

ACES **Li** POWER

Instruction for camper and caravan use ACES Li POWER 12V HFA Series



HFA series with smart BMS

LITHIUM **LiFePO₄** BATTERIES



ACES LI POWER®

Choice for the right type of battery

- Capacity and load when using inverters. Please note that these inverters or converters themselves have a efficiency of 85-90%, so 1000W is 1176W on the battery.
When using a 12V/230ac converter, the of maximum allowed 230Vac load is:
12V60HFA up to 600W load on the 230Vac
12V100HFA up to 1100W load on the 230Vac
12V100HFAS, 12V150HFA, 12V200HFA, 12V320HFA, 12V400HFA up to 1600W on the 230Vac
12V280HFA up to 2200W on the 230Vac
- In addition, the total continuous battery load current must always remain within the I_{max} specification.
- If higher current load is desired, up to a maximum of 4 batteries can be connected in parallel.

Charging the battery

- Charge the battery before use to 100%.
- When charging via solar MPPT charger, the max. charging voltage is 14.4-14.6V, Float voltage 13.5V
- Via the 230Vac charger up to 14.4V max. and 13.5V float.
- The battery must not be kept constant at 14.4-14.6V, this will lead to a short service life. Within 4 hours after the battery has been fully charged, it must return to the float voltage.
- The battery shall not be charged directly by a vehicle alternator, a so-called charging booster must always be switched between them.

Discharging the battery

- The battery must be discharged within the specifications.
- Users such as an inverter must have a low voltage limit set to 11... 11.5V. The BMS itself is adjusted to a lower undervoltage protection and should not intervene in normal use.

Installing and connecting the battery

- Ensure sufficient ventilation space around the battery.
- Preferably place the battery on a rubber surface and fix it securely with a strap.
- Use cable cross sections as e.g. 3A/mm² to 2m and 2A/mm² to 5m length.
- The battery poles shall always be equipped with a rubber hood as insulation.
- Thin cables connected to the poles shall always be provided with a suitable fuse close to the poles.
- The battery itself is short-circuit resistant and additionally has an internal fuse.

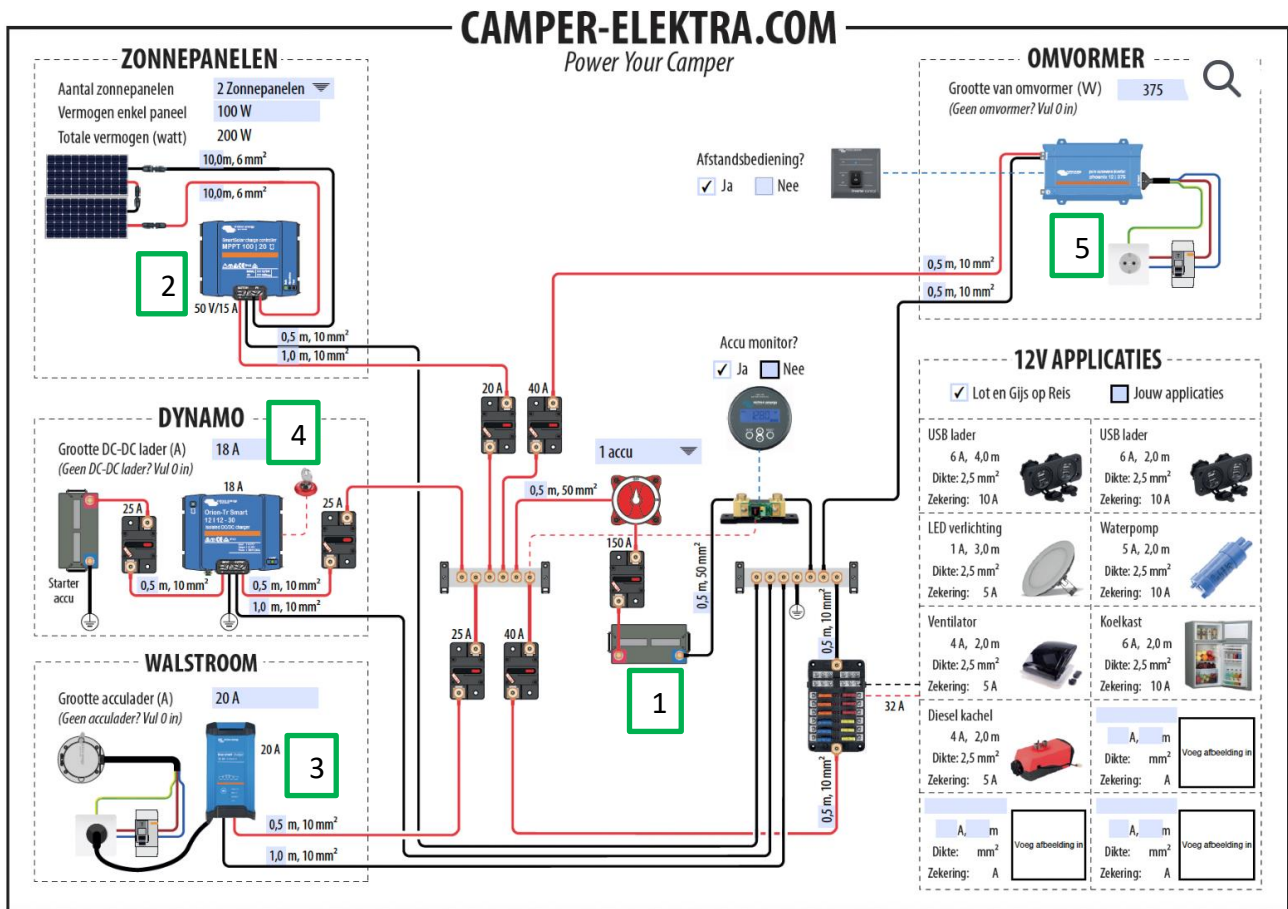
Parallel or series connection of the ACES battery

