



# GVI Global Vehicle Inverter

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



ENGINEERING YOUR SUCCESS.



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

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## Related Products

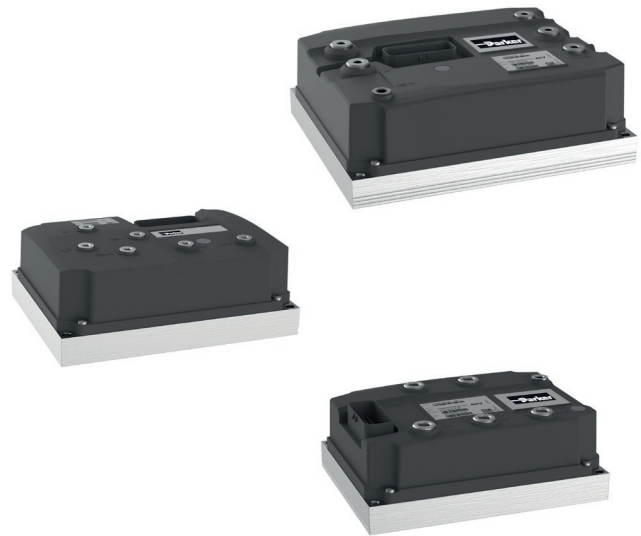
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# Low Voltage Mobile Inverters - GVI

