

Technical Specification of 48V100AH Energy Storage Battery

Model : TYL-48-100

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Contents

Contents.....	1
1. Scope.....	2
2. Mechanical Design.....	2
2.1 Battery specification: 51.2V,100AH.....	2
2.2 Battery dimension: 442*525*133mm.....	2
2.4 Combination Method: 16S.....	2
3. Battery Pack Basic Performance.....	3
4. Main Performance.....	3
4.1 Battery pack main performance parameter.....	3
4.2 Ambient Character.....	4
4.3 Safe Performance.....	5
5. BMS.....	5
5.1 Protection Parameter.....	5
5.2 Electrical Parameter.....	6
6. Storage and Transportation Requirement.....	7
7. Note for battery Usage.....	8
7.1 Prohibition.....	8
7.2 Attentions.....	8

1. Scope

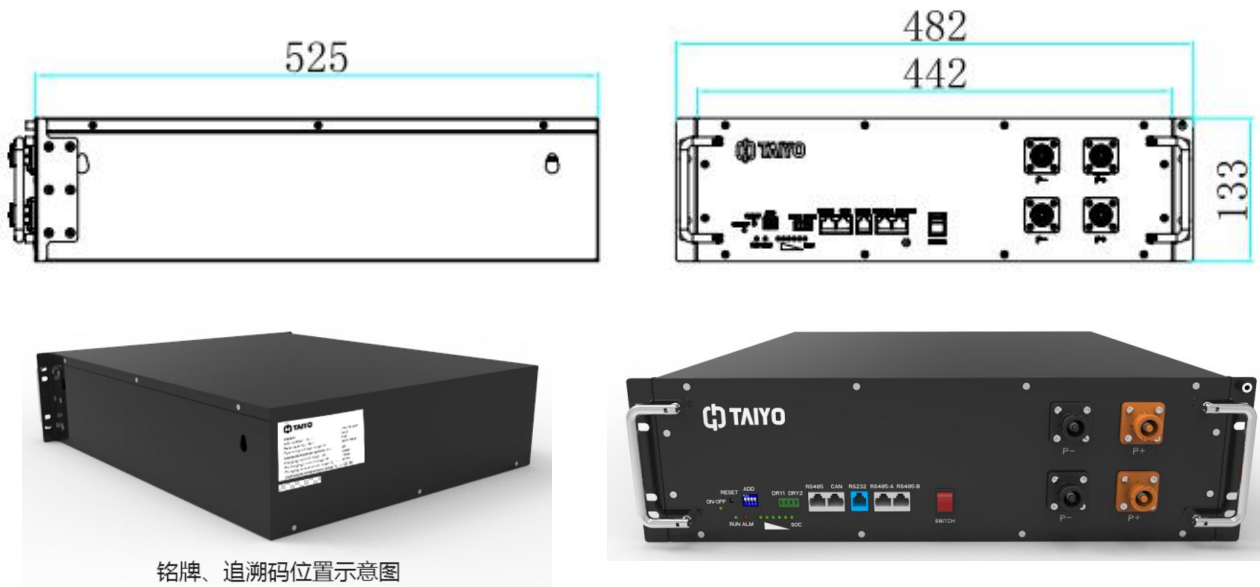
This specification describes the external dimensions, characteristics, technical requirements and matters needing attention of Energy Storage battery. This specification is applicable to TYL-48-100 lithium iron phosphate battery produced by Enertik.

2. Mechanical Design

2.1 Battery specification: 51.2V, 100AH

2.2 Battery dimension: 442*525*133mm

2.3 Combination Method: 16S



铭牌、追溯码位置示意图

Nameplate content:

Model :	TYL-48-100
Rate voltage (V) :	51.2
Rate capacity (Ah) :	100
Energy: (Wh) :	5120
Operating voltage range (V) :	43.2~58.4
Standard charging current (A) :	20
Charging current range (A) :	≤100
Discharging current range (A) :	≤100
Charging temperature range (°C):	0~55
Discharging temperature range (°C):	-20~60

3. Battery Pack Basic Performance

No.	Item	Parameter	Remark
1	Rated Capacity	100AH	23°C ± 5°C, 0.2C Constant current discharging ,43.2V cut off
2	Rated Voltage	51.2V	Battery module rate voltage
3	Standard Charge Current	20A (0.2C)	0°C~45°C, , 0.2C CC charge to 58.4V,then CV charge Cur off when charging current ≤ 0.05C.
4	Max. Charge Current	100A (1C)	0°C~45°C, less than 1C
5	Charge Cut Off Voltage	58.4V	
6	Max Continuous discharge Current	100A (1C)	25°C ± 3°C, continuous 100A discharge
7	Discharge Cut Off Voltage	43.2V	
8	Max Pulse Discharge Current	110A	25°C ± 3°C; ≤ 1S
9	Working Temperature(charge)	0°C~55°C	During charge, battery and ambient temperature should not exceed 55°C
10	Working Temperature(discharge)	-20°C~60°C	Battery can work at specified temperature range with capacity loss in tolerance
11	Weight	42 ± 2kg	
12	Impedence	≤ 25m Ω	AC 1kHz impedence with half electricity

