

Lithium Ion Battery System Specification

Customer:

Product name:	LiFePO4 Batter	y s'	ystem

Model: <u>MSP-HV-512-100 512V100Ah</u>

Author	Checked by	Approved by

Customer confirmation							
Customer company:							
Signature	Company signature						
Date:	Date:						

Battery Pack Specification

1. Overview

MSP-HV series is Lithium iron phosphate battery system which designed for high voltage UPS and energy storage system application, suitable for 100V to 1000V DC system which backup time is over 10min. This battery system consists of battery racks and CBMS,GBMS, every battery rack integrates with intelligent BMU inside. And this system has big advantages on safety, cycle life, energy density, fast charging, temperature range and environmental protection. MERITSUN is committed to providing safe and stable power supply for UPS system.

2. Advantages

The battery module consists of battery racks and CBMS.

- Packed with high performance LFP single cell, long life, safety and wide temperature range
- High energy density, small size, light weight, no pollution;
- Use CBMS-BMU design, protect voltage, current, temperature in whole process
- Integrated communication interface, CAN2.0 and RS485 communicate with UPS or PC
- Integrated LED indicator, display the SOC and operating status
- Balance between cells, balance between racks
- LCD display the battery system information(customized)
- Packed in 19 inches standard container, easily for installation and capacity expansion
- can customize the battery system with neutral line
- 15 years design life, Stable performance, maintenance-free

3. Battery specification

Name	Item	Parameter	Remarks
	Battery Type	LiFePO4	
	Pack	4P-160S	
	Rated voltage	512V with neutral line (±256V)	
Battery system	Rated capacity	100Ah	0.2C , @25°C
512V100Ah	Rated energy	51.2kWh	
(±256V100Ah)	Max. Charging current	100A	Constant
	Max. Discharging current	100A	Constant
	Max. Output power	50kW	Constant

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	Charging voltage	560~576V	
	Discharge cut-off voltage	448V	
	Cycle life (1C/1C)	>2500	100%DOD,@@25℃
	Short circuit current(A)	200A	<10mS
	System dimension	600*1000*2000(mm)	19-inches cabinet
	Total weight(kg)	≈720kg	
	Internal Resistance	<50mΩ	Fully charged @25°C
	Thermal Management	Fan cooling(controlled by tem	p.)
	Operating temperature	Charge: -5~55°C	
		Discharge: -20~65°C	
	Communication	RS485/CAN/LAN	
	Dry contact	3	
	Display	7 inches touch LCD screen	
	Cell container	Prismatic, Aluminum shell	
	Rated	3.2V 25Ah	
	Operating voltage range	2.5V~3.6V	
	Dimension (T*W*H,mm)	27*70*180	
	Weight	~660g	
Single cell	Rated Charging current	1.0C	
	Max. Charging current	1.0C	
	Rated discharging current	2.0C	
	Pulse. Discharging current	2.0C	
	Impedance(1kHz)	<4mΩ	
	Cycle life(1.0C)	>6000, 80%DOD @25°C	
	Module Voltage	51.2V	
	Rated capacity	100Ah	
	Pack	4P-16S	
Battery module	BMU inside	1	
rack	Dimension (W*D*H)	442*765*128	E.
	Weight	~52kg	10 10
	Power Terminal	M8 Screw	(Chamming the same
	Max. Output Power	24.4kW	

4. BMS Parameters

The HV Series BMS products are battery management systems developed for large-scale high-voltage battery energy storage and UPS systems. It adopts distributed architecture, modular design concept, high configurability, easy assembly, debugging and maintenance. It is suitable for various battery energy storage systems with DC voltage below 1000V. This product can be configured as a secondary architecture (BMU+CBMS) for 10KWh-100KWh. Cooperate with industrial computer and battery stack management software to form a three-level architecture (BMU+CBMS+GBMS) for 50KWh-2MWh applications. In conjunction with the server and plant battery management system software, it can form a four-level architecture (BMU+CBMS+GBMS) for applications from 2MWh to 1000MWh to meet different project requirements.

The product has a complete and reliable operation and protection strategy to effectively extend the life of the battery pack. It comes with a variety of communication interfaces and can be directly or indirectly connected to third-party energy management systems.

Item		Parameter	
Battery Series Support		16S x 10	
Rated voltage		512V	
Rated current		100A	
Number of BMU ma	anagement	10	
Two level protection	I	Relay & MCB	
LCD Screen integrat	ed	Into the cabinet	
LED indicator		RUN & ALM	
Balance between ba	ttery modules	Passive, integrated	
Balance between ce	lls	Passive, integrated	
BMU temperature	No. of sensor	8	
sensor	Accuracy	±2℃	
BMU cell voltage	Accuracy	±5mV	
Current sensor	Range	-400~+400A	
Current sensor	Accuracy	FSC±1%	
SOC calculate error		≤5%	
Power	Switch off	0	
consumption	Operating	< 40W	
Dimension (W*D*H) mm		442*650*225mm	
Weight		40kg	
Communication		CAN, RS485, Ethernet	
Dry contact integrated		3	

For this project, we choose the CBMS+BMU for UPS system.



