050M020-X | fast charge solution 48V20Ah

1. Product characteristics

It is composed of **CKAA21700** cylindrical full pole ear fast charging lithium ion battery, with strong current carrying capacity and good safety.

Wide working environment temperature range: 050M020-1 conventional battery pack consists of wide temperature **CKAA21700H** battery, suitable for application at the working environment temperature of-20~55℃.

High low temperature working environment capacity retention rate: 050M020-2 low temperature battery pack consists of low temperature **CKAA21700L** battery, suitable for application at the working environment temperature of-40~45℃, and the discharge capacity retention rate of-30℃ is 88%.

Long cycle life: low temperature type up to 5000 times, conventional type up to 6000 times, to reduce the operation and maintenance cost for end customers.

Fast charging: 80A charging can charge by 90% in 15 minutes, greatly reducing the charging time, increasing the effective working time of the equipment, and reducing the investment of the project equipment.

Support high power drive: the maximum discharge current up to 50A, can output power of 1850W.

Compact flat structure design, height minimum up to 80mm.

Application fields: mobile robot, automatic transportation system, etc.

2. Main technical parameters

order number	Technical specification name	condition	unit	Specification value	
				050M020-1X	050M020-2X
1	Energy storage capacity@BOL	RT charge and release -20℃ charge and discharge-30℃ charge and discharge RT, -20℃ RT, and-30℃	Ah	≥ 20@1C ≥ 15.6@0.5C ≥ 12.1@0.5C ≥ 18.2@0.5C release ≥ 16.8@0.5C release	≥ 20@1C ≥ 17.8@0.5C ≥ 16.7@0.5C ≥ 18.6@0.5C release ≥ 17.9@0.5C release
2	nominal voltage		V	50.4	
3	Battery pack charging off		V	58.8	
4	Battery pack discharge cut-off voltage		V	37.06	
5	Maximum charging current pour 1	From overdischarge protection to overcharge protection	A	80	
6	Maximum discharge current pour 1		A	50	
7	rated current	Continuous charge and discharge for 8 hours, the battery temperature rise ≤ 10℃	A	20	

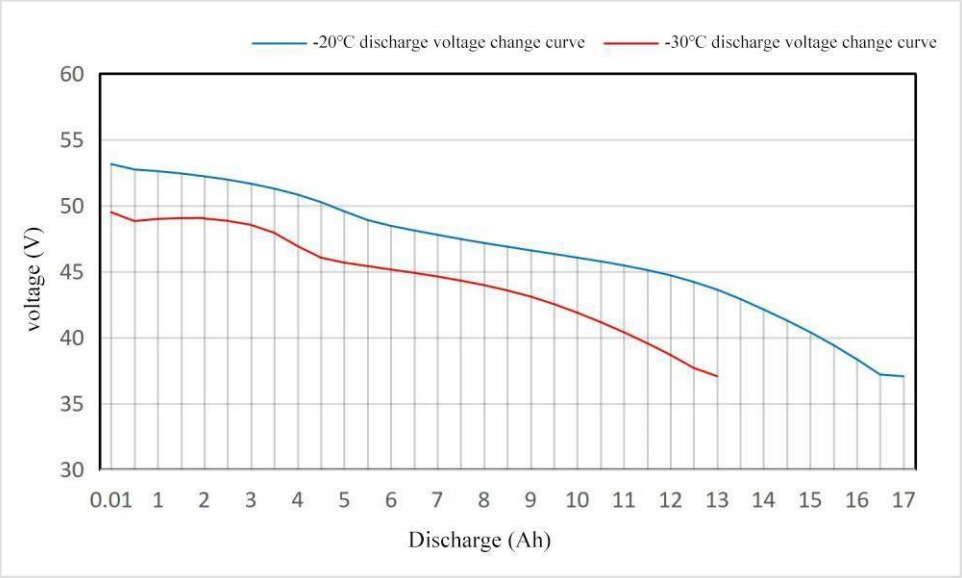
order number	Technical specification name	condition	unit	Specification value	
				050M020-1X	050M020-2X
8	cycle life	RT, 80A charging, 50A discharge, DOD 90%, capacity decay rate of 20%	order	6000	5000
9	life length	The annual average working environment temperature is 30℃, and the capacity decay rate is 20%	year	8	
10	Main circuit to ground voltage	RT	DC1.5kV@1min,≤ 1mA		
11	BMS function	Single cell voltage, battery total voltage, battery total current, battery temperature, switch temperature real-time collection, SOC, SOH monitoring, single cell voltage balance, fault diagnosis.			
12	defencive function	Over charge, over discharge, over current, short circuit, over temperature and low temperature			
13	Charge and discharge control	After undervoltage protection, in the non-charging working state, BMS will force the delay into hibernation and turn off the charge and discharge protection switch; Charging automatically activates the BMS and turns on the charge and discharge protection switch; RS485 The communication signal activates the BMS and turns on the charge and discharge protection switch; RS485 When the communication signal is interrupted, turn off the charge and discharge protection switch, and the BMS delay into hibernation.			
14	The monomer voltage resolution		mV	1	
15	Single voltage accuracy	RT		±0.2% or ±5mV	
16	Charge and discharge current resolution		A	0.01	
17	Charge and discharge current accuracy	RT		±0.5% or ±0.05A	
18	Battery temperature resolution		℃	0.1	
19	Battery temperature accuracy	>-10℃	℃	±2	
20	SOC resolution ratio			0.1%	
21	SOC precision	RT		±5%	
22	Single-body voltage balancing capability	Equilibrium current for each string of monomer ≥ 100mA@3.6V			
23	The monomer voltage equilibrium deviation	The average monomer voltage at3.6~3.9V	mV	±15	

