

Manual

EN

Handleiding

NL

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Anleitung

DE

Manual

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SE

Appendix

Phoenix Inverter Smart

12 | 1600 230V

12 | 2000 230V

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48 | 3000 230V

1. SAFETY INSTRUCTIONS

General

Please familiarize yourself with the safety features and instructions by first reading the documentation supplied with this product before using the equipment. This product has been designed and tested in accordance with international standards. The equipment must be used exclusively for the purpose for which it was designed.

WARNING: ELECTRIC SHOCK HAZARD.

The product is used in combination with a permanent energy source (battery). Even if the equipment is switched off, a dangerous electrical voltage can occur at the input and/or output terminals. Always disconnect the battery before performing maintenance.

The product has no internal user-serviceable components. Do not remove the front plate or operate the product if any panels have been removed. All servicing must be undertaken by qualified personnel.

Never use the product where there is a risk of gas or dust explosions. Consult the battery manufacturer's information to ascertain that the product is intended for use in conjunction with the battery. Always comply with the battery manufacturer's safety instructions.

WARNING: Do not lift heavy loads without assistance.

Installation

Read the installation instructions in the installation manual before installing the equipment.

This is a Safety Class I product (supplied with a protective grounding terminal). **The chassis must be grounded.** A grounding point is located on the outside of the product. Whenever it is likely that the grounding protection has been damaged, the product must be turned off and secured against unintended operation; please contact qualified service staff.

Ensure that the DC and AC input cables are fused and fitted with circuit breakers. **There is no internal fuse inside this product.** Never replace a safety component with a different type. Consult the manual to determine the correct component.

During installation ensure that the remote connector with wire bridge is removed (or switch off the remote on/off switch if installed) to be sure that the inverter cannot be switched on unexpectedly.

Before applying power, ensure that the available power source matches the configuration settings of the product as described in the manual.

Ensure that the equipment is used under the correct ambient conditions. Never operate the product in a wet or dusty environment. Ensure there is adequate free space for ventilation around the product and check that the ventilation vents are not blocked.

Ensure that the required system voltage does not exceed the product's capacity.

Transport and Storage

Ensure that the mains power and battery leads have been disconnected before storing or transporting the product.

No liability can be accepted for any transport damage if the equipment is shipped in non-original packaging.

Store the product in a dry environment; the storage temperature must be between -20°C and 60°C .

Consult the battery manufacturer's manual in respect of transport, storage, charging, recharging and disposal of the battery.

2. DESCRIPTION

2.1 General

Bluetooth built-in: fully configurable with a tablet or smartphone

- Low battery voltage alarm trip and reset levels
- Low battery voltage cut-off and restart levels
- Dynamic cut-off: load dependent cut-off level
- Output voltage: 210 - 245V
- Frequency: 50 Hz or 60 Hz
- ECO mode on/off and ECO mode sense level
- Alarm relay

Monitoring:

- In- and output voltage, % load and alarms

For more information, refer to the [VictronConnect manual](#).

VE.Direct communication port

The VE.Direct port can be connected to a computer (VE.Direct to USB interface cable needed) to configure and monitor the same parameters.

Proven reliability

The full bridge plus toroidal transformer topology has proven its reliability over many years.

The inverters are short circuit proof and protected against overheating, whether due to overload or high ambient temperature.

High start-up power

Needed to start loads such as power converters for LED lamps, halogen lamps or electric tools.

ECO mode

When in ECO mode, the inverter will switch to standby when the load decreases below a preset value (min load turn on level: 10VA; and min load turn off level: 0VA). Once in standby the inverter will switch on for a short period (adjustable, default: every 3 seconds). If the load exceeds a preset level, the inverter will remain on.

Remote on/off

A remote on/off switch can be connected to a two pole connector, between battery plus and the left hand contact of the two pole connector or between battery minus and the right hand contact of the two pole connector

LED diagnosis

See section 3.3

To transfer the load to another AC source: the automatic transfer switch

For our low power inverters we recommend our Filax Automatic Transfer Switch. The Filax features a very short switchover time (less than 20 milliseconds) so that computers and other electronic equipment will continue to operate without disruption. Alternatively use a MultiPlus with built-in transfer switch.

3. OPERATION

3.1 On/Off Switch

When switched to "on" with the push button, the product is fully functional. The inverter will come into operation and the LED "inverter" will light up. By pushing the push button subsequently, within a short period of time, the inverter toggles between "on", "ECO" and "off".

