

Life Is On

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Electric

# Lithium-ion batteries

For uninterruptible power supplies



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# Lithium-ion solution

## Challenges

Choosing the right energy storage solution for your data center, critical building, industrial process, or critical infrastructure is more challenging than ever. Today's backup storage solution must maintain or even increase availability and manageability while reducing the uninterruptible power supply (UPS) footprint. In order to reduce total cost of ownership (TCO), it is important to extend lifetime, decrease footprint, streamline maintenance, and lower cooling costs and other operating expenses, in addition to minimizing the upfront capital cost.

Lithium-ion (Li-Ion) batteries are poised to revolutionize energy storage for secure power applications. From the data center to the industrial floor, energy storage is transforming from medium-lifetime, sprawling, and heavy batteries to a long life, compact, lightweight solution with predictable performance, simplified maintenance, and robust life cycle management.

## Solution overview

The Schneider Electric™ Li-Ion battery solution for three-phase UPSs is a high-value, innovative energy storage protection solution for data centers, industrial processes, or critical infrastructure.

This solution is supported by Schneider Electric Symmetra™ MW, Symmetra™ PX 250/500kVA, Galaxy™ 7000, Galaxy VS, VM, VL, VX UPSs and brings the following benefits:

- Significantly reduced battery footprint and weight to allow for a more effective use of space
- Double the life and simplified maintenance vs. traditional batteries
- Reduced cooling requirements
- Improved backup storage predictability and manageability (BMS included)
- Reduced TCO



Li-Ion battery system



## System components

### Cell

- Highly reliable Li-Ion battery prismatic can cell
- Rated at 67 Ah, nominal voltage 3.8 V



### Module

- Contains eight cells in series (8S1P)
- Module includes battery management system (BMS)



### Switch gear

- Contains rack BMS, molded case circuit breaker (MCCB), and shunt resistor
- All harness connections are at front for simplified maintenance



### Switched mode power supply (SMPS)

- Contains 24 V redundant power supply to rack BMS and system BMS (1 per battery system)
- Communication to rack BMS using CAN and to UPS using dry contact



### Rack

- Contains modules (in series), switchgear, and SMPS assembly
- All connections are placed at front for simplified maintenance
- Minimal depth enables installation back-to-back or against a wall to conserve space
- Multiple racks are connected in parallel to configure various power ratings and runtimes



# Features and benefits

## Improved use of real estate

Maintain or increase your facility's revenue-generating capacity while reducing the size of the technical room with Li-Ion batteries:

- Reduce the secure power footprint by 50 to 75%, so revenue-generating equipment can take its place
- Reduce the weight by over two-thirds, providing flexibility to install on any floor while minimizing structural modification requirements.
- Reduce the battery room size and increase tolerance to a wider operating temperature range, which allows you to decrease the capacity of the cooling solution

## Reduced cooling requirements

Today's VRLA batteries have a limited lifetime and, to optimize it, it is essential to keep battery rooms at around 20 – 25 °C. While all batteries will age faster at higher temperatures, the Li-Ion batteries' nominal lifetime and aging characteristics are such that they will tolerate higher operating temperatures (or occasional spikes) and still retain much longer battery life vs. VRLA. With UPSs and servers also designed to tolerate higher operating temperatures, significant savings are possible when batteries are placed in the same environment.

Additionally, the volume of the battery room is greatly reduced with Li-Ion batteries. In warm climates, this will allow significant downsizing of the cooling solution that is needed to remove the heat due to imperfect battery room insulation.

## Extended battery life — and peace of mind

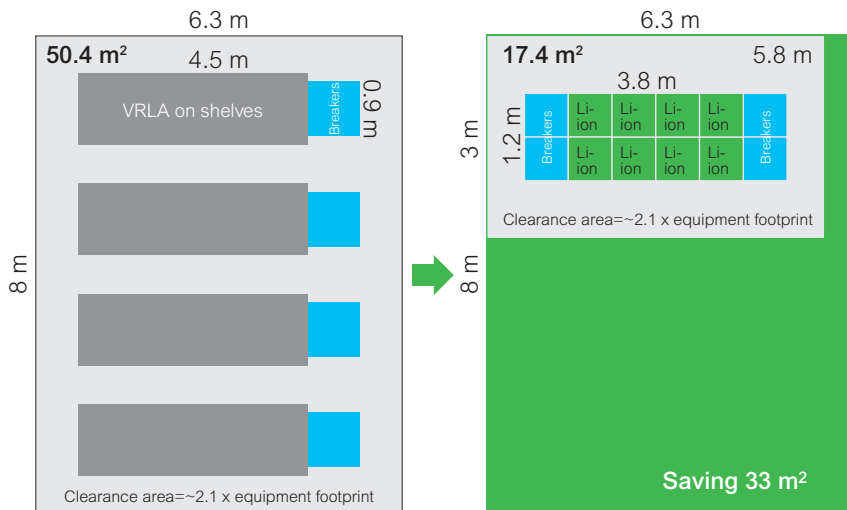
While the upfront cost of lead-acid batteries has sustained their appeal, they have a limited lifetime, especially when subject to temperature fluctuation. To ensure runtime availability, many customers replace even the highest quality lead-acid batteries every three to six years, driving up maintenance costs.

The Li-Ion technology doubles the service life of your batteries. Their extended battery service life reduces the burden and cost of battery replacements, as well as the risks of downtime or load interruption during maintenance.

