



## 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.**

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# Inverters for Traction, Electro-Hydraulic Pumps (EHP) and Auxiliary Systems

## Low Voltage Mobile Inverters - GVI



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# 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

Longvic, France  
Offenburg, Germany  
Milan, Italy  
Chomutov, Czech Republik

#### Asia

Wuxi, China  
Jangan, Korea  
Chennai, India

#### North America

Rohnert Park, California  
Irwin, Pennsylvania  
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](http://www.parker.com)



Rohnert Park, 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 CANopen communication
- Parker IQAN compatible
- Configurable coil drive digital outputs
- 2 Analog inputs / 9 Digital inputs / 6 Digital outputs for use with I/O control mode

## Applications

### On and off highway vehicles:

- Light and medium duty traction
- Electrohydraulic pump control
- Electric air conditioning compressors
- Electric air brake compressors

## Technical characteristics - overview

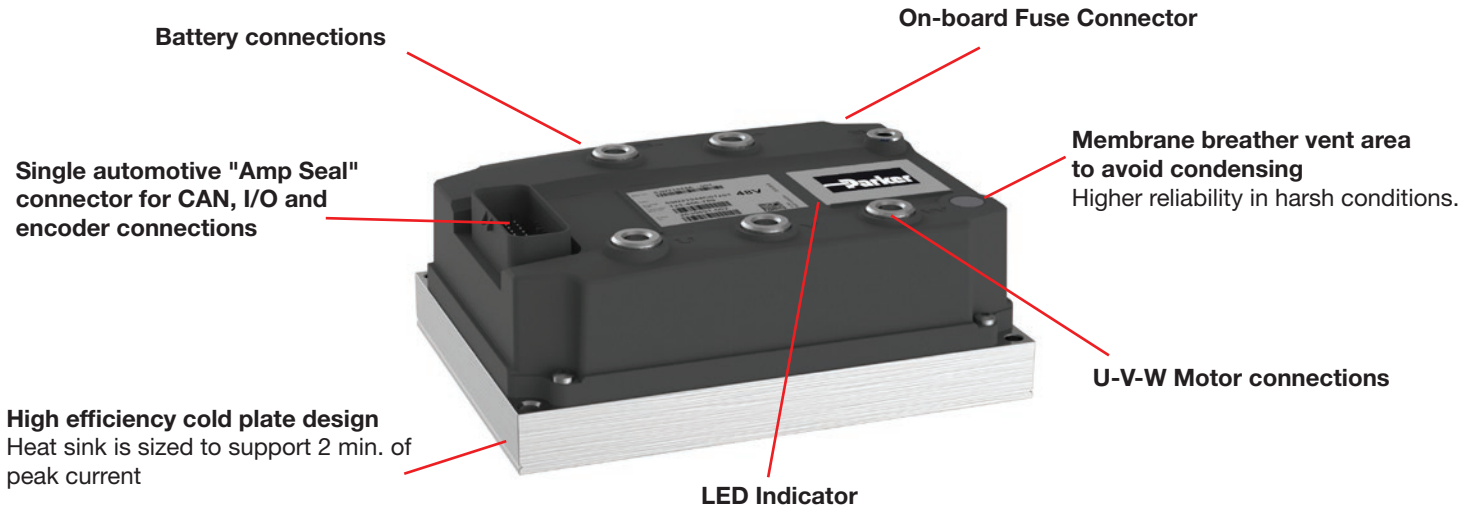
| Model                       | GVI  |
|-----------------------------|--|
| Motor type                  | Permanent magnet AC                              |
| Nominal voltage             | 24 / 48 / 80 Vdc                                 |
| Peak current                | 700 Arms   |
| Peak power                  | 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, Current, Torque and DC level Control      |
| Feedback                    | Sin/Cos encoder                                  |
| Communications              | CAN J1939, CANopen                               |
| Cooling                     | Cold plate                                       |
| Conformance                 | IEC60068, EN61000-4, EN1175-1, IEC60529, EN55022 |
| Output frequency            | 0 - 599 Hz <sup>1)</sup>                         |

