

# Lithium Battery Solutions

## UPS AND ENERGY STORAGE SYSTEMS (ESS) POWERED BY LITHIUM BATTERY SOLUTIONS



E-MEDICAL



INDUSTRY



DATACENTRE



TRANSPORT



Energy Storage



### HIGHLIGHTS

#### **EXTENDED BATTERY LIFE**

Longer than lead acid batteries.

#### **HIGH TEMPERATURES TOLERANCE**

Cooling system downsized, money saving.

#### **HIGH ENERGY DENSITY**

Footprint minimizing and weight reducing.

#### **REAL TIME MONITORING SYSTEM**

Safety, reliability and information management improves.

#### **HIGH NUMBER OF CYCLES**

11,000 vs 300 for traditional lead acid batteries.

#### **HIGH RATE PERFORMANCE**

Higher charging/discharging current (up to 2.5 C / 11 C).

#### **CAPACITY PERFORMANCE**

Higher capacity retention than lead acid batteries.

**Lithium batteries offer all types of facility operators a new set of solutions to help improve their energy storage performance.**

**Lithium batteries are the ideal solution for all applications requiring a high number of cycles, high rate performance, new concepts of facility operating modes such as “peak shaving” or where there are very limited space and temperature constraints.**

Thanks to the chemical and technological advances made during the last 10 years, Riello UPS and Riello Solartech introduce lithium battery solutions that are a valid alternative to the conventional lead acid battery for a wide range of usages. The innovative lithium technology proposed by Riello UPS provides several advantages over traditional lead acid battery solutions, starting with the

smaller number (or even the absence) of replacements for the entire duration of the UPS and ESS installation life cycle, which reduces or eliminates the risk of interruptions due to replacement of the batteries and granting an important cost saving. Lead acid batteries require a managed room temperature around 20/25 °C, which has a high impact on cooling system design. The lithium battery has a greater tolerance to high temperatures (including casual spikes) and if the UPSs / ESSs and servers are also designed to tolerate higher operating temperature, it is possible to save money, downsizing the cooling system and reducing the electricity costs.

Furthermore, for the same amount of energy supplied their weight is reduced by more than half, which makes them more manageable and easier to position. The footprint is reduced by up to 75% of

conventional lead acid batteries, leaving free space for additional IT equipment or additional room to accommodate future power upgrades.

Unlike lead acid batteries, the capacity does not degrade as a function of the discharging current rate: in case a high discharging current is required, the cell capacity is maintained, no oversizing is required, and a high cost saving is achieved. The number of charging / discharging cycles is increased over 10 times, depending on the technology, temperature and depth of discharge. This is a fundamental feature to enable UPS/ESS applications requiring a high number of battery cycles as "peak shaving" and "OFF GRID configuration". The charging times, which are essential in the various blackout scenarios, are at least four times faster and this must be taken into account in a smart grid and smart energy perspective; for instance in all hybrid installations (grid/GE + solar + wind) that requires higher charging / discharging rate.

Because such technology requires electrical cell balancing, the Riello UPS lithium battery solution integrates a sophisticated Battery Monitoring System, (typically not part of a lead acid battery solution for UPS systems), that guarantees improvements in the performance, safety, and reliability of the as well as enabling full system supervision.

Riello UPS lithium solutions are compatible with much of the Riello UPS product series and the Riello Solartech energy storage portfolio and easily adaptable to any customer needs in terms of power, architecture and installation requirements.

## EXTENSIVE RANGE OF SOLUTIONS

The Riello UPS lithium battery proposal incorporates several solutions spanning a large number of application requirements that meet the most pressing market demands. This is achieved through a series of products that are characterised by discharging duration time, number of battery cycles and charging / discharging current rate.