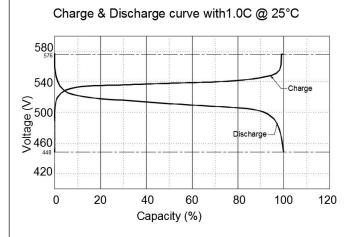
BMS settings

Item	Name	Value	
	Rated capacity of one string	100AH	
	Number of module in one string	10	
Basic	Number of cells of one module	16	4P-16S
	Number of temp sensor in one module	8	
	BMS Communication ID	0~15	
	Rated charging voltage	560.00V	
Rated	Rated charging current	50.00A	
Rated	Rated discharging current	100.00A	
	Rated discharging cut-off voltage	448.00V	
	Warning	584.00V	
Charging voltage	First-class protection	592.00V	
protection for system	Second-class protection	600.00V	
	Protection release	552.00V	
	Warning	448.00V	
Discharging voltage	First-class protection	432.00V	
rotection for system	Second-class protection	400.00V	
	Protection release	480.00V	
	Warning	55.00A	
Charging current	First-class protection	105.00A	
protection	Second-class protection	120.00A	
	Protection release	100.00A	
	Warning	110.00A	
Discharging current	First-class protection	150.00A	
protection	Second-class protection	200.00A	
	Protection release	100.00A	
	Warning	3700mV	
Over-charging voltage	First-class protection	3800mV	
protection for cell	Second-class protection	3900mV	
	Protection release	3500mV	
ver-charging voltage	Warning	2500mV	
protection for cell	First-class protection	2200mV	

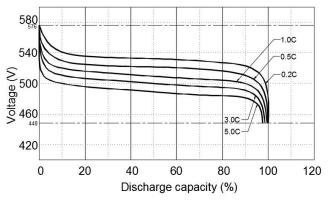
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	Second-class protection	2000mV		
	Protection release	3000mV		
	Warning	60 °C		
Charging over	First-class protection	65 ℃		
temperature protection	Second-class protection	70 ℃		
	Protection release	45 ℃		
	Warning	-3 °C		
Charging low	First-class protection	-5 °C		
temperature protection	Second-class protection	-10 ℃		
	Protection release	0 ℃		
	Warning	65 ℃		
Discharging over	First-class protection	70 °C		
temperature protection	Second-class protection	75 ℃		
	Protection release	60 °C		
	Warning	-10 °C		
Discharging low	First-class protection	-20 ℃		
temperature protection	Second-class protection	-25 °C		
	Protection release	0 ℃		
	Balance start voltage	3450mV		
Cell balance inside	Voltage difference_start	40mV		
module	Voltage difference_Stop	20mV		
	Balance start voltage	53.00mV		
Voltage balance between		300mV		
modules	Voltage difference_Stop	100mV		
	Fan start	45 ℃		
Cooling Fan control	Fan stop	35 ℃		
5	Fan starting current	30mA		
	The difference of string voltage			
Parallel	when connect strings in parallel	<15V		
	Module Module	CAN		
	Module — BMS	CAN		
Communication	BMS → UPS/GBMS	CAN		
	BMS → PC	LAN/RS485		



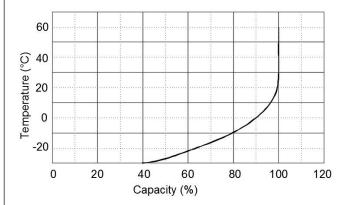
5. Performance curve



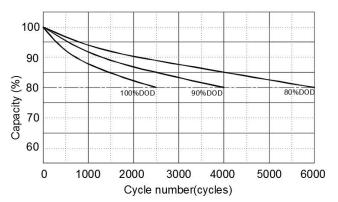
Discharge perfomance with different rate @ 25°C



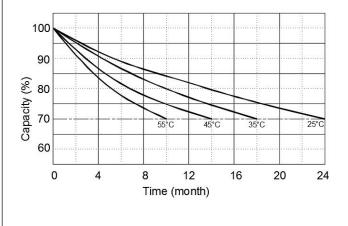
Discharge capacity with different temperature @ 1.0C

