YN-LP-51.2V100Ah-J Lithium iron phosphate

Product Specification

Authorized strength:	Examine and verify:	Ratify:
Date:	Date:	Date:
Customer confirmation:		

Specification book revision record

Date	Revise the reason	Revised

Catalogue

1. Preface

This standard is the enterprise standard uniformly implemented by the company.

This standard is set up according to GB / T38713-2020 National Standard for Energy Storage Batteries.

This standard is drafted by the power storage Battery Department.

This standard is managed by the power storage battery Department.

The main drafters of this standard: Li Xiang.

2. Scope of application

This product specification is only used in the YN-LP-51.2V100Ah-J model lithium iron phosphate battery produced by the company.

3. Terms and relevant definitions

3.1. Rate current: abbreviated symbol C, 1C represents the current of the battery charged and discharged at a rate of 1 hour,

3.2. DC internal resistance: under the condition of room temperature (25℃± 2℃) and 50%S0C, with the maximum pulse current discharge for 10s, calculate the voltage and current change before and after the discharge, and then divide the

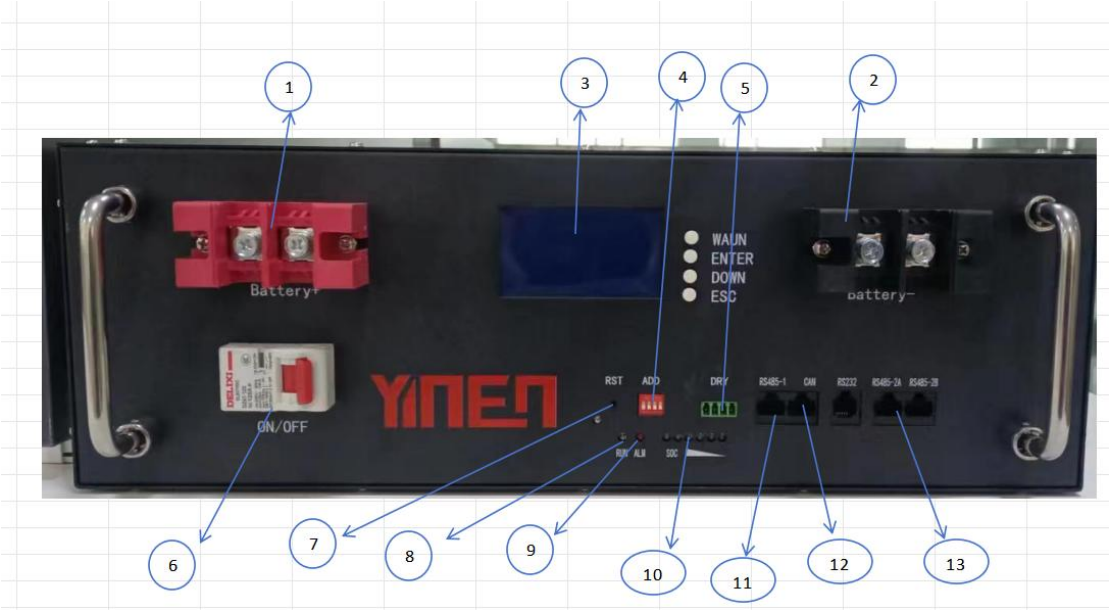
difference of the voltage change by the difference of the current change, that is, the DC internal resistance.

3.3. Maximum continuous charging current: the maximum continuous charging current allowed by the battery to ensure the normal operation of the battery at the specified temperature.

3.4. Maximum continuous discharge current: the maximum continuous discharge current allowed by the battery to ensure the normal operation of the battery at the specified temperature.

