# GVI Global Vehicle Inverter

Mobile Inverters for Traction, Electro-Hydraulic Pumps (EHP) and Auxiliary Systems
24 to 650 VDC

ENGINEERING YOUR SUCCESS.

***WARNING — USER RESPONSIBILITY***

**FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.**

- This document and other information from Parker-Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.
- The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.
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# Inverters for Traction, Electro-Hydraulic Pumps (EHP) and Auxiliary Systems

## Low Voltage Mobile Inverters - GVI



## High Voltage Mobile Inverters - GVI



## Related Products

# Electromechanical & Drives Division

## Global products with local manufacturing and support

### 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.

**Manufacturing Locations**

**Europe**
Littlehampton, United Kingdom
Longvic, France
Offenburg, Germany
Milan, Italy
Chomutov, Czech Republik

**Asia**
Wuxi, China
Jangan, Korea
Chennai, India

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

## Manufacturing

Parker electromechanical & drive products are manufactured globally to provide our customers with quality products at a competitive price point. In addition to factory- direct support, Parker provides sales assistance and local technical support through a group of dedicated sales teams and a network of authorized systems integrators, field service engineers, and technical distributors across the globe. For contact information, please refer to the Sales Offices listed on the back cover of this document or visit www.parker.com

Charlotte, US

Chennai, India

Wuxi, China


Offenburg, Germany

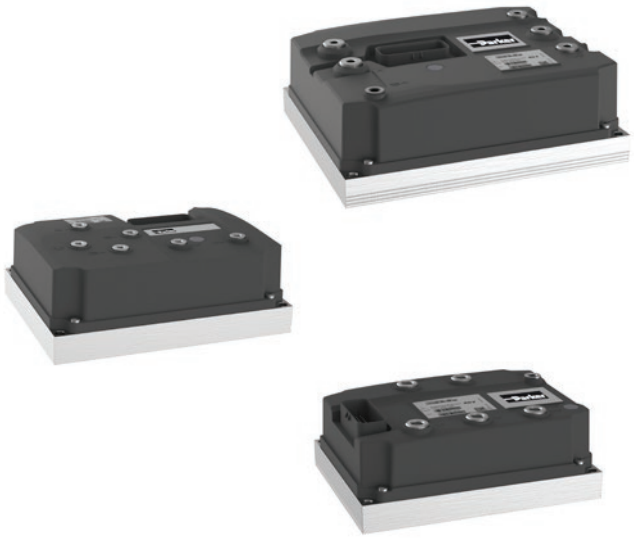
Longvic, France


Milan, Italy

# Low Voltage Mobile Inverters - GVI

## Overview

The Low Voltage Parker GVI series represents the latest design standards for compact and reliable inverters for mobile applications. Providing a motor control solution for low voltage battery systems between 24 and 80VDC, GVI motor controllers offer OEMs a superb combination of power, performance and functionality. The compact dimensions and high efficiency of GVI controllers make integration into very limited spaces a reality without sacrificing output performance. Partnered with the Parker GVM range of highly efficient PMAC mobile motors, the GVI range aims to provide the lowest possible installed cost, whilst still maintaining superior reliability even in the most demanding of applications.



### Product Features

- Auto-tuning
- High efficiency cold plate design
- IP65 protection class
- Motor temperature sensor input
- Sin/Cos encoder feedback
- CAN J1939 or CAN Open communication
- Parker IQAN compatible
- Configurable coil drive digital outputs
- 2 Analog inputs / 9 Digital inputs / 6 Digital Outputs

### Applications

- Utility vehicles
- Handling equipment, handling gantries
- Refuse Truck
- Turf care
- Street sweepers
- Compressors
- Other hydraulic pump control

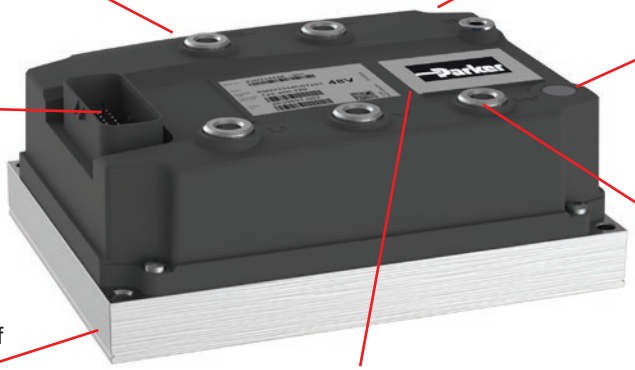
### Technical characteristics - overview

