

OPTIMUM POWER BATTERY

ENGLISH
VERSION

INTRODUCTION

The advantages of lithium batteries, compared to conventional batteries, are largely admitted. They offer a better performance at all levels (number of cycles, charging speed...).

However, up until now, their installation on boats or vehicles used to require advanced skills, as lithium batteries require a very specific charging cycle to balance the cells together. Failure to comply with these constraints could significantly reduce the performance of the battery and even lead to a fire hazard. These fears and the complexity of the installation discouraged many professional installers.

OPTIMUM POWER® lithium batteries have been developed to easily replace lead batteries (conventional lead, gel or AGM) for any application requiring a storage solu-

tion with superior performance (weight, charging speed or cycling performance). These latest generation lithium batteries have a BMS (battery management system) integrated into the battery and therefore do not require any modification of the installation when replacing lead batteries.

The performance level of the cells used and the protection and balancing circuit (BMS) make it possible to accept high charge / discharge currents. That makes the use of these batteries possible even with powerful alternators.

The installation of OPTIMUM POWER® batteries is therefore easy for any application requiring high quality and high performance batteries. OPTIMUM POWER® batteries are designed to be used as service batteries but can also be used as backup starter batteries.

ADVANTAGES OF OPTIMUM POWER LITHIUM BATTERIES

AVAILABLE CAPACITY CORRESPONDING TO 100% OF THE NOMINAL CAPACITY:

A 100Ah OPTIMUM POWER® lithium battery can restore 100Ah. At 85% discharge rate, the battery voltage will remain above 12V. The entire capacity is therefore available. Only gel batteries can achieve this level of performance without risk to the battery. However, the gel battery's voltage drops in similar conditions.

EXCEPTIONAL CYCLING PERFORMANCE:

4000 discharge cycles at 100% for use at 0.5C. This represents an 800% increase in performance compared to the best gel batteries available on the market.

RECHARGING INTENSITY 3 TO 4 TIMES HIGHER:

The charging intensity of a lead battery is limited to 25% - 30% of its nominal capacity compared to 100% or even more for OPTIMUM POWER® batteries. The charging time is also very fast and the time of the absorption cycle is reduced.

SUITABLE FOR ALL CONFIGURATIONS:

These batteries have been specially developed for installation on vehicles or boats. In this context, the maximum load intensity (160A for 100Ah) makes them compatible with all

alternators available on the market. When the batteries are connected in parallel, the current is added. A 200Ah fleet will thus be able to support 320A of maximum load (200A recommended).

EASY TO INSTALL:

Connect your optimum Power batteries to replace your lead batteries and they are ready to use. Optimum Power batteries incorporate a protection circuit (BMS) that is designed to protect the battery and maintain it at its optimal capacity throughout its lifetime.

WEIGHT SAVING:

OPTIMUM POWER® batteries are twice as light as conventional batteries. If we take into account the fact that the entire capacity is available, this makes them four times lighter than lead batteries for the same capacity.

FLEXIBLE CONFIGURATION:

The batteries can be connected in parallel to increase the available capacity or in series to have a larger voltage pool. Up to four batteries can be connected in parallel and two batteries in series.

3 YEAR WARRANTY - VERY HIGH QUALITY AND DURABILITY

GENERAL CHARACTERISTICS OF THE RANGE

System voltage	12 Volts
Charging temperature	-15°C à 45°C
Discharge temperature	-20°C à 60°C
Cycling for charge / discharge at 1C*	2000 cycles minimum
Cycling for charge / discharge at 0.5C*:-	4000 cycles minimum
Self-discharge	<=3%
Technology used	LiFePO4
Charging voltage	14.4V à 14.6V
Maintenance voltage	13.6V
Charging current	100% of the capacity
Discharge current	100% of the capacity
Parallel connection (increased capacity)	Up to four batteries
Serial connection	Two batteries
Output voltage	Very stable during discharge
Breakdown voltage	10 V
Reconnection voltage	11.2 V
High break voltage	15.5 V
Reconnection voltage	15 V
Maximum charge and discharge current	See data in the table below
Safety	BMS (integrated battery management)
Guarantee	3 years

CHARACTERISTICS BY MODEL :

RÉF.	VOLTAGE NOMINAL	CAPACITANCE CURRENT /C1	DISCHARGE/ RECOM-MENDED LOAD	DISCHARGE CURRENT /MAX	DISCHARGE CURRENT (5 SEC)	DIMENSIONMM (L*L*H)	WEIGHT (KG)
BLI12080	12V	80Ah	80A	100A	260A	307*169*219	M8 12 kg
BLI12100	12V	100Ah	100A	160A	500A	330*171*223	M8 14 kg
BLI12120	12V	132Ah	130A	160A	500A	341*173*292	M8 17.5 kg