4. Battery-related parameters

4.1 Battery appearance



Number	Item
1	Battery positive pole
2	Battery negative electrode
3	Display screen
4	Dial switch
5	Dry contact point
6	Air circuit-breaker
7	Reset switch
8	Battery running light
9	Battery alarm lamp
10	SOC pilot lamp
11	The RS485 communication interface
12	CAN communication interface
13	Parallel RS485 communication interface

4.2 Battery-related parameters

Items		Specifications	Remarks
Individual Cell Parameters	Cell model	IFP50160116-102AH	
	Cell size	50mm×160mm×116mm	Thickness×width×height
	Nominal voltage	3.2V	
	Nominal capacity	102AH	
	Communication internal resistance	0.27mΩ≤R≤0.4mΩ	
	DC internal resistance	R=1.5mΩ	
Battery Pack Parameter	Nominal voltage	51.2V	
	Nominal capacity	102Ah	
	Product size	450mm×400mm×150mm	length x width x height (excluding exposed parts)
	Charging port	2P wall-type terminal	
	Discharge port	2p through-wall terminal	
	Compound mode	16S1P	
	Protocol	CAN RS485	
	Product weight	45KG	
	Nominal charge and discharge current	50A	
	Maximum continuous charge and discharge current	100A	
	Peak discharge current	110A	
	Charging cut-off voltage	58.4V	
	Discharge cut-off voltage	40V	
	Optimum operating temperature range	10 - 35℃	
	Discharge temperature range	-30 - +60℃	
	Charging temperature range	-10 - +55℃	Continuous charging below 0℃
	Storage range	-10℃ - +30℃	Long-time storage temperature

			25±2℃
	Cycle index	⩾5000cycles	100% deep charge and discharge at 0.33C rate
	Battery protection grade	IP64	
Accessories	Charger		
	Battery wiring		

5. Battery management system

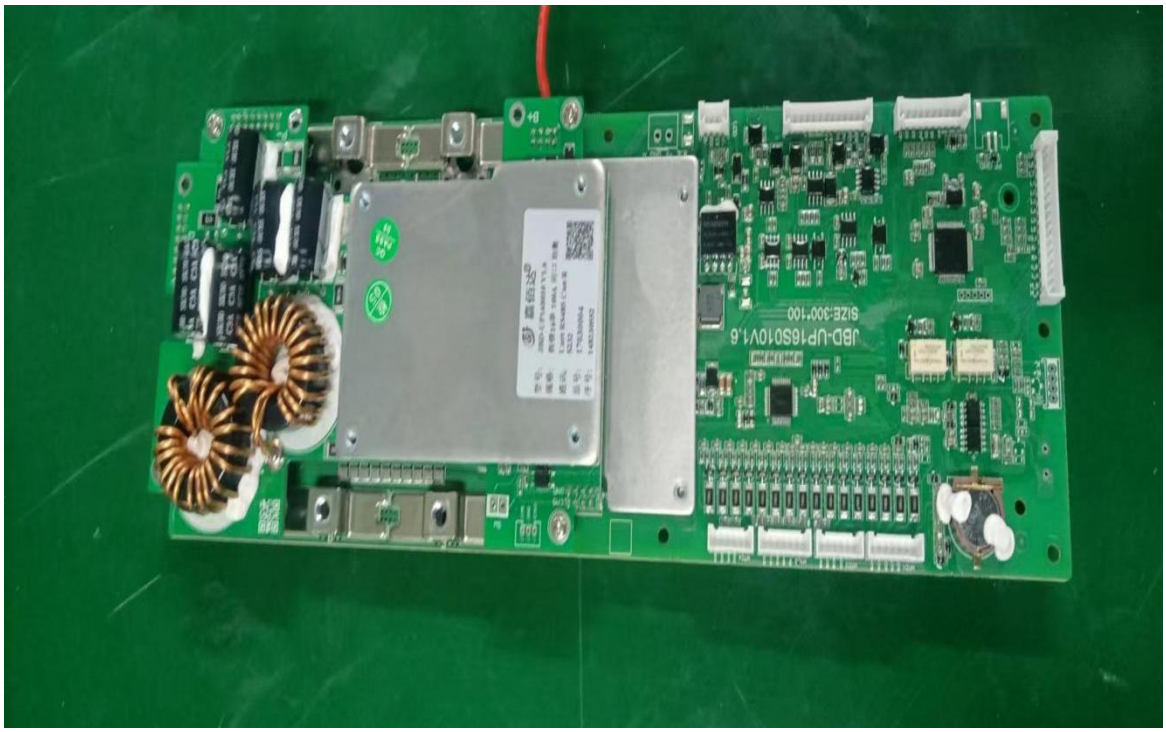
5.1 Description of the battery management system