## 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 96VDC, 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

- 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

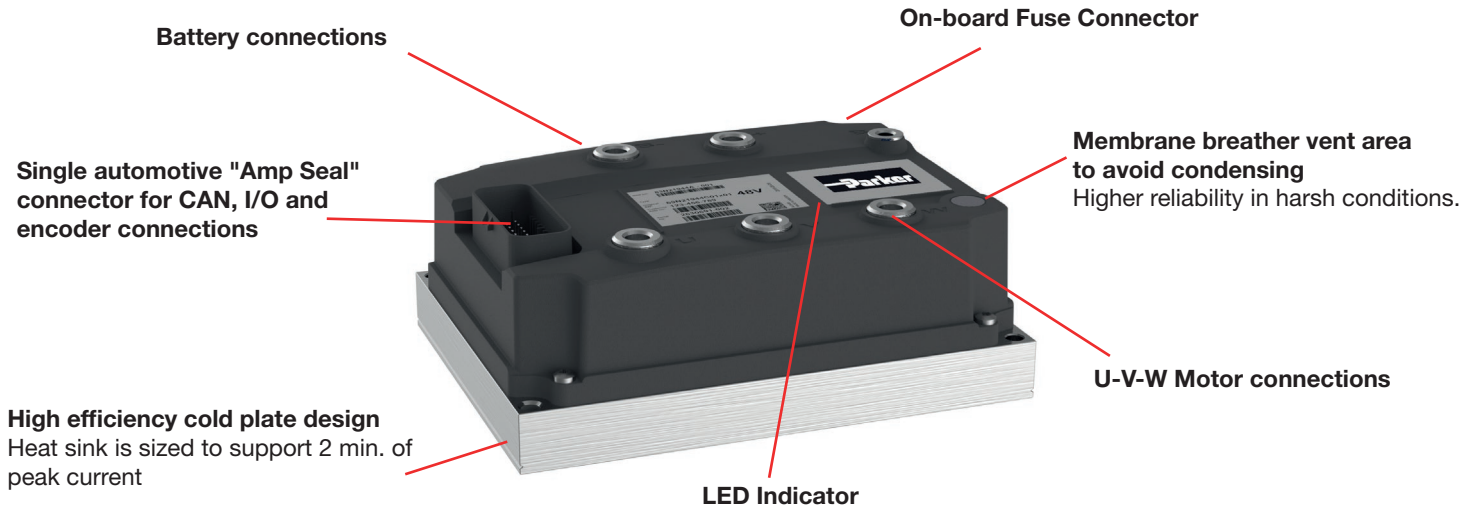
## Technical characteristics - overview

Model	GVI
Motor type	Permanent magnet AC
Nominal voltage	24 / 48 / 80 / 96 Vdc
Peak current	700 Arms
Peak power	82 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	2.3 (5)
GVI-C048-0280S1-S00-G0000	C	280	120	48	33-53	2.3 (5)
GVI-D024-0550S1-S00-G0000	D	550	275	24	16-27	2.5 (5.5)
GVI-D048-0450S1-S00-G0000	D	450	225	48	33-53	2.5 (5.5)
GVI-D048-0550S1-S00-G0000	D	550	275	48	33-53	2.5 (5.5)
GVI-D080-0230S1-S00-G0000	D	230	115	80	50-88	2.5 (5.5)
GVI-D080-0350S1-S00-G0000	D	350	175	80	50-88	2.5 (5.5)
GVI-D080-0400S1-S00-G0000	D	400	200	80	50-88	2.5 (5.5)
GVI-D096-0230S1-S00-G0000	D	230	115	96	56-106	2.5 (5.5)
GVI-D096-0350S1-S00-G0000	D	350	175	96	56-106	2.5 (5.5)
GVI-D096-0400S1-S00-G0000	D	400	180	96	56-106	2.5 (5.5)
GVI-E048-0700S1-S00-G0000	E	700	350	48	33-53	4.8 (10.6)
GVI-E080-0500S1-S00-G0000	E	500	250	80	50-88	4.8 (10.6)
GVI-E080-0700S1-S00-G0000	E	700	350	80	50-88	4.8 (10.6)
GVI-E096-0500S1-S00-G0000	E	500	250	96	56-106	4.8 (10.6)
GVI-E096-0700S1-S00-G0000	E	700	350	96	56-106	4.8 (10.6)

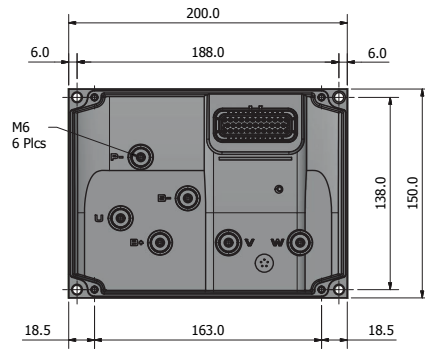
Notes: All current ratings are rms values per motor phase.

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

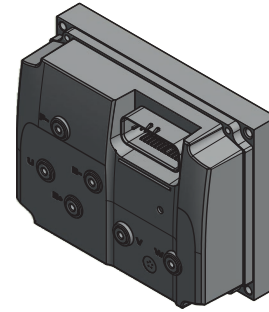
(2) 1 hr rating at 8kHz switching frequency and 40°C ambient temperature

# Dimensions

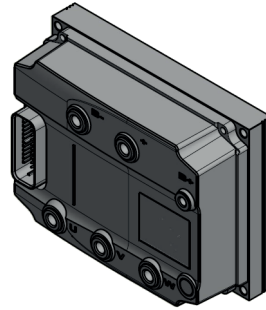
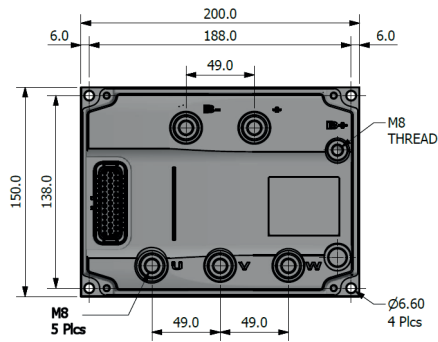
Frame C



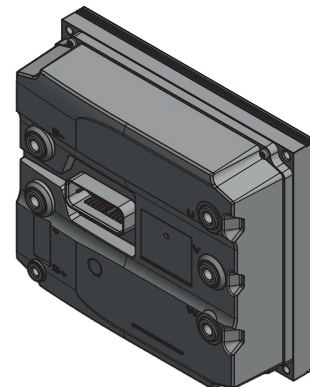
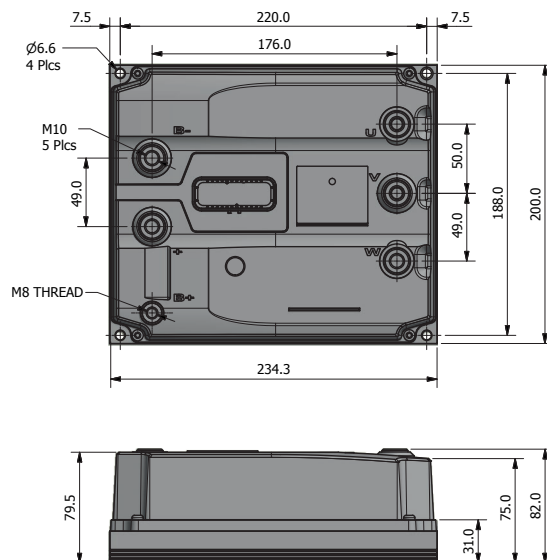
Dimensions [mm]



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>096</b>	96 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>96 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\* and 1 digital output
- 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>