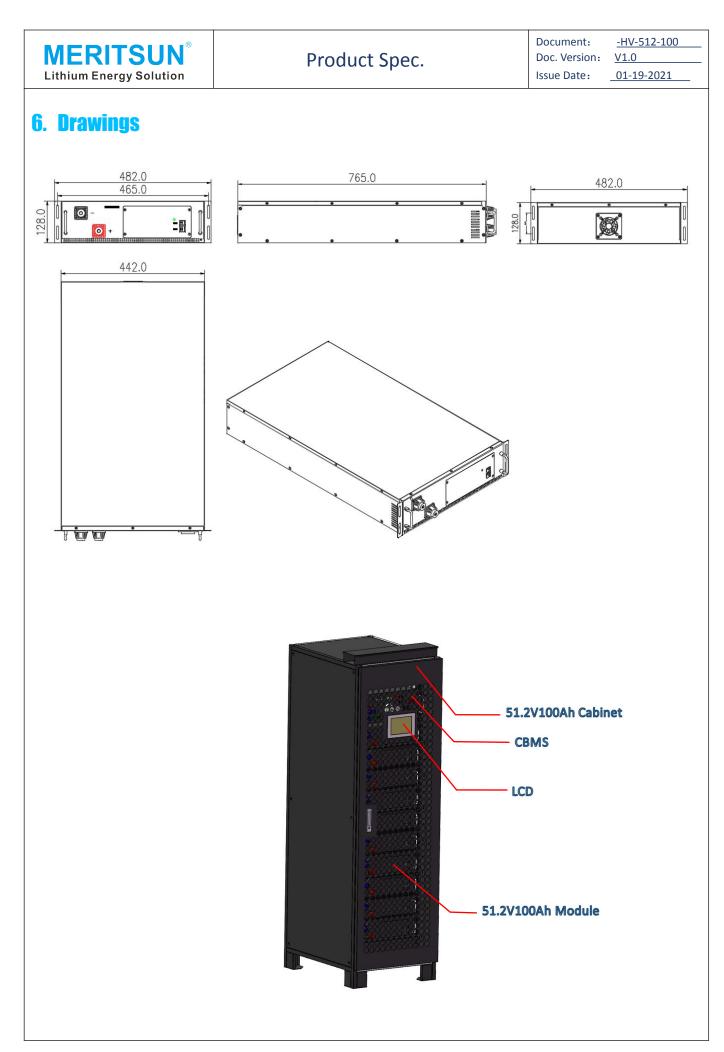


Cycle life with DOD @ 1.0C, 25°C



Self-discharge @ different temperature







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 -HV-512-100

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7. PC Software Preview

LS_BMS_Monitor	V 1.2.5.4							
Q Search Device	BMS	Monitoring PHS	Parameter)	fistory Records	di Real-time M	onitoring Records	Warning & Pro	ection
nitor Status Local IP	-System Infomation-				and the second se	Warning Status	Protect 1 Status	-Protect 2 Statu
192.168.0.250 ×	- Statur	MaxCell	mV	Module Num		Pack OV	Pack OV	Pack OV
Device IP	Voltage	V MinCell	mγ	Module Num		Pack W	Pack UV	Pack UV
	P-Current	A DifCell	mγ			Charge OC	Charge OC	Charge OC
Start Monitorin	N-Current	A MaxTemp	r o	Module Num		Discharge OC	Discharge OC	Discharge OC
ce List	SOH	% MinTemp	Dr.	Module Num		Charge OT	Charge OT	Charge OT
	SOC	% DifTemp	с лсь	us voltage	γ	Charge UT	Charge UT	Charge UT
	-Module Information	Balancing C	11		_	BMU Failure	BMU Failure	BMU Failure
	Module 1	•	1 2 3 4 5	6 7 8 9 10 11 12	13 14 15 16	Temp Imbalance	Temp Imbalance	Temp Imbalanc
						Cell Imbalance	Low Insulation	Low Insulatio
	CellO1	Cel102	Cel103	Cel104		Low SOC	Cell Imbalance	Cell Imbalanc
	Cell05	Cell06	Cel107	Cel108		Low Insulation	Low SOC	Low SOC
	Cell09	Cell10	Cell11	Cell12		Cell OV	Cell OV	Cell OV
	Cell13	Cell14	Cell15	Cell16		Cell UV	Cell UV	Cell UV
		Cerrit	Cellis	Cerrio		Discharge OT	Discharge OT	Discharge OT
	Temp01	Temp02	Temp03	Temp04		Discharge UT	Discharge UT	Discharge VI
	Temp05	Temp06	Temp07	Temp08				
	MaxCell	MinCell	AvgCell	DifCell		SelfCheck	Breaker & Contacto	r Status
ce Information						Hall sensor	MCB	Erre
lel	MaxTemp	MinTemp	AvgTemp	DifTemp		Ethernet	Positive Charge Con	ntactor Erro
ial Number	Module-Communicati	on 6 7 8 9 10 11 12 13 1	4 15 16 17 18 19 20 21	22 23 24 25 26 27 28	29 30 31 32	Memory	Discharge Contactor	Err
mware Verison	Module-Voltage	6789101112131	4 15 16 17 18 19 20 21	22 23 24 25 26 27 28	29 30 31 32	BMU Power	Negative Charge Com	ntactor Err
dware Verison	Module-Temperature					SendTime		
states	Data info	0%	Server Start 0	(2020-02-28 1

8. Packing List

No.	Item	Specification	Number	Remarks
1	Cabinet	IP20,600*1000*2000mm(W* D* H)	1pcs	
2	LiFePO4 battery rack	MSPUES48100 51.2V100Ah battery rack	10pcs	
3	CBMS Module	MSP16S08D400A Battery system CBMS	1pcs	
4	LCD Screen	Integrated on the cabinet	1pcs	
5	Power cable	Connecting battery racks, CBMS, UPS and utilization equipment.	1 set	
6	Communication cable	Communication cable between battery racks and CBMS, LCD	1 set	
7	User manual	User manual	1pcs	
8				
	1			