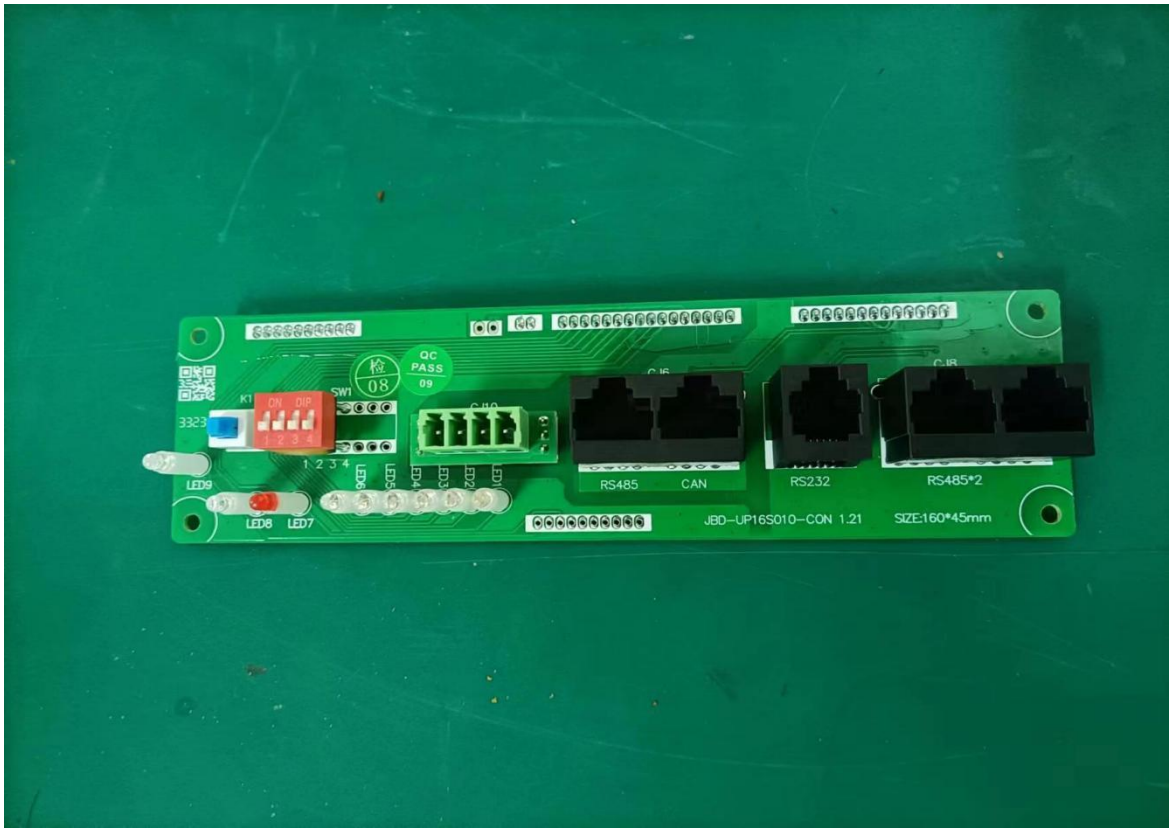
1.BMS is designed for 16 series of lithium-ion batteries

2. the BMS system has the following functions:

- Over charge protection function
- Over-discharge protection function
- Over current protection function
- Short circuit protection function
- Temperature protection function
- Balanced function
- Communication function
- Warning function
- Total capacity function
- Storage history function

