional Performance

Parker’s range of PMAC motors and generators have been designed to meet the challenging requirements of vehicle duty performance. The design has focused on reducing magnetic material content, optimising stator lamination design, and cooling configuration that yields a compact motor with very high output power.

- Max. specific Power (peak) >12.95 kW/dm³
- Max. specific Power (cont) >9.07 kW/dm³
- Max. power Density (peak) >2.62 kW/kg
- Max. power Density (cont) >1.84 kW/kg

All data given for a cooling liquid temperature of 65 °C

Parker’s vehicle motors include patent-pending cooling, constant torque/constant power regions, simple and cost-effective electrical connections and full environmental protection.

Custom Solutions

Parker’s family of PMAC motors and generators share leading edge magnetic and thermal designs, but can easily be customised to fit the mechanical constraints of our customers’ vehicle programs. Parker can assist in the development of both prototype and serial production motors and generators with no minimum volume requirement.

Customisation Specialists

As a designer and manufacturer of PMAC motors and generators, Parker is well positioned to quickly and cost effectively design and produce custom solutions to our customers’ specifications, including mechanical solutions, such as connectors, shafts, mounting and motor kits. Additionally, Parker can customise motor magnetic designs and cooling systems to produce desired performance under specific conditions, such as voltage, duty cycle, ambient temperature or operating environment.

Features

- High Flexibility
- Provided as a “kit” or a complete assembly
- High modularity of standard lamination stack length
- Hollow spline shaft available for Electro Hydraulic Pumps (SAE) and solid spline shaft for traction application
- Water cooling or Natural convection
- Operating voltages available from 24 to 640 VDC
- Rugged Design
- High power density & compactness

Technical Characteristics

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Rated Torque [Nm]</th>
<th>Peak Torque [Nm]</th>
<th>Rated Power [kW]</th>
<th>Peak Power [kW]</th>
<th>Rated Speed [min⁻¹]</th>
<th>Max. Speed [min⁻¹]</th>
<th>Length [mm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>GVM210-050-CR</td>
<td>36,7</td>
<td>82</td>
<td>26,9</td>
<td>36,7</td>
<td>7000</td>
<td>8000</td>
<td>234 max</td>
<td>38</td>
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<tr>
<td>GVM210-100-JQ</td>
<td>79,1</td>
<td>173</td>
<td>57,1</td>
<td>75,0</td>
<td>6900</td>
<td>8000</td>
<td>286 max</td>
<td>47</td>
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<tr>
<td>GVM210-150-YP</td>
<td>118</td>
<td>262</td>
<td>84,1</td>
<td>114,8</td>
<td>6800</td>
<td>8000</td>
<td>336 max</td>
<td>56</td>
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<tr>
<td>GVM210-200-HP</td>
<td>154</td>
<td>352</td>
<td>108</td>
<td>146,8</td>
<td>6700</td>
<td>8000</td>
<td>387 max</td>
<td>65</td>
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<tr>
<td>GVM210-250-HP</td>
<td>181</td>
<td>442</td>
<td>136</td>
<td>194,2</td>
<td>7200</td>
<td>8000</td>
<td>436 max</td>
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<td>GVM210-300-HP</td>
<td>232</td>
<td>530</td>
<td>144</td>
<td>198,7</td>
<td>5910</td>
<td>8000</td>
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<tr>
<td>GVM210-350-EP</td>
<td>285</td>
<td>621</td>
<td>164</td>
<td>225,5</td>
<td>5910</td>
<td>7100</td>
<td>540 max</td>
<td>92</td>
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<td>GVM210-400-EP</td>
<td>319</td>
<td>710</td>
<td>167</td>
<td>235,2</td>
<td>5000</td>
<td>8000</td>
<td>591 max</td>
<td>101</td>
</tr>
</tbody>
</table>
Dimensions

