

Victron MultiPlus

Inverter/Charger Battery Back-Up - 500VA to 3000VA

Revision: 7.1 - 31st July 2024

INTRODUCTION

The [Victron](#) range of Inverter/Chargers provide advanced solutions to ensure that Newton Pumping Systems continue pumping during power interruption by inverting battery-stored DC energy to clean and efficient 230 VAC power. The battery backup range includes specifically sized Inverter/Charger units plus a number of ancillaries to provide advanced system control and telemetry. Revision 5 and onwards includes a major update that introduces a new range of inverters with updated software that allows for the inverters in this range to be matched with larger pumps than with the previous models.

PRODUCT HIGHLIGHTS

- Powerful true sine wave inverters
- Sophisticated and powerful battery chargers featuring adaptive charge technology
- High-speed AC transfer switch <20 milliseconds
- Class-leading inverter efficiency
- Multiple battery monitoring options including off-site via cloud and internet
- High-grade components for dependable and reliable pumping during power outage
- Matched with class-leading telecommunications batteries of 40 to 200 Ah to ensure pumping of large volumes of water during power outages
- Protection measure to protect the person and the property from replicated grid mains risks are included
- Connection to Victron Cerbo and Newton Cloud* for advanced monitoring, diagnostics and communication of battery and connected pumping systems

*Expedited launch October 2024

TYPICAL APPLICATIONS

To provide continued pumping of Newton pumps and pumping systems during power disruption.

INVERTER SIZING & PUMP MATCHING

Newton Pump	Inverter Model	Recommended battery size Ah
TAS250	MultiPlus 12/500/20	60-300
CP400	MultiPlus 12/800/35	100-400
NP400 eco	MultiPlus 12/800/35	100-400
NP750 eco	MultiPlus 12/1600/70	200-700

Further information on battery sizing can be found within the PERFORMANCE EXAMPLES section on page 4.

INVERTER SIZING & NEX-CDM PANEL MATCHING

Newton Pump	Inverter Model	Recommended battery size Ah
2x TAS250	12/2000/80	100-400
2x CP400	12/2000/80	100-600
2x NP400 eco	12/2000/80	100-600
2x NP750 eco	12/3000/120	200-1000



MODEL ATTRIBUTES

12/XXX/XX - Units are to be used with 12 V batteries

XX/500/XX - Output power in VA (volt amperes)

XX/XXX/20 - Charger size in A (amps)

ITEMS INCLUDED WITHIN PACKAGING

Included items supplied with the inverter are:

DC CABLE SET - 500VA to 1600VA

- 1 x Positive DC cable - Red - 1.0m
- 1 x Positive DC cable - Red - 0.5m
- 1 x Negative DC cable - Black - 1.7m
- 1x DC Isolator switch

DC CABLE SET - 2000VA & 3000VA

- 1 x Positive DC cable - Red - 0.33m
- 1 x Positive DC cable - Red - 0.5m
- 1 x Positive DC cable - Red - 0.7m
- 1 x Negative DC cable - Black - 1.7m
- 1x DC Isolator switch
- 1 x Mega-Fuse & Holder 300A (2000VA)
- 1 x Mega-Fuse & Holder 400A (3000VA)

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TECHNICAL DATA - INVERTER/CHARGER UNITS