5.2 Appearance of the battery management system





5.3 Parameters of the battery management system

	Items	Specifications			Unit	Remarks
		least value	representative value	crest value		
Functions	Over voltage protection voltage	3.620	3.650	3.680	V	Settable
	Overcharge protection delay time	1000	2000	3000	ms	
	Overcharge protection recovery voltage	3.330	3.380	3.430	V	Settable
	Over-discharge protection voltage	2.600	2.700	2.800	V	Settable
	Over-discharge protection delay time	1000	2000	3000	ms	
	Over-discharge protection recovery voltage	2.850	2.950	3.050	V	Settable
	Over-discharge protection recovery conditions	Voltage self-recovery or charge recovery				
Over current Protection during charge	Charging over current protection value	120	130	140	A	
	Charging over current delay	0.5	1.0	1.5	S	
	Charge over current release conditions	Automatic reply after 60s delay				
Discharge Over current protection	Discharge over current 1 protection value	120	130	140	A	
	Discharge over current 1 protection delay	5	10	15	S	
	Discharge over current 2 protection value	300	350	400	A	
	Discharge over current 2 protection delay	250	500	750	ms	
	Discharge over current protection recovery conditions	Delay of 60s automatic recovery				
	Short circuit protection current		1400		A	
	Short circuit protection current delay	200	300	600	Us	
	Short circuit protection recovery	Recovery after disconnecting the load				
	Short circuit instructions	The short circuit current is less than the minimum value or higher than the maximum value may cause short circuit protection failure. The short circuit current exceeds 3000A, and the short				

		circuit protection test is not recommended.				
Discharge high Temperature protection	Temperature protection value	65	70	73	℃	
	Temperature protection release value	57	60	63	℃	
Low discharge Temperature protection	Temperature protection value	-23	-20	-17	℃	
	Temperature protection release value	-18	-15	-12	℃	
Charging high Temperature protection	Temperature protection value	62	65	68	℃	
	Temperature protection release value	52	55	58	℃	
Charging low Temperature protection	Temperature protection value	-8	-5	-2	℃	
	Temperature protection release value	-3	0	3	℃	
FET discharge high temperature protection	Temperature protection value	110	115	120	℃	
	Temperature protection release value	80	85	90	℃	
High environment Temperature protection	Temperature protection value	72	75	78	℃	
	Temperature protection release value	62	65	68	℃	
Low environment Temperature protection	Temperature protection value	-23	-20	-17	℃	
	Temperature protection release value	-18	-15	-12	℃	
Balanced function	Lithium iron equalized open voltage	3.470	3.500	3.530	V	
	Lithium iron opens the pressure difference		30		mV	

	equalizing current	20		60	mA	
	Balanced way	Static / charge balance				
	Balanced type	Time-sharing equilibrium / pulse equilibrium				
charge current-limiting function	Charging-limiting current opening conditions	Turn on after charging and over current protection				
	Charging limit current	20±2A				
	Charging limit is closed	Charging current is <1A or over voltage protection				

6 Battery communication

6.1 RS485 communication and UART communication.

Various information of the battery can be monitored through the host computer, including battery voltage, current, temperature, status and battery production information, etc. The default baud rate is 9600bps.

6.2 CAN communication

Environment configuration: To install USB CAN Driver into a computer, you first need to check the computer operating system. 32-bit operating systems and 64-bit operating systems match different driver files. (32-bit operating systems match the file suffix "x86", and 64-bit operating systems match the file suffix "x64"). Finally, you can view the port in your computer's Device Manager to check whether the installation was successful. Connection method: Insert the USB cable of the communication box into the USB port of the computer, and connect the other end to the corresponding interface of the battery protection plate. Communication format: ID CAN ID 0 is selected by default, CAN device is selected according to the

communication box type, the baud rate defaults to 500K, and the channel selection defaults to 0.

6.3 Battery parallel communication

When PACK packages are used in parallel, the address can be set through the DIP switch on the BMS to distinguish different PACK packages. To avoid the same PACK package address, refer to the following table for the definition of the BMS DIP switch.

