AOR Recommendations For 12V System

STORAGE SETTINGS

System description: *ALL vans pre Manager 30 system*

- Ozcharge 30A AC battery charger or CTEK AC charger
- Ozcharge LVD 50A (Low voltage disconnect device)

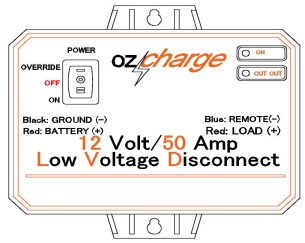
Options include:

- Morningstar solar regulator (Prostar or Sunsaver)
- VSR isolator relay for Vehicle input
- BM1 (Battery monitor display)
- Redarc BCDC 1240 (DC to DC charger with vehicle and Solar inputs)

Storage:

We recommend that you should check your batteries state of charge every 4-6weeks depending on the health and/or age of your batteries. If charge is below 50% or 12.4V, connect van to mains to activate AC charger or provide solar input until van is fully charged. **TURN OFF INVERTER!** We recommended you only turn your inverter on when you are using it as there is a standby draw which adds up over time.

1. Isolate your 12v system by switching the Oz charge Low Voltage Disconnect unit to the "OFF" position. This should be in the "ON" position during normal usage.
   Do this step for all long-term storage situations.
   NOTE: Turn "*OFF*" your inverter!
   There is a switch on all inverters that will isolate it completely and prevent added discharge to your batteries.



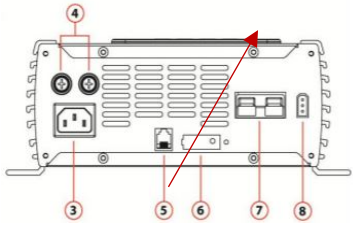
Ozcharge LVD device

2. Mains Available:
   Charge your system to 100% then disconnect from mains. If you have an Ozcharge charger, you can disconnect the Gray Anderson plug from the end of the charger. This will help prevent the chargers small draw from adding to the systems discharge.
   CTEK charges do not continue to draw and will not need to be disconnected from batteries.

Ozcharge 30A AC charger

Check batteries every 4 weeks to see how quickly the system discharges. If state of charge still high and voltage well above 12.4V, leave for another few weeks and check again. This will give you a reference for the self-discharge rate of your batteries. The older or the more well used your batteries, the quicker the self-discharge. If your batteries discharge very quickly, then you may need to consider getting a professional load test done.

3. Solar Available:
This is the ideal storage situation if you plan to store for a very long period. Follow the steps above, then leave the solar to maintain your batteries!



Gray Anderson plug

12V SYSTEM HEALTH CHECK.

Battery Voltage and State of Charge.
Use this as a guide to reference how full your batteries are:

State of Charge	AGM battery voltage
100%	12.80+
75%	12.60
50%	12.30
25%	12.00
0%	11.80

LOAD TESTING BATTERIES
Deep cycle batteries need to be load tested to determine their health.
Every battery should have a reference to the “Reserve Capacity” This is a measured period of time it takes a certain load to draw the battery down to set voltage. For AGMs this discharge voltage is generally 10.5V. On average, one 120AH AGM battery should be able to maintain a constant load of 6A for 20Hrs. Because there is a relationship between the load and the capacity of an AGM batteries, this basically means a smaller load will be maintained for longer period and a larger load will be maintain for shorter period.

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Apart from checking your batteries health you should also consider the over status of the charging system of your van.

You can use your battery monitor to easily check the current flowing from your chargers into your battery.

BM-1 Monitor

NOTE: This type of monitor will only show the greater of either the charge or discharge of your system. For example, if you have 10A coming in from your solar and have your fridge drawing 4A, the BM-1 will show a *Charge* of 6A total.
If you had only 3A coming in from your solar, and your fridge is drawing 4A, then you will see a *Discharge* of 1A.

Morningstar PROSTAR - solar regulator with display

NOTE: This solar charger has a built-in display with shows battery voltage as well as the amount of solar charge current coming into the system, directly from the panels. The display cycles through the values indicated by the red led next to the display. This system has not been wired up to show the load option as a std feature.

Solar panel output test

NOTE: *You will need the batteries to be discharged below 80% to see the maximum current output from your solar charger*.

The simplest way to check your total solar charge is to have your van in the full sun. Do this at around 11am with the back or front of the van facing in-line with the sun – you want the shadow directly behind the end of the van. The aim is to have the sun hit your panels evenly.
Turn off your fridge and ACC switch, so there is no draw on the batteries.
Now check you display: BM-1 for total *Charge* amount, Prostar for *Solar AMPS.*
This indicates the amount of current outputting from your roof panels. Your van will have either 120W or 150W panels, depending on the model and build date. But you should except between 10 – 16Amps.

What to except from your panels

The output from your panels will depend on the following factors:

- Cleanliness – Keep your panels clean as dust and dirt can build up and block the cells
- Age- As your panels age, they loss efficacy. Average for van panels to be 0.2% per year or 20% over 10 years.

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It is also a good idea to check your mains AC charger is maintaining your batteries correctly.
Again, you can use your BM-1 or other display voltage meter to check this, but the Ozcharge 30A charger has a display on the unit that shows you the output voltage and charging Amps – Push the Amp/Volt button to cycle between. It will also show you the stage of charge as well – Boost, Absolution or float. When your charger is in Float and the voltage is between 13.5 -13.8 (depending on the charger) the battery is fully charged.
Check all terminals and fuses are tight and seated properly.
Check battery wiring is correct – see diagram below.
Batteries are wired in parallel with All loads and charge equally spread over the batteries.
This is achieved by attaching all system Positives on one battery, and all Negatives from the last battery in connection. The same applies when 3 batteries are connected.