## Increased availability of your backup storage system

A reliable and monitored backup solution with easily accessible battery health data is a necessity in today's connected business environment, and the Li-Ion solution meets this demand with advanced battery management.

Embedded monitoring at the cell, module, and cabinet level provides a clear picture of battery runtime and health, with the added benefits of predictable, consistent runtime performance and stable cell health.



## Actual example:

- 1.6 MVA (4x400 KVA; PF = 0.9)
- 10 min backup time
- VRLA batteries on shelves

### Footprint reduction

- 50.4 m² (60.3 y²) -> 17.4 m² (20.8 y²) = (65%)

### Weight reduction

- 18 ton -> 4.4 ton (76%)





### Expected life

- 5 years -> 12 years (2.4X)

\*Calculations based on Galaxy 7000 UPS with 10 min runtime

# Technical specifications

## System component

Description	Rack Type G (17 modules)*	Rack type S (13 modules)*	Rack Type O (10 Modules)*	Rack Type E (16 Modules)*
Dimensions (HxWxD)	80.9 x 25.6 x 23.6 in; 2055 x 650 x 600 mm	80.9 x 25.6 x 23.6 in; 2055 x 650 x 600 mm	80.9 x 25.6 x 23.6 in; 2055 x 650 x 600 mm	80.9 x 25.6 x 23.6 in; 2055 x 650 x 600 mm
Weight	1212.5 lb (550 kg)	1058.2 lb (480 kg)	948 lb (430 kg)	1175 lb (533 kg)
Nominal voltage (V)	516.8 V 	395.2 V 	304 V 	486.4 V 
Operating range (V)	408 V – 571 V	312 V – 437 V	240 V - 336 V	384 V - 537 V
Capacity (kWh)	34.6 kWh	26.5 kWh	20.4 kWh	32.6 kWh
Maximum power (kW)	231 kW	177 kW	136 kW	217 kW

### Rack type G 17 modules/rack — Runtimes listed in minutes

\*MCCB: 600 A; DC fuse: 500 A / Three-year warranty included.

UPS	Power	1 rack	2 racks	3 racks	4 racks	5 racks	6 racks	7 racks	8 racks
Galaxy VL (PF = 1) <small>*can be 16 modules/rack</small>	300 kVA	N/A	12.0	19.0	25.5	32.5	39.0	46.0	52.5
	400 kVA	N/A	8.00	14.0	19.0	24.0	29.0	34.0	39.5
	500 kVA	N/A	N/A	11.0	15.0	19.0	23.0	27.0	31.0
Galaxy VM (PF = 0.9)	160 kVA	12.5	27.0	41.0	55.0	69.0	83.0	97.0	110.0
	180 kVA	11.0	23.5	36.0	48.5	61.0	73.5	86.0	98.5
	200 kVA	10.0	21.0	32.5	43.5	55.0	66.0	77.5	88.5
Galaxy VX (PF = 1)	225 kVA	7.2	18.5	28.5	38.5	48.5	58.5	68.5	78.5
	500 kW	N/A	N/A	10.5	14.5	18.5	23.0	27.0	31.0
	625 kW	N/A	N/A	5.1	11.5	15.0	18.0	21.0	24.5
	750 kW	N/A	N/A	N/A	9.4	12.0	14.5	17.5	20.0
	1000 kW	N/A	N/A	N/A	N/A	7.5	10.5	12.5	14.5
	1250 kW	N/A	N/A	N/A	N/A	N/A	4.8	10	11.5
	1500 kW	N/A	N/A	N/A	N/A	N/A	N/A	2.6	9.3

### Rack type S 13 modules/rack — Runtimes listed in minutes

UPS	Power	2 racks	4 racks	6 racks	8 racks	10 racks	12 racks	14 racks	16 racks
Symmetra MW (PF = 1)	400 kW	N/A	14.0	21.5	29.0	37.0	44.5	52.5	60.0
	600 kW	N/A	8.2	14.0	19.0	24.0	29.0	34.5	39.5
	800 kW	N/A	N/A	10.0	14.0	17.5	21.5	25.5	29.0
	1000 kW	N/A	N/A	1.5	10.5	14.0	17.0	20.0	23.0
	1200 kW	N/A	N/A	N/A	8.2	11.0	14.0	16.5	19.0
	1400 kW	N/A	N/A	N/A	N/A	9.6	11.5	14.0	16.0
	1600 kW	N/A	N/A	N/A	N/A	4.6	10.0	12.0	14.0

### RackType O 10 modules/rack - Runtimes listed in minutes

UPS	Power	2 racks	4 racks	6 racks	8 racks
Symmetra PX 250/500 (PF = 1)	250kW	4.0	18.0	27.5	37.0
	500kW	N/A	4.0	13.0	18.0

### Rack type E 16 modules/rack — Runtimes listed in minutes

UPS	Power	1 rack	2 racks	3 racks	UPS	Power	1 rack	2 racks	3 racks
Galaxy VS (PF = 1)	20 kW	94.0	190	285	Galaxy VS (PF = 1)	100 kW	18.0	37.0	56.0
	30 kW	63.0	125	190		120 kW	14.5	30.5	46.5
	40 kW	47.0	95.0	140		150 kW	11.5	24.5	37.0
	50 kW	37.0	75.0	110					
	60 kW	30.0	63.0	95.0					
	80 kW	22.0	47.0	71.0					

The values are stated at nominal condition and are subject to normal production tolerances. Runtimes are subject to tolerances (+/- 5%) and may vary.

Contact Schneider Electric for more information:  
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