BLUE POWER
World quality leader in independent electric power
ABOUT VICTRON ENERGY

With over 30 years’ experience, Victron Energy enjoys an unrivalled reputation for technical innovation, reliability and quality, and is a world leader in the supply of self-supporting electric power. Our products have been designed to meet the most demanding situations faced by a diversity of craft, recreational and commercial alike, whilst we also cater for many other industrial and commercial applications. Our product range includes sine wave inverters and inverter/chargers, battery chargers, DC/DC converters, transfer switches, Gel and AGM batteries, alternators, battery monitors, complete network solutions and many other innovative solutions.

**[ Products range ]**
- Sinewave Inverters
- Combined Inverter/chargers
- Automatic Battery Chargers
- DC DC Converters
- Transfer Switches
- Deep Cycle Gel and AGM batteries
- High Power Alternators
- Battery Monitors
- DC Distribution Units
- Control and Distribution Panels
- Battery Isolators
- Shore Power Connection Kits
- System Monitoring and Control
- Solar Panels

**[ Applications ]**
- Solar and wind power systems
- Yachts and commercial vessels
- Special vehicles such as live broadcasting vehicles, ambulances, service vans, trains, caravans etc
- Industrial
- Telecom
- Emergency power supply
- Remote areas where there is no continuous supply
**Characteristics 230VAC/50Hz**

- **SinusMax - Superior engineering**
  True sine wave inverter with optimised efficiency but without compromise in performance. Employing hybrid HF technology, the result is a top quality product with compact dimensions, light in weight and capable of supplying power, problem-free, to any load.

- **Extra start-up power**
  A unique feature of the SinusMax technology is very high start-up power. Phoenix inverters, however, are well suited to power up difficult loads such as refrigeration compressors, electric motors and similar appliances.

- **Virtually unlimited power thanks to parallel and 3-phase operation capability**
  Up to 10 units Phoenix 24/5000 can operate in parallel to achieve 50KVA power output. Operation in 3-phase configuration is also possible.

- **To transfer the load to another AC source: the automatic transfer switch**
  If an automatic transfer switch is required on models rated at 1200 VA or more, we recommend using the Phoenix Multiplus instead. The switch is included in these products and the charger function of the Multi can be disabled. For our lower power models we recommend the use of our Filax Automatic Transfer Switch. Computers and other electronic equipment will continue to operate without disruption because both the Filax and the Phoenix Multi feature a very short switchover times (less than 20 milliseconds).

- **Computer interface**
  All models rated at 1200 VA or more have a RS-485 computer interface. Together with the VEConfigure software, all parameters of the inverters can be customised. The inverters can also be connected to VEnet, the power control network of Victron Energy.

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**Accessories**

- **Phoenix 12 Volt inverter 14 Volt 48 Volt**
- **Input voltage range (VCD)**
  - 10.5 - 15.5
  - 21.0 - 31.0
  - 42.0 - 62.0
- **Cont. output power at 25 °C (VA)**
  - 180
  - 350
  - 750
- **Cont. power at 25 °C / 40 °C (W)**
  - 200
  - 500
- **Peak power (W)**
  - 2000
- **Max. Efficiency 12/24/48 V (%)**
  - 91 / 92 / 92
  - 90 / 91 / 94
  - 93 / 94
- **Zero-load power 12/24/48V (w)**
  - 2.2 / 3.0 / 4.0
  - 12 / 12 / 12
- **Muti purpose relay driver or relay (2)**
  - relay
  - relay
- **Common Characteristics**
  - Output: 230 V ± 2% /50/60 Hz ± 0,2% (switch selectable) Operating temperature range: -20 to +50˚C   Humidity: max 95%

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**Accessories**

- **Remote panel (RS485)**
  - √
- **Remote on-off switch**
  - √
- **Automatic transfer switch**
  - FILAX
- **Batteries & Batteries Connections**
  - 1) Battery cables of 1.5 meter
  - 2) Multipurpose relay which can be set for general alarm, DC under voltage or genset starts signal function

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**Standards**

- **Safety**
  - EN 60950
  - EN 60335-1
- **Emission / Immunity**
  - EN 55014-1 / EN55014-2
- **Automotive Directive**
  - 95/54/EC and 2004/104/EC

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**Computer controlled operation and monitoring (Victron Interface MkII)**

- **Battery Alarm**
  An excessively high or low battery voltage is indicated by an audible and visual alarm, and a relay for remote signalling.
**CHARACTERISTICS 120VAC/60HZ**

- **SinusMax - Superior engineering**
  True sine wave inverter with optimised efficiency but without compromise in performance. Employing hybrid HF technology, the result is a top quality product with compact dimensions, light in weight and capable of supplying power, problem-free, to any load.

- **Extra start-up power**
  A unique feature of the SinusMax technology is very high start-up power. Phoenix inverters, however, are well suited to power up difficult loads such as refrigeration compressors, electric motors and similar appliances.

- **Virtually unlimited power thanks to parallel and 3-phase operation capability**
  Up to 6 units Phoenix 24/3000 can operate in parallel to achieve 18KVA power output. Operation in 3-phase configuration is also possible.

- **To transfer the load to another AC source: the automatic transfer switch**
  If an automatic transfer switch is required on models rated at 1200 VA or more, we recommend using the Phoenix Multiplus instead. The switch is included in these products and the charger function of the Multi can be disabled. For our lower power models we recommend the use of our Filax Automatic Transfer Switch. Computers and other electronic equipment will continue to operate without disruption because both the Filax and the Phoenix Multi feature a very short switchover times (less than 20 milliseconds).

<table>
<thead>
<tr>
<th>12V: 180-5000 VA</th>
<th>24V: 180-5000 VA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accessories</strong></td>
<td></td>
</tr>
<tr>
<td>Phoenix Inverter</td>
<td>120VAC/60HZ</td>
</tr>
<tr>
<td>12 Volt Inverter</td>
<td>24 Volt Inverter</td>
</tr>
<tr>
<td>12/180</td>
<td>24/180</td>
</tr>
<tr>
<td>12/350</td>
<td>24/350</td>
</tr>
<tr>
<td>12/750</td>
<td>24/750</td>
</tr>
<tr>
<td><strong>Input voltage range (VCD)</strong></td>
<td>10.5 - 15.5 / 21.0 - 31.0</td>
</tr>
<tr>
<td><strong>Cont. output power at 25 °C (VA)</strong></td>
<td>180 / 350 / 750</td>
</tr>
<tr>
<td><strong>Cont. power at 35 °C / 40 °C (W)</strong></td>
<td>175 / 150 / 300 / 250 / 700 / 650</td>
</tr>
<tr>
<td><strong>Peak power (W) (W)</strong></td>
<td>350 / 700 / 1400</td>
</tr>
<tr>
<td><strong>Max. Efficiency 12/24/48 V (%)</strong></td>
<td>87 / 88 / 89 / 91 / 93</td>
</tr>
<tr>
<td><strong>Zero-load power 12/24/48V (w)</strong></td>
<td>2.6 / 3.8 / 3.1 / 5.0 / 14 / 14</td>
</tr>
<tr>
<td><strong>Zero-load power in AES mode n.a.</strong></td>
<td>3 / 4 / 5</td>
</tr>
<tr>
<td><strong>Protection (S)</strong></td>
<td>9 - 9</td>
</tr>
<tr>
<td><strong>Common Characteristics</strong></td>
<td>Output: Output: 120 V ± 2% / 60 Hz ± 0.2% (switch selectable)</td>
</tr>
<tr>
<td></td>
<td>Operating temperature range: 0 - 122 °F Humidity: max 95%</td>
</tr>
</tbody>
</table>

**ENCLOSURE**

- Material & Colour: Aluminium (blue RAL 5012)
- Battery-connection: 1) Screw conn.
- 230 V AC-connection: NEMA5-15R
- Protection category: IP20 / IP20 / IP20
- Weight (kg): 2.7 / 5.4 / 3.5 / 7.7 / 2.7 / 5.4
- Dimensions (h x w x d in mm): 72x132x200 / 72x155x237 / 72x180x295

**ACCESSORIES**

- Remote panel (RS485)
- Remote on-off switch: √ / √ / √
- Automatic transfer switch: FILAX / FILAX / FILAX

**STANDARDS**

- Safety: EN 60950 / EN 60950 / EN 60950
- Emission / Immunity: EN 55014-1 / EN 55014-2
- Automotive Directive: 95/54/EC and 2004/104/EC

1) Battery cables of 1.5 meter
2) Relay driver: open Collector 66V
3) Multipurpose relay which can be set for general alarm, DC under voltage or genset starts signal function
4) Suitable for parallel and 3-phase
5) Protection
   a. Output short circuit
   b. Overload
   c. Battery voltage too high
   d. Battery voltage too low
   e. Battery reverse polarity detection
   f. Input voltage ripple too high
   g. Temperature too high
   h. Temperature too high
   i. 230 V AC on inverter output

Battery Alarm
An excessively high or low battery voltage is indicated by an audible and visual alarm, and a relay for remote signalling.
Multi-functional, with intelligent mains and generator power management

The multi gets its name from the multiple functions it can perform. It is a powerful true sine wave inverter, a sophisticated battery charger that features adaptive charge technology, and a high-speed AC transfer switch in a single compact enclosure.