order number	Technical specification name	condition	unit	Specification value	
				050M020-1X	050M020-2X
24	Communication interface and protocol	RS485, "Lithium iron battery single communication Protocol V2.5" and customer communication protocol, such as "Lithium BMS board and upper computer communication protocol Rev 0"			
25	Battery operating temperature range		℃	-20~65	-40~55
26	Product working environment temperature range	During the charge-discharge cycle cycle, the root mean square current is not greater than the rated current	℃	-20~55	-40~45
27	Product protection level			Not less than IP54	
28	Humidity range of the product working environment		%R.H.	≤ 90	
29	above sea level		m	≤ 3000	
30	External size	See product shape chart			
31	weight		kg	12.5±1	
32	memory time	RT, SOC 50%	day	365	

Note 1: The maximum charging current and maximum discharge current of each type of products are also limited by the carrying capacity of the charging and discharge interface. The maximum charging current and maximum discharge current of the products using Anderson SG-50A600V interface are 50A.

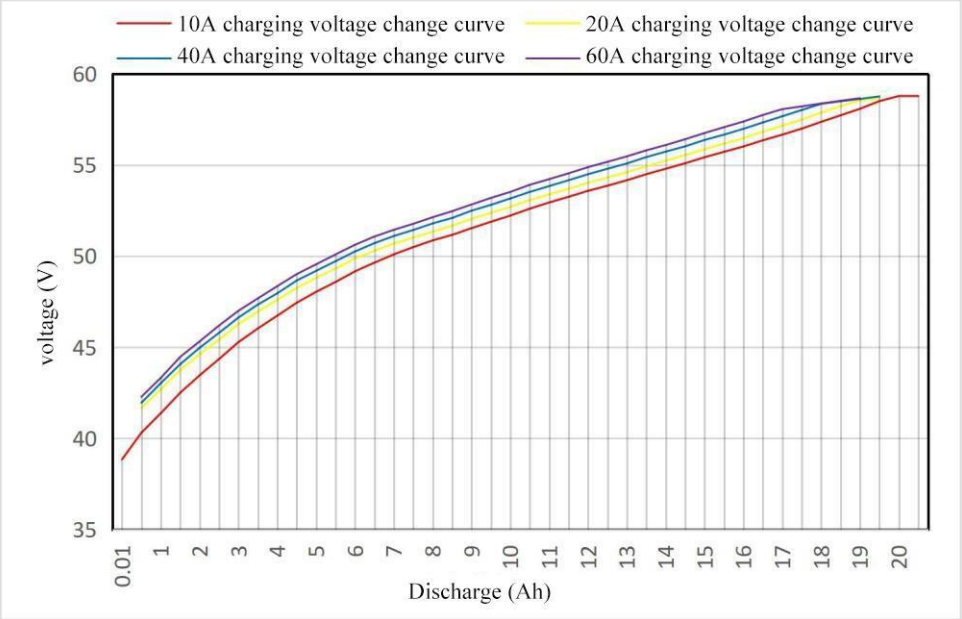
3. Performance curves of charging and discharging at low temperature, doubling rate charging and discharging at normal temperature and temperature rise test

3.1 050M020-1X low-temperature charging performance curve



Low temperature 10A constant current discharge curve after full charge at low temperature