4. Main Performance

4.1 Battery pack main performance parameter

NO.	Item	Standard	Test Method
1	Discharge Rate Character	0.2C	Test Temperature: 25°C ± 3°C; Charge: 0.2C CC charge to 58.4V, transfer to constant voltage ,Cut off when current ≤ 0.05C Discharge:0.2C/0.5C/1C constant current discharge cut off@43.2V.
2		0.5C	

		1C	≥97%	
3	Capacity & Temperature Character	55℃	≥95%	Charge: 0.2C CC charge to 58.4V, transfer to CV, cut off when current ≤0.05c; Discharge:0.5C CC discharge cut off at 43.2V,2 hours interval for the temperature.
4		45℃	≥95%	
5		25℃	100%	
6		0℃	≥65%	
7		-10℃	≥50%	
8	Life Cycle Character		≥6000	After finish the standard charging , lay aside for 30 min, in 25℃ ± 5,0.3C CC discharge to 80% DOD, then go for next cycle.
9	Storage Character	25℃ 6months	≥95%	Charge battery with 60%~75% capacity for storage
10		45℃ 3months	≥90%	
11		60℃ 1months	≥90%	

4.2 Ambient Character

NO.	Item	Standard	Test Method
1	Steady damp heat test	No fire, No explosion, No leakage. Discharge capacity cannot be lower than 60% of initial capacity	After standard charge, test as below: Temp:40℃ ± 5℃ , Relative Humidity:90%~95%; Standing time:48h; take out and place for 2h at room temperature, Then discharge with 1C till cut off voltage
2	Vibration	No fire, No explosion, No leakage.	After standard charge, fix to vibration machine and vibrate 30 minutes each at XYZ direction. Frequency Sweeping Rate:1oct/min; Vibration Frequency:10Hz~30Hz; Displacement amplitude(Single):0.28mm; Vibration Frequency:30Hz~55Hz; Displacement amplitude(Single):0.19mm.
3	Low Pressure	No fire, No explosion, No	Under 25 ± 3℃ ambient temperature, put

		leakage.	call into vacuum cabinet, and reduce internal pressure gradually to not high than 11.6kPa(Simulated altitude 15240m), keep 6 Hours
4	Drop Test	No fire, No explosion, No leakage.	Under the condition of shipment, the battery is free fall from a height of 1 m to a concrete floor of 5 cm thick repeat 3 times from X,Y,Z axis direction.

4.3 Safe Performance

NO.	Item	Standard	Test Method
1	Over Charge Test	No fire, No explosion, No leakage	After standard charge, Under 25°C ± 3°C ambient temperature for 1h. Then under the same temperature, 0.5C constant current charge to 5V(the simple cell)
2	Over Discharge Test	No fire, No explosion, No leakage	After standard charge, Under 25°C ± 3°C ambient temperature for 1h. Then under the same temperature, 0.2C constant current discharge to 0V(the simple cell)
3	Heat shock	No fire, No explosion, No leakage	Put battery in hot cabinet, temperature is up with 5°C
4	High Temperature Test	No fire, No explosion, No leakage	After standard charge, place battery in 85°C for 4h.
5	Short Circuit	No fire, No explosion, No leakage	After standard charge, ambient temperature for 1h. Then put the battery by external short circuit for 10min, the outside line resistance should be less than 100mΩ.

5. BMS

5.1 Protection Parameter

NO.	Item	Description	Value	Unit
1	Over Charge Parameter	Unit Overcharge Warning Voltage	3600	mV
		Unit Overcharge Protection	3650	mV
		Battery pack over charge warning voltage	57.6	V

		Battery pack over charge Protection voltage	58.4	V	
2	Over Discharge Parameter	Unit Over discharge Warning Voltage	3000	mV	
		Unit Over discharge Protection voltage	2700	mV	
		Battery pack over discharge warning voltage	48	V	
		Battery pack over discharge Protection voltage	43.2	V	
3	Charge Over Current Parameter	Charge Over Current Warning	105	A	
		Charge 1st over current	110	A	
		Short circuit at charging port	YES		
4	Discharge Over Current Parameter	Discharge Over Current Warning	105	A	
		Discharge 1st over current	110	A	
		Discharge 2st over current	130	A	
		Short circuit at discharging port	YES		
5	Temperature Protection	Charge	High temperature warning	50.0	°C
			Low temperature warning	5.0	°C
			High temperature protection	55.0	°C
			Low temperature protection	0.0	°C
		Discharge	High temperature warning	55.0	°C
			Low temperature warning	-15.0	°C
			High temperature protection	60.0	°C
			Low temperature protection	-20.0	°C