| Model | GVI |
|---|---|
| Motor type | Permanent magnet AC |
| Nominal voltage | 24 / 48 / 80 Vdc |
| Peak current | 700 Arms |
| Peak power | 68 kVA |
| Switching frequency | 4, 8, 12, 16 kHz |
| Operating temperature range | -40°C to +55°C |
| Storage temperature range | -40°C to +70°C |
| Protection | IP65 |
| Control type | Speed or Torque control |
| Feedback | Sin/Cos encoder |
| Communications | CAN J1939, CAN Open |
| Cooling | Cold plate |
| Conformance | IEC60068, EN61000-4, EN1175-1, IEC60529, EN55022 |
| Output frequency | 0 - 599 Hz[1)] |

[1)] For output frequencies > 599 Hz please contact Parker

# Product Details

Thanks to an IP65 protection class, the drive can be direct vehicle mounted without an enclosure.
(no direct high pressure spray)




# Technical Data

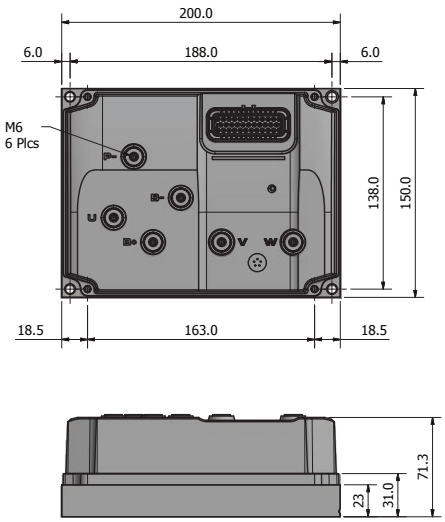
| Product Code | Frame Size | Output Current [Arms] S2, 2 min(1) | Output Current [Arms] S2, 1 h(2) | Nominal input voltage [Vdc] | Operating range [Vdc] | Weight [Kg] (lbs) |
|---|---|---|---|---|---|---|
| GVI-C024-0350S1-S00-G0000 | C | 350 | 150 | 24 | 16-32 | 1.8 (4) |
| GVI-C048-0280S1-S00-G0000 | C | 280 | 120 | 48 | 33-63 | 1.8 (4) |
| GVI-D024-0550S1-S00-G0000 | D | 550 | 275 | 24 | 16-32 | 2.9 (6.4) |
| GVI-D048-0450S1-S00-G0000 | D | 450 | 225 | 48 | 33-63 | 2.9 (6.4) |
| GVI-D048-0550S1-S00-G0000 | D | 550 | 275 | 48 | 33-63 | 2.9 (6.4) |
| GVI-D080-0230S1-S00-G0000 | D | 230 | 115 | 80 | 50-104 | 2.9 (6.4) |
| GVI-D080-0350S1-S00-G0000 | D | 350 | 175 | 80 | 50-104 | 2.9 (6.4) |
| GVI-D080-0400S1-S00-G0000 | D | 400 | 200 | 80 | 50-104 | 2.9 (6.4) |
| GVI-E048-0700S1-S00-G0000 | E | 700 | 350 | 48 | 33-63 | 4.8 (10.6) |
| GVI-E080-0500S1-S00-G0000 | E | 500 | 250 | 80 | 50-104 | 4.8 (10.6) |
| GVI-E080-0700S1-S00-G0000 | E | 700 | 350 | 80 | 50-104 | 4.8 (10.6) |

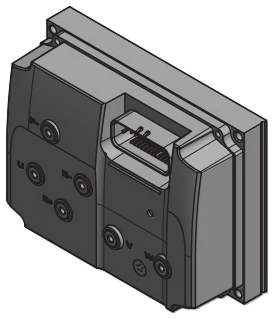
Notes: All current ratings are rms values per motor phase.
(1) 2 minute rating at 8kHz switching frequency and 25°C ambient temperature
(2) 1 hr rating at 8kHz switching frequency and 40°C ambient temperature