	Multiplus 12/500/20	Multiplus 12/800/35	Multiplus 12/1600/70	Multiplus 12/2000/80	Multiplus 12/3000/120
Newton product code	BB5K	BB1K	BB11K	BB18K	BB3K
Used with	Pumps only			Pumps operated by a controller	
Inverter	Results				
Input voltage range (VDC)	9.5 - 17				
Output voltage (VAC ± 2%)	230				
Output frequency (Hz ± 0.1%)	50				
Continual output power at 25°C (VA)	500	800	1600	2000	3000
Continual output power at 25°C (W)	430	700	1300	1600	2400
Continual output power at 40°C (W)	400	650	900	1400	2200
Peak power (W)	900	1600	2400	3500	5500
Maximum efficiency (%)	90	92	93	93	93
Zero load power (W)	6	7	10	10	13
Zero load in search mode (W)	2	2	3	3	3
Battery lead diameter mm ²	16	25	50	70	95
Internal fuse size (A)	125	150	200	No	No
Charger	Results				
AC input voltage range (VAC)	187-265				
AC input frequency (Hz)	45-65				
Charge voltage 'absorption' (DC)	14.4				
Charge voltage 'float' (VDC)	13.8				
Storage mode (VDC)	13.2				
Charge current (A)	20	35	120	80	120
Battery temperature sensor	Yes				
Maximum combined battery capacity	See Multiple Batteries section on Page 4				
Battery Charging	Results				
Battery Bank Size in Ah (Amp hours)	Time to fully charge a 50% depleted battery*				
40	5	5	5	5	5
60	5	5	5	5	5
100	5	5	5	5	5
200	8	5.4	5	5	5
400	14	8.7	5.5	5	5
800	25.5	15.4	8.7	8	6
General	Results				
V.E. Bus communication port	For remote monitoring and system integration				
Remote On/Off	No	Yes	Yes	On/Off	
Dip switches	Yes ⁽⁶⁾			Yes ⁽⁷⁾	
Operating temperature (°C)	-40 to +65 (fan assisted cooling)				
Internal DC Fuse	125	150	200	No	No
Maximum humidity-non-condensing(RH)	95%				
Protection	Output short circuit; Overload; Battery voltage too high; Battery voltage too low; Temperature too high; 230 VAC on inverter output; Input voltage ripple too high				
Warranty (Years)	5				

*Charging amps restricted to 20% of Ah capacity. (6) Remote / battery charge voltage / inverter frequency / search mode. (7) Battery charge voltage / search mode

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Enclosure	Results				
	12/500/20	12/800/35	12/1600/70	12/2000/80	12/3000/120
Material	Steel/ABS				
Colour	Blue - RAL 5012				
Protection category	IP21				
Battery connection (mm ²)	16*	25*	50*	70**	95**
230V AC connection (mm)	G-ST18i connector				
Dimensions - H x W x D	311 x 182 x 100	360 x 240 x 100	470 x 265 x 100	506 x 236 x 147	546 x 275 x 147
Weight (kg)	4.4	6.4	10.2	15.5	19

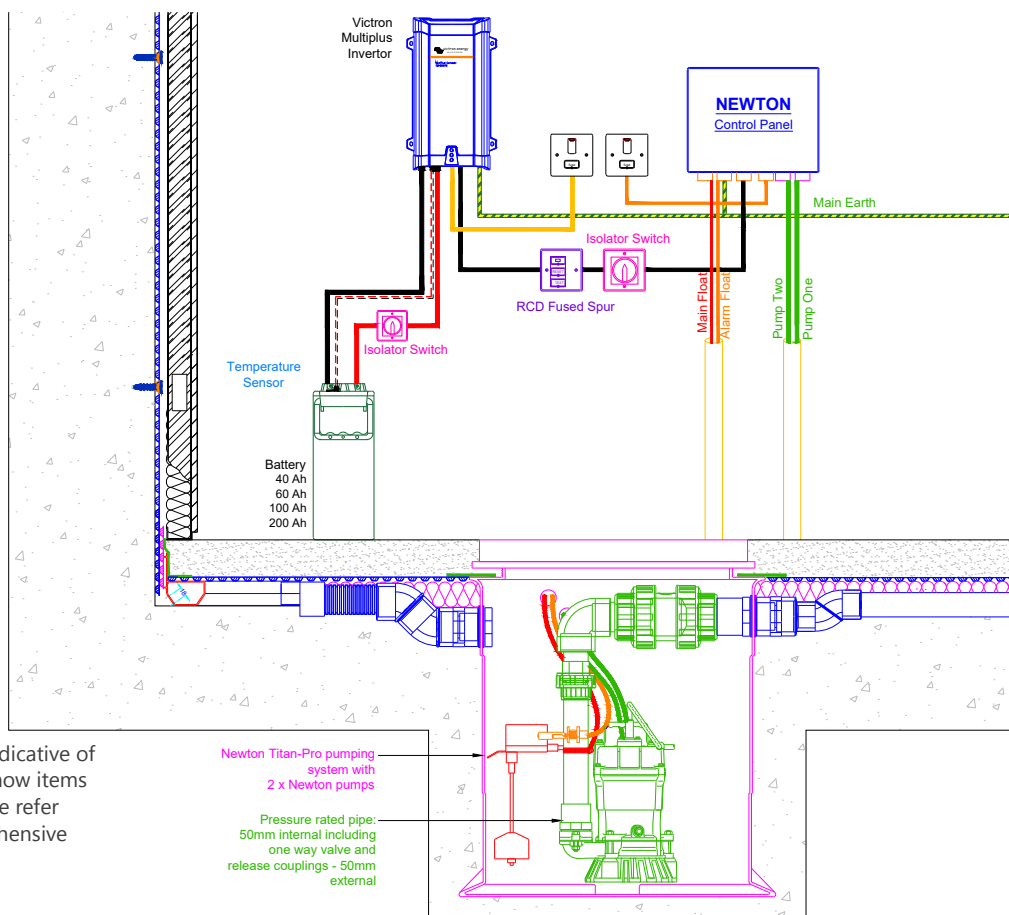
*Post-fitted to quick connect terminals. ** Post fitted via supplied M8 bolts.

