Supercapacitor module cabinets for Eaton UPS systems

Eaton's supercapacitor module systems are highly reliable and flexible energy storage solutions that provide fast responding very high peak power in a small footprint. These systems use the XLM-62 module as a core building block with 10 units wired in series to increase distribution voltages and can be integrated with an Eaton 9395P and 93PM UPS.

Benefits of supercapacitors:

- **Long lifetime:** millions of charge/discharge cycles, providing up to 20 year life at +30 °C

- **Maintenance free:** supercapacitors are virtually maintenance free and do not require complex battery management systems

- **Safe and Green:** by using organic materials, there are no additional hazards requiring additional containment and helps provide "worry free" operation

- **Scalability:** simply add strings (10 modules per string) in parallel to meet load (kW) or backup time (sec) requirements

- **Fast Recharge:** module strings can be charged at double the rate of Li-ion solutions to provide greater system availability of managing repeated power distruptions

- **Wide operating temperatures:** supercapacitors can be operated from -40 °C to +65 °C with predictable effects on lifetime

- **Superior reliability:** the highest availability and response is ideal for mission critical loads

Technical specifications	2 String cabinet	3 String cabinet
Voltage range	570 V – 360 V	570 V – 360 V
Dimensions in inches (W x D x H)	23.2" x 31" x 88"	30.2" x 31" x 88"
Weight (kg)	545	730
Maximum power	300 kW	300 kW
Useable energy within acceptable UPS voltage range	2354 kW-sec	3531 kW-sec
Maximum charge current	100 A	150 A
Temperature range	-40 °C to +65 °C	-40 °C to +65 °C

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Additional information on Eaton's supercapacitor modules

Management system

- The XLM-62 has an integrated passive balancing system using simple resistors within the module to balance the voltage on the individual cells to help the module achieve long lifetimes
- Each module is equipped with an overvoltage alarm that alerts when an individual cell has been overcharged
- With this management structure, the XLM modules provide 98% round-trip efficiency
- The state of charge is known at all times and can be clearly displayed through UPS

Protection

- Each cabinet has a main Vdc molded case circuit breaker (MCCB) as a main disconnect in combination with Bussmann series high speed fuses to limit fault current
- The MCCB has a 48 Vdc shunt trip with auxiliary contacts while the fuses have open fuse indicators as an add-on accessory
- The current limiting fuses ensure let through currents are reduced during short circuit conditions and helps reduce unnecessary arc flash hazards

Configurations and integration

- XLCM is designed to UL1778 to support pairing with UPS installations and systems
- The charts below indicate backup discharge or autonomy times when paired with Eaton's 93PM and 9395P when the XLM-62 modules are at end-of-life conditions and supporting 100% load
- With supercapacitor modules, a UPS solution can be manufactured entirely by Eaton. Contact Eaton click here for additional information on backup times and pairing with an Eaton UPS

Run time at end of life (in seconds)	Eaton 93PM output power rating in kW (100% full load rating, 95% inverter efficiency)									
Number of supercapacitor strings	30	40	50	60	80	100	120	150	160	200
1	30	25	17	11						
2			30	24	22	17	14			
3					30	26	22	17	18	12
4						32	30	23	25	17
5								29	30	21
6										26
7										30

Run time at end of life (in seconds)	Eaton 9395P output power rating in kW (100% full load rating, 95% inverter efficiency)									
Number of supercapacitor strings	200	250	300	400	500	600	800	900	1000	1200
3	12	10								
4	16	13	11							
6	26	20	17	12						
8	37	29	24	16	13					
10		37	30	22	17	14	10			
12			37	26	20	17	12			
16			37	29	24	18	16	13	11	
24						37	27	24	21	17

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