

110V100Ah Power Supply System Design

1 Basic system parameters

The basic parameters of lithium iron phosphate battery system are as follows:

No	Item	Parameter
1	Cell	
1.1	Cell model	IFP11200275(1)
1.2	Types of cell	Lithium iron phosphate
1.3	Rated capacity of cell	50Ah
1.4	Cell nominal voltage	3.2V
2	Pack Module	
2.1	Module type	CH57100
2.2	Module Rated Capacity	100Ah
2.3	Module Nominal Voltage	57.6V
3	System	
3.1	Module Qty	2
3.2	Module voltage	115.2V
3.3	Module capacity	100Ah
3.4	Upper charging voltage	131.4V
3.5	Charging current	0.5C
3.6	Discharge lower limit voltage	100.8V
3.7	Discharge current	1C
3.8	Float charging voltage	124.2 V
3.9	Working temperature	5°C-40°C
3.10	Size	1PCS cabinet, size 600*600*1000
3.11	Weight	Around 150kg

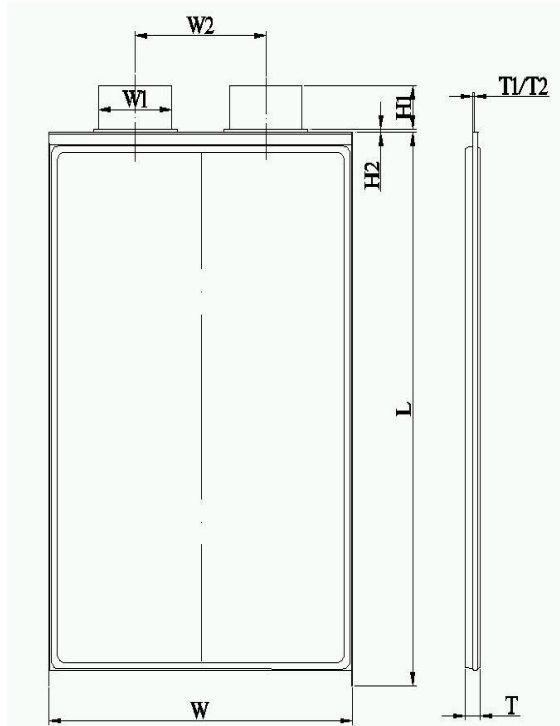
2 Cell

2.1 Cell type and performance

The main technical parameters of lithium iron phosphate cell are as follows

Cell specifications		IFP11200275 (1)
Nominal capacity		50Ah
Rated voltage		3.2V
Discharge cut-off voltage		2.5V
Internal resistance		≤1.5mΩ
Size		See below table
Charging method		CC/CV
Maximum charging voltage		3.65V
Rated charging current		10A (0.2 C ₅ A)
Rated discharge current		10A (0.2 C ₅ A)
Maximum charging current		50A (1.0 C ₅ A)
Maximum discharge current		100A (2.0 C ₅ A)
Working temperature	Charge	10~50°C
	Discharge	-20~60°C
Storage temperature	< 1 month	-10~50°C
	< 3 months	-10~35°C
	< 1 year	-10~25°C
Cycle life at room temperature (25°C)		≥3000 times

2.2 Dimensional diagram of the cell



2.3 The dimensions of the cell are shown in the table below:

Item	Instructions	Dimensions
T	Cell thickness	10.9±0.3
W	Cell width	200.0±2.0
L	Cell Length	275.0±2.0
H1	Ear Length	26.0±1.0
H2	Exposed length of polar ear glue	2.0±1.5
W1	Ear width	50.0±0.2
W2	Center distance of pole ear	90.0±1.0
T1	Thickness of positive lug (aluminum)	0.2±0.03
T2	Thickness of negative lug (copper plating nickel)	0.2±0.03