Standards	Results				
Safety	EN-IEC 60335-1, EN-IEC 60335-2-29, EN 62109-1				
Emission, Immunity	EN 55014-1, EN 55014-2, EN-IEC 61000-3-2, EN-IEC 61000-3-3, IEC 61000-6-1, IEC 61000-6-2, IEC 61000-6-3				
Road Vehicles	ECE R10-5				

Technical data - Batteries	40 Ah	60 Ah	100 Ah	200 Ah	Units
Newton product code	BB23	BB20	BB21	BB22	
Battery Type	Valve regulated - Telecoms standard				
Voltage	12				VDC
Battery storage capacity	40	60	101	195	Ah
Service design life	12+				Years
Weight	13	18	33	61	kg
Dimensions (L x W x H)	105 x 280 x 198	105 x 280 x 260	108 x 395 x 275	126 x 558 x 321	mm
Warranty	5				Years

TYPICAL DETAIL

Typical example of the Multiplus Inverter, control panel and telecommunications battery running a dual pump system.



Please Note: This drawing is indicative of a typical detail and does not show items such as AC fuse sizes etc. Please refer to the [Quick Guide](#) for comprehensive installation recommendations.

Newton Titan-Pro pumping system with 2 x Newton pumps
 Pressure rated pipe: 50mm internal including one way valve and release couplings - 50mm external

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BATTERIES

The Victron Inverter/Charger units draw 12 VDC power from a single or a bank of 12 VDC batteries which is inverted into clean, pure sine wave, 230 VAC power. Newton also sell high-performance, telecommunications grade batteries of the following sizes:

- 40 Ah - 12 V - Code BB23
- 60 Ah - 12 V - Code BB20
- 100 Ah - 12 V - Code BB21
- 200 Ah - 12 V - Code BB22

BATTERIES

Battery quality is key to ensuring pumping during power outages. Newton supply the highest quality UPS (Uninterruptible Power Supply) batteries with:

- Eurobat >12 years - VERY LONG LIFE
- Front terminal design reducing the installation footprint and maximising the energy density
- Corrosion resistance
- VRLA AGM low-resistance separators
- Leak-resistant post seal with threaded female M6/M8 high conductivity terminals
- One-way gas safety relief valves
- Flame arrestors & flame retardant ABS plastic
- Install in any orientation (exc. permanently inverted)
- 100% Recyclable

BATTERY BACKUP PERFORMANCE

The Victron Inverter/Charger units and batteries detailed above have been chosen to provide continued removal of water by the pumping system during power outage. There is a direct relationship between the energy used to pump water and the volume pumped. Larger batteries hold more power and so more water will be pumped. The energy held within a battery is measured in Amp-hours (Ah). Larger battery packs with higher Ah values will pump more water for longer than smaller batteries with low Ah values.

Ultimately what is required to keep the basement dry is the ability to remove the water that enters. The volume of water that can be removed is proportional to both the capacity and efficiency of the battery and the efficiency of the inversion from DC to 230 VAC power. The battery backup systems set out in this document combine class leading inverter and battery efficiency to ensure that the largest possible volumes of water are removed by the pumping system.

PERFORMANCE EXAMPLES

Newton regularly test pump and battery backup performance on our testing rig which is set with a pumping head of four metres with four pump starts per hour. To mimic the pumping operation of the [Newton Titan-Pro](#) system, the floats are set to pump approximately 66 litres of water at each start. Pump flow rate and pumped volume is measured by flow metre with battery charge, pump start and run currents and battery depletion rates recorded by the Victron Cerbo GX.