# Dimensions

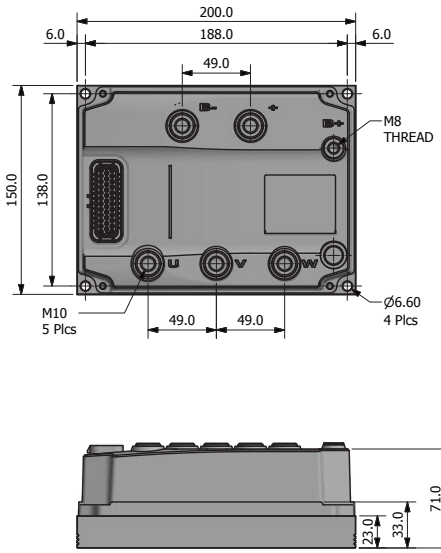
**Dimensions [mm]**

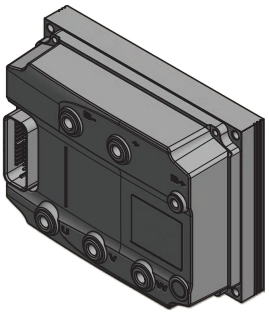
## Frame C



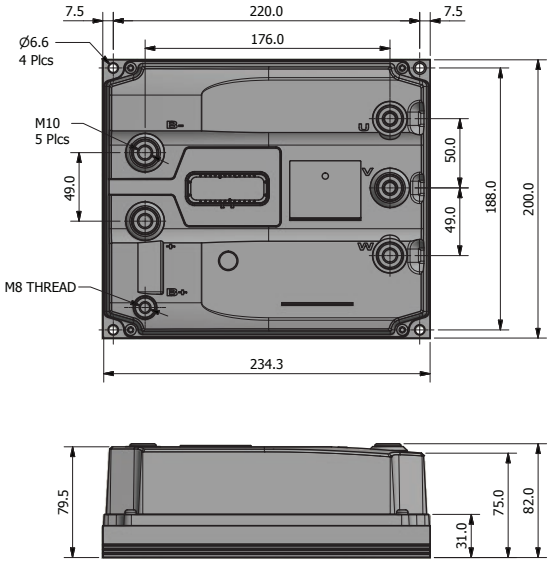



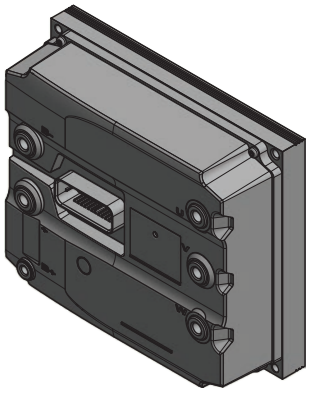
## Frame D



## Frame E



# Order Code

| | 1 | | 2 | 3 | | 4 | 5 | 6 | | 7 | 8 | | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Order example | **GVI** | **-** | **C** | **024** | **-** | **0350** | **S** | **1** | **-** | **S** | **00** | **-** | **G0000** |

| | | |
|---|---|---|
| **1** | **Inverter family** | |
| | **GVI** | Global Vehicle Inverter |
| **2** | **Frame size** | |
| | **C** | Frame size C |
| | **D** | Frame size D |
| | **E** | Frame size E |
| **3** | **Nominal DC Supply** | |
| | **024** | 24 VDC |
| | **048** | 48 VDC |
| | **080** | 80 VDC |
| **4** | **Current Rating** | |
| | **24 VDC Nominal Voltage** | |
| | **0350** | 350 A - Frame C |
| | **0550** | 550 A - Frame C |
| | **48 VDC Nominal Voltage** | |
| | **0280** | 280 A - Frame C |
| | **0450** | 450 A - Frame D |
| | **0550** | 550 A - Frame D |
| | **0700** | 700 A - Frame E |
| | **80 VDC Nominal Voltage** | |
| | **0230** | 230 A - Frame D |
| | **0350** | 350 A - Frame D |
| | **0400** | 400 A - Frame D |
| | **0500** | 500 A - Frame E |
| | **0700** | 700 A - Frame E |
| **5** | **Package** | |
| | **S** | Single |
| **6** | **Series** | |
| | **1** | Series 1 |
| **7** | **Feedback Type** | |
| | **S** | Sin/Cos encoder |
| **8** | **Reserved** | |
| | **00** | |
| **9** | **Special Option** | |
| | **G0000** | Global specification |
| | **N0000** | North America specification |
| | **E0000** | European specification |

# High Voltage Mobile Inverters - GVI

## Overview

### Description

Providing a motor control solution for battery systems up to 650 V, high voltage GVI controllers offer OEMs high reliability and minimized total lifetime cost. The rugged IP6K9K design is perfect for the harsh environments of mobile equipment, while the integrated DC filter and wide operating voltage range allow maximum flexibility in system design.