<sup>1)</sup> 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 <sup>(1)</sup> | Output Current [Arms] S2, 1 h <sup>(2)</sup> | Nominal input voltage [Vdc] | Battery Voltage Range [Vdc] | Weight [Kg] (lbs) |
|---------------------------|------------|--|--|-----------------------------|-----------------------------|-------------------|
| GVI-C024-0350S1-S00-G0000 | C          | 350  | 150  | 24                          | 16-27                       | 1.8 (4)           |
| GVI-C048-0280S1-S00-G0000 | C          | 280  | 120  | 48                          | 33-54                       | 1.8 (4)           |
| GVI-D024-0550S1-S00-G0000 | D          | 550  | 275  | 24                          | 16-27                       | 2.9 (6.4)         |
| GVI-D048-0450S1-S00-G0000 | D          | 450  | 225  | 48                          | 33-54                       | 2.9 (6.4)         |
| GVI-D048-0550S1-S00-G0000 | D          | 550  | 275  | 48                          | 33-54                       | 2.9 (6.4)         |
| GVI-D080-0230S1-S00-G0000 | D          | 230  | 115  | 80                          | 50-90                       | 2.9 (6.4)         |
| GVI-D080-0350S1-S00-G0000 | D          | 350  | 175  | 80                          | 50-90                       | 2.9 (6.4)         |
| GVI-D080-0400S1-S00-G0000 | D          | 400  | 200  | 80                          | 50-90                       | 2.9 (6.4)         |
| GVI-E048-0700S1-S00-G0000 | E          | 700  | 350  | 48                          | 33-54                       | 4.8 (10.6)        |
| GVI-E080-0500S1-S00-G0000 | E          | 500  | 250  | 80                          | 50-90                       | 4.8 (10.6)        |
| GVI-E080-0700S1-S00-G0000 | E          | 700  | 350  | 80                          | 50-90                       | 4.8 (10.6)        |

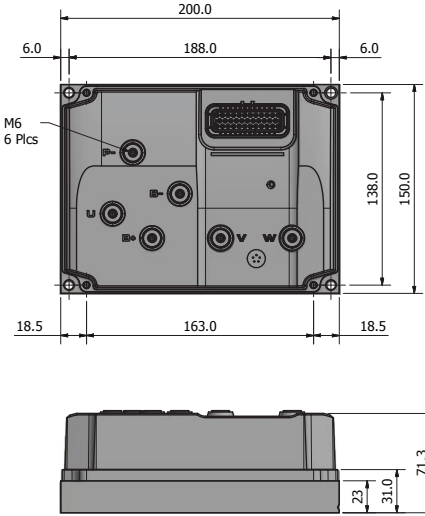
Notes: All current ratings are rms values per motor phase.

(1) 2 minute rating at 8kHz switching frequency and 25°C ambient temperature

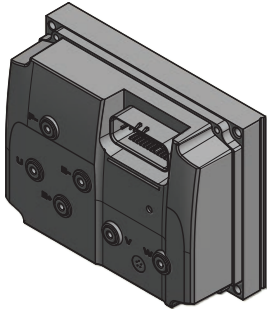
(2) 1 hr rating at 8kHz switching frequency and 40°C ambient temperature

# Dimensions

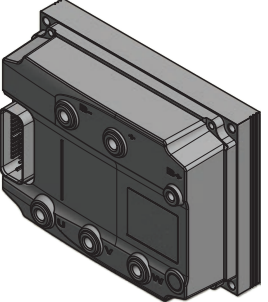
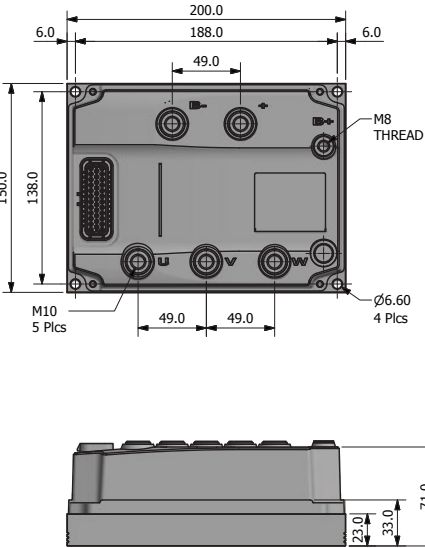
Frame C



