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Phoenix Multi / MultiPlus

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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. Beside these primary functions, however, the Multi has several advanced features that provide a range of new applications as outlined below.

Uninterrupted AC power (UPS function)

In the event of a grid failure, or shore 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. The maximum current of the transfer switch is 16 A per Multi. An external transfer switch for up to 80 A is available at request: see the **PowerMan** under accessories.

Virtually unlimited power thanks to parallel operation

Up to 6 Multi's can operate in parallel to achieve higher power output. Six 24/3000/70 units, for example, provide 15 kW / 18 kVA output power with 420 Amps of charging capacity.

Three phase capability

In addition to parallel connection, three units of the same model can be configured for three-phase output. But that's not all: up to 6 sets of three units can be parallel connected for a huge 45 kW / 54 kVA inverter and 1260 A charger!

PowerControl – Dealing with limited generator or shore side / grid power

The Multi is a very powerful battery charger. It will therefore draw a lot of current from the generator or shore side supply (nearly 10 A per Multi at 230 VAC). 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, thus preventing the generator or shore supply from being overloaded.

PowerAssist – Boosting the capacity of shore or generator power, an innovative feature of the MultiPlus

The feature that distinguishes the Phoenix MultiPlus from the standard Multi is PowerAssist. 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. When the load reduces, the spare power is used to recharge the battery.
Note: minimum shore current 2 A or generator capacity 2 kW required per MultiPlus.

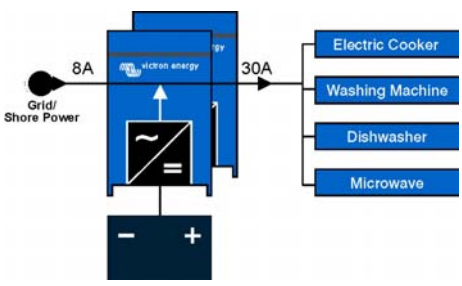
Four stage adaptive charger and dual bank battery charging

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 ads a forth stage for long periods of float charging. The adaptive charge process is described in more detail on the Phoenix Charger datasheet and on our website, under Technical Information. 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.

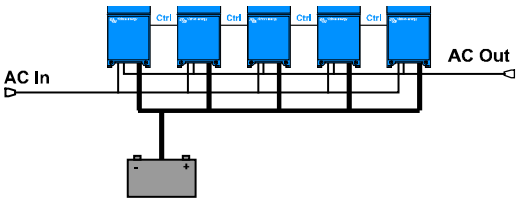
Electricity on Board

The possibilities of paralleled high power Multi's are truly amazing. For ideas, examples and battery capacity calculations, please refer to our book "Electricity on board" (available free of charge from Victron Energy and downloadable from www.victronenergy.com). More about the unique PowerAssist function, "Achieving the impossible", can be found on our website under "The MultiPlus explained".

PowerAssist with 2x MultiPlus in parallel



Five parallel units: output power 12,5 kW



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Specifications

Phoenix Multi/MultiPlus	12 Volt 24 Volt 48 Volt	C 12/800/35 C 24/800/16	C 12/1200/50 C 24/1200/25 C 48/1200/12	C 12/1600/70 C 24/1600/40 C 48/1600/20	12/2000/100 24/2000/60	12/2500/120 24/3000/70 48/3000/35
PowerControl		yes	yes	yes	yes	yes
PowerAssist (MultiPlus version)		No (3)	yes, MultiPlus	yes, MultiPlus	yes, MultiPlus	yes, MultiPlus
INVERTER						
Input voltage range (V DC)			9,5 – 17 V	19 – 33 V	38 – 66 V	
Output			Output voltage: 230 VAC ± 2%		Frequency: 50 Hz ± 0,1% (1)	
Cont. output power at 25 °C (VA) (5)		800	1200	1600	2000	2500 / 3000 / 3000
Cont. output power at 25 °C (W)		700	1000	1300	1800	2000 / 2500 / 2500
Cont. output power at 40 °C (W)		650	900	1200	1500	1600 / 2000 / 2000
Peak power (W)		1600	2400	3000	4000	4500 / 6000 / 6000
Maximum efficiency (%)		92 / 94	93 / 94 / 95	93 / 94 / 95	93 / 94	93 / 94 / 95
Zero-load power (W)		5 / 8	5 / 8 / 10	5 / 8 / 10	10 / 10	10 / 10 / 12
CHARGER						
AC Input			Input voltage range: 187-265 VAC		Input frequency: 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 house battery (A) (4)		35 / 16	50 / 25 / 12	70 / 40 / 20	100 / 60	120 / 70 / 40
Charge current starter battery (A)			4			
Battery temperature sensor			yes			
GENERAL						
Multi purpose relay driver or relay (6)		relay driver (7)	relay driver (7)	relay driver (7)	relay	relay
Protection (2)			a,b,c,d,f,g,h		a - h	
Common Characteristics			Operating temp. range: -20 to +50°C (fan assisted cooling)		Humidity (non condensing) : max 95%	
ENCLOSURE						
Common Characteristics			Material & Colour: aluminium (blue RAL 5012)		Protection category: IP 21	
Battery-connection			battery cables of 1.5 meter		M8 studs	
230 V AC-connection			G-ST18i connector		screw-clamp 2,5 mm	
Weight (kg)		10	10	10	18	18
Dimensions (hxwxd in mm)			375x214x110		362x258x218	
STANDARDS						
Safety			EN 60335-1, EN 60335-2-29			
Emission			EN 50081-1, EN55014, EN 61000-3-2, EN 61000-3-3			
Immunity			EN 55014-2			
Automotive Directive			95/54/EC			

1) Can be adjusted to 60 Hz; 120 V 60 Hz on request
2) Protection
   a. Output short circuit
   b. Overload
   c. Battery voltage too high
   d. Battery voltage too low
   e. Battery reverse polarity detection
   f. 230 V AC on inverter output
   g. Input voltage ripple too high
   h. Temperature too high
3) Not available in MultiPlus version
4) At 25 °C ambient
5) Non linear load, crest factor 3:1
6) Multipurpose relay which can be set for general alarm, DC undervoltage or genset start signal function
7) Open collector output 66V 40mA

Accessories

Phoenix Multi Control

This is a remote control and monitoring panel for the Phoenix Multi/MultiPlus.
In addition, the remote panel also offers PowerControl and PowerAssist, (simply by setting a maximum AC current with a 0 to 16 A rotary knob), thus preventing the shore supply or a genset from being overloaded.
The brightness of the LED's is automatically reduced during night time. Connection to the Multi is with a standard UTP – cable.

Phoenix Inverter Control

This panel is intended for Phoenix inverters equipped with a UTP remote monitoring and control socket. It can also be used on a Phoenix Multi when an automatic transfer switch but no charger function is desired.
The brightness of the LED's is automatically reduced during night time.

PowerMan

When used together with a diesel generator, the transfer switch of the Multi/MultiPlus might not have sufficient capacity to switch the full output current of the genset.
The solution is the PowerMan which is available in a 40 A and a 80 A version.

Computer controlled operation and monitoring (Victron Interface MK1b)

Every Phoenix Multi/MultiPlus is ready to communicate with a computer through its RS-485 data port. All you need to link to your PC and be able to set and read out all parameters is the data link as shown.
Moreover, all Victron Energy products equipped with an RS-485 data port can easily be integrated in a computerised monitoring and control system, such as VE.Net from Victron Energy.