MUSASHI
Energy Solutions

Backup Beyond UPS Batteries

ESS400
ENERGY STORAGE SYSTEM

Hybrid SuperCapacitors

Musashi's Hybrid SuperCapacitor (HSC) products deliver unparalleled high-power density energy storage to meet the diverse needs of an electrified world with flexible configurations.

For over a decade, we have been at the forefront of automated high-volume HSC manufacturing, accumulating valuable expertise to deliver energy storage solutions for a variety of industries. The ESS400 paired with a 3-phase UPS enables seamless generator transfer, reduces costs, and saves space while supporting the requirements of a wide range of sensitive data center equipment. It offers a lifespan of more than 15 years and 100K-cycles, eliminating costly power upgrades while meeting growing peak power demands.

Key Benefits

- **Reliable Backup** for data centers & other mission critical applications
- **UL1973 Listed**
- **Paired with a 3-Phase UPS**, the ESS400 enables transfer to generator in seconds
- **Eliminate Batteries** to save space & cost; safeguards emergency power for data center infrastructure
- **Peak Power Support** for generative AI operations

High Power Density
Saves space in your facility or enclosure

Long Product Life
More than 15 years; even in the most challenging environments

Wide Temperature Range
0- 40°C

High Cycle Life
Achieve up to 100K+ full discharge/recharge cycles

Safe and Reliable
No thermal runaway; UL1973; IBC, HCAI (OSHPD) Seismic

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GO FAR BEYOND

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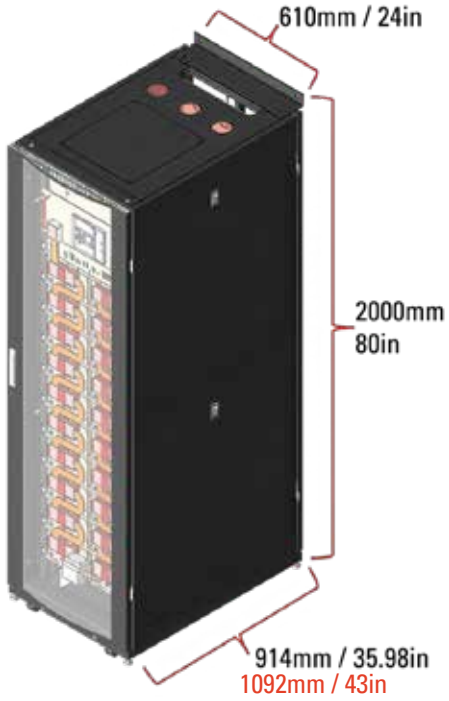
Specification Overview

	ITEM	DESCRIPTION
Basic Parameters	Cell Type	Hybrid SuperCapacitor
	Nominal Voltage	480 Vdc
	Maximum Voltage	594 Vdc
	Minimum Voltage	384 Vdc
	Maximum Charging Current	285A
	Maximum Discharge Current	1033 A
	Discharge Duration (@333kW)	33 seconds
	Maximum Power Output	400 kW
	Cycle Life	>100,000 @ 100% DOD; >400,000 @ 80% DOD
	Communicration Interface	Modbus TCP, Dry Contact
	Protection	Over/under temp., over/under voltage, short circuit, communication failure
	Design Life	15 years
Environment	Certifications & Testing	UL 810A, UL 1973, UL 9540A, RoHS
	IP Level	IP 20
	Storage Temperature	0- 40°C (10- 30°C recommended)
	Operating Temperature	0- 40°C (10- 30°C recommended)
	Relative Humidity	90% and less
	Maximum Operating Altitude	3000m
	Transport	UN 3508

PARAMETER	STANDARD FULL CABINET	ESS400-S SEISMIC CABINET
Configuration	20 modules in series	20 modules in series
Usable Capacity	2740 Wh	2740 Wh
Nominal Voltage	480 Vdc	480 Vdc
Operation Voltage Range	384- 594 Vdc	384- 594 Vdc
Dimensions- WxDxH (mm/in)	610x914x2000 / 24x35.98x80	610x1092x2000 / 24x43x80
Weight (maximum)	627 kg / 1,383 lbs	653 kg / 1,440 lbs
Certifications & Testing	UL 810A, UL 1973, UL 9540A, RoHS	+ IBC, HCAI (OSHPD)



BOL Back-Up Time (in seconds) **@ 25°C 384V-594V DC** (Number of Cabinets)

Load (KW)	1	2	3	4	5	6	7	8
100	122	253	385	516	647	778	910	1041
250	43	96	148	201	253	306	358	411
400	23	56	89	122	155	188	220	253
600		34	56	78	100	122	144	166
800		23	40	56	73	89	106	122
1200			23	34	45	56	67	78
1600				23	32	40	48	56
2000					23	30	37	43

Note: Backup times (in seconds) are estimated, and do not account for resistances external to cabinet (busbar, UPS, etc)