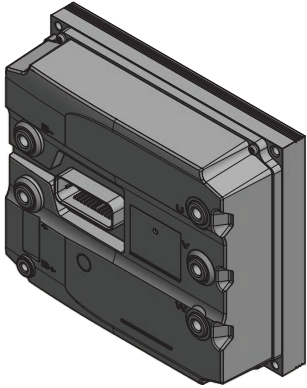
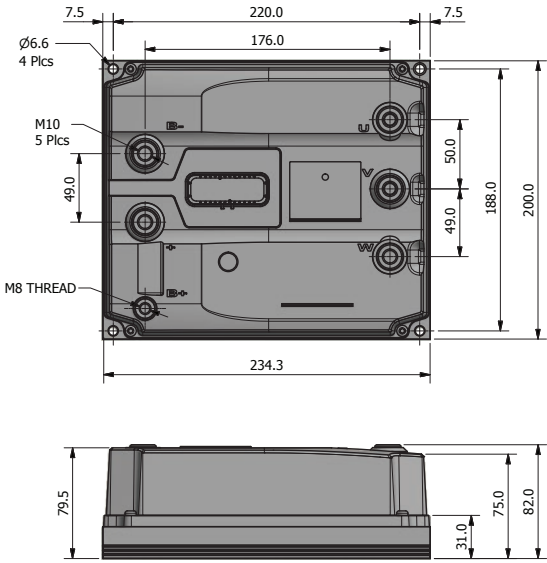
Dimensions [mm]



Frame D



Frame E



## Order Code

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

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

\* G0000 Global specification is the default reference. For other specifications please contact Parker



# 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 CANopen communication
- Parker IQAN compatible
- 4 Digital inputs\*
- Full current available at 100-750 VDC
- Motor Torque Off and HVIL

### Applications

#### On and off highway vehicles:

- Off highway traction
- Electrohydraulic pump control
- Electric air conditioning compressors
- Electric air brake compressors
- Agricultural implements

### 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, Current, Torque and DC level Control  |
| Feedback                    | Resolver   |
| Communications              | CAN J1939, CANopen   |
| 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 <sup>1)</sup>   |

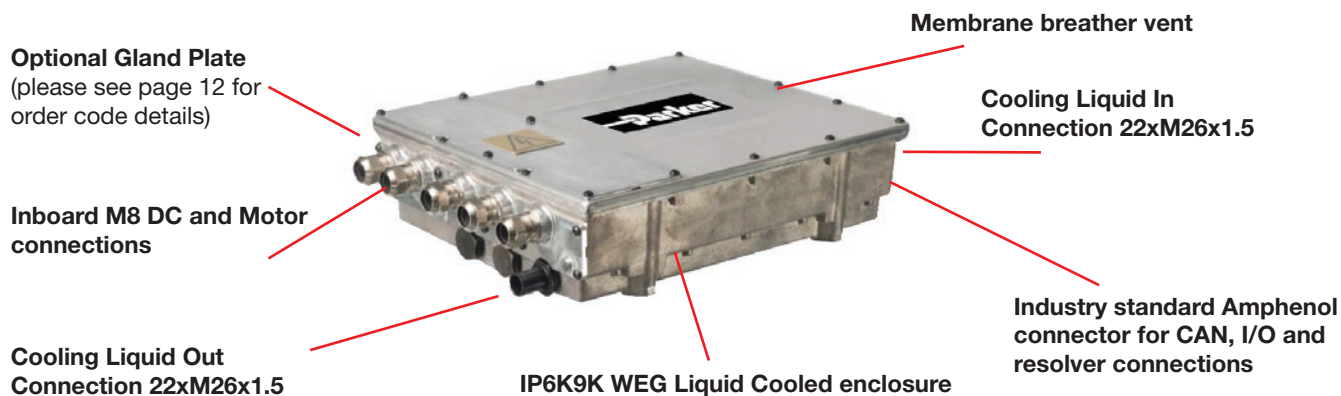
<sup>1)</sup> For output frequencies > 599Hz please contact Parker