For Traction Applications

GVM210

<table>
<thead>
<tr>
<th>Motor size</th>
<th>L1 [mm]</th>
<th>L2 [mm]</th>
<th>Shaft interface</th>
<th>L3 [mm]</th>
<th>L4 [mm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>GVM210-050</td>
<td>234 max</td>
<td>90</td>
<td>TA</td>
<td>39.4</td>
<td>16.8</td>
<td>36.5 kg</td>
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<tr>
<td>GVM210-100</td>
<td>285 max</td>
<td>140</td>
<td>TA</td>
<td>39.4</td>
<td>16.8</td>
<td>45.5 kg</td>
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<td>190</td>
<td>TA</td>
<td>39.4</td>
<td>16.8</td>
<td>54.5 kg</td>
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<tr>
<td>GVM210-200</td>
<td>387 max</td>
<td>240</td>
<td>TA</td>
<td>39.4</td>
<td>16.8</td>
<td>63.5 kg</td>
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<tr>
<td>GVM210-250</td>
<td>438 max</td>
<td>290</td>
<td>TA</td>
<td>39.4</td>
<td>16.8</td>
<td>72.5 kg</td>
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<tr>
<td>GVM210-300</td>
<td>489 max</td>
<td>340</td>
<td>TB</td>
<td>63.5</td>
<td>38.1</td>
<td>81.5 kg</td>
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<tr>
<td>GVM210-350</td>
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<td>390</td>
<td>TB</td>
<td>63.5</td>
<td>38.1</td>
<td>90.5 kg</td>
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<tr>
<td>GVM210-400</td>
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<td>440</td>
<td>TB</td>
<td>63.5</td>
<td>38.1</td>
<td>99.5 kg</td>
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</tbody>
</table>

Spline interface TA

- ANSI B92.2M
- Class 6h
- Number of teeth: 24
- Module: 1.000
- Spline pitch: -
- Pressure angle: 30°
- Pitch diameter: Ø24.000
- Base diameter: Ø20.785
- Major diameter: Ø25.00/Ø24.75
- Minor diameter: Ø22.50/Ø22.26
- Form diameter: Ø22.89
- Circular tooth thickness: 1.571
- Circular tooth thickness: 1.485
- Pin diameter: 2.12
- Measurement over pins: Ø27.479/Ø27.399

Spline interface TB

- ANSI B92.1
- Class 5
- Number of teeth: 27
- Module: -
- Spline pitch: 16/32
- Pressure angle: 30°
- Pitch diameter: Ø42.863
- Base diameter: Ø37.12
- Major diameter: Ø44.45/Ø44.32
- Minor diameter: Ø39.27
- Form diameter: Ø41.17
- Circular tooth thickness: 2.456
- Circular tooth thickness: 2.421
- Pin diameter: 3.048
- Measurement over pins: Ø47.460/Ø47.407
Mobile Inverters and Motors
Global Vehicle Motor - GVM: Dimensions

For Electro-Hydraulic Pumps (EHP) Applications

GVM210

<table>
<thead>
<tr>
<th>Motor size</th>
<th>L1 [mm]</th>
<th>L2 [mm]</th>
<th>Weight [kg]</th>
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<tr>
<td>GVM210-050</td>
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<td>GVM210-150</td>
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<tr>
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</table>
**Highest Efficiency**

The right selection and design of the best component technology with the optimal performance characteristics ensures that PMAC motors and generators will perform at very high efficiencies. PMAC stators and rotors have been very carefully designed to minimise losses over a large operational region. Not only does this utilise each battery charge more effectively, but it also increases reliability by limiting thermal build up and cycling that may lead to material fatigue and failure. Together, this provides the lowest total cost of ownership.

[Sample efficiency map]

**Hybrid Solutions**

**Problem**

European standards are more and more restrictive in terms of emissions. Customer are forced to reduce fuel consumption and CO₂ emissions. Hybrid technology can be the solution. Parker raised the challenge by replacing full hydraulic system by Electro Hydraulic Pump (EHP).

**Characteristics**

The motorization is based on PMAC servomotors with very low inertia:
- Lift / Extension / Boost functions
- Diam 305 mm
- Length 690 mm
- Power 128 kW
- Torque 340 Nm
- Weight 215 kg

Motors for steering and boost functions:
- Diam 258 mm
- Length 705 mm
- Power 65 kW
- Torque 270 Nm
- Weight 155 kg

**Benefits**

- Reduce fuel consumption and CO₂ emissions
- Smaller ICE required
- Complete Parker solution with hydraulics and Electrics components
- High dynamic system
Mobile Inverters and Motors
EHP Kits

Electro - Hydraulic Pump Kits (EHP Kits)

Mobile Inverters, PMAC/Induction Motors, Hydraulic Pump

Subsystem Capabilities
Mobile OEMs face tremendous demands to provide machines that cost less to operate and that meet future regulatory standards. To reduce the time to meet these demands, Parker offers pre-engineered and customisable EHP kits to assist in the development of hybrid-electric vehicle platforms. An EHP kit includes:

- Low or high voltage inverter, depending on the battery system and performance requirements
- Matched AC induction or PMAC motor
- Motor-pump mounting
- Mobile hydraulic pump- fixed displacement (vane or gear style) or variable displacement (bent-axis piston style)

Please consult your local Parker sales office to discuss your specific application requirements.

