

Using Lithium-Ion and Advanced Batteries with the Conext™ Series of Inverter/Chargers and MPPT Solar Charge Controllers - Introduction

Li-ion and other advanced chemistry batteries are now selected more often for use in battery hybrid systems because they provide significant performance improvements over traditional lead-acid batteries.

Some of these performance improvements include one or more of the following:

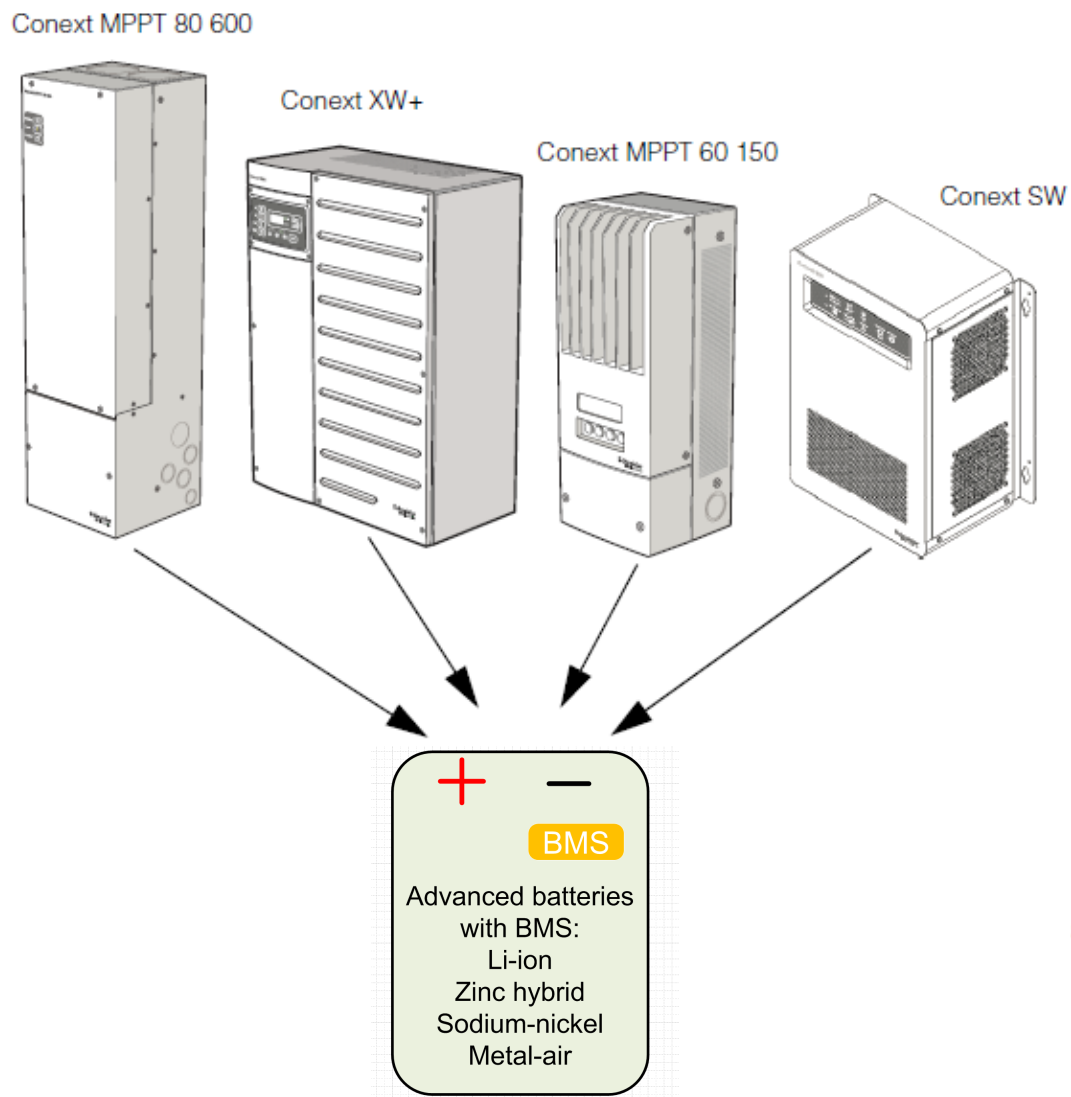
1. **Higher density** - three times the watt-hours per kilogram and half the volume.
2. **Higher charge cycles** - about six times that of traditional lead-acid batteries.
3. **Low self-discharge rate** such as 2-3% per month.
4. **Low internal resistance** - one-fourth of lead-acid resulting in lower heat loss and better efficiency as well as voltage regulation.
5. **No degradation of overall battery life** when operated at partial state-of charge (SOC) for an extended period.
6. **Cell balancing circuits** which mitigates cell divergence, thereby maintaining capacity over lifetime.
7. **Safety protections** which are suitable for unattended applications.
8. **Ability to operate under extended temperature ranges**

Li-ion and advanced chemistry batteries pose few challenges when compared to conventional lead-acid, such as:

1. Batteries with a Battery Management System (BMS) can trigger protection and disconnect the battery from inverter/chargers thus removing power. This means that the batteries are no longer dependent on the inverter/charger for their protection.
2. The life cycle of batteries is highly affected by charging profile over age, temperature, and depth of discharge, and sometimes they require a frequent change of configuration settings rather than a one-time configuration set-up.

3. Some batteries have a very wide voltage operating range (such as sodium-ion) or very narrow voltage operating range (such as iFePO4) from 100% to 20% SOC.
4. Different types of Li-ion and advanced batteries, and their BMS in the market today, pose a dilemma for the system designer. The main challenge is determining the method of integration between the battery pack and power conversion equipment to achieve optimum performance and battery life span while still ensuring the system is safe.

We want to ensure you are completely satisfied with your system installation. Before purchasing Lithium-Ion batteries we suggest you contact us for additional information and ask for the detailed application guide for Lithium-Ion and Advanced Batteries (**976-0319-01-01 Revision A**).



Conext Family of Battery Based Power Conversion Products