Address bit (binary system)	Switch position				Illustrate
	1	2	3	4	
0000（0）	OFF	OFF	OFF	OFF	Select MASTER (0000) for 485 communication alone, and be the host for parallel communication
0001（1）	OFF	OFF	OFF	ON	Select SLAVE1 (0001)
0010（2）	OFF	OFF	ON	OFF	Single-channel 485 communication time selection SLAVE2 (0010)
0011（3）	OFF	OFF	ON	ON	Single 485 communication SLAVE3 (0011)
0100（4）	OFF	ON	OFF	OFF	Single 485 communication SLAVE4 (0100)
0101（5）	OFF	ON	OFF	ON	Single 485 communication SLAVE5 (0101)
0110（6）	OFF	ON	ON	OFF	Single 485 communication SLAVE6 (0110)
0111（7）	OFF	ON	ON	ON	Single 485 communication SLAVE7 (0111)
1000（8）	ON	OFF	OFF	OFF	Select SLAVE8 (1000)
1001（9）	ON	OFF	OFF	ON	Select SLAVE9 for single 485 communication (1001
1010（10）	ON	OFF	ON	OFF	Single 485 communication SLAVE10 (1010)
1011（11）	ON	OFF	ON	ON	Single 485 communication SLAVE11 (1011)
1100（12）	ON	ON	OFF	OFF	Select SLAVE12 (1100)
1101（13）	ON	ON	OFF	ON	Select SLAVE13 for single-channel 485 communication (1101)
1110（14）	ON	ON	ON	OFF	Select SLAVE14 for single-channel 485 communication (1110)
1111（15）	ON	ON	ON	ON	Illustrate

7 LED lamp operating status

Table 1: LED working status indication

State	Normal warning protection	ON/OFF (LED9)	RUN (LED8)	ALM (LED7)	Power instructions (LED6-1)						Illustrate
		●	●	●	●	●	●	●	●	●	
Shutdown	Hibernate Mode	Off	Off	Off	Off	Off	Off	Off	Off	Off	All Turn off
Standby	Normal	On	Flash 1	Off	According to battery indicator						Standby mode
	Warn	On	Flash 1	Flash3							low voltage
Charg	Normal	On	On	Off	According to battery indicator						The battery power LED
	Report an	Off	On	Flash	(The highest battery indicator						

e	emergency			3	LED flashes 2)						flashes (flash 2), and the ALM does not flash when there is an overcharge alarm.
	Overcharge protection	On	On	Off	On	On	On	On	On	On	If there is no mains power, the indicator light turns to standby state. state
	Temperature, over current, failure, and protection	On	Off	On	Off	Off	Off	Off	Off	Off	Stop charging
Discharge	normal	On	Flash 3	Turn off	According to the electricity instruction						
	report an emergency	On	Flash 3	Flash 3							
	Under voltage protection	Off	Flash 12	Off	Off	Off	Off	Off	Off	Off	Stop discharge
	Temperature, over current, short circuit, back connection, failure protection	On	Off	On	Off	Off	Off	Off	Off	Off	Stop discharge
Failure		Off	On	On	Off	Off	Off	Off	Off	Off	Stop charging and discharge

Table 2 Description of battery capacity indication

State	Charge	discharge

Capacity indicator light		L6 ●	L5 ●	L4 ●	L3 ●	L2 ●	L1 ●	L6 ●	L5 ●	L4 ●	L3 ●	L2 ●	L1 ●
Battery Level	0-16.6%	Off	Off	Off	Off	Off	Flash 2	Off	Off	Off	Off	Off	On
	16.6%-33.2%	Off	Off	Off	Off	Flash 2	On	Off	Off	Off	Off	On	On
	33.2%-49.8%	Off	Off	Off	Flash 2	On	On	Off	Off	Off	On	On	On
	49.8%-66.4%	Off	Off	Flash 2	On	On	On	Off	Off	On	On	On	On
	66.4%-83.0%	Off	Flash 2	On	On	On	On	Off	On	On	On	On	On
	83.0%-100%	Flash 2	On	On	On	On	On	On	On	On	On	On	On
Running lights		Often bright						Flashing (Flash 3)					

Table 3. Description of the LED flashing

Flash mode	On	Off
Flash 1	0.25s	3.75s
Flash 2	0.5s	0.5s
Flash 3	0.5s	1.5s

8 Battery test requirements

The test battery must be a new battery with the company's factory time of no more than one month, and the battery has not carried out more than five charge and discharge cycles. Unless other special requirements, the environmental

conditions are: temperature 25 ± 2℃, charge / discharge current 0.33C, relative humidity 75%, air pressure 86 Kpa ~ 106 Kpa.