Asynchronous Motors
Available for 24 VDC to 96 VDC operation, Parker’s asynchronous motors can be supplied as part of a complete mobile inverter system with a pre-configured and tested mobile inverter. Please consult your local Parker sales office to discuss your specific application requirements. Typically adapted for Electro-Hydraulic-Pump, they are commonly used in steering applications.

- Speed up to 3500 min⁻¹
- Full programmability
- Power up to 40 kW
- Torque up to 150 Nm
- IP rating: IP20 to IP65
## Order Code

### MA Series Inverters

<table>
<thead>
<tr>
<th>Order example</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<td>R0</td>
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1. **Inverter family**
   - M: Mobile Inverter

2. **Control module build**
   - A: High Voltage - 400, 600, 800 VDC

3. **Frame size**
   - 3: MA Series Inverter

4. **Maximum operating voltage**
   - 40: 400 VDC
   - 60: 600 VDC
   - 80: 800 VDC

5. **Peak current ratings**
   - 400 VDC Max. Voltage
     - 0225: 225 A - MA3-40 Series Inverter
     - 0325: 325 A - MA3-40 Series Inverter
     - 0400: 400 A - MA3-40 Series Inverter
   - 600 VDC Max. Voltage
     - 0225: 225 A - MA3-60 Series Inverter
     - 0325: 325 A - MA3-60 Series Inverter
     - 0400: 400 A - MA3-60 Series Inverter
   - 800 VDC Max. Voltage
     - 0225: 225 A - MA3-40 Series Inverter
     - 0325: 325 A - MA3-40 Series Inverter
     - 0400: 400 A - MA3-40 Series Inverter

6. **Feedback Option**
   - 00: None
   - R0: Resolver
   - EQ: Incremental quadrature encoder
   - A0: Absolute encoder
   - M1: SinCos encoder
   - LS: Line sync card

7. **Communication Option**
   - 0: None
   - 1: CANopen communications

8. **Coolant Connections**
   - 0: None
   - 1: Water/Glycol hose
   - 2: Hydraulic fitting

9. **Branding**
   - 01: Parker branded
   - XX: OEM branding (assigned by factory)

10. **Special Options**
    - 00: None
    - XX: Special option (assigned by factory)
## MC Series Inverters

<table>
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</table>

### 1 Inverter family
- **M** Mobile Inverter

### 2 Control module build
- **C** Low Voltage - 24...96 VDC

### 3 Frame size
- **C**
- **D** MC Series Frame F
- **E**
- **F**

### 4 Maximum operating voltage

#### Low Voltage MC Series Inverter
- **02** 24 VDC
- **03** 36 VDC
- **04** 48 VDC
- **08** 80 VDC
- **09** 96 VDC

### 5 Peak current ratings

#### 24 VDC Nominal Voltage
- **0180** 180 A - MC Series Frame C
- **0250** 250 A - MC Series Frame C
- **0350** 350 A - MC Series Frame D

#### 36 VDC Nominal Voltage
- **0400** 400 A - MC Series Frame E
- **0500** 500 A - MC Series Frame E
- **0650** 650 A - MC Series Frame F
- **0800** 800 A - MC Series Frame E

#### 48 VDC Nominal Voltage
- **0200** 200 A - MC Series Frame C
- **0275** 275 A - MC Series Frame D
- **0350** 350 A - MC Series Frame D
- **0450** 450 A - MC Series Frame E
- **0450** 450 A - MC Series Frame F
- **0550** 550 A - MC Series Frame E
- **0650** 650 A - MC Series Frame F

#### 80 VDC Nominal Voltage
- **0175** 175 A - MC Series Frame C
- **0250** 250 A - MC Series Frame D
- **0350** 350 A - MC Series Frame E
- **0550** 550 A - MC Series Frame F
- **0650** 650 A - MC Series Frame F

#### 96 VDC Nominal Voltage
- **0550** 550 A - MC Series Frame F
- **0650** 650 A - MC Series Frame F

### 6 Branding
- **01** Parker branded

### 7 Special options
- **00** E Version with PMAC
- **01** Non E version without PMAC
- **02** E Version without PMAC
At Parker, we’re guided by a relentless drive to help our customers become more productive and achieve higher levels of profitability by engineering the best systems for their requirements. It means looking at customer applications from many angles to find new ways to create value. Whatever the motion and control technology need, Parker has the experience, breadth of product and global reach to consistently deliver. No company knows more about motion and control technology than Parker. For further info call 08000 27 27 5374