Uninterrupted AC power (UPS function)

In the event of a grid failure, mains or generator power being disconnected, the inverter within the Multi is automatically activated and takes over the supply to the connected loads. This happens so fast (less than 20 milliseconds) that computers and other electronic equipment will continue to operate without disruption.

PowerControl - Dealing with limited generator, shore side or grid power

With the Phoenix Multi Control Panel a maximum generator or shore current can be set. The Multi will then take account of other AC loads and use whatever is extra for charging, this preventing the generator or mains supply from being overloaded.

PowerAssist - Boosting the capacity of grid or generator power, an innovative feature of the MultiPlus

This feature takes the principle of PowerControl to a further dimension allowing the MultiPlus to supplement the capacity of the alternative source. Where peak power is so often required only for a limited period, the Phoenix MultiPlus will make sure that insufficient shore or generator power is immediately compensated for by power from the battery.

Four stage adaptive charger and dual bank battery charging

The main output provides a powerful charge to the battery system by means of advanced ‘adaptive charge’ software that fine-tunes the three stage automatic process to suit the condition of the battery, and adds a fourth stage for long periods of float charging. In addition to this, the Multi will charge a second battery using an independent trickle charge output intended for a main engine or generator starter battery.

### CHARACTERISTICS 230VAC/50HZ

- **Multiplus 12V / 24V / 48V**
  - C12/800/16
  - C24/800/35
  - C12/1200/50
  - C24/1200/25
  - C12/1600/70
  - C24/1600/40
  - C12/2000/80
  - C24/2000/50
  - C12/3000/120
  - C24/3000/70
  - C48/3000/55
  - C12/4800/80
  - C24/4800
  - C48/10000

#### PowerControl / PowerAssist

Transfer switch (A)

- 16
- 30
- 16 or 50
- 50
- 100
- 100

#### INVERTER

- Input voltage range (VCD)
  - 9.5 – 17 V
  - 19 – 33 V
  - 38 – 66 V
- Output
  - 230 V ± 2% / 50 Hz ± 0.1%
  - Frequency: 50 Hz ± 0.1%
- Cont. output power at 25°C (VA) (S)
  - 800
  - 1200
  - 1600
  - 2000
  - 3000
  - 5000
  - 8000
  - 10000
- Cont. output power at 25/40°C (W)
  - 700 / 650
  - 1000 / 950
  - 1300 / 1200
  - 1600 / 1450
  - 2500 / 2000
  - 4250 / 3350
  - 7000 / 6300
  - 9000 / 8000
- Peak power (W)
  - 1600
  - 2400
  - 3000
  - 4000
  - 6000
  - 10000
  - 15000
  - 20000
- Maximum efficiency (%) 92 / 94
- Zero-load power (W) 8 / 10
- Zero-load power in AES Modus 5 / 8
- Zero-load power in Search Modus 2 / 3

#### CHARGER

- AC input 187-265 VAC, 45-55 HZ, Power factor: 1
- Charge voltage ‘absorption’ (V DC)
  - 14,4 / 28.8 / 57.6
- Charge voltage ‘float’ (V DC)
  - 13.8 / 27.6 / 55.2
- Storage mode (V DC)
  - 13,2 / 26.4 / 52.8
- Charge current starter battery (A)
  - 4 (Only by the 12V and 24V)
- Battery temperature sensor

#### GENERAL

- Auxiliary output (A) (S)
  - n.a.
  - Yes (10A)
  - Yes (25A)
  - 50
  - 50
- Multi purpose relay driver or relay
  - relay driver (7)
  - 3x relay
- Protection (5)
  - a - g
- VE.Bus communication port
  - For parallel and three phase operation, remote monitoring and system integration
- General purpose com. port (7)
  - 1x
  - 1x
  - 2x
  - 3x
- Common Characteristics
  - Operating temp- range: 20 - 50 °C (fan assisted cooling)
  - Humidity (non condensing): max 95%

#### ENCLOSURE

- Common Characteristics
  - Material & Colour: aluminum (blau RAL 5012)
  - Protection category: IP 21
- Battery-connection
  - Battery cables 1,5 m
  - M8 Studs
- 230V AC-connection
  - G:STI Stecker
  - Spring-clamp
  - Screw-clamp
- Weight (kg)
  - 10
  - 12
  - 18
  - 30
  - 41
  - 45
- Dimensions (hxwxd in mm)
  - 375x214x110
  - 520x255x125
  - 362x258x218
  - 444x328x240
  - 470x350x280
  - 470x350x280

#### STANDARDS

- Safety
  - EN 60335-1
  - EN 60335-2-29
- Emission / Immunity
  - EN 55014-1
  - EN 61000-3-2
  - EN 55014-2
  - EN 61000-3-3
- Automotive Directive
  - 95/54/EC and 2004/104/EC
- DC undervoltage or genset start
  - (optional function, AC rating: 230V/4A
  - DC rating: 4A up to 33VDC, 1A up to 60VDC
  - 7) Open collector output 66V 40mA

### ACCESSORIES

- VECBUS digital panel
- This is a remote control and monitoring panel for the Phoenix MultiPlus
- Computer controlled operation and monitoring (Victron Interface Mk2)
- Blue Power panel
- VE.Net / VE.Bus panel
- Victron Global Remote
- Two AC inputs with integrated transfer switch
- Two AC outputs
  The main output has no-break functionality. The second output is live only when AC is available on one of the inputs of the Quattro.
- Virtually unlimited power thanks to parallel operation
  Up to 6 Quattro's can operate in parallel.
- Three phase capability
  Three units can be configured for three-phase output.
- PowerControl - Dealing with limited generator, shore-side or grid power
- PowerAssist - Boosting shore or generator power
- Solar energy: AC power available even during a grid failure
  The Quattro can be used in off grid as well as grid connected PV and other alternative energy systems.
- A grid connected PV system will shut down when the grid fails! Not anymore with a Quattro and batteries
CHARACTERISTICS 120VAC/60HZ

- Multi-functional, with intelligent shore and generator power management
  The multi gets its name from the multiple functions it can perform. It is a powerful true sine wave inverter, a sophisticated battery charger that features adaptive charge technology, and a high-speed AC transfer switch in a single compact enclosure.

- Uninterrupted AC power (UPS function)
  In the event of a grid failure, or mains or generator power being disconnected, the inverter within the Multi is automatically activated and takes over the supply to the connected loads. This happens so fast (less than 20 milliseconds) that computers and other electronic equipment will continue to operate without disruption.

- Virtually unlimited power thanks to parallel operation and three phase capability
  Up to 6 Multi's can operate in parallel to achieve higher power output. Three units of the same model can be configured for three-phase output.

- PowerControl - Dealing with limited generator or grid power
  With the Phoenix Multi Control Panel a maximum generator or shore current can be set. The Multi will then take account of other AC loads and use whatever is extra for charging, this preventing the generator or shore supply from being overloaded.

- PowerAssist - Boosting the capacity of shore or generator power, an innovative feature of the MultiPlus
  This feature takes the principle of PowerControl to a further dimension allowing the MultiPlus to supplement the capacity of the alternative source. Where peak power is so often required only for a limited period, the Phoenix MultiPlus/Quattro will make sure that insufficient shore or generator power is immediately compensated for by power from the battery.

- Four stage adaptive charger and dual bank battery charging
  The main output provides a powerful charge to the battery system by means of advanced ‘adaptive charge’ software that fine-tunes the three stage automatic process to suit the condition of the battery, and adds a fourth stage for long periods of float charging. In addition to this, the Multi will charge a second battery using an independent trickle charge output intended for a main engine or generator starter battery.