Partnered with the Parker GVM range of highly efficient PMAC mobile motors, the GVI range aims to provide the lowest possible installed cost, highest efficiency while still maintaining superior reliability even in the most demanding of applications.

### Product Features

- Auto-tuning
- Liquid cooled design
- IP6K9K protection class
- Motor temperature input
- Resolver feedback
- CAN J1939 or CAN Open communication
- Parker IQAN compatible
- 4 Digital inputs*
- Full current available at 100-750 VDC
- Safe Torque Off and HVIL

### Applications

- Utility vehicles
- Handling equipment, handling gantries
- Refuse Truck
- City van
- Bus and Coach
- Turf care
- Street sweepers
- Agricultural implements
- Other hydraulic pump control

*Standard firmware reserves 2 Digital inputs for CAN address ID

### Technical characteristics - Overview

| Model | GVI |
|---|---|
| Motor type | Permanent magnet AC |
| Nominal voltage | 650 Vdc |
| Peak current | 500 Arms |
| Peak power | 300 kVA |
| Switching frequency | 1, 2, 4, 6 kHz |
| Operating temperature range | -40°C to +85°C |
| Storage temperature range | -40°C to +85°C |
| Protection | IP6K9K |
| Control type | Speed or Torque control |
| Feedback | Resolver |
| Communications | CAN J1939, CAN Open |
| Cooling | WEG liquid cooled |
| Conformance | ISO20653:2006, ISO16750-4, ISO16750-3 EN60068-2, CISPR25 Ed.4 Class 3, ISO11452-4, ISO11452-8, ISO7637-2 |
| Output frequency | 0 - 599 Hz[1)] |

[1)] For output frequencies > 599Hz please contact Parker

# Product Details

Rugged IP6K9K design suitable for the demanding environment of electric vehicles


# Technical Data

| Product Code | Frame Size | Output Current [Arms] S2, 10 s(1) | Output Current [Arms] S2, 1 h(2) | Nominal input voltage [Vdc] | Operating range [Vdc] | Weight [Kg] (lbs) |
|---|---|---|---|---|---|---|
| **GVI-G650-0300S1-R00-G0000** | G | 300 | 225 | 650 | 100-750 | 21 (46.3) |
| **GVI-H650-0500S1-R00-G0000** | H | 500 | 375 | 650 | 100-750 | 25 (55.1) |

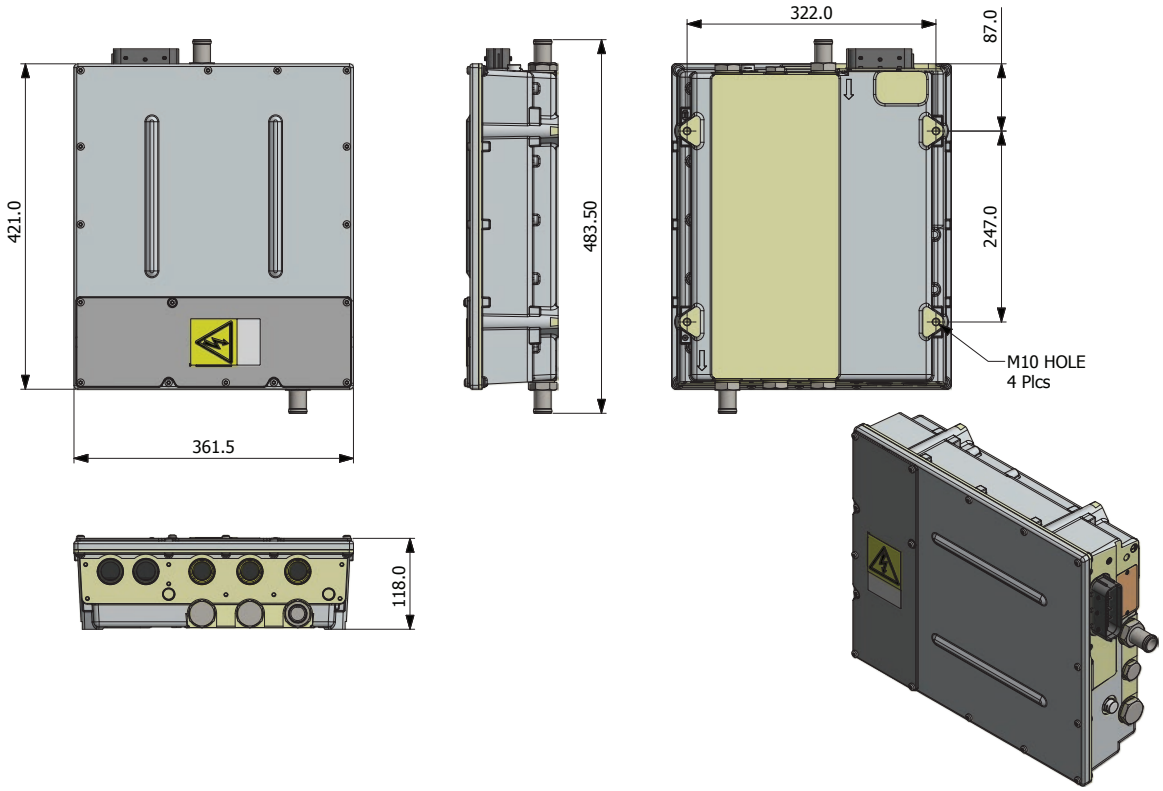
Notes: All current ratings are rms values per motor phase.
(1) 10 second rating at 4kHz switching frequency and 25°C
(2) 1 hr rating at 4kHz switching frequency and 60°C coolant temperature, 85°C ambient and 18l/min flow