Apart from the pushbutton; the inverter can also be switched on (normal or ECO) and off with Bluetooth on a mobile device running iOS or Android and the Victron Connect app. However when switched off via Bluetooth or the push button; the unit **cannot** be switched on and off again via the wired VE.Direct port.

3.2 Remote control

Remote control is possible with a simple on/off switch or with a Phoenix Inverter Control panel. A switch for remote control (on/off) can be connected to a two pole connector. The switch can also be connected between battery plus and the left hand contact of the two pole connector (marked "H"; see appendix A) or between battery minus and the right hand contact of the two pole connector (marked "L"; see appendix A).





For safety purposes, this product can be turned off completely (i.e. the inverter cannot be switched on via the push button or Bluetooth) by removing the remote connector and its default installed wire bridge (or switch off the remote on/off switch if installed). The user can then be certain that the inverter cannot be switched on accidentally via Bluetooth by an unexpected other user.






3.3 LED definitions

Green LED	Status	Trouble shooting
 Solid on	Inverter on	Red LED Off status OK Red LED On or blinking: The Inverter is still on, but will shut down when the condition gets worse. See red LED table for warning reason
 single pulse	Slow	ECO mode
 double pulse	Fast	Off and waiting
 Off	Inverter off	Red LED Off Check Remote on/off connector. Check DC cable connections and fuses. Check operational mode by pushing push button one time. Red LED On or blinking The inverter did shut down because of a protection. It will no longer automatically restart. The red LED indicates the reason for shutdown. Remove the cause and then restart the inverter by switching it Off, and then back On.
 Fast	Off and	Red LED Blinking (-●-●-●-●)



blink	firmware update in progress or failed	Firmware update in progress or firmware update failed. When failed; retry firmware update.
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Yellow LED	Status	Trouble shooting
 Solid on	ECO mode	Red LED Off status OK Red LED On or blinking: The Inverter is still on, but will shut down when the condition gets worse. See red LED table for warning reason
 Off	ECO mode off	Red LED Off Check operational mode by pushing push button one time. Check Remote on/off connector. Check DC cable connections and fuses. Red LED On or blinking The inverter did shut down because of a protection. It will no longer automatically restart. The red LED indicates the reason for shutdown. Remove the cause and then restart the inverter by switching it Off, and then back On.

Red LED	Definition	Trouble shooting
 Solid on	Overload	Reduce load
 Slow blink	Low batt.	Recharge or replace battery Check DC cable connections Check cable cross section as it may be insufficient. See section 4.2 Protections and automatic restarts for manual and automatic restart behavior.
 Fast blink	High batt.	Reduce DC input voltage, check for faulty charger
 Double pulse	High temp.	Reduce load and/or move inverter to better ventilated area
 Fast single pulse	High DC ripple	Check DC cable connections and cable cross section.

3.4 Protections and automatic restarts

Overload

Some loads like motors or pumps draw large inrush currents in a start-up situation. In such circumstances, it is possible that the start-up current exceeds the over current trip level of the inverter. In this case the output voltage will quickly decrease to limit the output current of the inverter. If the over current trip level is continuously exceeded, the inverter will shut down: wait 30 seconds and then restart.

After three restarts followed by another overload within 30 seconds of restarting, the inverter will shutdown and remain off. The LEDs will signal shutdown due to overload. To restart the inverter, switch it Off, then On.

Low battery voltage (adjustable)

The inverter will shut down when the DC input voltage drops below the low battery shutdown level. After a minimum delay of 30 seconds, the inverter will restart if the voltages rise above the low battery restart level.

After three restarts followed by a low battery shutdown within 30 seconds of restarting, the inverter will shutdown and stop retrying. The LEDs will signal low battery shutdown. To restart the inverter, switch it Off, and then On, or recharge the battery: as soon as the battery has risen and then stays above the Charge detect level for 30 seconds, it will switch on.

See the Technical Data table for default low battery shutdown and restart levels. They can be changed with the VictronConnect App.

High battery voltage

Reduce DC input voltage and/or check for a faulty battery- or solar-charger in the system. After shutting down due to a high battery voltage, the inverter will first wait 30 seconds and then retry operation as soon as the battery voltage has dropped to acceptable level. The inverter will not stay off after multiple retries.

High temperature

A high ambient temperature or enduring high load may result in shut down to over temperature. The inverter will restart after 30 seconds. The inverter will not stay off after multiple retries. Reduce load and/or move inverter to better ventilated area.