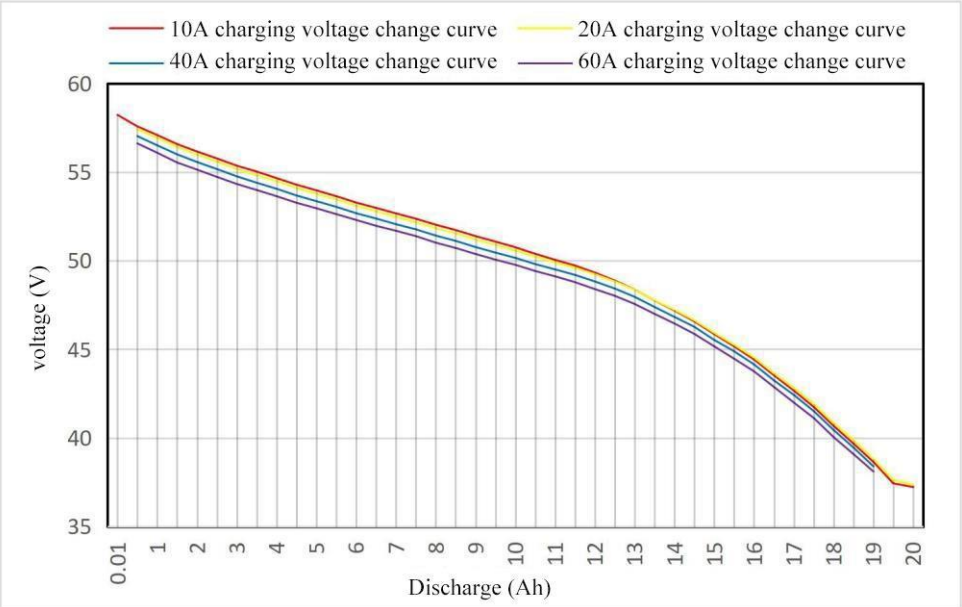
3.2 050M020-1X Dimension charging performance curve



Charging curve of 10A, 20A, 40A and 60A constant current + 58.8V constant voltage at room temperature

The charging capacity of 10A current is 20.07Ah, 19.85Ah for 20A current, 19.73Ah for 40A current, and 19.5Ah for 60A current.

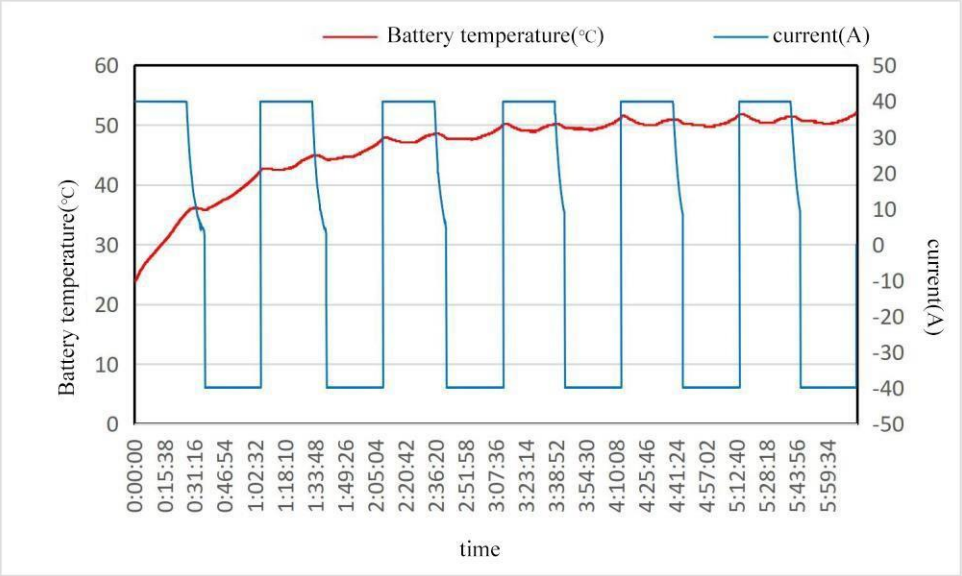
3.3 050M020-1X Rate-rate discharge performance curve