Minimum Coolant Flows:
@Coolant temp <0°C >5 l/min
@Coolant temp 0-50°C >10-15 l/min
@Coolant temp >50°C >15-20 l/min

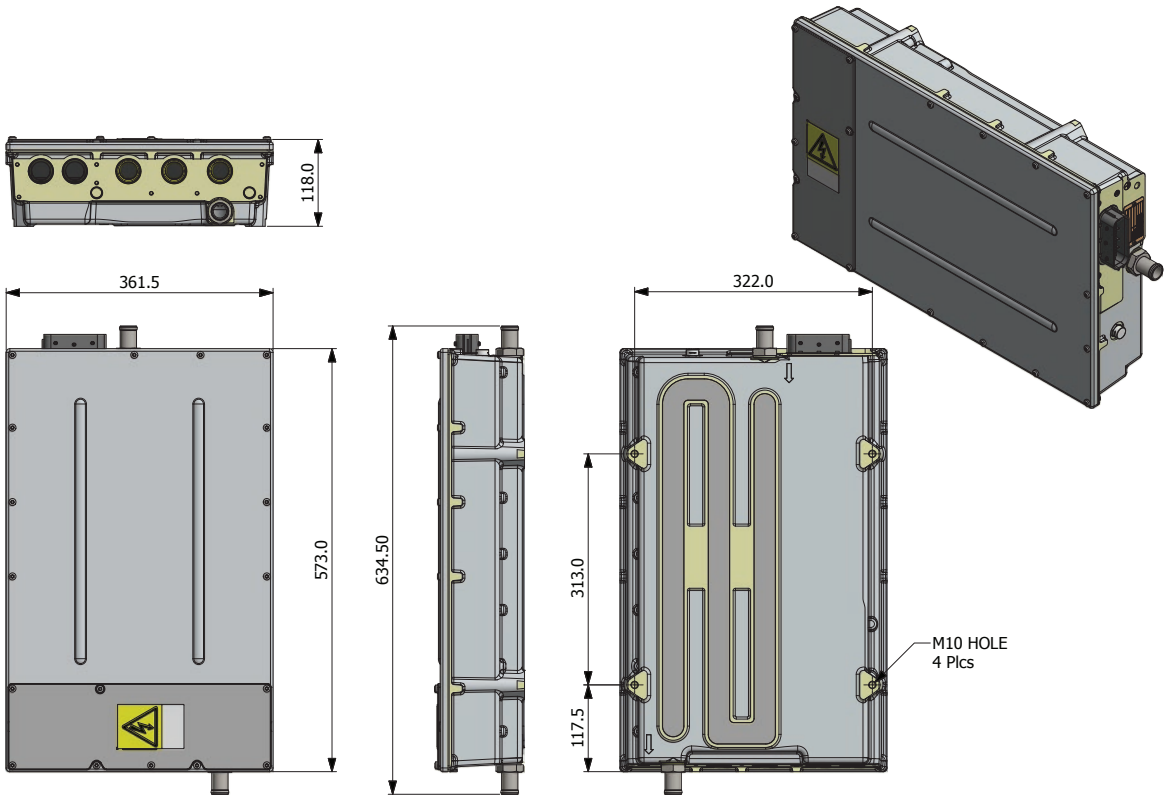
# Dimensions

**Dimensions [mm]**

Frame G




Frame H



# Order Code

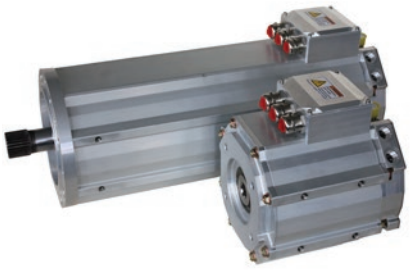
| | 1 | | 2 | 3 | | 4 | 5 | 6 | | 7 | 8 | | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Order example | **GVI** | **-** | **H** | **650** | **-** | **0500** | **S** | **1** | **-** | **R** | **00** | **-** | **G0000** |

| | | |
|---|---|---|
| **1** | **Drive Family** | |
| | **GVI** | Global Vehicle Inverter |
| **2** | **Frame size** | |
| | **G** | Frame size G |
| | **H** | Frame size H |
| **3** | **Nominal DC Supply** | |
| | **650** | 650 VDC |
| **4** | **Current Rating** | |
| | **650 VDC Nominal Voltage** | |
| | **0300** | 300 A - Frame G |
| | **0500** | 500 A - Frame H |
| **5** | **Package** | |
| | **S** | Single |
| **6** | **Series** | |
| | **1** | Series 1 |
| **7** | **Feedback type** | |
| | **R** | Resolver |
| **8** | **Reserved** | |
| | **00** | |
| **9** | **Special Option** | |
| | **G0000** | Global Specification |
| | **N0000** | North American Specification |
| | **E0000** | European Specification |

| Order Code | Description |
|---|---|
| GVI-GH-ADAPTORKIT | Power Connection Gland Plate Adaptor Kit (Frames G-H Only) |

# Related Products

## Global Vehicle Motor (GVM)



### Description

PMAC servomotors offer the best solution to meet the requirements of vehicle duty performance. The torque density and speed capabilities of Parker Permanent Magnet AC motors (PMAC) provide the speed and torque required to achieve breakthrough performance in a variety of vehicle platforms.

### Product Features

- High efficiency
- Compactness (High power density)
- Can be used either as motor or generator
- Operating voltages available from 24 to 800 VDC