**Multifunctional 120VAC/60HZ**

- **Input 1**
  - 230 VAC single-phase version

- **Input 2**
  - 230 VAC split-phase version

- **Output**
  - 120VAC split-phase version

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**PowerControl**
- Yes

**PowerAssist**
- Yes

**Transfer switch (A)**
- 30 A
- 50 A
- 60 A

**INVERTER**

<table>
<thead>
<tr>
<th>Power</th>
<th>Voltage Range (V DC)</th>
<th>Output Voltage</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cont. output power at 25°C (VA) (2)</td>
<td>2000</td>
<td>3000</td>
<td>5000</td>
</tr>
<tr>
<td>Cont. output power at 25/40°C (W)</td>
<td>1600/1450</td>
<td>2500/2000</td>
<td>4250/3350</td>
</tr>
<tr>
<td>Peak power (W)</td>
<td>4100</td>
<td>6000</td>
<td>7500</td>
</tr>
<tr>
<td>Maximum efficiency (%)</td>
<td>93/94</td>
<td>93/94</td>
<td>94</td>
</tr>
<tr>
<td>Zero-load power (W)</td>
<td>10/10</td>
<td>15/15</td>
<td>30</td>
</tr>
</tbody>
</table>

**CHARGER**

<table>
<thead>
<tr>
<th>AC input</th>
<th>Voltage Range (V DC)</th>
<th>Input Voltage Range: 95-140 VAC</th>
<th>Input Frequency: 45-65 Hz</th>
<th>Power Factor 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charge voltage 'absorption' (V DC)</td>
<td>14.4/28.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charge voltage 'float' (V DC)</td>
<td>13.8/27.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage mode (V DC)</td>
<td>13.2/26.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charge current house battery (A)</td>
<td>80/50</td>
<td>120/70</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>Charge current starter battery (A)</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Battery temperature sensor</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**GENERAL**

- Multi purpose relay driver or relay (1)
  - Relay
- Protection (3)
  - a-h
- Common characteristics
  - Operating temp. range: 0-120°F (fan assisted cooling)
  - Humidity (non condensing): max 95%

**ENCLOSURE**

<table>
<thead>
<tr>
<th>Material &amp; Colour</th>
<th>Blots M8</th>
<th>Protection category</th>
</tr>
</thead>
<tbody>
<tr>
<td>aluminium (blue RAL 5012)</td>
<td>Four M8 Blots (2+, 2-)</td>
<td></td>
</tr>
<tr>
<td>Protection category</td>
<td>IP 21</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Connection</th>
<th>M8 Studs</th>
<th>Spring-clamp</th>
</tr>
</thead>
<tbody>
<tr>
<td>230 V AC</td>
<td>Screw-clamp</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Protection category</th>
<th>IP 21</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Protection</th>
<th>a) Output short circuit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection</td>
<td>b) Overload</td>
</tr>
<tr>
<td>Protection</td>
<td>c) Battery voltage too high</td>
</tr>
<tr>
<td>Protection</td>
<td>d) Battery voltage too low</td>
</tr>
<tr>
<td>Protection</td>
<td>e) Battery reverse polarity detection</td>
</tr>
<tr>
<td>Protection</td>
<td>f) Temperature too high</td>
</tr>
</tbody>
</table>

**STANDARDS**

- Safety EN 60335-1, EN 60335-2-29
- Emission / Immunity EN 55014-1, EN 55014-2/EN61000-3-2, EN 61000-3-3
- Automotive Directive 95/54/EC abd 2004/104/EC

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1) Multipurpose relay which can be set for general alarm, DC under voltage or genset starts signal function
2) Suitable for parallel and 3-phase operation
3) Protection
4) Battery voltage too high
5) Battery voltage too low
6) Battery reverse polarity detection
7) Temperature too high
CHARACTERISTICS

- **Universal input: 90-265 VAC or 90-350 VDC**
  The charger will operate on whatever supply is available.

- **Adaptive 4-stage charge characteristics: bulk - absorption - float - storage**
  The Blue Power charger features a microprocessor controlled 'adaptive' battery management. The 'adaptive' feature will automatically optimise the charging process relative to the way the battery is being used.

- **Less maintenance and aging when the battery is not in use: the Storage Mode**
  The storage mode kicks in whenever the battery has not been subjected to discharge during 24 hours. In the storage mode float voltage is reduced to 2.2 V/Cell (13.2 V for a 12 V battery) to minimise gassing and corrosion of the positive plates. Once a week the voltage is raised back to the absorption level to 'equalize' the battery. This feature prevents stratification of the electrolyte and sulphation, a major cause of early battery failure.

- **Protected against overheating and silent fan cooling**
  Output current will reduce as temperature increases up to 60°C but the Blue Power charger will not fail. The load and temperature controlled fan is practically inaudible.

- **Two LED’s for status indication**
  Yellow LED: bulk charge (blinking fast), absorption (blinking slow). float (solid)
  Green LED: power on

<table>
<thead>
<tr>
<th>Blue power charger IP 20</th>
<th>12/7</th>
<th>12/10</th>
<th>12/15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage range</td>
<td>90-265 VAC, 90-350 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>45-65 or DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charge voltage 'absorption' (V DC)</td>
<td>14.4</td>
<td>28.8</td>
<td></td>
</tr>
<tr>
<td>Charge voltage 'float' (V DC)</td>
<td>14</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>Charge voltage 'storage' (V DC)</td>
<td>13.2</td>
<td>26.4</td>
<td></td>
</tr>
<tr>
<td>Charge current (A)</td>
<td>7/10/15</td>
<td>5/8</td>
<td></td>
</tr>
<tr>
<td>Charge characteristic</td>
<td>4-stage adaptive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum battery capacity (Ah)</td>
<td>24/36/55</td>
<td>16/24</td>
<td></td>
</tr>
<tr>
<td>Can be used as power supply</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection</td>
<td>Battery reverse polarity (fuse in battery cable)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Output short circuit, over temperature</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating range</td>
<td>-20 to 60°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humidity: Max 95%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ENCLOSURE**
- **Material & Colour**
  Aluminium (blue RAL 5012)
- **Battery-connection**
  Black and red cable of 1.5 meter
- **230 V AC-connection**
  Cable of 1.5 meter with Europe class 1 plug (CE certified)
- **Protection category**
  IP20
- **Weight (kg)**
  1.3
- **Dimensions (hxwxd in mm)**
  50x85x200

**STANDARDS**
- **Safety**
  EN60335-1, EN60335-2-29
- **Emission**
  EN55014-1, EN61000-3-2
- **Immunity**
  EN55014-2, EN61000-3-3
**CHARACTERISTICS**

- **Completely encapsulated:** waterproof, shockproof and ignition protected  
  Water, oil or dirt will not damage the Blue Power charger. The casing is made of cast aluminium and the electronics are molded in resin.

- **Protected against overheating**  
  Can be used in a hot environment such as a machine room. Output current will reduce as temperature increases up to 60°C, but the Blue Power charger will not fail.

- **Automatic three stage charging**  
  Once the absorption voltage has been reached to a low break point current (see specifications), or after a 20 hour absorption period. The battery is therefore effectively protected against overcharging and can remain permanently connected to the charger. The charger will automatically reset and start a new charge cycle after interruption of the AC supply.

- **Two LED’s for status indication**  
  Yellow LED: battery being charged  
  Green LED: float charge, the battery is charged

---

**Blue Power charger**

<table>
<thead>
<tr>
<th>Input voltage range (V AC) (1)</th>
<th>12/7</th>
<th>12/17</th>
<th>24/3</th>
<th>24/12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency (Hz)</td>
<td>45-65</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charge voltage ‘absorption’ (V DC)</td>
<td>14.4</td>
<td>17</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Charge voltage ‘float’ (V DC)</td>
<td>13.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charge current (A)</td>
<td>7</td>
<td>17</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Charge characteristic</td>
<td>3 stage with max. 20 hours absorption time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum battery capacity (Ah)</td>
<td>15</td>
<td>35</td>
<td>6</td>
<td>24</td>
</tr>
<tr>
<td>Breakpoint current (A)</td>
<td>0.7</td>
<td>1.7</td>
<td>0.3</td>
<td>1.2</td>
</tr>
<tr>
<td>Can be used as power supply</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection</td>
<td>Battery reverse polarity (fuse in battery cable) Output short circuit, over temperature</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating range</td>
<td>-20 to 60°C, Humidity Max: 100%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ENCLOSURE**

- Material & Colour: Aluminium (blue RAL 5012)
- Battery-connection: Black and red cable of 1.5 meter
- 230 V AC-connection: Cable of 1.5 meter with Europe class 1 plug (CE-certified)
- Protection category: IP 65
- Weight (kg): 1.1 / 1.4 / 1.1 / 1.4
- Dimensions (hxwxd in mm): 43x80x155 / 47x99x193 / 43x80x155 / 47x99x193

**STANDARDS**

- Safety: EN60335-1, EN 60335-2-29
- Emission: EN55014-1, EN61000-3-2
- Immunity: EN55014-2, EN61000-3-3

1) 120V / 60 Hz available
• Adaptive 4-stage charge characteristic: bulk - absorption - float - storage
The Phoenix charger features a microprocessor controlled ‘adaptive’ battery management system that can be preset to suit different types of batteries. The ‘adaptive’ feature will automatically optimise the process relative to the way the battery is being used.