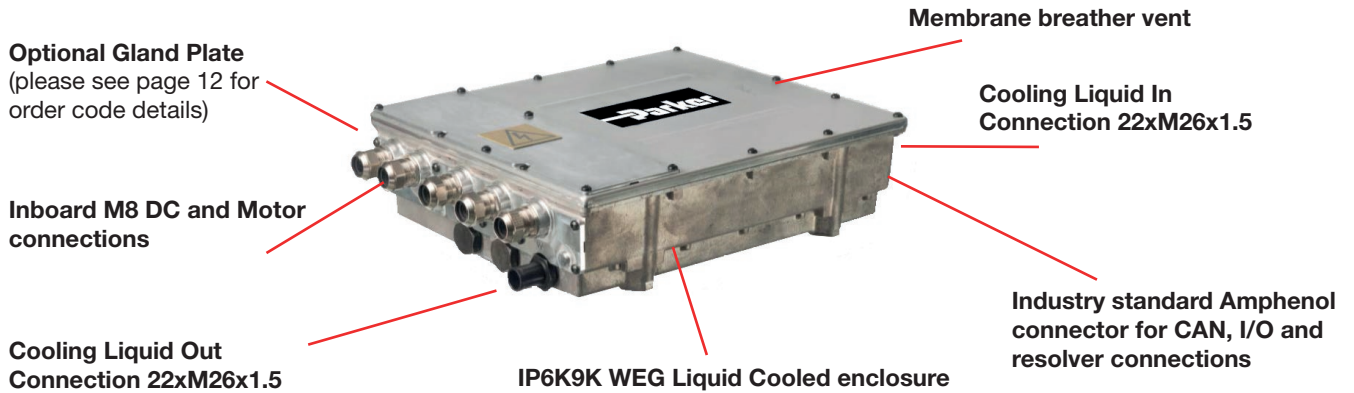
<sup>1)</sup> For output frequencies > 599Hz please contact Parker

<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)
<b>GVI-G650-0300S1-R00-G0000</b>	G	320	225	650	100-750	21 (46.3)
<b>GVI-H650-0500S1-R00-G0000</b>	H	500	375	650	100-750	25 (55.1)

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

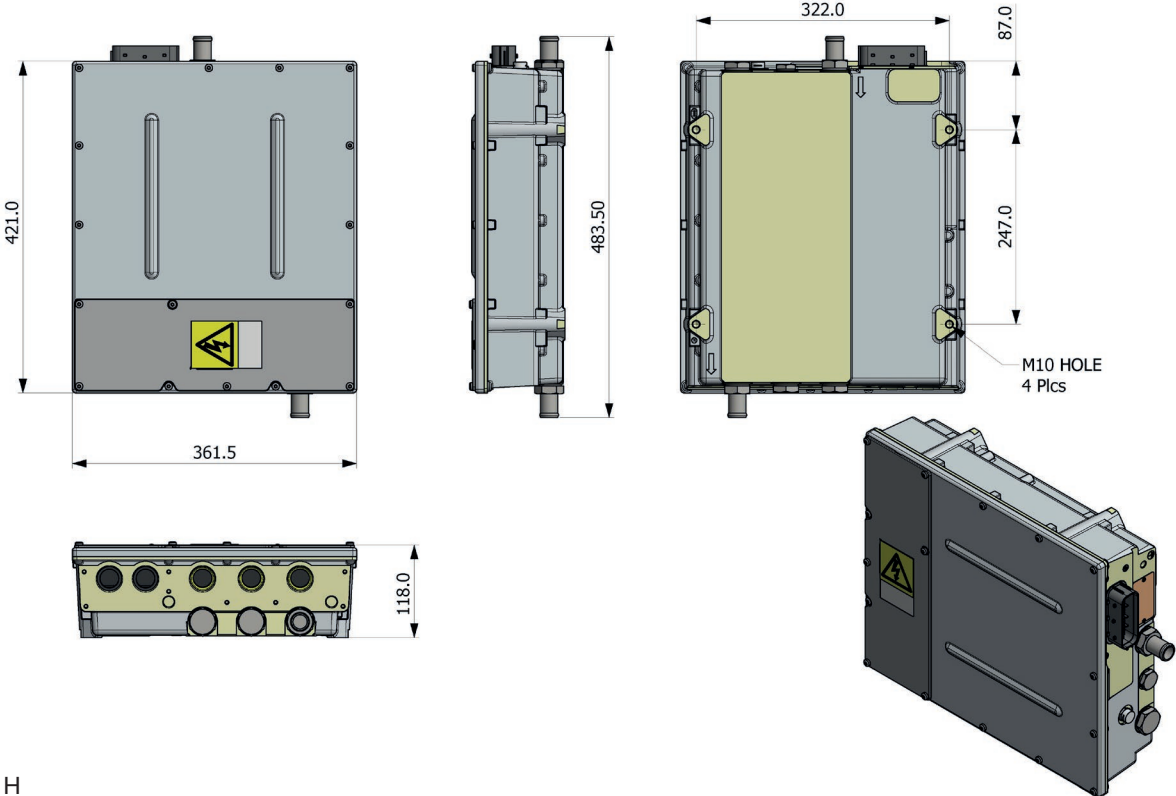
(1) 10 second rating at 4kHz switching frequency and 25°C