## Electro-Hydraulic Pumps (EHP)

### Description

The Electro-Hydraulic Pump (EHP) kits are designed for hybrid electric and all electric mobile applications. EHP systems consist of an electric motor directly coupled to an hydraulic pump controlled by a high performance mobile hardened inverter.
Parker's global expertise in hydraulic, electric motor, and drive technologies is brought together in the EHP to create a system that has been optimally adapted to the customer requirements.

### Product Features

- Complete Electro-Hydraulic Pump solutions
- Pre engineered system with fully validated pressure, flow and voltage data
- Wide range of motor/pump combinations to adapt to every battery pack

# Parker's Motion & Control Technologies

**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 00800 27 27 5374**

## Aerospace

### Key Markets

Aftermarket services
Commercial transports
Engines
General & business aviation
Helicopters
Launch vehicles
Military aircraft
Missiles
Power generation
Regional transports
Unmanned aerial vehicles

### Key Products

Control systems & actuation products
Engine systems & components
Fluid conveyance systems & components
Fluid metering, delivery & atomization devices
Fuel systems & components
Fuel tank inerting systems
Hydraulic systems & components
Thermal management
Wheels & brakes

## Climate Control

### Key Markets

Agriculture
Air conditioning
Construction Machinery
Food & beverage
Industrial machinery
Life sciences
Oil & gas
Precision cooling
Process
Refrigeration
Transportation

### Key Products

Accumulators
Advanced actuators
$CO_2$ controls
Electronic controllers
Filter driers
Hand shut-off valves
Heat exchangers
Hose & fittings
Pressure regulating valves
Refrigerant distributors
Safety relief valves
Smart pumps
Solenoid valves
Thermostatic expansion valves