• The right-amount of charge: adaptive charge
When only shallow discharges occur (a yacht connected to shore power for example) the absorption time is kept short in order to prevent overcharging of the battery. After a deep discharge the absorption time is automatically increased to make sure that the battery is completely recharged.

• Preventing damage due to excessive gassing: the Battery Safe mode (see fig1. below)
If, in order to quickly charge a battery, a high charge current in combination with a high absorption voltage has been chosen, the Phoenix charger will prevent damage due to excessive gassing by automatically limiting the rate of voltage increase once the gassing voltage has been reached (see the charge curve between 14,4 V and 15,0 V in fig.1 below).

• Less maintenance and aging when the battery is not in use: the Storage mode (see fig.1 below)
The storage mode kicks in whenever the battery has not been subjected to discharge during 24 hours. In the storage mode float voltage is reduced to 2,2 V/cell (13,2 V for 12 V battery) to minimise gassing and corrosion of the positive plates. Once a week the voltage is raised back to the absorption level to ‘equalize’ the battery. This feature prevents stratification of the electrolyte and sulphation, a major cause of early battery failure.

• To increase battery life: temperature compensation
Every Phoenix charger comes with a battery temperature sensor. When connected, charge voltage will automatically decrease with increasing battery temperature.

• Battery voltage sense
In order to compensate for voltage loss due to cable resistance, Phoenix chargers are provided with a voltage sense facility so that the battery always receives the correct charge voltage.

• Computer interface
Every Phoenix Charger is ready to communicate with a computer through its RS-485 data port. Together with our VEConfigure software, all parameters of the chargers can be customised. The chargers can also be connected to VENet, or to other computerised monitoring control systems.

---

**ACCESSORIES**

- **Battery Monitor**
- **Phoenix Charger Control**
- **Battery Alarm**
  - An excessively high or low battery voltage is indicated by an audible and visual alarm.

---

**PHOENIX BATTERY CHARGER**

**PHOENIX BATTERY CHARGER**

**CHARACTERISTICS**

- **Phoenix charger**
  - **12/24V**
    - **12/30**
    - **24/16**
    - **12/50**
    - **24/25**
    - Input voltage range: 90-265 VAC, 90-400 VDC
    - Frequency (Hz): 45-65, PF 1
    - Charge voltage ‘absorption’ (V DC): 14.4 / 28.8
    - Charge voltage ‘float’ (V DC): 13.8 / 27.6
    - Battery bank: 3
    - Charge current house batt. (A/Q): 30/16 50/25
    - Charge current starter batt. (A): 4
    - Charge characteristics: 4 stage adaptive
    - Battery capacity (Ah): 100-400
    - Temperature sensor: Yes
    - Can be used as power supply: Yes
    - Forced cooling: Yes
    - Protection (1): a,b,c,d
    - Common characteristics: Temperature: -20 to 60 °C (0 - 140°F) Max humidity: 95%

**ENCLOSURE**

- Material & Colour: Aluminium (blue RAL 5012)
- Battery-connection: M6 Studs
- 230 V AC-connection: Screw-clamp 4mm²
- Protection category: IP21
- Weight (kg): 3.8
- Dimensions (hxwxd in mm): 350x200x108

**STANDARDS**

- Safety: EN60335-2-29
- Emission: EN50014, EN61000-3-2, EN61000-3-3
- Immunity: EN50014-2
- Vibration: IEC68-2-6: 10-150Hz/1.0G
- Automotive directive: 95/54/EC

---

1) Protection
   a. Output short circuit
   b. Battery reverse polarity detection
   c. Battery voltage too high
   d. Temperature too high

2) Up to 40 °C ambient
CHARACTERISTICS

- **Perfect chargers for any type of battery**
  Charge voltage can be precisely adjusted to suit any sealed or unsealed battery system. In particular, sealed maintenance free batteries must be charged correctly in order to ensure a long service life. Over voltage will result in excessive gassing and venting of a sealed battery. The battery will dry out and fail.

- **Controlled charging**
  Every TG charger has a microprocessor, which accurately controls the charging in three steps. The charging process takes place in accordance with the IUoUo characteristics and charges more rapidly than other processes.

- **Use of TG chargers as a power supply**
  As a result of the perfectly stabilized output voltage, a TG charger can be used as a power supply if batteries or large buffer capacitors not available.

- **Two outputs to charge 2 battery banks**
  The TG chargers feature 2 isolated outputs. The second output, limited to approximately 4 A and with a slightly lower output voltage, is intended to top up a starter battery.

- **To increase battery life: temperature compensation**
  Every Skylla TG charger comes with a battery temperature sensor. When connected, charge voltage will automatically decrease with increasing battery temperature. This feature is especially recommended for sealed batteries which otherwise might be overcharged and dry out due to venting.

- **Battery voltage sense**
  In order to compensate for voltage loss due to cable resistance, TG chargers are provided with a voltage sense facility so that the battery always receives the correct charge voltage.

### ACCESSORIES

- **Battery Monitor**
- **Skylla Control**
- **GMDSS panel**

### SKYLLA TG BATTERY CHARGER

**CHARGE VOLTAGE**

- 24V: 30-50-80-100 A
- 48V: 25-50 A

**SKYLLA TG BATTERY CHARGER**

- **Skylla 24V / 48V**
  - 24/30 TG
  - 24/30 GMDS
  - 24/50 TG
  - 24/50 GMDS
  - 24/50 TG
  - 24/80 TG
  - 24/100 TG
  - 24/100 TG
  - 48/25 TG
  - 48/50 TG

**INPUT VOLTAGE**

- 185-265VAC, 320-450VAC or 180-400VDC

**FREQUENCY (Hz)**

- 45-65

**CHARGE VOLTAGE**

- ‘absorption’ (VDC): 28.5
- ‘float’ (VDC): 26.5

**BATTERY CAPACITY (Ah)**

- 150-300
- 230-500
- 400-800
- 500-1000
- 125-250
- 250-500

**CHARGE CURRENT**

- House batt.: 30, 50, 75, 100 A
- Starter batt.: 4 A

**CHARGE CHARACTERISTICS**

- IUoUo
- Temperature sensor
- Can be used as power supply
- Potential free contacts
- Protection (1) a,b,c,d

**COMMON CHARACTERISTICS**

- Temperature: -20 to 60 °C (0 - 140 °F)
- Max humidity: 95%

**ENCLOSURE**

- Material & Colour: Aluminium (blue RAL 5012)
- Battery-connection: M8 Studs
- 230 V AC connection: Screw-clamp 2,5 mm² (AWG 6)
- Protection category: IP21

**WEIGHT**

- 5.5/6 kg
- 5.5/13 kg
- 10 kg
- 10/23 kg
- 5.5 kg
- 10 kg

**DIMENSIONS**

- 365x250x147 mm
- 365x250x147 mm
- 365x250x257 mm
- 365x250x257 mm
- 365x250x257 mm
- 365x250x257 mm
- 365x250x257 mm

**STANDARDS**

- Safety: EN60335-2-29
- Emissions: EN55014, EN61000-3-2, EN61000-3-3
- Immunity: EN55014-2
- Automotive directive: 95/54/EC

1. Protection
   - a. Output short circuit
   - b. Battery reverse polarity detection
   - c. Battery voltage too high
   - d. Temperature too high
2. Up to 40 °C ambient

Wide input voltage 90-265 VAC and GL approval model available
**CHARACTERISTICS**

- **Quality without compromise**
  Aluminium epoxy powder coated cases with drip shield and stainless steel fixings withstand the rigors of adverse environments: heat, humidity and salt air. Circuit boards are protected with an acrylic coating for maximum corrosion resistance. Temperature sensors ensure that power components will always operate within specified limits, if needed, by automatic reduction of output current under extreme environmental conditions.

- **Universal 90 to 265 Volt input voltage range**
  All models will operate without any adjustment needed over a 90 to 265 Volt input voltage range, whether 50 Hz or 60 Hz.