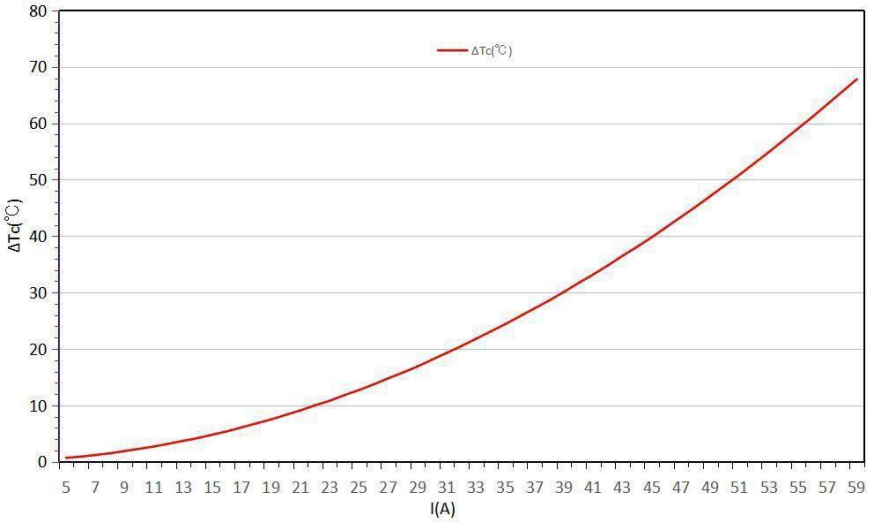
Current discharge curves of 10A, 20A, 40A and 60A after the corresponding current is fully charged at room temperature

The discharge capacity of 10A current is 19.76Ah, 19.66Ah for 20A current, 19.35Ah for 40A current and 19.05Ah for 60A current.

3.4 050M020-1X temperature rise test performance curve

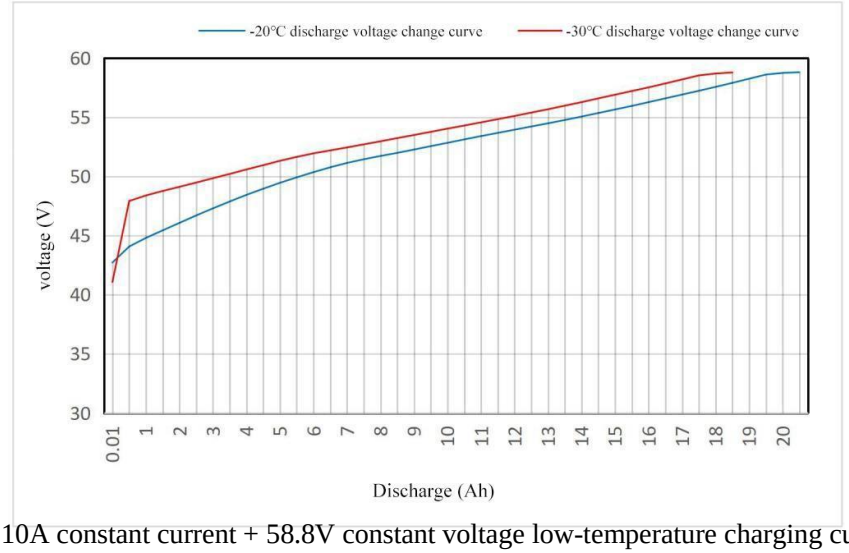


Temperature and current curve during the temperature rise test



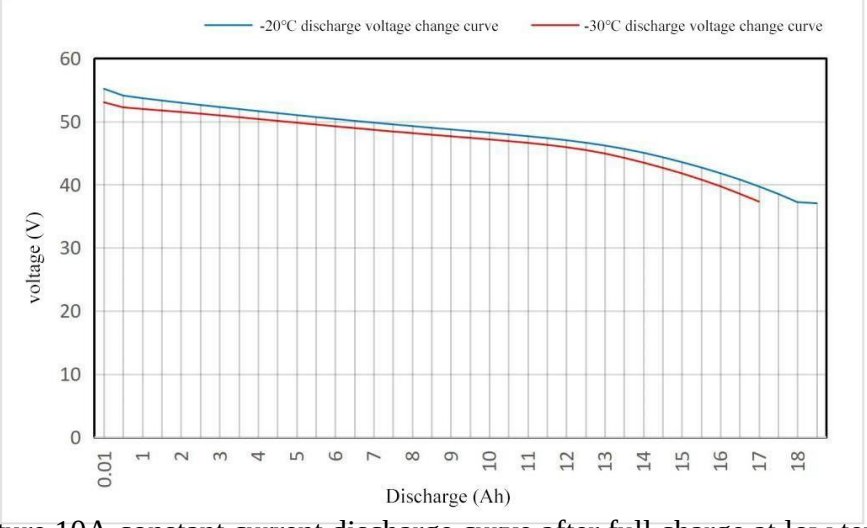
The relationship curve of the current value I and the air temperature rise around the battery pack