## Electromechanical

### Key Markets

Aerospace
Factory automation
Life science & medical
Machine tools
Packaging machinery
Paper machinery
Plastics machinery & converting
Primary metals
Semiconductor & electronics
Textile
Wire & cable

### Key Products

AC/DC drives & systems
Electric actuators, gantry robots & slides
Electrohydrostatic actuation systems
Electromechanical actuation systems
Human machine interface
Linear motors
Stepper motors, servo motors, drives & controls
Structural extrusions

## Filtration

### Key Markets

Aerospace
Food & beverage
Industrial plant & equipment
Life sciences
Marine
Mobile equipment
Oil & gas
Power generation & renewable energy
Process
Transportation
Water Purification

### Key Products

Analytical gas generators
Compressed air filters & dryers
Engine air, coolant, fuel & oil filtration systems
Fluid condition monitoring systems
Hydraulic & lubrication filters
Hydrogen, nitrogen & zero air generators
Instrumentation filters
Membrane & fiber filters
Microfiltration
Sterile air filtration
Water desalination & purification filters & systems

## Fluid & Gas Handling

### Key Markets

Aerial lift
Agriculture
Bulk chemical handling
Construction machinery
Food & beverage
Fuel & gas delivery
Industrial machinery
Life sciences
Marine
Mining
Mobile
Oil & gas
Renewable energy
Transportation

### Key Products

Check valves
Connectors for low pressure fluid conveyance
Deep sea umbilicals
Diagnostic equipment
Hose couplings
Industrial hose
Mooring systems & power cables
PTFE hose & tubing
Quick couplings
Rubber & thermoplastic hose
Tube fittings & adapters
Tubing & plastic fittings

## Hydraulics

### Key Markets

Aerial lift
Agriculture
Alternative energy
Construction machinery
Forestry
Industrial machinery
Machine tools
Marine
Material handling
Mining
Oil & gas
Power generation
Refuse vehicles
Renewable energy
Truck hydraulics
Turf equipment

### Key Products

Accumulators
Cartridge valves
Electrohydraulic actuators
Human machine interfaces
Hybrid drives
Hydraulic cylinders
Hydraulic motors & pumps
Hydraulic systems
Hydraulic valves & controls
Hydrostatic steering
Integrated hydraulic circuits
Power take-offs
Power units
Rotary actuators
Sensors

## Pneumatics

### Key Markets

Aerospace
Conveyor & material handling
Factory automation
Life science & medical
Machine tools
Packaging machinery
Transportation & automotive

### Key Products

Air preparation
Brass fittings & valves
Manifolds
Pneumatic accessories
Pneumatic actuators & grippers
Pneumatic valves & controls
Quick disconnects
Rotary actuators
Rubber & thermoplastic hose & couplings
Structural extrusions
Thermoplastic tubing & fittings
Vacuum generators, cups & sensors

## Process Control

### Key Markets

Alternative fuels
Biopharmaceuticals
Chemical & refining
Food & beverage
Marine & shipbuilding
Medical & dental
Microelectronics
Nuclear Power
Offshore oil exploration
Oil & gas
Pharmaceuticals
Power generation
Pulp & paper
Steel
Water/wastewater

### Key Products

Analytical Instruments
Analytical sample conditioning products & systems
Chemical injection fittings & valves
Fluoropolymer chemical delivery fittings, valves & pumps
High purity gas delivery fittings, valves, regulators & digital flow controllers
Industrial mass flow meters/ controllers
Permanent no-weld tube fittings
Precision industrial regulators & flow controllers
Process control double block & bleeds
Process control fittings, valves, regulators & manifold valves

## Sealing & Shielding

### Key Markets

Aerospace
Chemical processing
Consumer
Fluid power
General industrial
Information technology
Life sciences
Microelectronics
Military
Oil & gas
Power generation
Renewable energy
Telecommunications
Transportation

### Key Products

Dynamic seals
Elastomeric o-rings
Electro-medical instrument design & assembly
EMI shielding
Extruded & precision-cut, fabricated elastomeric seals
High temperature metal seals
Homogeneous & inserted elastomeric shapes
Medical device fabrication & assembly
Metal & plastic retained composite seals
Shielded optical windows
Silicone tubing & extrusions
Thermal management
Vibration dampening

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