- Max. 4 batteries can be connected inparallel, using short cabling.
- When connected N batteries in parallel the max. load is $0.8 \cdot I_{max} \cdot N$
- The ACES batteries shall not be connected in series; this can cause damage

Important points of attention for use

- Make sure that the battery is always in a charged condition as much as possible (>20%).
- Charge the batteries most of the time to 100%
- When the batteries are stocked make sure the SOC is >50% and check the capacity every 3 months and recharge the battery when needed.
- Make sure the battery is charged for about 80...100% for the period of not use in wintertime.
- Often several small electricity consumers are connected to the battery, therefore it is advisable to disconnect the battery poles during a long period of no use.
- If the above instructions are not followed and the battery enters in the deep discharge condition, it may become irretrievably defective. In that case, there is no warranty.

Example diagram typical installation for the Motorhome



Main Components Overview

- Lithium battery; overview 12V program ACES lithium batteries on the ACES [website](#)
Models: 45AH, 60AH, 80AH, 100AH, 120AH, 150AH, 200AH, 280AH, 320AH, 400AH
- For solar panels MPPT charger Victron SmartSolar:
MPPT 75/10, 75/15, 100/15, 100/20, 100/30, 100/35, 100/50, 150/45, 150/60
- Wal outlet 230Vac charger:
Victron 12V Blue Smart IP65 chargers 4A, 15A, 20A
ACES: ABC300-1212LF, ABC700-1220LF, ABC720-1230LF
Samlex: Field 12-7, 12-17, 12-30,
- Alternator DCDC charger when using lithium battery:
Victron Orion-TR Smart 12/12 model 10A, 15A, 18A, 30A
- Inverter for Off-grid 230Vac in the RV:
 - Victron 12V 375VA, 500VA, 800VA, 1200VA; Multiplus: 1600VA, 2000VA, 3000VA
 - Votronic VBCS 45/30/350, SMI1200NVS, SMI1700NVS
 - Pro-User 600W, 1500W, 2000W, 3000W

Installation

We recommend that you have the installation taken care of by the professionals of your caravan/motorhome dealer. They have the necessary knowledge and experience for this.