- **Three outputs that each can supply the full output current**
  Three isolated outputs to simultaneously charge 3 battery banks. Each output is capable to supply the full rated current.

- **Three stage charging, with temperature compensation**
  The Centaur charges at bulk rate until the output has reduced to 70% of the rated Amps, at which a 4 hour timer begins. After the timed period the charger switches to float rate. An internal temperature sensor is used to compensate the charge voltage with 2 mV/°C (1mV/°F) per cell.

---

**ACCESSORIES**

**Battery Monitor**
An excessively high or low battery voltage is indicated by an audible and visual alarm.

**Battery Alarm**
An excessively high or low battery voltage is indicated by an audible and visual alarm.

---

1. Fasten the separate mounting plate (A) to the wall where you want to place the battery charger, and simply hook up the Centaur.
2. Secure the bottom of the backside (B) to the wall.

---

**ENCLURE**

- **Material & Colour**: Aluminium (blue RAL5012)
- **AC-connection**: Screw-clamp 4mm² (AWG 6)
- **Battery-connection**: IP21
- **Protection category**: M6 Studs M8 Studs
- **Weight (kg)**: 3.8 5 12 16
- **Dimension (fixed in mm)**: 355x215x110 425x239x135 505x235x130 505x255x230

---

**STANDARDS**

- **Safety**: EN 60335-2-29, UL 1236
- **Emission**: EN 55014, EN61000-3-2, EN 61000-3-3
- **Immunity**: EN 55014-2

---

1) Standard setting. Optimum charge/floating voltages for Flooded Lead-acid, Gel-Cell or AGM batteries selectable by dip switch.
2) Up to 40 °C (104 °F) ambient. Output will reduce to approximately 80% of nominal at 50 °C (122 °F) and 60% of nominal at 60 °C (140 °F)
Possibly the widest range on the market!
An ever-increasing is being used on vehicles and industrial systems. Because most low-voltage equipment is designed for 12 Volts, Victron Energy supplies DC/DC converters which deliver a stable 12 Volt supply from a 24 Volt system. These products are also distinguished by high efficiency, together with absolute safety. An inferior supply can cause irreparable damage to your 12 Volt system, but the use of an Orion voltage converter prevents problems of that type. Next to converters from 24 V to 12 V, a wide range of other models available.

Battery charger
The Orion 24/12-20 and 24/12-30 can also be used as a 13.8 Volt battery charger for a 12 Volt starter or accessory battery in an otherwise 24 Volt system.

To charge a 24 V battery from a 12 V system the Orion 12/24-7, 12/24-10 can be used. The output voltage of this model can be adjusted with a potentiometer.

A super wide input range buck-boost regulator:
The Orion 7-35/12-3 is an isolated converter with a very wide input range, suitable for both 12 V and 24 V systems, and a fixed 12,6 V output.

### CHARACTERISTICS

<table>
<thead>
<tr>
<th>Non isolated converters</th>
<th>Orion 24/12-5</th>
<th>Orion 24/12-8</th>
<th>Orion 24/12-12</th>
<th>Orion 24/12-20</th>
<th>Orion 24/12-30</th>
<th>Orion 24/12-60</th>
<th>Orion 12/24-7</th>
<th>Orion 12/24-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output voltage (V)</td>
<td>13.2</td>
<td>13.2</td>
<td>13.2</td>
<td>13.8</td>
<td>13.8</td>
<td>13.8</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Max. output current (A)</td>
<td>5.5</td>
<td>8</td>
<td>12</td>
<td>20</td>
<td>30</td>
<td>60</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Fan assisted cooling (temp. Controlled)</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td>Galvanic isolation</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Off load current</td>
<td>&lt;5mA</td>
<td>&lt;5mA</td>
<td>&lt;5mA</td>
<td>approx. 25mA</td>
<td>approx. 25mA</td>
<td>approx. 50mA</td>
<td>&lt;15mA</td>
<td>&lt;15mA</td>
</tr>
<tr>
<td>Temperature increase after 30 minutes at full load (° C)</td>
<td>30</td>
<td>20</td>
<td>30</td>
<td>25</td>
<td>33</td>
<td>33</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>0.17</td>
<td>0.25</td>
<td>0.26</td>
<td>0.48</td>
<td>0.6</td>
<td>1.2</td>
<td>0.3</td>
<td>0.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dimensions (hxwxd in mm)</th>
<th>49x88x68</th>
<th>49x88x98</th>
<th>49x88x98</th>
<th>49x88x126</th>
<th>49x88x151</th>
<th>49x88x126</th>
</tr>
</thead>
</table>

Note: two units Orion 24/12-60 can be connected in parallel to obtain a 120A converter

<table>
<thead>
<tr>
<th>Isolated converters</th>
<th>Orion xx/yy-100W</th>
<th>Orion xx/yy-200W</th>
<th>Orion xx/yy-360W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power rating (W)</td>
<td>100 (12,5V/8A or 24V/4A)</td>
<td>200 (12,5V/16A or 24V/8A)</td>
<td>360 (12,5V/30A or 24V/15A)</td>
</tr>
<tr>
<td>Galvanic isolation</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Temperature increase after 30 minutes at full load (° C)</td>
<td>25</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Fan assisted cooling (temp. Controlled)</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>0.5</td>
<td>0.6</td>
<td>1.4</td>
</tr>
<tr>
<td>Dimensions (hxwxd in mm)</td>
<td>49 x 88 x 153</td>
<td>49 x 88 x 182</td>
<td>64 x 163 x 160</td>
</tr>
<tr>
<td>Input voltage (V)</td>
<td>12 V (9-18V) or 24 V (20-35 V) or 48 V (30-60 V) or 96 V (60-120 V), 110 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output voltage (V)</td>
<td>12,5 V or 24 V</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Isolated 24V battery charger: Orion 12/27-6-12</th>
<th>Input 9 - 18 V, output 27,6 V, current limit 12 A, fan assisted cooling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (kg), dimensions 64 x 163 x 160 mm</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Isolated buck-boost regulator: Orion 7-35/12-3</th>
<th>Input 7 - 35 V, output 12,6 V, current limit 3 A, derate current linearly from 3 A at 18 V to 1.5 A at 7 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight 1,4 kg, dimensions 64 x 163 x 160 mm</td>
<td></td>
</tr>
</tbody>
</table>

### COMMON CHARACTERISTICS

| Output voltage stability | 2 % (Orion 12/24-7 and Orion 12/24-10: + 0% / -3%)
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Output voltage tolerance</td>
<td>3%</td>
</tr>
<tr>
<td>Output noise</td>
<td>≤ 50 mV rms</td>
</tr>
<tr>
<td>Off load current</td>
<td>≤ 25 mA (isolated converters)</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Non isolated: approx. 92% Isolated: approx. 85%</td>
</tr>
<tr>
<td>Isolation</td>
<td>&gt; 400 Volts between input, output and case (isolated products only)</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-20 to + 30 °C, Derate linearly to 0 A at 70 °C</td>
</tr>
<tr>
<td>Humidity</td>
<td>Max 95% non condensing</td>
</tr>
<tr>
<td>Casework</td>
<td>Anodised aluminium</td>
</tr>
<tr>
<td>Connections</td>
<td>6.3 mm push-on flat blade connectors</td>
</tr>
</tbody>
</table>

### PROTECTION

<table>
<thead>
<tr>
<th>Overcurrent</th>
<th>Short circuit proof</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overheating</td>
<td>Reduction of output voltage</td>
</tr>
<tr>
<td>Reverse polarity conn</td>
<td>Fuse and reverse connected diode across input</td>
</tr>
<tr>
<td>Overvoltage</td>
<td>Varistor (also protects against load dump)</td>
</tr>
</tbody>
</table>

### STANDARDS

<table>
<thead>
<tr>
<th>Emission</th>
<th>EN 50081-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immunity</td>
<td>EN 50082-1</td>
</tr>
<tr>
<td>Automotive Directive</td>
<td>95/4/EC</td>
</tr>
</tbody>
</table>
ARGO DIODE BATTERY ISOLATORS

Diode battery isolators allow simultaneous charging of two or more batteries from one alternator, without connecting the batteries together. Discharging the accessory battery for example will not result in also discharging the starter battery.

The Argo battery isolators feature a low voltage drop thanks to the use of Schottky diodes: at low current the voltage drop is approximately 0.3 V and at the rated output approximately 0.45 V. All models are fitted with a compensation diode that can be used to slightly increase the output voltage of the alternator. This compensated for the voltage drop over the diodes in the isolator.