3.5050M0202-2X



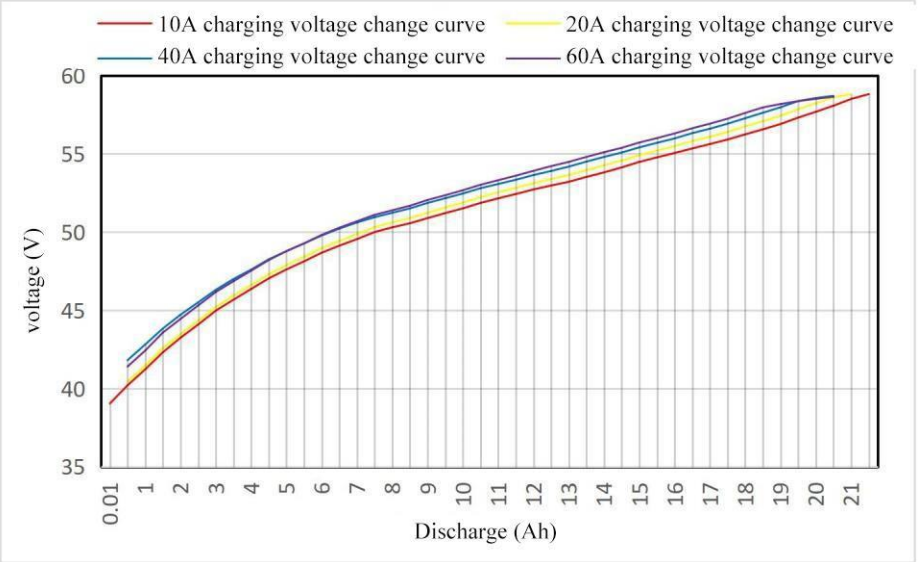
10A constant current + 58.8V constant voltage low-temperature charging curve

3.6 050M0202-2X



Low temperature 10A constant current discharge curve after full charge at low temperature

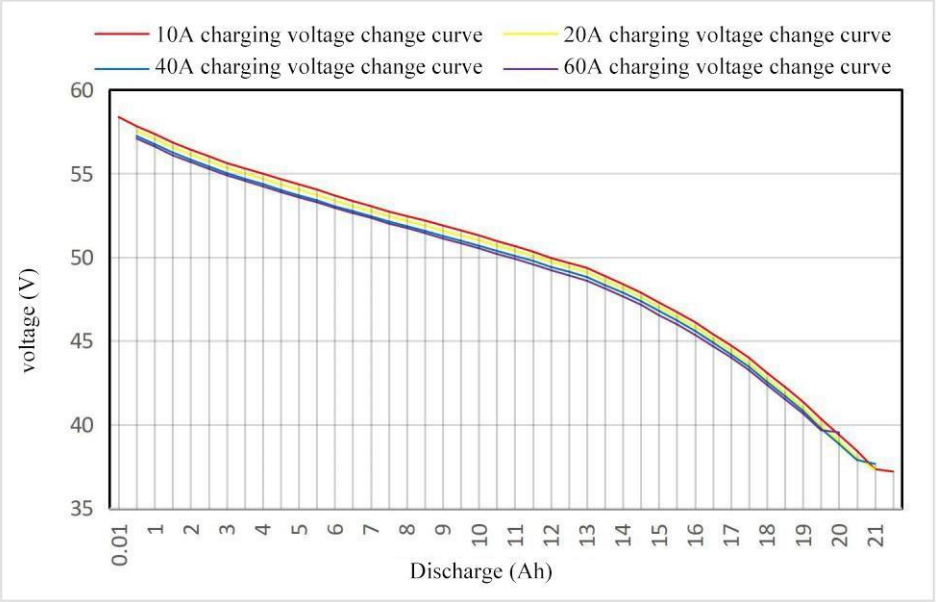
3.7 050M020-2X-rate charging performance curve



Charging curve of 10A, 20A, 40A and 60A constant current + 58.8V constant voltage at room temperature

The charging capacity of 10A current is 21.42Ah; 21.02Ah for 20A current, 20.92Ah for 40A current and 20.95Ah for 60A current.