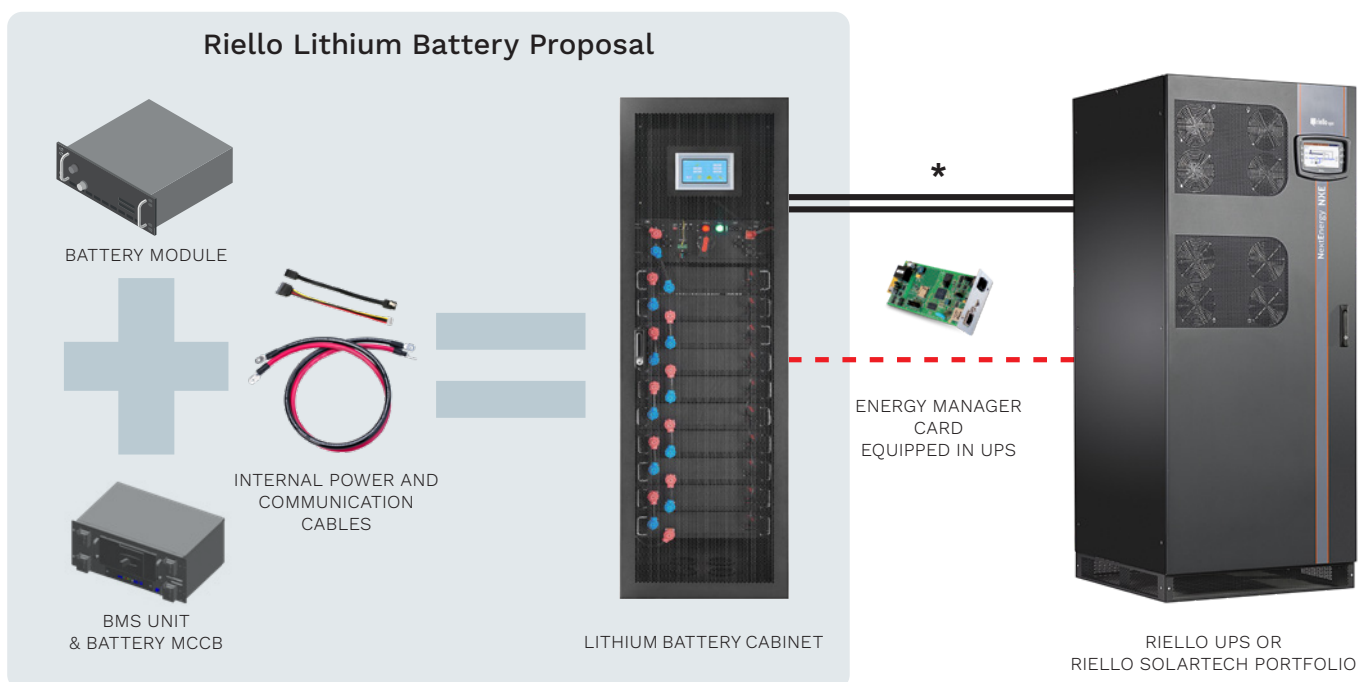
The Riello UPS lithium battery proposal is suitable for:

- Data centers (e.g., co-location, control rooms);
- Telecom (e.g. fixed and mobile operator);
- Healthcare (e.g., hospitals and medical centers);
- Building infrastructures (e.g., financial institutions, education centers);
- Transportation (e.g., railway and airport infrastructure);
- Manufacturing (e.g., food & beverage industry);
- Energy storage (e.g., photovoltaic, wind and cogeneration applications, smart grid and OFF GRID applications).

## THE RIELLO UPS LITHIUM BATTERY PROPOSAL

The Riello UPS lithium battery solution offers a full proposal that includes:

- Battery Modules with integrated electronic control;
- Battery breaker protection;
- BMS unit;
- Interconnection power cables between modules;
- Internal cabinet communication cables;
- External communication cable for data exchange between the BMS unit and Riello UPS or Riello Solartech system.



\* Power cables between Battery cabinet and Riello UPS or Riello Solartech are not supplied.