# PowerVerter 24Vdc to 12Vdc Converters

## 24Vdc to 12Vdc Converters

**These products offer a convenient way to operate mass produced 12Vdc equipment, such as cell phones, in car entertainment equipment, professional communication equipment, telematics equipment, refrigerators, televisions, etc. from the 24Vdc mobile electrical systems found on diesel engined vehicles and vessels and the 28Vdc systems found on aircraft.**

**These cool running products use switch mode technology and are assembled using surface mount technology.**

**All the products are CE marked, e marked and meet the requirements of FCC Class B.**

### A Comprehensive 24Vdc to 12Vdc Converter Range

This leaflet covers the PowerVerter series, ten products from 3 Amps to 30 Amps in isolated or common earth configurations. They have been optimised for high volume 24Vdc to 12Vdc applications such as on heavy goods vehicles, coaches, buses, construction, forestry and agricultural vehicles, commercial vessels, yachts and many types of light aircraft. Consequently they are manufactured at low cost and offer excellent value for money. All the products may also be used for constant voltage lead-acid battery charging providing the battery manufacturers guidelines are followed.

All the PowerVerter products are CE marked, e-marked and meet the requirements of FCC Class B.

### Secure Isolation

It's your choice. The PowerVerter range offers an isolated option at every power rating. Some vehicle manufacturers, such as Scania, require that "the converter shall be ground loss protected". This means that the output voltage shall not exceed the specification if the supply ground connection and/or the load ground connection is lost. This requires an isolated converter. Isolated converters also prevent a direct connection between the 24Vdc input and the 12Vdc appliance in the case of a semiconductor failure.

### Cool Running

The converters operate with a power conversion efficiency as high as 93%. This results in very little heat being generated. The reliability of semiconductors is inversely proportional to temperature so high efficiency leads to high reliability. The Mean Time Between Failure figure is around 160 years!

### Rugged and Compact

The converters are enclosed in a rugged aluminum extrusion. The low mass Surface Mount Technology components are also less prone to damage from vibration and shock, further increasing the reliability of the units. The use of SMT results in a very compact unit, making it easier for the installer to find a convenient location.

### Tamper Proof

There are no ventilation holes to permit stray objects, dust or water droplets to enter the case. There are no external fuses to be tampered with. Fuses will only blow if there is a fault so there is no need to make them accessible.

### Fast Installation

All the units consume an off load current of less than 15mA, which is probably less than the self discharge current of the vehicle's battery. In most cases this can be ignored, speeding the installation by removing the need to fit a remote switch.

The low heat dissipation allows them to be mounted in less well ventilated positions which makes installation easier.

All the products fit onto a 'Click 'n' Fit' mounting clip which is fixed in three points allowing it to be mounted on uneven surfaces. It is easy to fit the clip into awkward places and then simply click the unit into position.

A red LED indicates when there is output from the converter. This gives reassurance to the installation engineer and speeds fault finding.

### Product Coding

The product code is developed as follows, taking the PV3i as an example:

| | |
|---|---|
| **PV** | PowerVerter 24Vdc to 12Vdc converter |
| **3** | 3 amps continuous output (12Vdc output at 3 amps) |
| **i** | Isolated between input and output (s indicates switchmode, non-isolated) |

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*for use on* **vehicles, vessels** *and* **aircraft**

# Choose *your* PowerVerter

| All PowerVerters convert 24Vdc to 12Vdc | | Isolation | |
|---|---|---|---|
| | | **Non-Isolated** Common Negative | **Isolated** Input to Output |
| **Load current** Continuous/ intermittent | **3/6A** | PV3s | PV3i |
| | **6/10A** | PV6s | PV6i |
| | **12/18A** | PV12s | PV12i |
| | **18/21A** | PV18s | PV18i |
| | **24/30A** | PV24s | PV24i |

The intermittent current may be drawn for a maximum of 2 minutes followed by 8 minutes rest.

# Technical *data*

| Model | Size | Weight | Model | Size | Weight |
|---|---|---|---|---|---|
| **PV3s** | 67 x 87 x 50mm | 225g | **PV18s, PV24s, PV12i** | 167 x 87 x 50mm | 620g 590g |
| **PV6s, PV3i** | 89 x 87 x 50mm | 270g/290g | | | |
| **PV12s, PV6i** | 127 x 87 x 50mm | 405g | **PV18i, PV24i** | 217 x 87 x 50mm | 835g |

## Common Characteristics

| | |
|---|---|
| Input voltage range | 17 to 32Vdc |
| Output voltage | 13.6Vdc +15% and -20% at extremes of temperature, load, input tolerance, etc |
| Transient voltage protection | Meets ISO7637-2 International Standard for 24Vdc Commercial Vehicles |
| Electro static voltage protection | Meets ISO10605, ISO14982, >8kV contact, 15kV discharge |
| Output noise | <50mV pk-pk at continuous load. Meets CISPR25 |
| Off load current | <15mA |
| Power conversion efficiency | Typically: 90% for non-isolated units, 85% for isolated units |
| Isolation | >400Vrms between input, output and case, on isolated products only |
| Mean time between failures | >162 years (HRD4) |
| Operating temperature | -25°C to +30°C to meet this specification table. +30°C to +80°C de-rate linearly to 0A |
| Storage temperature | -25°C to +100°C |
| Operating humidity | 95% max, non-condensing |
| Casework | Anodised Aluminium, Glass Filled Polycarbonate. Dust water and impact resistance IP533 |
| Connections | Four 6.3mm push-on flat blade connectors |
| Output indicator | Red LED adjacent to output terminals |
| Mounting method | 'Click 'n' Fit' mounting clip, fitted separately using three hole fixing |
| Safe area protection: Over current<br>Over heat<br>Transients<br>Catastrophic failure | Limited by current sensing circuit<br>Limited by temperature sensing circuit<br>Protected by filters and rugged component selection<br>Protected by internal input and output fuses |
| Approvals | 89/336/EEC The EMC Directive<br>95/54/EC The Automotive EMC Directive<br>93/68/EEC The CE Marking Directive<br>VIDG5 AES For use on Police and Fire Vehicles |
| Tested to | ISO7637-2, ISO10605, ISO14982, ISO11451, ISO11452, CISPR 25, VDE0879-3, EN60945 Annex A |
| Markings | CE Marked and e Marked No. ell 990324 |

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An ISO9001 Registered Company

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GB CE e
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