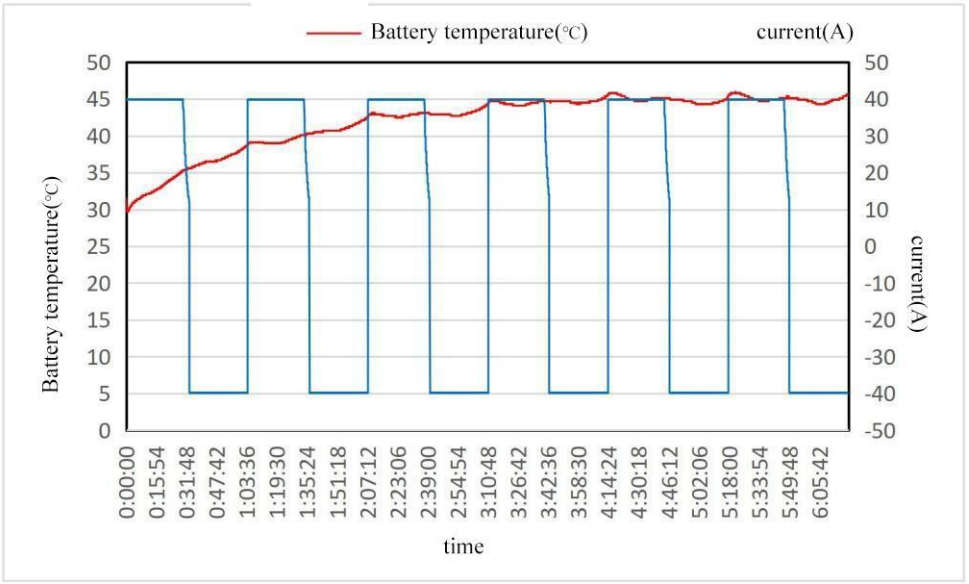
3.8 050M020-2X ratio discharge performance curve



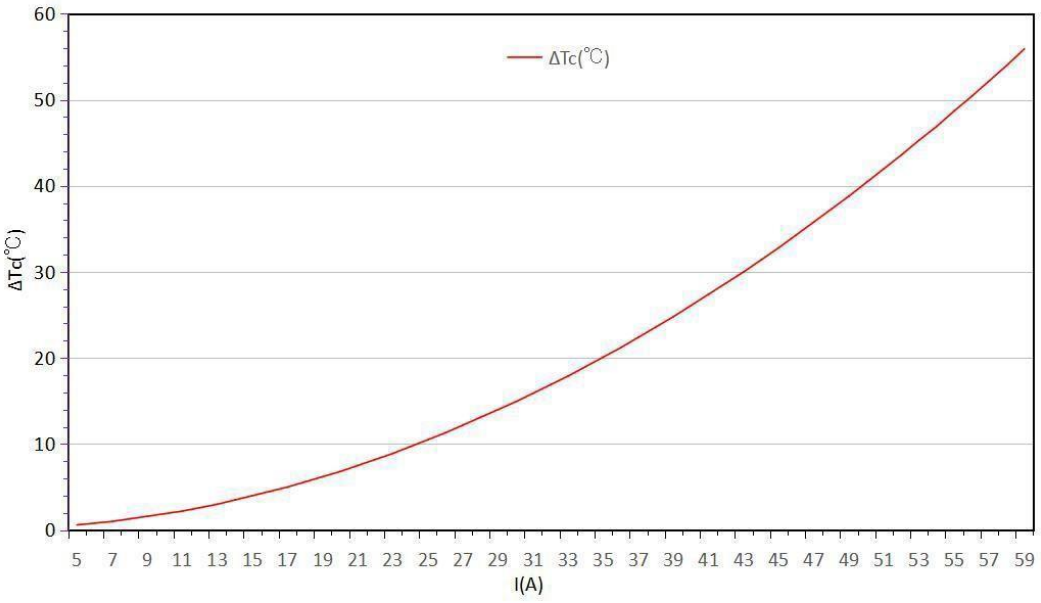
Current discharge curves of 10A, 20A, 40A and 60A after the corresponding current is fully charged at room temperature

The discharge capacity of 10A current is 21.17Ah, 20.87Ah for 20A current, 20.67Ah for 40A current and 19.69Ah for 60A current.