9. Battery storage and transportation requirements

9.1 According to the characteristics of the battery, the lithium battery pack shall meet the storage environmental conditions during the storage and transportation process,

To maximize the protection of the battery's performance.

9.2 During the storage and transportation of lithium battery, appropriate protection should be provided, to maintain the SOC level of about 50%~70%,

Ensure no short circuit and liquid into the lithium battery pack or soak in liquid (such as water, oil, etc.)

9.3 If not in use temporarily, the battery should be stored in a dry, clean and well-ventilated warehouse of 10℃ ~35℃.

9.4 In the process of loading and unloading, the battery should be moved and put gently to strictly prevent throwing, rolling and overloading.

10 Hazards and warnings

To prevent battery leakage, heating and explosion, note the following precautions:

warn!

It is strictly prohibited to immerse the battery in seawater or water. When stored in use, it should be placed in a cool and dry environment;

It is strictly prohibited to reverse the positive and negative electrode use battery;

It is forbidden to directly connect the positive and negative electrodes of the battery with metal;

Do not transport or store batteries together with metal, such as hairpins and necklaces;

No tapping or throwing, trample on the battery;

Do not weld the battery directly and puncture the battery with nails or other sharp tools;

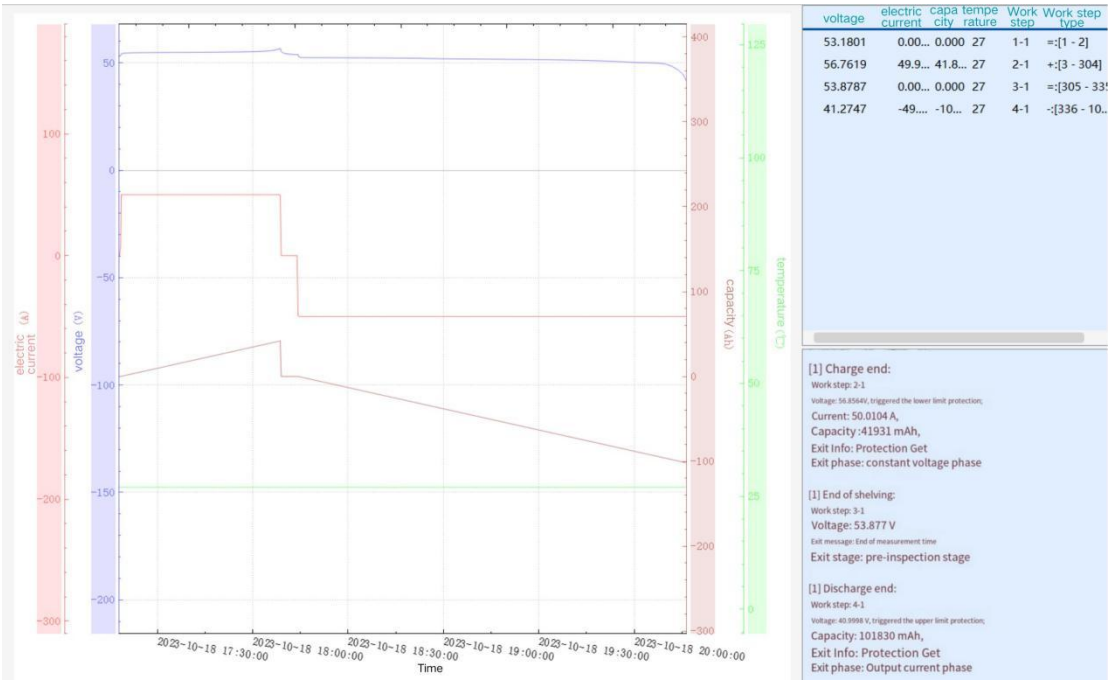
Notice!

Do not use or place batteries in high temperature (in hot sunlight or very hot cars), otherwise it may cause battery overheating, fire or function failure, and short life;

It is forbidden to leave batteries in fire or heater to prevent fire, explosion and environmental pollution; scrapped batteries should be returned to the supplier or battery recovery point for disposal.

Appendix A

Typical product charge and discharge curves



Appendix B

Battery upper computer interface