Cerbo GX power supply issue in 48V systems

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Summary

On the recent batches of the Cerbo GX, there is an error in the design of the power supply causing it to fail on – some – 48V systems. In such system, a replacement Cerbo with the same internals is likely to fail again, unless installed according to this document.

In most cases, the failure happens immediately when power is applied to the unit. I.e. when wiring it, installing the fuse and/or switching the system on. It can also happen when power is re-applied to the Cerbo after being installed.

Note that this is not a safety issue, and the percentage of it occurring is 1% or lower. Systems with a 12 or 24V battery are not affected.

This document provides a solution by adding a capacitor on the power input.

Note that the solution proposed in this document does not fix an already broken Cerbo. A broken Cerbo needs to be replaced, which is covered under warranty. When installing the replacement, check its serial number against the range in this document. When it matches, make sure to add the capacitor, to prevent the replacement from failing as well.

When to install the capacitor?

The chance of this failure occurring is rather small, well below 1%. When it does happen, its mostly during the installation. Recommendation:

- Replacing a failed Cerbo GX: always add the capacitor.
- New installs: preferably add the capacitor.
- Installed and running systems: no need to make an effort to add the capacitor. For example, there is no need to plan and execute special trips of installers to equip working installations with the capacitor.

Note that adding the capacitor is no longer necessary once we've started shipping newer batches, with serial number being HQ2221 or higher.

Technical background

At power-up of the Cerbo GX the inrush current causes a voltage peak. The maximum voltage of the peak depends on the length of the supply cable, size of the current, type of battery and other parameters that will differ from one system to another. In some 48V systems this transient exceeds the limits of the power supply circuit causing it to break.

Affected model/serial numbers

Model: Cerbo GX, part number BPP900450100
Serial numbers: HQ2201xxxxx up and including HQ2220xxxx

The serial number can be found on the carton, on the unit, in the E-Order environment and in the VictronConnect App as well as on the VRM Portal.

The Cerbo-S GX model is not affected.

Situation in stock

All current stock is affected by this issue. The plan as well as time needed for reworking that is not yet clear. This instruction was selected and is distributed for sake of speed, to prevent more systems from failing. An update will be provided once more information is available.

Also, once we have stock of good units, we are happy to replace it with a Cerbo GX that does not require an external capacitor for systems where the external capacitor is not accepted.

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Solution & required parts

Solution

Add a capacitor on the input, in parallel to the power wiring, as shown in picture on the right.

The capacitor needs to stay there permanently.

Make sure to connect the capacitor first; and only thereafter apply power (!).

We recommend to isolate the pins with a small piece of heat shrink, as shown in the second photo.

Carefully check proper connection of both the capacitor and the Cerbo power wires. The factory power cables are bootlace ferrule terminated and the smaller capacitor leads will be loose if not carefully aligned. We recommend to cut the factory bootlace ferrules off and re-crimp the wire and the leads of the capacitor into new bootlaces.

Its not necessary to install the capacitor on 12 or 24V systems. Its also not a problem to install the capacitor on such systems.

Important! Polarity of the capacitor

The capacitor has a minus (**–**) polarity marker. It is the white band with the minus in it, as shown on the picture here on the right. The pin on that side is the minus pin, and must be inserted into the minus terminal on the Cerbo GX.

Important! The capacitor needs to be connected when power is applied

Recommend steps, to ensure the capacitor is in place when applying power to the Cerbo GX:

Step 1: Take of the power from the leads, for example by removing the in-line fuse.

Step 2: Add the capacitor onto the input, in parallel to the power wiring, as shown above.

Step 3: Reconnect the power wires, including capacitor, to the terminal on the Cerbo GX.

Step 4: Now power up the Cerbo by connecting the leads / inserting in-line fuse again.

How to obtain

Below types have been selected on availability from stock as well as tested to solve the issue. For now, the best and fastest way to obtain them is purchasing them locally from a electronics distributor; such as Farnell, Digikey or Mouser.

They are also in stock in our Almere office. Note that due to distance as well as volume of Cerbo GX-es sold monthly, it will for many situations be quicker to order locally through one of the mentioned electronics distributors.

Manuf.	Description	Mfg part number	Farnell #	Digikey #	Mouser #
Rubycon	100 µF, 100 V Elco	100ZLH100MEFC10X20	1547012	1189-1887-ND	232-100ZLH100MEFC10X
Panasonic	100 µF, 100 V Elco	ECA2AHG101	9694625	P5597-ND	667-ECA-2AHG101

Electrolytic capacitors of a similar rating can be used as well. When selecting another capacitor, do make sure to not select special low ESR capacitors. A lower ESR will reduce the required effect.