3.9 050M020-2X temperature rise test performance curve



Temperature and current curve during the temperature rise test

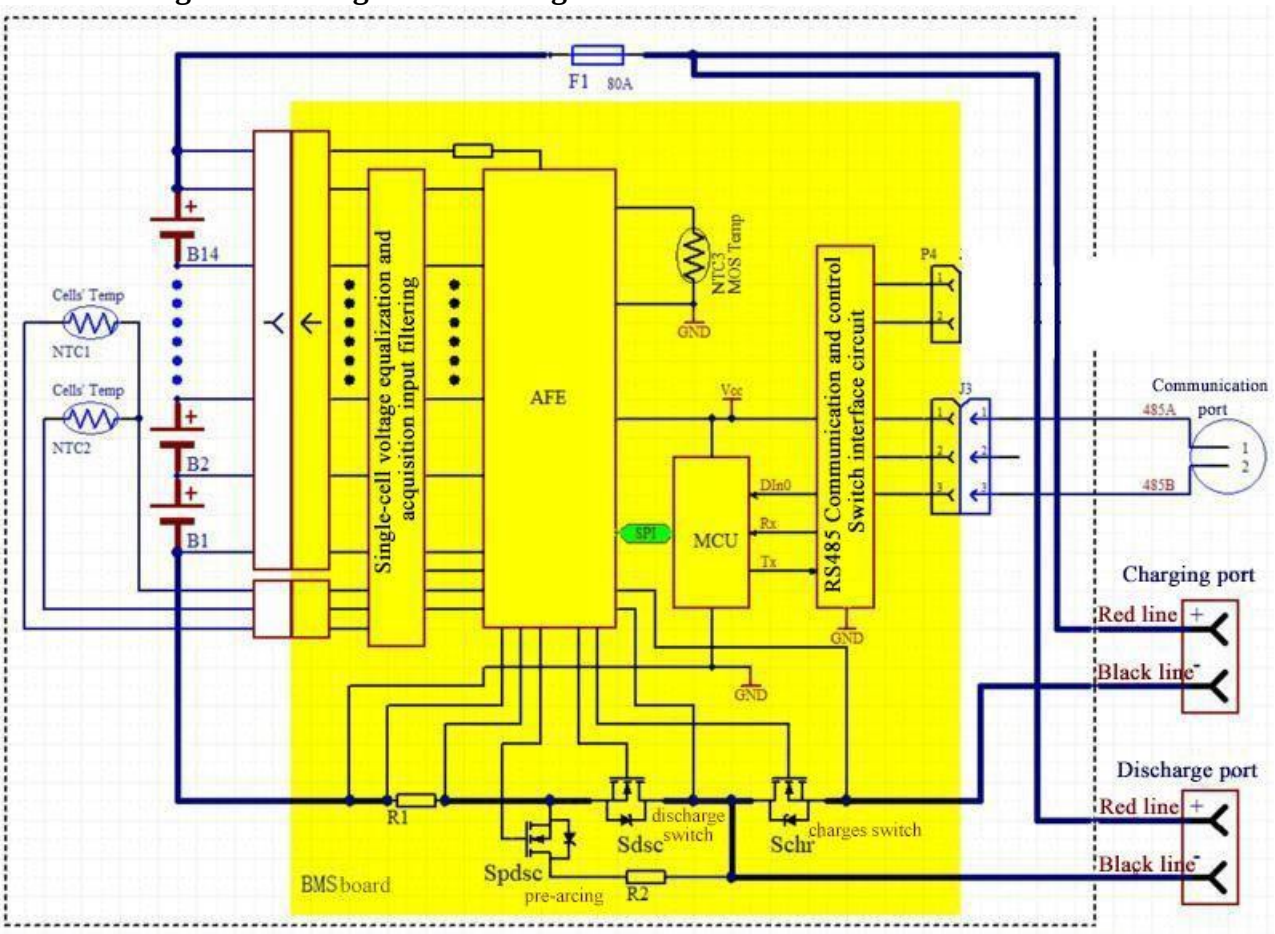


The relationship curve of the current value I and the air temperature rise around the battery pack

4. Product composition

4.1 Block diagram of charge and discharge

4.2 Block diagram of charge and discharge



4.3 Main components

Product model: 050M020-10

order number	name	specifications	quantity	remarks
1	Ultra-fast charging of lithium-ion batteries B 1-B 14	CKAA21700H	126 Only	9P14S
2	BMS board	BMB72-2	1 block	
3	Charging port	Andson SG-120A600V	One	red
4	Discharge port	Andson SG-120A600V	One	gray
5	Communication port	JAE MX19002S51	One	It can be customized according to the customer's needs
6	Fuse assembly F1	100A	One	