OP+IMUM-
POWER



Advanced lithium batteries

INSTALLATION OF OPTIMUM POWER LITHIUM BATTERIES

PREREQUISITE :

Since the BMS ensuring the safety and optimal operation of the battery is integrated into the OPTIMUM POWER® battery, it is not necessary to modify the existing installation. Nevertheless, the following points must be taken into account:

1. Lithium batteries being able to absorb much more current (3 to 4 times more than a standard battery). It is recommended to check that your charging circuit has the appropriate cable to support this current. The cross-section of the cable to be installed will depend on the most powerful source or consumer.
2. Even if OPTIMUM POWER® lithium batteries (just like lead batteries) can be charged directly from the alternator, we recommend the installation of a battery to battery charger or alternator to battery charger to ensure a perfectly adapted charging cycle and a complete and fast recharging. In some cases, the battery to battery charger may be useful to limit the current entering the batteries.

SIZING OF THE INSTALLATION :

In order to have a correctly sized installation, it must be validated that the maximum charge/discharge intensity is in relation to

the batteries installed. When the batteries are installed in parallel connection, the charge/discharge currents are also added. For two 100Ah batteries connected in parallel, the recommended charge/discharge current is 200A.

Example of sizing :

1. If you have a 2000 Watts converter (185A to 12V consumption), it is recommended to have at least 200Ah of lithium battery capacity available. These batteries will be able to discharge easily at 185A and will also be able to absorb peak currents.
2. A 115A alternator can be connected directly to a 100Ah battery, but an installation with a only 80 Ah battery (recommended charging current 80A) will not be suitable (charging current too high).

PROTECTION :

As with conventional batteries, it is recommended to install an ANL fuse on the positive line at the battery output. The size of the fuses to be installed will depend on:

1. Battery characteristics
2. Installation characteristics

Note that the fuse to be installed will generally be the one corresponding to the installation, insofar as the battery pack has been sized to be in relation to the whole installation.

CALIBRATION OF THE FUSES TO BE INSTALLED (TAKING INTO ACCOUNT THE CHARACTERISTICS OF THE BATTERIES ONLY):

MODEL	NO. OF BATTERIES //			
	1	2	3	4
80 Ah	100A	200A	300A	400A
100 Ah	150A	300A	450A	600A
130 Ah	150A	300A	450A	600A

Example of fuse sizing:

1. A sailing boat with a 115A alternator and without a large converter equipped with two 100Ah batteries: If you do not want to start the engine from service, one 150A fuse will be adapted (the most powerful source of load will be the alternator) If you wish to start the engine from the service park, a 300A fuse can be installed on the main line.
2. A sailing boat with 3 batteries lithium of 130Ah connected in parallel and a 3000 Watts converter : In this case a 400A fuse will be adapted. It will allow to accept the possible inrush currents of the devices that will be connected to the converter.

Note: In general, any line starting from the batteries (regardless of the type of batteries) must be protected by a fuse of the appropriate rating to prevent any electrical risk. Do not hesitate to call on our network of partners who can assist you in the implementation of an appropriate solution.

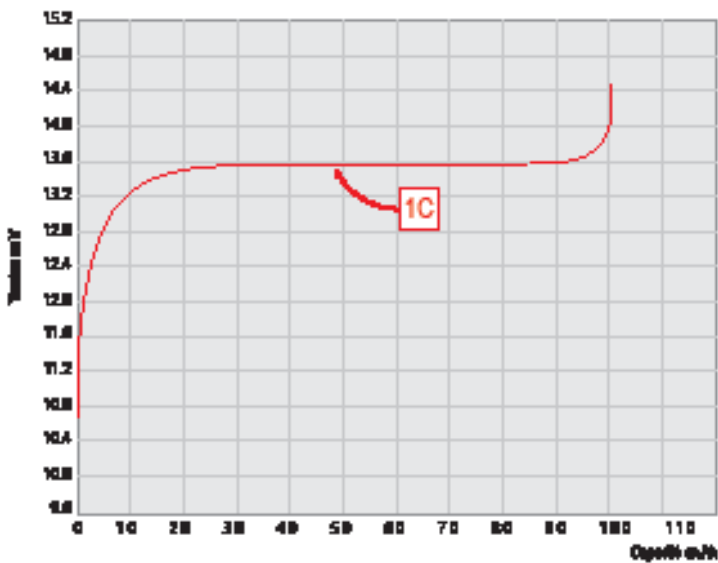
ENVIRONMENT :

Batteries should be installed in a dry, well ventilated area where the temperature does not exceed 45 degrees. In this respect, batteries should not be placed in the engine compartment where the ambient temperature can easily reach 50 degrees.