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

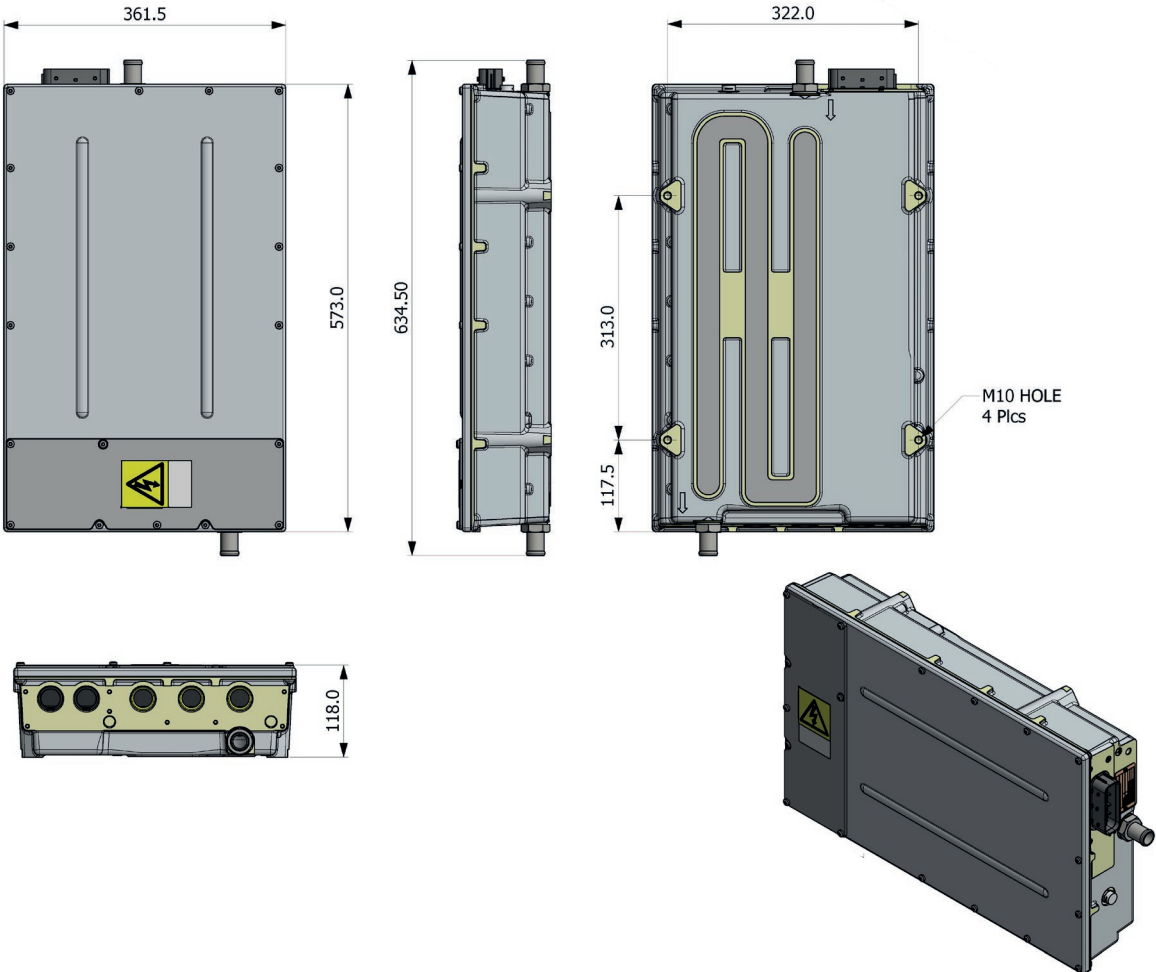
Minimum Coolant Flows: @Coolant temp <0°C >5 l/min  
 @Coolant temp 0-50°C >10-15 l/min  
 @Coolant temp >50°C >15-20 l/min