With a Newton TAS250 pump, battery starting charge of 12.84 Volts and the Victron inverters set to cut power at 10.5 Volts, testing has shown that each 10 Ah of battery charge is sufficient to pump approximately 1000 litres of water when pumping continuously and 1100 litres of water with 4 x starts per hour. This is reduced slightly with more powerful pumps. Larger battery banks are generally more efficient due to battery recovery where a smaller percentage of charge being used for each pumping operation allows the batteries to recover more efficiently. In all cases, the depth of discharge is set to 50%, as is usual with AGM type batteries.

Battery bank size (Ah)	Litres	Starts	Hours
10	1000	15	4
20	2150	33	8
40	4400	67	17
60	6600	100	25
100	11000	167	42

Battery bank size (Ah)	Litres	Starts	Hours
200	22500	341	87
400	46000	697	178
800	94000	1424	363
1600	195000	2955	753
2000	245000	3712	946

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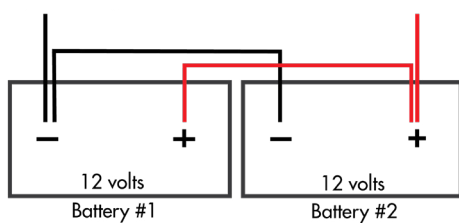
MULTIPLE BATTERIES

The battery backup system will remove water at a volume that is proportional to the power stored within the battery bank, measured in Ah. By adding further batteries in parallel, the available Ah is increased and the volume of water that the system can remove is increased also.

Two batteries of the same size connected in parallel doubles the Ah of available battery charge. Three batteries triples the Ah, etc. There is no maximum number of batteries that can be connected in parallel, but the time to recharge is dependent on the inverter charging rate. If quick battery recharge is required to a large capacity battery bank, consider using an inverter with a higher charge current. Please see the Battery Charging section within the table on page 2.

For connecting batteries in parallel you will need a set of battery cables for each additional battery.

CONNECTING BATTERIES IN PARALLEL



CONNECTING CABLE

Inverter	Size (mm ²)	Code
12/500/20	16	BLL/16K
12/800/35	25	BLL/25K
12/1600/70	50	BLL/50K
12/2000/80	70	BLL/70K
12/3000/120	95	BLL/95K

CUSTOM BUILDS

Newton can build battery backup systems to order. Examples of this are:

- Large inverter sizes of 3, 5, 10, and 15 kVA
- Large battery banks using multiple telecommunications batteries attached in both serial and parallel to match all back-up/redundancy requirements
- Rack-mounted, lithium-iron-phosphate battery banks
- 24 V and 48 V inverters
- Three-phase inverter systems
- Generator support for the above

TRAINING AND COMPETENCY OF THE USER

The Inverter/Charger units are mains powered and should be installed by persons who are aware of current electrical requirements and are electrically competent by way of appropriate training to either fit a fused plug or wire directly to a fused spur. Knowledge of DC input by battery and the connection of DC batteries leads to both the battery(s) and the Inverter/Charger is required.

In most cases these battery backup systems will be installed as part of the Newton CDM cavity drain waterproofing system by a Newton Specialist Basement Contractor (NSBC) who are trained and experienced in the installation of all Newton battery backup systems, pumps, pumping systems, panels and telemetry systems.

INSTALLATION INSTRUCTIONS

Please refer to the Quick Guide.

[Quick Guide - Victron Battery Backup Systems](#)

SPECIFICATION

Newton Waterproofing Systems work in partnership with RIBA NBS who publish our products on [NBS Source](#). The platform integrates seamlessly into project workflows, providing all product data from Newton's NBS BIM Objects, NBS Plus Clauses and RIBA Product Selector into one single source of product information.

WARRANTY

INVERTER/CHARGER & OPTIONS

The Victron Inverter/Chargers are covered by a 5 year warranty. Warranty includes next-day on-site replacement (delivery and collection, not decommission and installation) of the Inverter/Charger units by a replacement of the same model.

BATTERIES

The batteries are covered by a 5 year warranty. The warranty includes site replacement. A new battery will be delivered and the old battery collected (service does not include disconnection and re-connection). If the warranty claim is upheld, there is no charge for the exchange. If the warranty claim is not upheld, the client must decide the course of action, which will include the purchase of the replacement battery or the return of the original battery and payment of all of the costs associated with the failed warranty claim. The expected service life of the batteries is 12+ years.