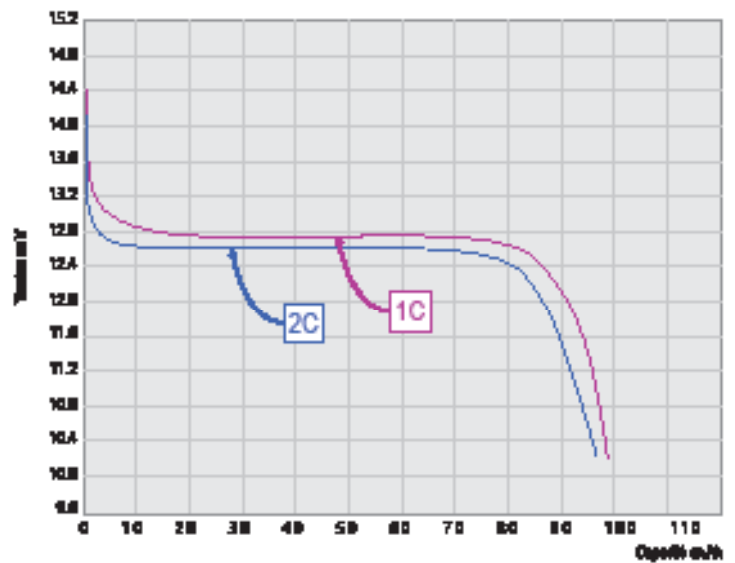
CHARGING CYCLE :

1. Lithium batteries require a constant current charging cycle (refer to the table of characteristics to know the charging current by battery type). When batteries are connected in parallel, the charging currents add up.
2. Then the charging voltage must be maintained at its absorption value at 14.4 Volts, this allows to finish the recharge of the battery.
3. Finally, the maintenance voltage can be applied to keep the batteries charged. The graph below gives an overview of the charging cycle for a 100Ah battery with a 100A charge.

Le graphique ci-dessous donne un aperçu du cycle de charge pour une batterie de 100Ah avec une charge à 100A :



Evolution of the voltage as a function of the discharge rate :



TIGHTENING OF CONNECTIONS :

The tightening torque of the terminals is 7 to 7.7 Nm

ELECTRICAL ARCS :

The OPTIMUM POWER® battery is equipped with Mosek relays to ensure the protection against current overload (charging and discharging). In this context, it is critical not to apply an electric arc to the batteries (e. g. by disconnecting / reconnecting an alternator during operation). As an option, we offer solutions that protect the batteries from such problems.

TRANSPORT NOTE

1. The battery must be properly protected during transport to prevent any damage.
2. During the transport, the battery must be charged to 50% to avoid any risk of short circuiting.
3. The temperature must be maintained between -20° C and +45° C in a dry and well ventilated warehouse
4. During the loading and unloading of the battery, special care must be taken not to throw it, turn it over and to avoid any rough handling.

SAFETY AND MAINTENANCE INSTRUCTIONS

In order to use your battery in the best conditions and avoid any risk, you should pay attention to the following points :

1. Never throw the battery in to water, keep it dry, store it in a cool, dry environment.
2. Never reverse the positive and negative.
3. Never connect the battery's positive and negative with metal.
4. Never hit, throw or trample the battery.
5. Never cut or drill the battery with a nail or any other object or tool.
6. If the battery emits a particular smell, heats up, or deforms itself, stop using it and call our support.
7. Never use or keep the battery at high temperature, otherwise it will shorten its life and may even cause explosion problems. The temperature of the battery for long-term use is +10°C to +45 degrees Celsius.
8. Never use the battery under a strong magnetic field as this could cause a problem for the protection circuit (BMS)
9. Never throw the battery into the fire, the battery must be returned to a suitable recycling station.
10. If the battery leaks and electrolyte enters the eyes, rinse your eyes and immediately consult a specialist.
11. During periods of non-use, it is recommended to recharge the battery to 50% and to complete the charge every 6 months
12. Clean the dirty electrode, if necessary, with a clean, dry cloth to ensure proper operation in the best conditions.