ARGO FET Battery isolators: no voltage loss

Similarly to diode battery isolators, FET isolators allow simultaneous charging of two or more batteries from one alternator (or a single output battery charger), without connecting the batteries together. Discharging the accessory battery for example will not result in also discharging the starter battery. In contrast with diode battery isolators, FET isolators have virtually no voltage loss. Voltage drop is less than 0.02 Volt at low current and averages 0.1 Volt at higher currents. The new Argofet isolators have a special current limited energize input that will power the B+ when the engine run/stop switch is closed.

CYRIX microprocessor controlled battery combiner

No voltage loss

The Cyrix battery combiner is a microprocessor controlled heavy duty relay that automatically connects batteries in parallel when one of the has reached a preset voltage (indicating that the battery is being charged), and disconnects when the voltage decreases below float level (indicating that one or more batteries are being discharged). Cyrix battery separators are an excellent replacement for diode isolators. The main feature is that there is virtually no voltage loss so that the output voltage of alternators or battery chargers does not need to be increased.

Prioritising the starter battery

In a typical setup the alternator is directly connected to the starter battery. The accessory battery, and possibly also a bow thruster and other batteries are each connected to the starter battery by Cyrix battery combiners. When a Cyrix senses that the starter battery has reached its connect voltage it will engage, to allow for parallel charging of the other batteries.

Bidirectional voltage sensing

The Cyrix senses the voltage of both connected batteries. It will therefore also engage if for example the accessory battery is being charged by a battery charger.

Parallel connection in case of emergency

The Cyrix can also be engaged with a switch to connect batteries in parallel manually. This is especially useful in case of emergency when the starter battery is discharged of damaged.
### CHARACTERISTICS

**Precision monitoring**
The essential function of a battery monitor is to calculate ampere-hours consumed and the state of charge of a battery. Ampere-hours consumed is calculated by integrating the current flowing in or out of the battery. In case of a constant current, this integration is equivalent to current multiplied by time. A discharge current of 10A during 2 hours, for example, amounts to 20Ah consumed. All our battery monitors are based on a powerful microprocessor, programmed with the algorithms needed for precision monitoring.

**Standard information and alarms**
- **Battery voltage (V)**
- **Battery charge/discharge current (A)**
- **Ampere-hours consumed (Ah)**
- **State of charge (%)**
- **Time to go at the current rate of discharge**
- **Visual and audible alarm: over- and under voltage, and/or battery discharged**
- **Programmable alarm or generator start relay.**

**BMV 600-S: low cost ultra high resolution monitor**
Highest resolution: 10mA (0.01A) with 500A shunt. Lowest current consumption: 1mA. Easiest to wire: the BMV 600 comes with stunt, 10 meter RJ 12 UTP cable and 2 meter battery cable with fuse. No other components needed. Easiest to install: separate front bezel for square or round appearance; ring for rear mounting and screws for front mounting. Broadest voltage range: 9-90 VDC without prescaler needed.

**BMV 602-S: two batteries and communication port**
In addition to all the features of the BMV600, the BMV602 can measure the voltage of a second battery and has a communication port. (Isolated RS232 interface is needed to connect to a computer)

**BMV 602-HS: 35 to 150VDC voltage range**
No prescaler needed.

**VE.Net Battery Controller: any number of batteries**
One VE.Net panel will connect to any number of battery controllers. Comes with 500A/50mV shunt and can be programmed for any other shunt. With use, abuse and data memory. Temperature sensor and connection kit included.

---

### RESOLUTION (with 500 A shunt)

<table>
<thead>
<tr>
<th>Battery Monitoring</th>
<th>BMV 600 - S</th>
<th>BMV 602 - S</th>
<th>BMV 602 - HS</th>
<th>VE.Net Battery Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply voltage range</td>
<td>9-90 VDC</td>
<td>9-90 VDC</td>
<td>35-150 VDC</td>
<td>9-60 VDC</td>
</tr>
<tr>
<td>Current draw, back light off</td>
<td>4mA at 12V</td>
<td>4mA at 12V</td>
<td>3mA</td>
<td>3mA at 48VDC</td>
</tr>
<tr>
<td>Input voltage range (VDC)</td>
<td>9-90 VDC</td>
<td>9-90 VDC</td>
<td>35-150 VDC</td>
<td>39-60 VDC</td>
</tr>
<tr>
<td>Battery capacity (Ah)</td>
<td>20-9999 Ah</td>
<td>20-60000Ah</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>30 - 50 °C (0 - 120 °F)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measures voltage of second battery</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Communication port</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes (VE.Net)</td>
</tr>
<tr>
<td>Potential free contacts</td>
<td>60V/1A (N/C)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### INSTALLATION AND DIMENSIONS

<table>
<thead>
<tr>
<th>Installation</th>
<th>Flush mount</th>
<th>DIN rail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front</td>
<td>63 mm diameter</td>
<td>22 x 75 mm (0.9 x 2.9 inch)</td>
</tr>
<tr>
<td>Front bezel</td>
<td>69 x 69 mm (2.7 x 2.7 inch)</td>
<td>n.a.</td>
</tr>
<tr>
<td>Body diameter</td>
<td>52 mm (2.0 inch)</td>
<td>n.a.</td>
</tr>
<tr>
<td>Body depth</td>
<td>31 mm (1.2 inch)</td>
<td>105 mm (4.1 inch)</td>
</tr>
</tbody>
</table>

### ACCESSORIES

| Shunt (included) | 500 A / 50 mV | 500 A / 50 mV |
| Cables (included) | 10 meter 6 core UTP with RJ12 connectors and cable with fuse for x connection | Supplied with 1m cables |
| Temperature sensor | n.a. | Supplied with 3m cable |
| Computer interface | n.a. | Optional | Optional | n.a. |
VE NET stands for VICTRON ENERGY NETWORK, a low power network that will monitor all essential equipment and alarms, and keep you informed through automatic e-mails, text messages, and even voice calls. Similarly the wireless connection could be used to access all systems on board remotely. For the ultimate in monitoring and control of your power system, VE.Net represents the state of the art. As a truly integrated solution, VE.Net provides the following components:

1. Blue power panel - multi character display and interface panel
2. Battery Controller - full function battery monitoring module (any number can be connected to the network).
3. Generator control - full monitoring and control of your generator including auto start/stop functionality.
4. VRM module - enables full access to system status and control remotely through the internet. It also gives a historical overview with graphs and bars through our internet website.

VE.Net can also be integrated with any number of other devices including an on board PC, power distribution systems and or senders and alarms. Your imagination is the only limit to what is possible.

Victron Global Remote

The Global Remote is a modem which sends alarms, warnings and system status reports to cellular phones via text messages (SMS). It can also log data from Victron Battery Monitors, Multi’s, Quattro’s and Inverters to a website through a GPRS connection. The usage of this website is free of charge.

The idea is simple: you can use it to get SMS alarms from a Multi, a Battery System, or both. When monitoring the usage of batteries, it can be extremely helpful to receive under and overvoltage alarms; whenever they occur. For this purpose, the Global Remote is perfect. A prepaid SIM-card (for example) in combination with the Global Remote is adequate for remotely monitoring your system.

Taking it one step further, an internet browser and -connection is all you need to view all of the data online. You can simply create an account on the website and add your modem(s). Subsequently you can configure the GPRS connection, which will enable you to monitor the historic data of several basic properties such as system voltages, power levels and status information. All of this data is graphed. These graphs are available in daily, weekly and monthly timeframes.

Victron Remote Management is the name of the system which consists of the VGR and the monitoring website. To get a preview: please go to http://www.victronenergy.com, and login at ‘Victron Remote Management’ via the Login menu on the upper right of the page.

1x Y cable (16-way plug to male DB9 + 12-way socket)

VGR900100000

D89 male

MK2 interface

(included with VGR)

RJ45 UTP

12/24Vdc

MJ2 interface

(included with VGR)

RJ12 UTP Cable
**Batteries**

- VRLA AGM: design life 7-10 years
- VRLA GEL: design life 12 years
- VRLA GEL 2 volt cells: design life 20 years
- The AGM range has very low internal resistance making them particularly suitable for high current discharge and charging.
- The GEL model range offer best deep cycle durability and overall longer life.
- The use of high purity materials and lead calcium grids ensure that for both AGM and GEL products have particularly low self discharge so that they will not go flat during long periods without charge.
- Both ranges are supplied with M8 drilled, flat copper terminals ensuring best possible connection contact and eliminating the need for battery terminals.
- Manufactured under ISO 9002 quality standards, they are compliant with both CE and UL specifications in ABS fireproof containers and come with Victron’s 2 year world-wide warranty.