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OPTIONS

A number of sophisticated options are available, which when added to the base Inverter/Charger, provide the end user or maintenance engineer with a host of features for the control and monitoring of the battery backup system.

VICTRON BMV-712 SMART BATTERY MONITOR



The Victron BMV-712 with Bluetooth capability to allow for real-time monitoring of the battery information via a smartphone, as well as providing future connectivity to other Victron components as Bluetooth connectivity is rolled out to these products.

Purchase code BB6.

VICTRON SMARTSHUNT 500A/50mV

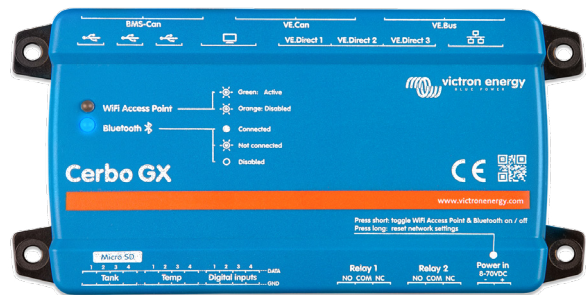


The SmartShunt is an all in one battery monitor, where your phone acts as the display. The SmartShunt connects via Bluetooth to the VictronConnect App on your phone (or tablet) and you can conveniently read out all monitored battery parameters, such as state of charge, time to battery depletion, historical information and much more.

Alternatively the SmartShunt can be connected to and be read by the Cerbo GX device. Connection to the SmartShunt is made via a VE.Direct cable.

The SmartShunt is a good alternative to the BMV battery monitor, especially for systems where battery monitoring is needed but less wiring and clutter is wanted. Purchase code BB15.

VICTRON CERBO GX & S GX



The Cerbo GX and S GX are a complete communication centre which allows you to always have full control over your system from wherever you are, to maximise system performance. Connect to the cloud through the Victron Remote Management (VRM) portal, or access directly, using the separate GX Touch 50, a MFD or the VictronConnect app thanks to its added Bluetooth capability.

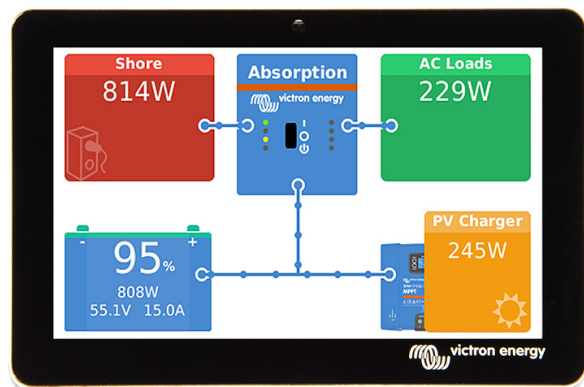
Instantly monitor the battery state of charge, power consumption, power harvest from PV, generator, and mains, or check tank levels and temperature measurements. Follow up on alerts, perform diagnostic checks and resolve challenges remotely. The Cerbo GX and S GX turn any power challenge into an effortless experience.

Purchase codes:

- Cerbo S GX: BB12
- Cerbo GX: BB16
- 12v Power Supply*: PA7

* Only needed when not used with victron inverter.

VICTRON GX TOUCH



The GX Touch 50 is the display accessory for the Cerbo GX. The five inch touch screen display gives an instant overview of your system and allows to adjust settings in the blink of an eye.

Simply connected to the Cerbo GX with one cable, its super slim waterproof design, top-mountable setup and simple installation bring a lot of flexibility when creating a crisp and clean dashboard.

Purchase code BB13.

GX Touch Wall Mount - Purchase Code BB14.

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STORAGE

Inverter/Charger units, ancillaries and batteries must be installed in a dry internal environment or within specially designed outdoor enclosures.

LIMITATIONS

These battery backup systems are intended for the continuation of power to pumps and pumping systems.

Users should be aware that the connection of other electrical equipment will deplete the battery charge which may result in pump failure once the battery charge is fully depleted.

We ask users to consider which is the most important to them: the continued removal of water, or the use of the other electrical equipment.

HEALTH & SAFETY

Use appropriate PPE for the environment the system is installed within. Use products only as stated within the this Data Sheet and the Quick Guide. Read the SDS and Quick Guide before use.

Batteries are heavy. We recommend that a Manual Handling Risk Assessment is carried out in accordance with current Health & Safety Regulations on the sizing and installation of the battery(s).