High DC ripple

High DC ripple is usually caused by loose DC cable connections and/or too thin DC wiring. After the inverter has switched off due to high DC ripple voltage, it waits 30 seconds and then restarts.

After three restarts followed by a shutdown due to high DC ripple within 30 seconds of restarting, the inverter will shutdown and stops retrying. To restart the inverter, switch it Off and then On.

Continuous high DC ripple reduces the inverter life expectancy.

4. INSTALLATION



This product should be installed by a qualified electrician.



During installation ensure that the remote connector with wire bridge is removed (or switch off the remote on/off switch if installed) to be sure that the inverter cannot be switched on unexpectedly.

4.1 Location

The product must be installed in a dry and well-ventilated area, as close as possible to the batteries. There should be a clear space of at least 10cm around the appliance for cooling.



Excessively high ambient temperature will result in the following:
 Reduced service life.
 Reduced charging current.
 Reduced peak capacity, or shutdown of the inverter.
 Never mount the appliance directly above the batteries.

The product is suitable for wall mounting. For mounting see appendix A. The appliance can be mounted horizontally as well as vertically; vertical mounting is preferable. The vertical position offers optimum cooling.



The interior of the product must remain accessible after installation.

Try and keep the distance between the product and the battery to a minimum in order to minimize cable voltage losses.



For safety purposes, this product should be installed in a heat-resistant environment if it is used with equipment where a substantial amount of power is to be converted. You should prevent the presence of e.g. chemicals, synthetic components, curtains or other textiles, etc., in the immediate vicinity.

4.2 Connection of Battery cables

In order to fully utilize the full capacity of the product, batteries with sufficient capacity and battery cables with sufficient cross section should be used. See table.

	12/1600	24/1600	48/1600	12/2000	24/2000	48/2000
Recommended cross section (mm ²)						
length up to 6 m	50	25	25	70	35	25

	12/3000	24/3000	48/3000
Recommended cross section (mm ²)			
0 - 5 m	95	50	35
5 -10 m	120	95	70

	12/1600	24/1600	48/1600	12/2000	24/2000	48/2000
Recommended battery capacity (Ah)	300 - 800	150 - 400	75 - 200	350 - 1000	200 - 500	100 - 250

	12/3000	24/3000	48/3000
Recommended battery capacity (Ah)	400 - 1200	200 - 700	100 - 400

Remark: Internal resistance is the important factor when working with low capacity batteries. Please consult your supplier or the relevant sections of our book "electricity on board", downloadable from our website.

Procedure

Proceed as follows to connect the battery cables:



Use an insulated box spanner in order to avoid shorting the battery.
Avoid shorting the battery cables.

Connect the battery cables: the + (red) and the - (black), to the battery see appendix A. Reverse polarity connection (+ to - and - to +) will cause damage to the product. Secure the nuts tightly in order to reduce the contact resistance as much as possible.

4.3 DC safety fuse

There is no safety fuse inside the inverter; this should be installed externally. The recommended safety fuses can be found in the table below

	12/1600	24/1600	48/1600	12/2000	24/2000	48/2000
Recommended DC fuse	250A	125A	60A	300A	150A	80A

	12/3000	24/3000	48/3000
Recommended DC fuse	400A	250A	125A

4.4 Connection of the AC cabling

This is a Safety Class I product (supplied with a protective grounding terminal).



The neutral wire of the AC output of this inverter is connected to the chassis (see appendix B for 1600VA/2000VA and appendix C for 3000VA).

This is to ensure proper functioning of a GFCI (or RCCB) to be installed in the AC output of the Inverter.

The chassis of the product must be connected to ground, to the frame (of a vehicle) or the ground plate or hull (of a boat).

Procedure

The terminal points are indicated clearly. From left to right: “L” (phase), “N” (neutral) and “PE” (earth).

4.5 Optional Connections

A number of optional connections are possible:

4.5.1 Remote on/off switch & remote Control panel

The product can be remotely controlled in three ways.

- With a smart phone (iOS or Android) and the Victron Connect app.
- With an external switch (connected to the two pole remote connector). Operates only if the switch on the Inverter is set to “on”.
- With a Phoenix Inverter Control VE.Direct panel (connected to the two pole remote connector; see appendix A). Operates only if the switch on the inverter is set to “on”.