**FILAX Transfer Switch**

- Filax: the ultra fast transfer switch
  The Filax has been designed to switch sensitive loads, such as computers or modern entertainment equipment from one AC source to another. The priority source typically is the mains, a generator or shore power. The alternate source typically is an inverter.

**PowerMan Transfer Switches**

- Ideal to build a no-break power supply with several paralleled Multi’s.
  The PowerMan transfer switch enables seamless power transfer from one or more AC sources to several paralleled Multi’s. In-built AC current monitoring ensures that the AC power management functionality of the Multi’s remains available.

**BatteryProtect (Models: BP-40i, BP-60i, BP-200i)**

- The BatteryProtect disconnects the battery from non-essential loads before it is completely discharged (which would damage the battery) or before it has insufficient power left to crank the engine.

**ESP system panel**

- The new ESP panel system provides a contemporary designed range of panels that cover the core engineering systems. The main system panel is the heart of the range. This provides AC and DC monitoring, Multi control and backlight control. Additional panels include AC and DC circuit breaker panels, a general control panel, a VE Net panel.
**PowerControl**: Dealing with limited generator or grid power. All models in the MultiPlus range feature powerful battery chargers. When the largest model is working hard it can draw almost 10A from a 230V supply. Using the remote panel it is possible to ‘dial-in’ the maximum current that is available from mains or generator. The MultiPlus will then automatically regulate the charger taking account of other system AC loads and ensuring the charger only uses what is spare. This way it is possible to avoid tripping the mains power or overloading the generator.

**PowerAssist**: Boosting the power available from mains or generator, an innovative feature of MultiPlus. The feature that most distinguishes the MultiPlus from other inverter/chargers is PowerAssist. This feature takes the principle of PowerControl to a further dimension by allowing a MultiPlus to supplement the power available from mains or generator to ‘assist’ during periods of high demand. Peak power demand is almost always sustained only for short periods, either a few minutes (in the case of items like cooking appliances) or just a few seconds (in the case of the burst of energy needed to start an air-conditioning or refrigeration compressor).

With the capacity of the generator or mains power set on the remote panel, the MultiPlus detects when the load is becoming too much for the supply and will instantly provide the extra power required. When the demand has reduced, the unit returns to charging the battery. This feature is equally effective in large and small systems helping to reduce the required generator capacity or to achieve greater things with limited mains power. There is even a special feature to enable the MultiPlus/Quattro to work perfectly with portable generators.

**Power Assist ©**

Inverter boosts incoming power, if required, to avoid overload of supply when system consumption exceeds supply.
### COMFORT SYSTEM

<table>
<thead>
<tr>
<th>Appliance</th>
<th>System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lighting</td>
<td>Quattro 12/3000/120</td>
</tr>
<tr>
<td>Communication &amp; navigation</td>
<td>BMV602-5 battery monitor</td>
</tr>
<tr>
<td>Water heater</td>
<td>2x12V/200AH and 1x80AH batteries</td>
</tr>
<tr>
<td>Microwave oven</td>
<td>Digital control remote panel</td>
</tr>
<tr>
<td>2 ring introduction hob</td>
<td>Alternator 12/150</td>
</tr>
<tr>
<td>Coffee machine/Kettle</td>
<td>DC Link Box</td>
</tr>
<tr>
<td>TV/DVD</td>
<td>Isolation transformer</td>
</tr>
<tr>
<td>Laptop</td>
<td>Cyrix battery separator</td>
</tr>
<tr>
<td>Small chargers (mobile phone, electric shaver)</td>
<td></td>
</tr>
<tr>
<td>Refrigerator and freezer</td>
<td></td>
</tr>
</tbody>
</table>

### COMFORT PLUS SYSTEM

<table>
<thead>
<tr>
<th>Appliance</th>
<th>System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lighting</td>
<td>2xQuattro 24/5000/120</td>
</tr>
<tr>
<td>Communication &amp; navigation</td>
<td>VE-NET Battery controller</td>
</tr>
<tr>
<td>Water heater</td>
<td>4x12V/200AH and 1x80AH batteries</td>
</tr>
<tr>
<td>Electric gallery with 4 ring induction hob, microwave/combi oven, refrigerator, freezer, washer/dryer.</td>
<td>Blue Power panel</td>
</tr>
<tr>
<td>Coffee machine and kettle</td>
<td>Alternator 12/150</td>
</tr>
<tr>
<td>TV/DVD</td>
<td>DC Link box</td>
</tr>
<tr>
<td>Multimedia PC</td>
<td>Isolation transformers</td>
</tr>
<tr>
<td>Small chargers (mobile, phone, shaver etc)</td>
<td></td>
</tr>
<tr>
<td>Modest air-conditioning</td>
<td></td>
</tr>
</tbody>
</table>

### COMFORT SYSTEM - 7 KVA (30A) CAPACITY

![Diagram of Comfort System - 7 KVA (30A) Capacity]

- **AC distribution**
  - Water heater (10A)
  - Microwave (6A)
  - Fridge (1A)
  - TV/DVD (1A)
  - Induction Hob
  - Coffee Maker (1A)
  - Hairdryer (8A)
  - Power Tools (2A)
  - Cabin Light
  - Water Pump
  - Navigation Equipment
  - Bilge Pumps
  - Shower Pump

- **DC distribution**
  - Only active with shore/genset

- **Genset**
  - 230V/50Hz
  - 4kVA

### COMFORT PLUS SYSTEM - 25 KVA CAPACITY

![Diagram of Comfort Plus System - 25 KVA Capacity]

- **AC distribution**
  - Water heater (10A)
  - Microwave (6A)
  - Fridge (1A)
  - TV/DVD (1A)
  - Induction Hob
  - Coffee Maker (1A)
  - Hairdryer (8A)
  - Washer/dryer (13A)
  - Air-Cond (Partial)
  - Induction Hob

- **DC distribution**
  - Only active with shore/genset

- **Genset**
  - 230V/50Hz
  - 15kVA

- **2 x Quattro 24/5000/120**
  - Blue Power panel
BlueSolar Panel 130W

- Low voltage-temperature coefficient enhances high-temperature operation.
- Exceptional low-light performance and high sensitivity to light across the entire solar spectrum.
- 25-year limited warranty on power output and performance.
- 2-year Limited warranty on materials and workmanship.
- Sealed, waterproof, multi-functional junction box gives high level of safety.
- High performance bypass diodes minimize the power drop caused by shade.
- Advanced EVA (Ethylene Vinyl Acetate) encapsulation system with triple-layer back sheet meets the most stringent safety requirements for high-voltage operation.
- A sturdy, anodized aluminum frame allows modules to be easily roof-mounted with a variety of standard mounting systems.
- Highest quality, high-transmission tempered glass provides enhanced stiffness and impact resistance.
- Pre wired quick-connect system with PV-ST01 connectors.

### BlueSolar Panel 130W

#### PV-ST01 connectors

<table>
<thead>
<tr>
<th>Type</th>
<th>Module Size</th>
<th>Glass size</th>
<th>Weight</th>
<th>Electrical data under STC (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module</td>
<td>MM MM</td>
<td>KG</td>
<td>Nominal Power</td>
<td>Max-Power Voltage</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PMPP W V A</td>
<td>VMPP V A</td>
</tr>
<tr>
<td>Module</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>532x418x23</td>
<td>527x413</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>B</td>
<td>810x534x35</td>
<td>804x528</td>
<td>6.5</td>
<td>50</td>
</tr>
<tr>
<td>B</td>
<td>1196x534x35</td>
<td>1189x528</td>
<td>8</td>
<td>80</td>
</tr>
<tr>
<td>B</td>
<td>1456x666x35</td>
<td>1450x660</td>
<td>13</td>
<td>130</td>
</tr>
<tr>
<td>B</td>
<td>1580x808x35</td>
<td>1574x802</td>
<td>15</td>
<td>180</td>
</tr>
<tr>
<td>B</td>
<td>1930x980x35</td>
<td>1924x974</td>
<td>19</td>
<td>280</td>
</tr>
</tbody>
</table>

#### INVERTER

<table>
<thead>
<tr>
<th>Module</th>
<th>Nominal Power (±3% tolerance)</th>
<th>Cell type</th>
<th>Number of cells in series</th>
<th>Maximum system voltage (V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module</td>
<td>30W</td>
<td>Monocrystalline</td>
<td>36</td>
<td>1000V</td>
</tr>
<tr>
<td>Module</td>
<td>50W</td>
<td>Polycrystalline</td>
<td>72</td>
<td></td>
</tr>
</tbody>
</table>