<sup>2)</sup> For internal only HVIL option please contact Parker

\*Standard firmware reserves 2 Digital inputs for CAN address ID

## 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 <sup>(1)</sup> | Output Current [Arms] S2, 1 h <sup>(2)</sup> | Nominal input voltage [Vdc] | Battery Voltage 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.

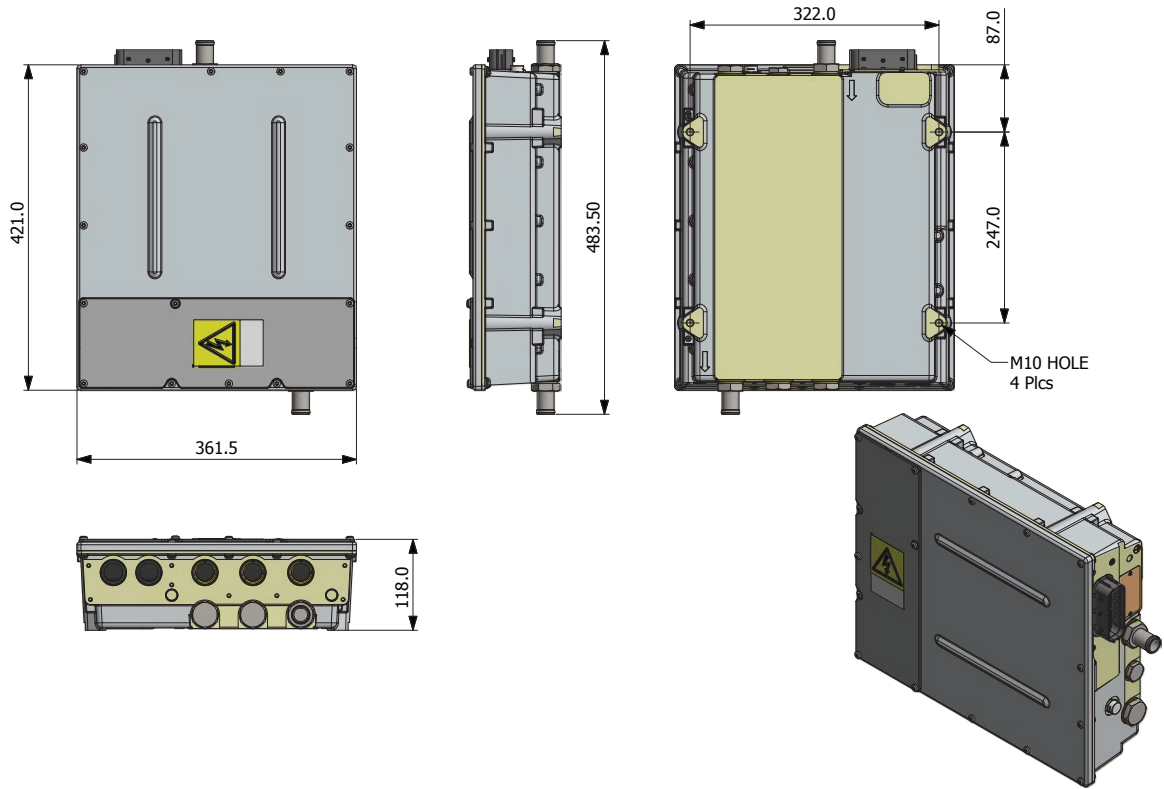
(1) 10 second rating at 4kHz switching frequency and 25°C