4.5.2. Programmable relay

The inverters are equipped with a multi-functional relay that by default is programmed in the normal operation mode. (VictronConnect software needed to change relay functionality). The different relay modes can be summarized as follows:

- Normal operation (“inverter” in VictronConnect app) – default
Relay closed during normal operation, and open when the inverter has switched off itself in alarm, has been switched off by a user and also open (of course) when there is no power available on the terminals, ie. battery disconnected. In ECO mode, the relay will be closed both when searching for a load and when fully on, ie. load detected.
Use this option when you want the relay to signal that there is power available on the output of the inverter.
- Warnings and alarms (“alarm” in VictronConnect app)
Similar to above, but then the relay will also open when there is a warning. For example because the battery voltage dropped to the cut-off value, or when loaded to the point where it will almost shut down due to overload. In ECO mode, the relay will be closed both when searching (no load) and when fully on (load detected), except when there is a warning.
Use this option when you want the relay to signal that it is time to do something (charge the battery, reduce the load, and-so-forth), in order to prevent a power outage.
- Low battery (“Low battery” in VictronConnect app)

Relay on during normal operation. The relay will switch off once there is a low battery warning. It will remain off in case the inverter shuts down due to low voltage, and will only switch back on again once the inverter is operational and the battery voltage is above the pre-alarm reset level. Use this option for load shedding, or to automatically start a generator. Note that this can only be considered a poor-mans generator start/stop. For more and better options, see here.

- External fan ("fan" in VictronConnect app)
Relay is off, unless the fan inside the inverter is running. Use this option to switch an external fan, for situations when the inverter is in a small enclosed space.
- Disabled relay ("off" in VictronConnect app)
This option sets the relay in the OPEN position. Use this option if you do not plan to use the relay function.

5. CONFIGURATION



Settings may only be changed by a qualified engineer.
Carefully read the instructions before changes are made.
Batteries should be placed in a dry and well-ventilated area during charging.

5.1 Standard settings: ready for use

On delivery, the Phoenix inverter is set to standard factory values. In general, these settings are suitable for stand-alone operation.

Standard factory settings

Inverter frequency	50 Hz
Inverter voltage	230 VAC
Search mode	off
Programmable relay	alarm function
Dynamic cut-off	off

5.2 Explanation of settings

Inverter frequency

Output frequency
Adjustability: 50Hz; 60Hz

Inverter voltage

Adjustability: 210 – 245V

ECO Mode

If ECO mode is 'on', the power consumption in no-load operation is decreased by approx. 80...90%. In this mode the Phoenix Inverter Smart, when operating in inverter mode, is switched off in case of no load or very low load, and switches on every two and a half seconds for a short period (adjustable). If the output current exceeds a set level, the inverter will continue to operate. If not, the inverter will shut down again.

The ECO Mode can be set with the push button on the front of the inverter.

The ECO Mode "shut down" and "remain on" load levels can be set with Victron Connect .

The factory settings are:

Shut down: 50 Watt (linear load).

Turn on: 100 Watt (linear load).

Programmable relay

By default, the programmable relay is set as an alarm relay, i.e. the relay will de-energise in the event of an alarm or a pre-alarm (inverter almost too hot, ripple on the input almost too high, battery voltage almost too low).



Dynamic Cut-off

Use VictronConnect to enable and configure Dynamic Cut-off (see <https://www.victronenergy.com/live/ve.direct:phoenix-inverters-dynamic-cutoff> for details). Do not use Dynamic Cut-off in an installation that also has other loads connected to the same battery: the battery voltage will drop because of the extra load, but the Dynamic Cut-off algorithm in the Inverter is not aware of that load: hence the Inverter will shut down too early with an under voltage alarm.

5.3 Configuration by computer

All settings can be changed by means of a smartphone, tablet or computer

For changing settings with a smartphone or tablet, the following is required:

- VictronConnect software: can be downloaded free of charge at www.victronenergy.com.

For changing settings with the computer, the following is required:

- VictronConnect software: can be downloaded free of charge at www.victronenergy.com.

- A VE.Direct to USB interface.