# 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>	320 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)

# GVI Configuration Tool

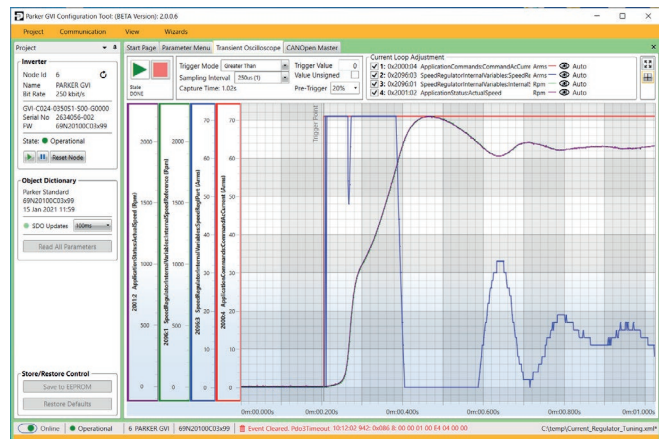
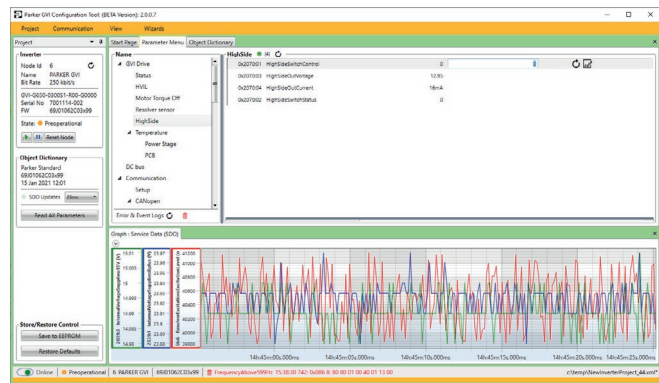
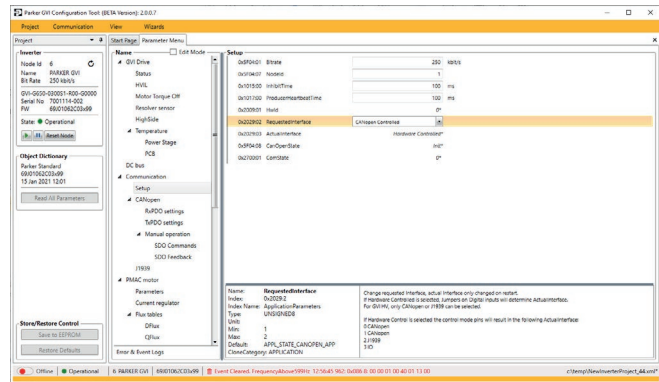
## Description

The Parker GVI configuration tool provides everything required to configure, tune and commission the GVI inverter. Using one of a range of popular USB-CAN adaptors, the GVI configuration tool maybe used on any Windows based PC. Simple and intuitive, the tool allows for cloning, firmware updates and tuning of the full range of possible GVI/GVM combinations. The Parker GVI configuration tool also provides a powerful graphing utility and a CANopen master facility aids commissioning by remotely controlling the GVI directly.

To download the tool for free and view video tutorials please visit the GVI product page on Parker.com.

## Configuration Tool Features

- Project based configuration tool
- Clone facility for rapid programming
- Firmware update wizard
- Customisable parameter group displays
- NMT control to start/stop the GVI application
- Online and Offline operation modes
- Online graphing tool for up to 8 parameters
- Fast transient 4 channel oscilloscope
- CANopen master simulation



## Related Products

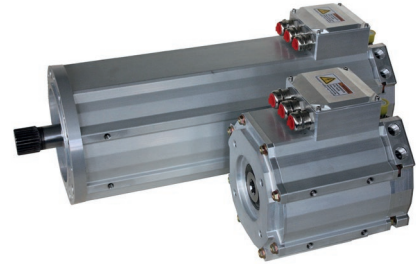
### Global Vehicle Motor (GVM)

#### 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<sub>2</sub> 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  
Oil & gas  
Primary metals  
Semiconductor & electronics  
Textile  
Wire & cable

### Key Products

AC/DC drives & systems  
Electric actuators, gantry robots & slides  
Electrohydraulic 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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### US Product Information Centre

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