(2) 1 hr rating at 4kHz switching frequency and 60°C coolant temperature, 85°C ambient and 18l/min flow

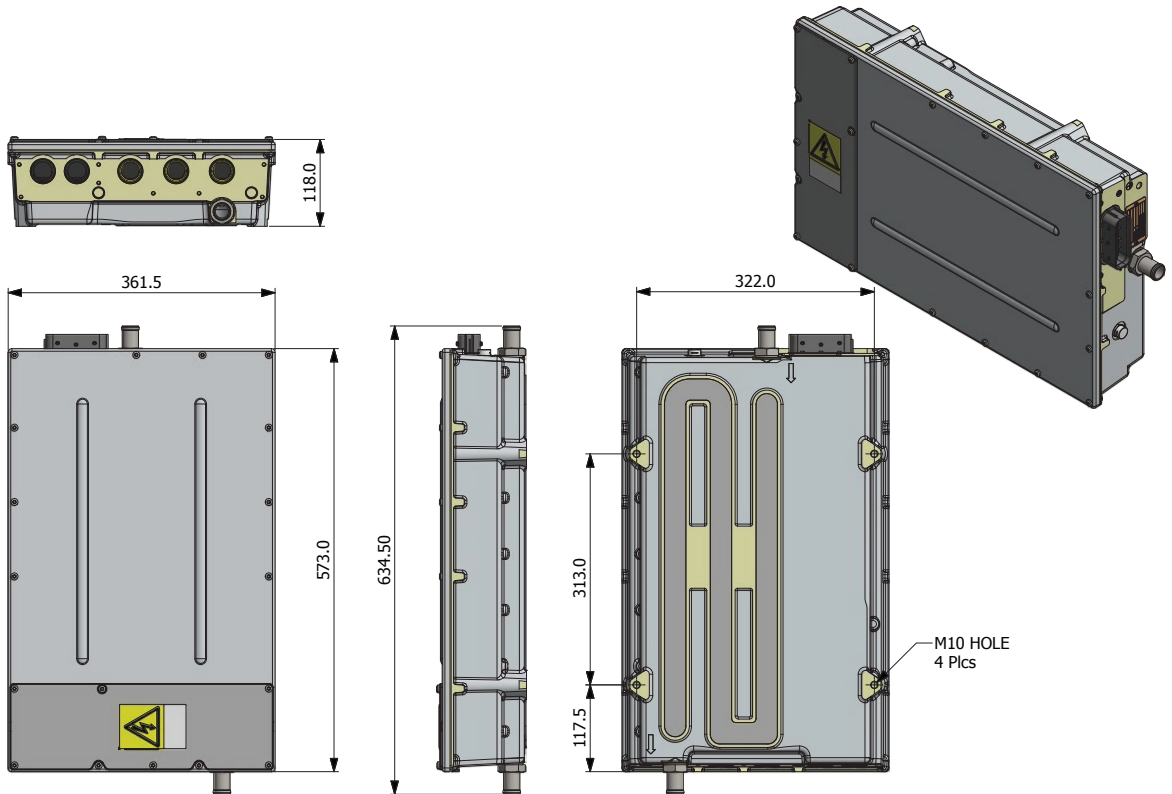
Minimum Coolant Flows: @Coolant temp <0°C >5 l/min  
 @Coolant temp 0-50°C >10-15 l/min  
 @Coolant temp >50°C >15-20 l/min

# Dimensions

Frame G



Frame H



## Order Code

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

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

\* G0000 Global specification is the default reference. For other specifications please contact Parker

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

## Related Products

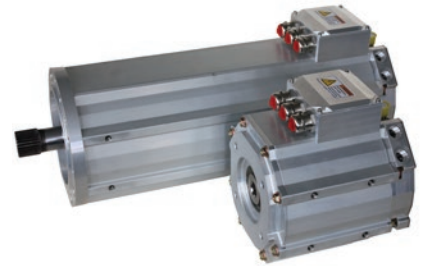
### Global Vehicle Motor (GVM)

#### 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