6. MAINTENANCE

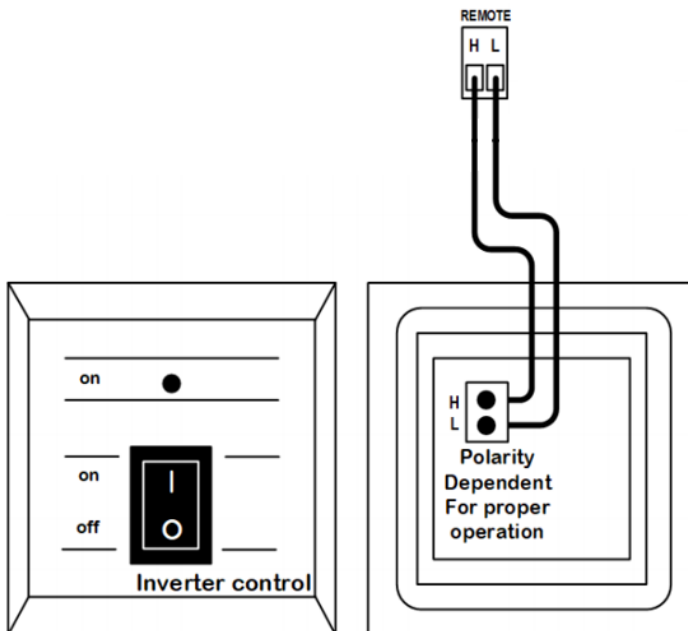
The Phoenix Inverter Smart does not require specific maintenance. It will suffice to check all connections once a year. Avoid moisture and oil/soot/vapours, and keep the device clean.

7. Technical data

Phoenix Inverter Smart	12 Volt	12/1600	12/2000	12/3000
	24 Volt	24/1600	24/2000	24/3000
	48 Volt	48/1600	48/2000	48/3000
Parallel and 3-phase operation	No			
INVERTER				
Input voltage range (1)	9,3 – 17V 18,6 – 34V 37,2 – 68V			
Output	Output voltage: 230VAC \pm 2% 50 Hz or 60Hz \pm 0,1% (1)			
Cont. output power at 25°C (2)	1600VA	2000VA	3000VA	
Cont. output power at 25°C	1300W	1600W	2400W	
Cont. output power at 40°C	1200W	1450W	2200W	
Cont. output power at 65°C	800W	1000W	1700W	
Peak power	3000VA	4000VA	6000VA	
Dynamic (load dependent) DC low shut down (fully configurable)	Dynamic cut-off, see https://www.victronenergy.com/live/ve.direct.phoenix-inverters-dynamic-cut-off			
Max. efficiency 12/ 24 /48 V	92/94/94 %	92/94/94 %	93/94/95%	
Zero load power 12 / 24 / 48 V	8/9/11 W	8/9/11 W	12/13/15 W	
Zero load power in ECO mode	0,6/1,3/2,1 W	0,6/1,3/2,1 W	1,5/1,9/2,8 W	
GENERAL				
Programmable relay (2)	Yes			
Stop & start power ECO-mode	adjustable			
Protection (3)	a - g			
Bluetooth wireless communication	For remote monitoring and system integration			
VE.Direct communication port	For remote monitoring and system integration			
Remote on-off	Yes			
Common Characteristics	Operating temperature range: -40 to +65°C (fan assisted cooling) Humidity (non-condensing): max 95%			
ENCLOSURE				
Common Characteristics	Material & Colour: steel (blue RAL 5012; and black RAL 9017) Protection category: IP 21			
Battery-connection	M8 bolts	M8 bolts	2+2 M8 bolts	
230 V AC-connection	Screw terminals			
Weight	12kg	13kg	19kg	
Dimensions (hxwxhd)	485 x 219 x 125mm	485 x 219 x 125mm	533x285x150mm (12V) 485x285x150mm (24/28V)	
STANDARDS				
Safety	EN-IEC 60335-1			
Emission Immunity	EN 55014-1 / EN 55014-2 / EN-IEC 61000-6-1 EN-IEC 61000-6-2 / EN-IEC 61000-6-3			
Automotive Directive	ECE R10-5			
1) Non-linear load, crest factor 3:1	3) Protection key:			
2) Programmable relay that can a.o. be set for general alarm, DC under voltage or genset start/stop function. AC rating: 230 V / 3 A DC rating: 3 A up to 30 VDC, 0.2A up to 70 VDC	a) output short circuit b) overload c) battery voltage too high d) battery voltage too low e) temperature too high f) 230 V AC on inverter output g) input voltage ripple too high			

