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Celxpert

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2. Battery Module Specification

Item	Function		Specification	Comment
1.	Cell Type		Li-ion ICR18650-2.2AH	
2.	Module Configuration.		60S10P	
	Nominal Voltage		216V DC	
	End of Discharge Voltage		168V DC	DischargerEndVoltage:2.8V/per cell
3.	Nominal Capacity		22.0 Ah	
4.	Minimum Capacity		21.3Ah	1.0C discharge rate, 2.8V cut off after standard charge
5.	Charging Method		CC-CV Mode	
	Charging Voltage		252V DC	
	Charging Current		11 A	0.5C
6	Max. Discharge Current		30 A	Except Over Temperature protection occur
7.	Cycle Life	Normal mode	>80% of initial capacity with 300 cycles at 25°C ambient.	
		Long life mode	TBD	"Long life mode" means to limit the available capacity of the battery to extend cycle life
8.	Initial AC Impedance		<400mΩ	1kHz AC Method
9.	Charge Continue Temperature		0°C~45°C	
10.	Discharge Temperature		-20°C~50°C	
11.	Storage Temperature without system(1*)		-20°C~40°C	Less than 12 months
			-20°C~50°C	Less than 6 months
12.	Storage Humidity(1*)		20%~85%	
13.	Pack Weight		<40Kg	
14	Communication Interface		CAN Bus	
15	Dimension		570x250x300 (mm)	WxDxH

Note (1*): If the cell is kept as ex-factory status (50% of charge), the capacity recovery rate is more than 80%.

3. Terminals and parts on front panel

Terminals / parts	Function
PACK+	Charge & Discharge positive output
PACK -	Charge & Discharge negative output
CAN1	Communication Interface
CAN2	Communication Interface
Power SW	Power switch of ESS
Reset Button	Reset the ESS from abnormal condition.
LED indicator	Indicate the ESS status

4. BMU

4.1 Protection Function (Ta=25°C unless otherwise specified)

No.	Function	Detection Condition	Action	Release Condition	Comment
1	Over-charge Voltage	4.25V±0.025V/cell for 0.5~1.5sec	Action-A(2*)	V_Cell <4.1V±0.05V	
		4.20V±0.025V/cell for 0.5~1.5sec	Action-B(3*)	Remove charger & push "Reset Button"	
		4.40V±0.025V/cell for 0.5~1.5sec	Action-B	Unreleaseable	
2	Under voltage	3.0V±0.025V/cell for 0.5~1.5sec.	Action-A	3.2V±0.025V/cell	
		2.8V±0.025V/cell for 0.5~1.5sec	Action-B	Apply charger & push "Reset Button"	
3	Over-discharge Current	>33A for 3~5s	Action-A	Current < 31A	
		>33A for 10s	Action-B	Push "Reset Button"	
		>40A for 0.5~1.5s			
4	Over Temperature	Cell Temp. ≥ 65±3°C	Action-A	Cell Temp. ≤ 40±3°C	
		Cell Temp. ≥ 70±3°C	Action-B	Cell Temp. ≤ 40±3°C & Push "Reset Button"	
5	Under Temperature	Cell Temp. < -20±3°C	Action-B	Unreleaseable	
6	Miss communication	CAN Bus miss communication for 10 seconds.	Action-B	Communication resume & Push "Reset Button"	
7	Cell Balance	TBD	Bleeding the higher voltage cell.	TBD	Bleeding Current:100 mA

Note (2*): Action-A: Request to stop charging or stop discharge via CAN Bus

Note (3*): Action-B: Cut off the ESS power relay by ESS oneself. While the ESS perform the Action-B, the precedent "Release condition" is correcting communication between ESS and Inverter condition. In other word, the CAN bus of ESS should always connect with Inverter correctly.