3 Battery module solution

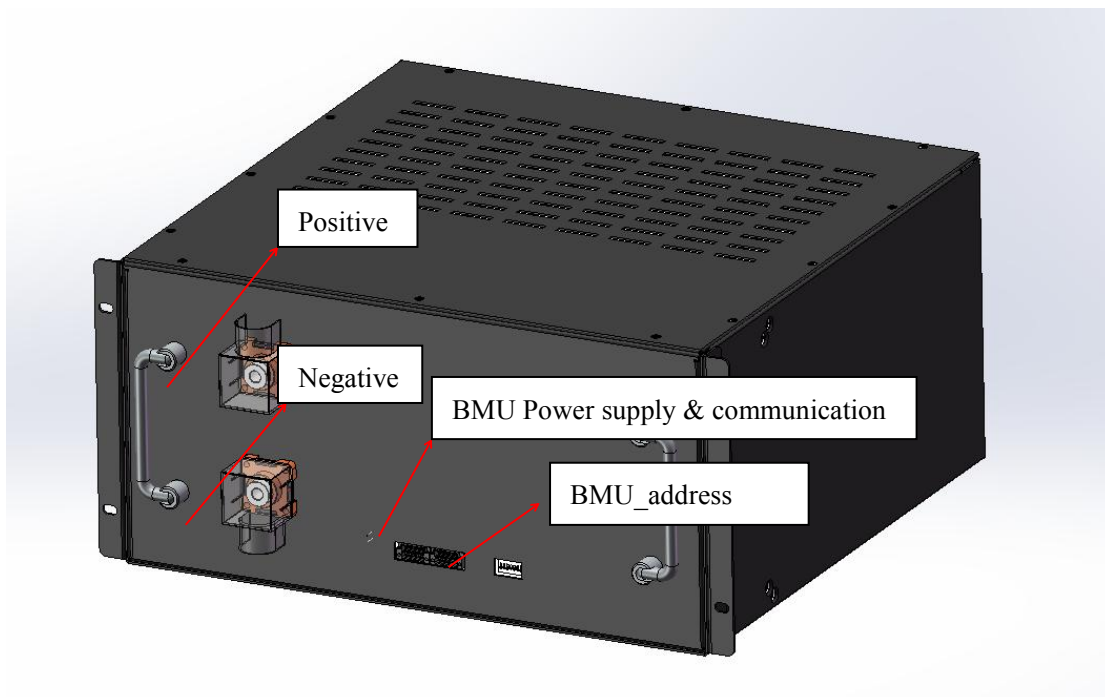
3.1 Battery module characteristics

The battery module consists of battery module, BMU (monitoring unit), interface and chassis, etc. The main parameters are shown in the table below

No	Item	Parameter
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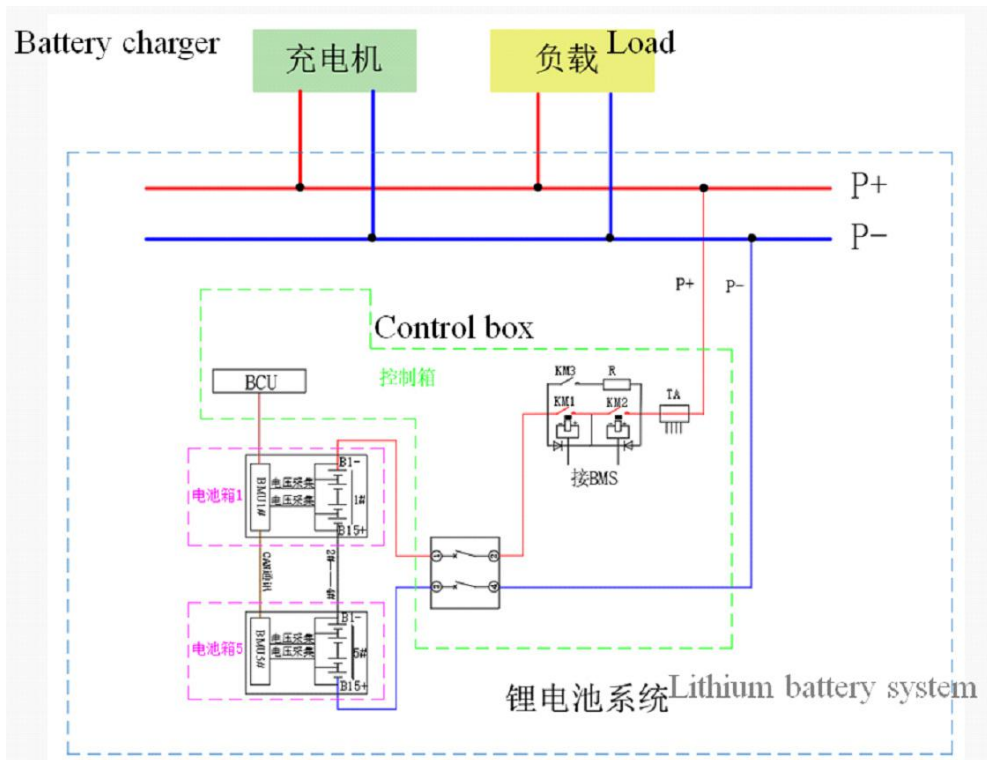
1	Series and connection mode	2P18S
2	Nominal voltage (V)	57.6
3	Nominal capacity (Ah)	100
4	Overall dimensions	5 U (19 inch cabinet)
5	Weight (kg)	Around 55
BMU (Monitoring unit)		
No	Item	Parameter
1	The power supply	24VDC
2	Single sampling channel	12circuits
3	Single sampling accuracy	10mV
4	Temperature sampling channel	4circuits
5	Single sampling accuracy	2℃
6	Monomer is balanced	Passive equalization
7	Communication	CAN

3.2 Battery module appearance:



4 Battery system design

4.1 The system principle block diagram is shown below:



4.2 Control unit

The master control unit is responsible for collecting the status information of the battery system, and then protecting the battery system (overcharge, over-discharge, over-temperature, etc.). The battery system status information and charging demand status can be sent to UPS or external monitoring system through communication (RS485) and dry contact.

The calculation parameters of the main control unit are as follows.