EN Appendix A: Inverter control

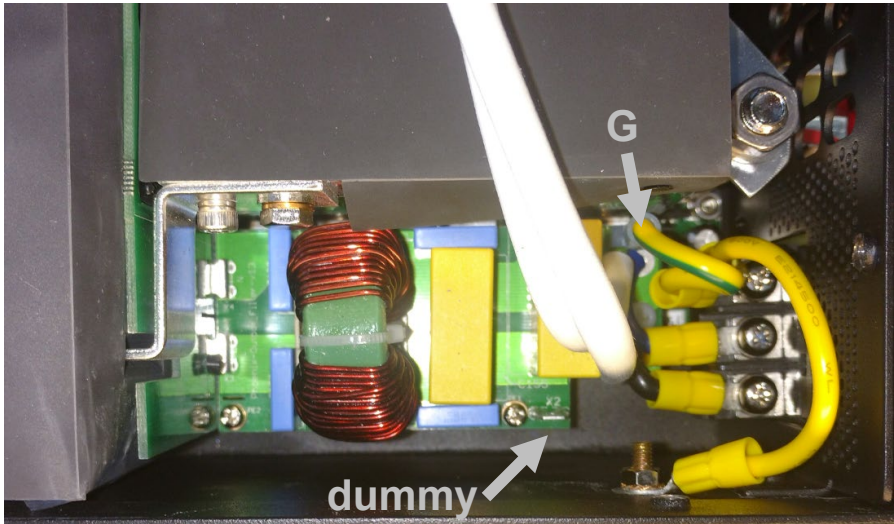
NL Bijlage A: Besturing van de omvormer
FR Annexe A : Contrôle du convertisseur
DE Anhang A: Wechselrichtersteuerung
ES Apéndice A: Control del inversor
SV Bilaga A: Växelriktarkontroll



Appendix B: Installation information 1600VA/2000VA

This ground wire "G" connects the output neutral to ground. It must be repositioned to a 'dummy' terminal if a floating output is required.

When a floating output is obtained the current reading at no load can show an offset of around 100...150mA. Also beware that the GFCI (or RCCB) will **not** function properly.



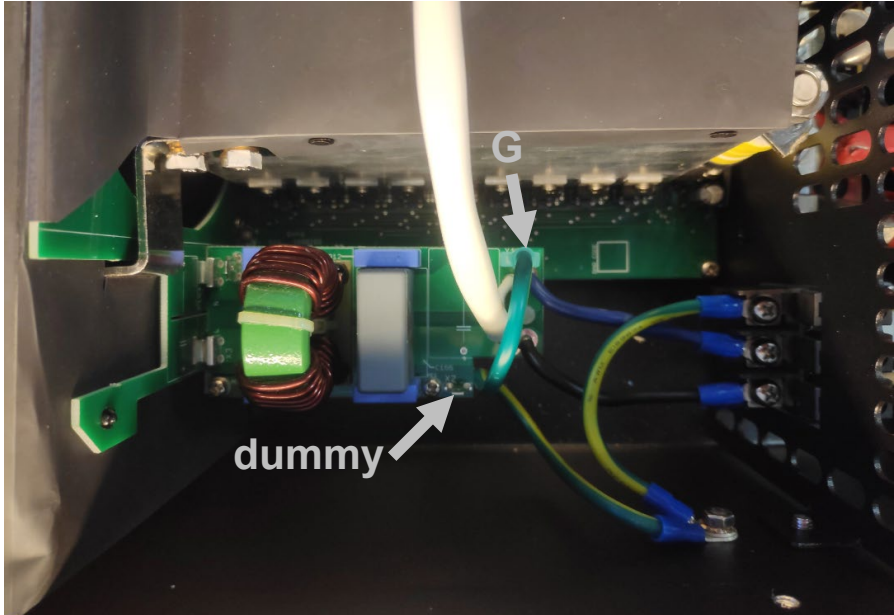
NL	<p>Bijlage B: Installatie-informatie</p> <p>Deze aardingsdraad "G" verbindt de uitgangsnutraal met aarde. Het moet worden verplaatst naar een 'dummy' terminal als een zwevende uitgang vereist is.</p> <p>Wanneer een zwevende uitvoer wordt verkregen, kan de huidige waarde bij nullast een offset van ongeveer 100...150mA laten zien. Pas ook op dat de GFCI (of RCCB) niet goed zal werken.</p>
FR	<p>Annexe B : Information relative à l'installation</p> <p>Ce câble de mise à la terre « G » raccorde le neutre de la sortie à la terre. Il doit être repositionné à une borne « fictive » si une sortie flottante est nécessaire.</p> <p>Si une sortie flottante est obtenue, la lecture de courant Pas-de-charge peut afficher un décalage d'environ 100...150 mA. Attention : le GFCI (ou RCCB) ne fonctionnera pas correctement.</p>
DE	<p>Anhang B: Information zur Installation</p> <p>Dieser Erdungsdraht "G" verbindet den Nullleiter des Ausgangs mit der Erde. Wenn ein "floating" (potentialfreier) Ausgang gewünscht wird, muss er an eine "Dummy"-Anschlussklemme neu angeschlossen werden.</p> <p>Wenn der „Floating“ Ausgang eingerichtet ist, kann es beim ermittelten Stromwert ohne angeschlossene Lasten eine Verschiebung von ca. 100...150 mA geben. Bedenken Sie außerdem, dass der FI-Schutzschalter (bzw. der Fehlerstromschutzschalter) nicht ordnungsgemäß funktionieren wird.</p>