5.2 Electrical Parameter

NO.	Item	Min	Typical	Max	Unit
1	Manage cell qty	-	16	-	↑
2	Normal Working Voltage	-	51.2	58.4	V
3	Working temperature range	-20	25	60	°C
4	Continuous charge current	-	20	100	A
5	Continuous discharge current	-	50	100	A
6	Total Operate Power Consumption	-		45	mA
7	Total dormant Power Consumption			200	uA

NO.	Function	Description
1	Setup address devices	By dial switch

2	System Rest	Using reset button
3	Communicate Interface	RS485 connector allows several devices connecting in parallel to enlarge battery capacity. RS232 interface communicates with computer. CAN communication and inverter communication
4	SOC Evaluate and Display	Can dynamic evaluate SOC for each battery pack, and display the remaining power by 4green LED.
5	Operation Status Display	Can display system operation status by 1 green LED.
6	Failure Warning Display	Can display system failure by 1 red LED
7	Data Storage	Can record battery array's voltage , temperature, each charge and discharge power
8	Low Consumption	Very slight static consumption deviation, and low operation & standby consumption
9	SOH Evaluation	Per sampling information, can do SOH evaluation for whole battery
10	Balance Management	The balanced opening voltage is 3380mv and the opening voltage difference is 30mV to improve the battery consistency
11	Unit Voltage Inspection	Test cell unit's voltage, 16S Max can be inspected
12	Temperature Inspection	Battery temperature protection function , battery high& low temperature protection and component high temperature protection.
13	Charge & Discharge control	Disconnect failed module when at abnormal charge, over discharge, over-hot, over current, short circuit, separate each defective module timely and reduce defective scope.
14	Short Circuit Protection	When battery has short circuit, system will be automatically protective within 300Us, Disconnect load and recover.
15	Communication	Through connection between upper computer and BMS, can remote signaling. Remote control, remote adjust,
16	Battery in Parallel Connection Management	Support multiple-unit battery connection in parallel, and set up address. Charge limiting current is 20A(0.2C).
17	Switch	The power switch is on the front panel

6. Storage and Transportation Requirement

Item	Requirement
Storage Temperature	Less than 1month -20℃~55℃
	Less than 6months -10℃~+35℃
Humidity	<70%RH
Storage SOC	60%~75%SOC

7. Accessories list

NO.	Product	Discription	Quantity	Unit
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1	Positive pole of power line	L500mm 25mm ² Quick connector at one end and 25mm ² terminal at one end	1	PCS/module
2	Negative pole of power line	L500mm 25mm ² Quick connector at one end and 25mm ² terminal at one end	1	PCS/module
3	Battery positive parallel line	L200mm 25mm ² Red quick connectors at both ends	1	PCS/module
4	Battery negative parallel line	L200mm 25mm ² Black quick connector at both ends	1	PCS/module
5	RS485 communication line	Length:500mm,RJ45 port *2	1	PCS/module
6	RS485-USB Converter Cable	Length:1500mm,	1/8	PCS/8 modules
7	RS232-USB Converter Cable	Length:1500mm,	1/8	PCS/8 modules
8	CAN communication line	Super class 5 8-core 3000mm long RJ45 terminals with two ends pressed	1	PCS/module

8. Note for battery Usage

8.1 Prohibition

For avoiding battery leakage, heat radiating, explosion, below prevent tips should be taken care of: :

- A) Prohibition of disassembly or re-assembly;
- B) Prohibition of short circuited battery;
- C) Prohibition to use near hot source;
- D) Prohibition of dumping of battery into water ,ocean or getting battery wet;
- E) Prohibition of charging near fire or under sunlight;
- F) Charge with specified charge according to charging requirement;
- G) Prohibition of inserting nail into battery, hammering or stepping on foot;
- H) Prohibition of throwing;
- I) Prohibition to use with damaged or deformed battery

8.2 Attentions

- A) Prohibit of using battery in sunlight, otherwise will cause over hot, firing, or function failure , life reducing;
- B) Prohibit use near static place which over 64V;
- C) Prohibit charge at temperature below 0°C or above 60°C ;
- D) When use at first time, if has corrosion, or bad smell, or any other abnormal, please do not use;