#### Specifications

- Surface Maximum Load Capacity: 200kg/m²
- Allowable Hail Load: Steel ball (weight 227g, diameter 25mm) fall down from 1m height
- Junction Box Type: PV-RH0301
- Connector Type: PV-ST01/M PV-ST01/F
- Length of Cables: 900mm
- Output tolerance: ±3%
- Frame: Aluminium
- Product warranty: 2 years
- Warranty on electrical performance: 10 years 90% + 15 years 80% of power output
- Smallest packaging unit: 2 panels

<table>
<thead>
<tr>
<th>Quantity per pallet</th>
<th>88 panels</th>
<th>44 panels</th>
<th>44 panels</th>
<th>40 panels</th>
<th>52 panels</th>
<th>36 panels</th>
</tr>
</thead>
</table>

1) STC (Standard Test Conditions): 1000W/m², 25°C, AM (Air Mass) 1.5
AC SOLAR SYSTEM

- **Blue Power panel**
- **2 x Quattro 48/1000/140**
- **PV system**
- **Grid inverter**
- **VE Solar Switch**

### AC distribution

- Water Heater (10A)
- Microwave (6A)
- Fridge (1A)
- TV / DVD (1A)
- Computer (1A)
- Coffee Maker (8A)
- Hairdryer (8A)
- Washer/dryer (13A)
- Air - Con (Partial)
- Induction Hob

### Equipment List

- **Genset 230V/50Hz**
- **Battery**
- **Controller**
- **Induction Hob**
- **QUATTRO**
- **Water Heater (10A)**
- **Microwave (6A)**
- **Fridge (1A)**
- **TV / DVD (1A)**
- **Computer (1A)**
- **Coffee Maker (8A)**
- **Hairdryer (8A)**
- **Washer/dryer (13A)**
- **Air - Con (Partial)**
- **Induction Hob**

### Electrical Data

<table>
<thead>
<tr>
<th>Type Module Size Glass size Weight</th>
<th>Nominal Power</th>
<th>Max-Power</th>
<th>Voltage</th>
<th>Max-Power</th>
<th>Current</th>
<th>Open-Circuit Voltage</th>
<th>Short-circuit Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSP30-12 532x418x23 527x413 3</td>
<td>3</td>
<td>30</td>
<td>18</td>
<td>1.66</td>
<td>21.6</td>
<td>1.83</td>
<td></td>
</tr>
<tr>
<td>BSP50-12 810x534x35 804x528 6.5</td>
<td>5</td>
<td>50</td>
<td>18</td>
<td>2.58</td>
<td>36.2</td>
<td>3.05</td>
<td></td>
</tr>
<tr>
<td>BSP80-12 1196x534x35 1189x528 8</td>
<td>8</td>
<td>80</td>
<td>18</td>
<td>4.44</td>
<td>21.6</td>
<td>4.88</td>
<td></td>
</tr>
<tr>
<td>BSP130-12 1456x666x35 1450x660 13</td>
<td>13</td>
<td>130</td>
<td>36</td>
<td>7.23</td>
<td>21.6</td>
<td>7.94</td>
<td></td>
</tr>
<tr>
<td>BSP180-12 1580x808x35 1574x802 15</td>
<td>15</td>
<td>180</td>
<td>36</td>
<td>4.95</td>
<td>43.2</td>
<td>5.45</td>
<td></td>
</tr>
<tr>
<td>BSP280-12 1930x980x50 1924x974 19</td>
<td>19</td>
<td>280</td>
<td>36</td>
<td>7.78</td>
<td>43.2</td>
<td>8.55</td>
<td></td>
</tr>
</tbody>
</table>

### Technical Specifications

- **Inverter Module Size**
- **Nominal Power (±3% tolerance)**
- **Cell type**
- **Number of cells in series**
- **Maximum system voltage (V)**
- **Temperature coefficient of Isc (%)**
- **Temperature coefficient of Voc (%)**
- **Temperature coefficient of IMPP**
- **Temperature coefficient of VMPP**
- **Temperature Range**
- **Surface Maximum Load Capacity**
- **Allowable Hail Load**
- **Junction Box Type**
- **Connector Type**
- **Length of Cables**
- **Output tolerance**
- **Frame**
- **Product warranty**
- **Warranty on electrical performance**
- **Smallest packaging unit**
- **Quantity per pallet**
When the public grid is available, the Victron SolarSwitch will connect the solar inverter directly to the grid. If the grid fails, the power from the solar inverter will be redirected to the output of the MultiPlus. The MultiPlus replaces the grid and will balance the power mismatch between the load and the solar inverter. A power shortage will be supplemented by the MultiPlus, discharging the battery, and excess power will be used to recharge the battery. Once the batteries are fully charged, the excess power can be redirected to a water heater (relay not shown), or a dump load (not shown), or the grid inverter can be stopped by slightly changing the output frequency of the MultiPlus (this is a standard feature of the MultiPlus).

In order to prevent the batteries from discharging completely in case of insufficient solar power, some or all loads can be shut down with programmable relays available on the SolarSwitch (not shown).

### SPECIFICATIONS OF THE SOLARSWITCH

<table>
<thead>
<tr>
<th>SolarSwitch</th>
<th>AC inputs (Mains, MultiPlus/Quattro and Solar)</th>
<th>Input voltage range: 187-265 VAC</th>
<th>Input frequency: 45 – 65 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maximum switch through current (A)</td>
<td>25A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maximum power consumption (W)</td>
<td>&lt; 4W</td>
<td></td>
</tr>
<tr>
<td><strong>GENERAL</strong></td>
<td>Auxiliary programmable Relay (3X) (1)</td>
<td>Max load: 8A 250VAC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Status LED</td>
<td>1 Blue / 1 Yellow / 1 Red</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Common Characteristics</td>
<td>Operating temp.: -20 to +50°C</td>
<td>Humidity (non condensing): max 95%</td>
</tr>
<tr>
<td><strong>ENCLOSURE</strong></td>
<td>Common Characteristics</td>
<td>Material &amp; Colour: Housing polyamide 6.6 / green</td>
<td></td>
</tr>
<tr>
<td></td>
<td>230 V AC-connection</td>
<td>Screw terminals 5.2mm² (10 AWG)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Auxiliary relay connection</td>
<td>Screw terminals 2.5mm² (19 AWG)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Weight (grams)</td>
<td>750</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dimensions (hxwxd in mm)</td>
<td>88 x 215 x 110</td>
<td></td>
</tr>
<tr>
<td><strong>STANDARDS</strong></td>
<td>Safety</td>
<td>EN 60335-1, EN 60335-2-29</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Emission / Immunity</td>
<td>ENS5014-1, EN 55014-2, EN 61000-3-3</td>
<td></td>
</tr>
</tbody>
</table>

1) Three programmable relays Can be programmed with VEConfigure Application examples: Alarm, generator start or load shedding function
Ac rating: 230V/4A Dc rating: 4A up to 35VDC, 1A up to 60VDC

### NO-BREAK BACK-UP FOR GRID CONNECTED SOLAR SYSTEM
**BLUESOLAR CHARGE CONTROLLERS**

**BLUESOLAR 12/24-10**
- Low cost PWM controller.
- Internal temperature sensor.
- Three stage battery charging (bulk, absorption, float).
- Protected against over current.
- Protected against short circuit.
- Protected against reverse polarity connection of the solar panels and/or battery.
- With low voltage load disconnect output.

**BLUESOLAR DUO 12/24-20**
- PWM controller.
- Charges two separate batteries. For example the starter battery and the service battery of a boat or mobile home.
- Programmable charge current ratio (standard setting: equal current to both batteries).
- Charge voltage settings for three battery types (Gel, AGM and Flooded).
- Internal temperature sensor and optional remote temperature sensor.
- Protected against over current.
- Protected against short circuit.
- Protected against reverse polarity connection of the solar panels and/or battery.

**BLUESOLAR MPPT 12/24-40**
- Maximum Power Point Tracking (MPPT) controller. Increases charge current by up to 30% compared to a PWM controller.
- Charge voltage settings for eight battery types, plus two equalize settings.
- Remote temperature sensor.
- Protected against over current.
- Protected against short circuit.
- Protected against reverse polarity connection of the solar panels and/or battery.
- With low voltage load disconnect output.

---

**BLUE SOLAR CHARGE CONTROLLERS**

![System Diagram]