ES	<p>Apéndice B: Instrucciones de instalación</p> <p>Este cable de puesta a tierra "G" conecta la salida neutra a tierra. Debe reposicionarse en una conexión ficticia si se necesita una salida flotante.</p> <p>Cuando se obtiene una salida flotante, la lectura de corriente sin carga puede mostrar una descompensación de entorno a 100...150 mA. Tenga también en cuenta que el GFCI (o RCCB) no funcionará correctamente.</p>
SV	<p>Bilaga B: Installationsinformation</p> <p>Den jordade kabeln "G" kopplar den neutrala utgången till jord. Den måste flyttas till en falsk (dummy) terminal om en flytande utgång krävs.</p> <p>När en flytande utgång är tillgänglig kan strömvälningen utan belastning visa en avvikelse på ca 100... 150 mA. Tänk också på att GFCI (eller RCCB) inte kommer att fungera korrekt.</p>

Appendix C: Installation information 3000VA

This ground wire "G" connects the output neutral to ground. It must be repositioned to a 'dummy' terminal if a floating output is required.

When a floating output is obtained the current reading at no load can show an offset of around 100...150mA. Also beware that the GFCI (or RCCB) will **not** function properly.



NL	<p>Bijlage C: Installatie-informatie</p> <p>Deze aardingsdraad "G" verbindt de uitgangsneutraal met aarde. Het moet worden verplaatst naar een 'dummy' terminal als een zwevende uitgang vereist is.</p> <p>Wanneer een zwevende uitvoer wordt verkregen, kan de huidige waarde bij nullast een offset van ongeveer 100...150mA laten zien. Pas ook op dat de GFCI (of RCCB) niet goed zal werken.</p>
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DE	<p>Anhang C: Information zur Installation</p> <p>Dieser Erdungsdraht "G" verbindet den Nullleiter des Ausgangs mit der Erde. Wenn ein "floating" (potentialfreier) Ausgang gewünscht wird, muss er an eine "Dummy"-Anschlussklemme neu angeschlossen werden.</p>

	<p>Wenn der „Floating“ Ausgang eingerichtet ist, kann es beim ermittelten Stromwert ohne angeschlossene Lasten eine Verschiebung von ca. 100...150 mA geben. Bedenken Sie außerdem, dass der FI-Schutzschalter (bzw. der Fehlerstromschutzschalter) nicht ordnungsgemäß funktionieren wird.</p>
ES	<p>Apéndice C: Instrucciones de instalación</p> <p>Este cable de puesta a tierra "G" conecta la salida neutra a tierra. Debe reposicionarse en una conexión ficticia si se necesita una salida flotante.</p> <p>Cuando se obtiene una salida flotante, la lectura de corriente sin carga puede mostrar una descompensación de entorno a 100...150 mA. Tenga también en cuenta que el GFCl (o RCCB) no funcionará correctamente.</p>
SV	<p>Bilaga C: Installationsinformation</p> <p>Den jordade kabeln "G" kopplar den neutrala utgången till jord. Den måste flyttas till en falsk (dummy) terminal om en flytande utgång krävs.</p> <p>När en flytande utgång är tillgänglig kan strömvälningen utan belastning visa en avvikelse på ca 100... 150 mA. Tänk också på att GFCl (eller RCCB) inte kommer att fungera korrekt.</p>

Victron Energy Blue Power

Distributor:

Serial number:

Version : 01
Date : March 4th, 2020

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