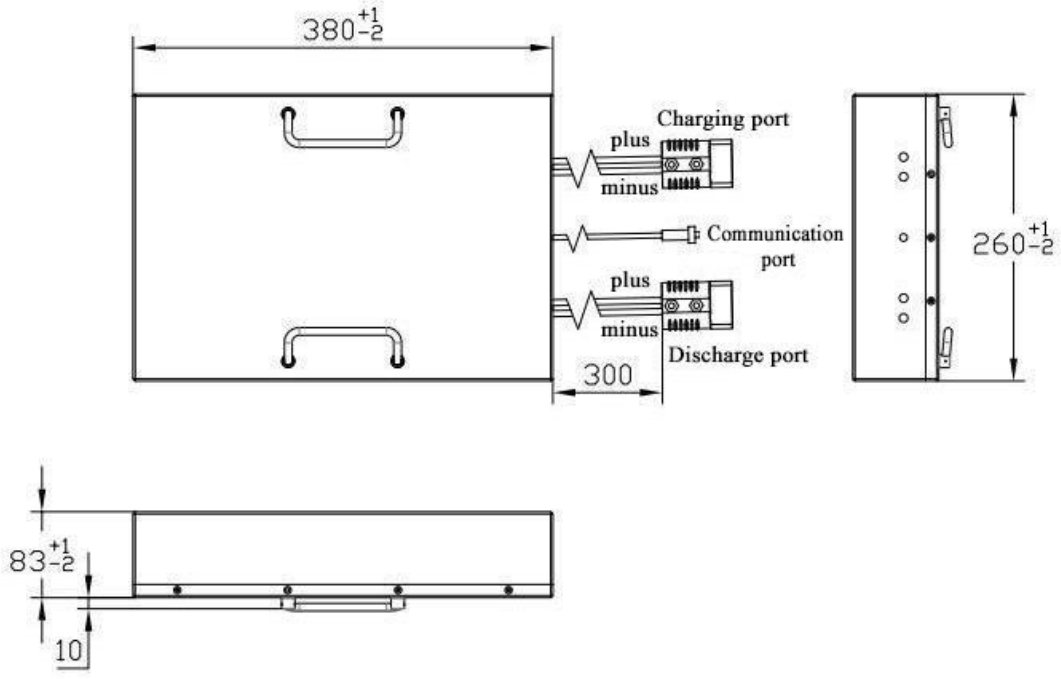
Product model: 050M020-20

order number	name	specifications	quantity	remarks
1	Ultra-fast charging of lithium-ion batteries B 1-B 14	CKAA21700L	126 Only	9P14S
2	BMS board	BMB72-2	1 block	
3	Charging port	Andson SG-120A600V	One	red
4	Discharge port	Andson SG-120A600V	One	gray
5	Communication port	JAE MX19002S51	One	It can be customized according to the customer's needs
6	Fuse assembly F1	100A	One	

Product model: 050M020-21

order number	name	specifications	quantity	remarks
1	Ultra-fast charging of lithium-ion batteries B 1-B 14	And HES050M020-21 using CKAA21700L	126 Only	9P14S
2	BMS board	BMB72-2	1 block	
3	Charging port	Andson SG-50A600V	One	gray
4	Discharge port	Andson SG-50A600V	One	red
5	Communication port	JAE MX19002S51	One	It can be customized according to the customer's needs
6	Fuse assembly F1	100A	One	

5. Product appearance diagram



6. Definition of the product interface

Charge and discharge port: the charge and discharge different port, see the principle block diagram.
Communication port: see the principle block diagram for the definition of connector model and core line, and the build-in 1.5 kΩ terminal resistance between 485A and 485B lines
The product is equipped with an isolated RS485 transceiver that supports a maximum communication rate of 19.2kbps and its output characteristics are as follows:

7. Precautions

7.1 Use

- Water should be avoided from the interior of the battery pack.
- The operating temperature of the battery and the working ambient temperature of the battery pack should not exceed the upper or lower limit of the rated temperature.
- It shall be used in the operating voltage range of the battery pack.
- Before installing the battery pack, confirm the main interface polarity and reverse junction.
- The ambient temperature has an important impact on the life of lithium-ion batteries, please stay away from the heat source.
- Do not squeeze, spike, or remove the battery pack and its lithium-ion batteries.
- Do not discard lithium-ion batteries at will, and please dispose of them according to the national environmental protection standards.
- Before the battery pack is shipped, it has a certain voltage and energy storage. During the transportation, do not make the positive and negative electrode short circuit during the installation process.

7.2 lay in

- Battery packs should not be stored in places with relative humidity above 85% or containing toxic gases. The leads and shell are susceptible to moisture and corrosion, which reduces the service life of the product and may cause internal faults.
- If you need to store the battery pack for a long time, please store in the temperature-20~40℃, relative humidity below 60% and well ventilated place, no exposure to the sun.
- Before storage, the charge state of the battery pack should be checked. When the storage time exceeds the storage period, the power should be replenished in time to avoid the power damage of the battery pack.