Power supply	24V is provided by AC/DC and 24V power supply is provided for slave control
Total pressure acquisition	0~500V
Current collection	±500A
Insulation testing	Yes
Relay control	3circuits (Charge, discharge, precharge)
CAN communication	2circuits (internal CAN、 external CAN)
485communication	1circuit (MODBUS protocol)

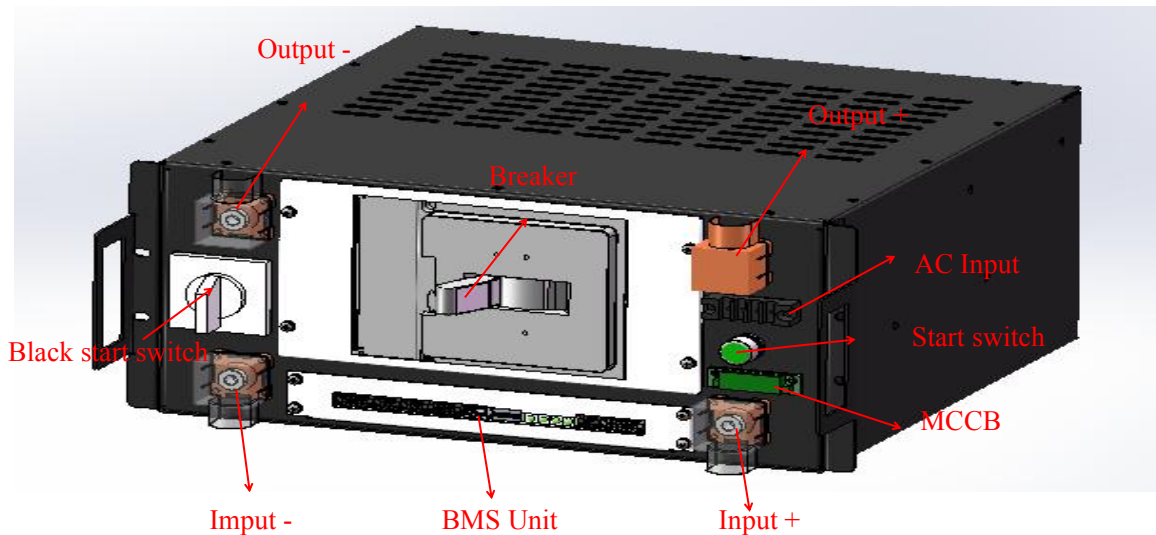
Dry contact	Refer to below drawing
Indicator drive	4 LED light drivers

4.3 Dry contact:

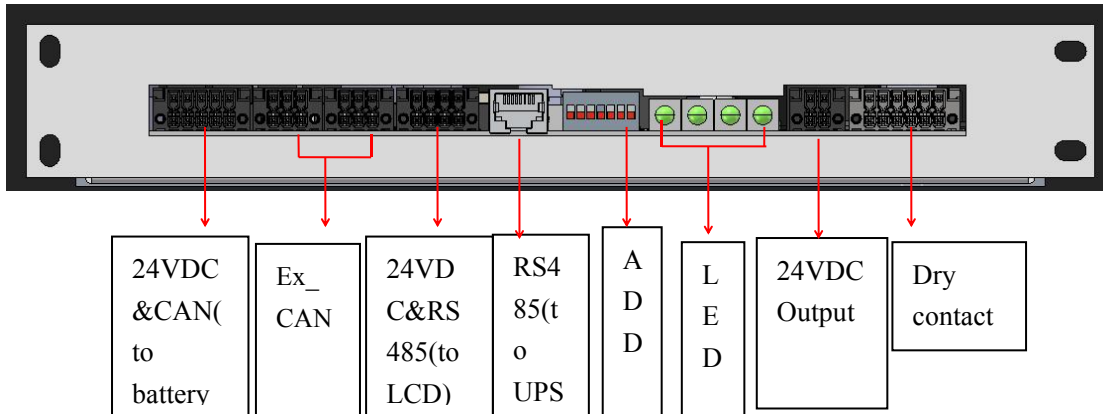
Battery Status	MAJOR			MINOR			CHARGE STOP		
	B1	A1	B2	A2	B3	A3	B4	A4	B5
Normal Status	COM	Open	Close	COM	Open	Close	COM	Open	Close
Major Protection	COM	Close	Open	COM	Open	Close	COM	Open	Close
Minor Protection	COM	Open	Close	COM	Close	Open	COM	Open	Close
Charge Stop	COM	Open	Close	COM	Open	Close	COM	Close	Open
BMS Power Off	COM	Close	Open	COM	Close	Open	COM	Close	Open

Pin No.	Pin Name	Function
B1	Major Common	Over-Voltage Protection Under-Voltage Protection Over-Temperature Protection Over-Current Protection
A1	Major Normal Close	
B2	Major Normal Open	
A2	Minor Common	Voltage Imbalance Error Voltage Sensing Error Under Temperature protection Temperature Imbalance Error
B3	Minor Normal Close	
A3	Minor Normal Open	
B4	Charge Common	Charge Stop Set Condition 1. Overvoltage alarm(4.25V/Cell) 2. SOC 100%
A4	Charge Normal Close	
B5	Charge Normal Open	Charge Stop Release Condition 1. SOC < 97% or Discharge Current > 3A

4.4 The appearance of the main control unit is shown in the figure:



4.5 BMS cell interface definition



4.6 System outline diagram (schematic diagram)

