DOCAN POWER

280L3 BATTERY PACK SPECIFICATION

Product name: 280L3

Customer acknowledgment stamp		Company acknowledgment stamp		R & D department	
Department		Department		Version	V2.0
				Latest effective date	2025-01-15
				Editor	Jingyang Shao
				Reviewer	
Efective date		Efective date	2025-01-15	Approver	

Version Change History Form			
Version	Major Change History Descrip tion	Editor	Effective date
V1.0	Initial release	Jingyang Shao	2024-04- 12
V2.0	Add DC breaker	Jingyang Shao	2025-01- 15

For Users

Before purchasing and using this product, users should be aware of the special characteristics of lithium battery products and the potential risks associated with improper use. It is essential to carefully read this product manual, and the product should be operated by personnel with the necessary technical skills and knowledge. The technical performance, safety performance, and quality standards specified for this product are applicable only when users meet the technical, environmental, and skill requirements and follow the correct operating procedures.

Improper use, including incorrect methods, wrong connections, use of inappropriate power adapters, or load parameters that do not comply with the performance specifications indicated in this manual, may damage the product and endanger the safety of users and their property. Any product damage or other losses caused by improper use by users do not fall under product quality issues, and the company will not assume any related responsibilities.

01.Scope

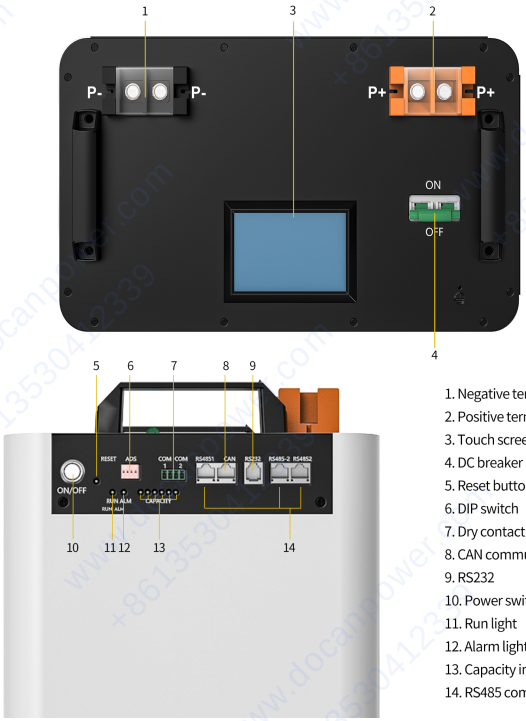
This product specification applies to the 51.2V 280 Ah lithium iron phosphate battery pack independently developed by Apexium. The specification stipulates the applicable scope, technical specifications, packaging, transportation, storage and other matters needing attention of this product.

02.Specifications

Model	APEX 280L3
BMS	JK- PB2A16S20P 200A BMS
Communication	RS485,CAN,Bluetooth
Balance	2A active equalization
Display	4.3-inch touch screen
Length、Width、Height(mm)	910×416×295(mm)
Weight(kg)	118(KG)
Cells	16 pcs Lifepo4 3.2V 280Ah cells
Material	Iron
Ambient Temperature	-30~55°C
Process	Painting
Thickness(mm)	1.5mm
Distance from Bottom to Ground	20mm
IP level	IP20

03.Dimensions and Appearance

04.Function Instructions



1. Negative terminal (M8)
2. Positive terminal (M8)
3. Touch screen
4. DC breaker
5. Reset button
6. DIP switch
7. Dry contact
8. CAN communication port
9. RS232
10. Power switch
11. Run light
12. Alarm light
13. Capacity indicator light
14. RS485 communication port

05.BMS parameters

5.1. Electrical specifications

Function name	Project list	Parameters	Set range
Single-cell overcharge protection	Single-cell overcharge protection voltage	3600mV	Can be set
	Single-cell overcharge recovery voltage	3550mV	Can be set
Single-cell under-voltage protection	Single-cell under-voltage protection voltage	2600mV	Can be set
	Single-cell under-voltage recovery voltage	2650mV	Can be set
	Single-cell under voltage automatic shutdown voltage	2500mV	Can be set

Active balancing function	Balancing voltage difference trigger voltage	10mV	Can be set
	Balancing start-up voltage	3000mV	Can be set
	Maximum balancing current	1A	Can be set
Overall overcharge protection	Maximum charging current	25A	Can be set
	Charging overcurrent delay	2s	Can be set
	Charging overcurrent alarm release	60s	Can be set
	Charging overcurrent limit current	10A	/
Overall overdischarge protection	Maximum discharge current	150A	Can be set
	Discharge overcurrent delay	300s	Can be set
	Discharge overcurrent alarm release	60s	Can be set
Short circuit protection	Short circuit protection current	300A	/
	Short circuit protection delay	20us	Can be set
	Short circuit protection release	60s	Can be set
Temperature protection	Overcharge temperature protection	70°C	Can be set
	Overcharge temperature recovery	60°C	Can be set
	Over-discharge temperature protection	70°C	Can be set
	Over-discharge temperature recovery	60°C	Can be set
	Low-temperature charging protection	-20°C	Can be set
	Low-temperature charging recovery	- 10°C	Can be set
	MOS over-temperature protection	100°C	Can be set
	MOS over-temperature recovery MOSFET over-temperature recovery	80°C	Can be set
	Battery alarm temperature	60°C	Can be set
	Battery alarm recovery	50°C	Can be set

5.2. Status indication

Status	Operating status	ON/OFFF	RUN	ALM	L1	L2	L3	L4	L5	L6	Illustrate
Shutdown	normal	off	off	off	off	off	off	off	off	off	
Balance	normal	on	Flash	off	According to the power display					off	
Charge	normal	on	Flash	off	According to the power display					off	
	Abnormal	on	Flash	Flash	According to the power display					off	
Discharge	normal	on	Flash	off	According to the power display					off	
	Abnormal	on	Flash	Flash	According to the power display					off	
Other	Abnormal	on	Flash	Flash	According to the power display					off	

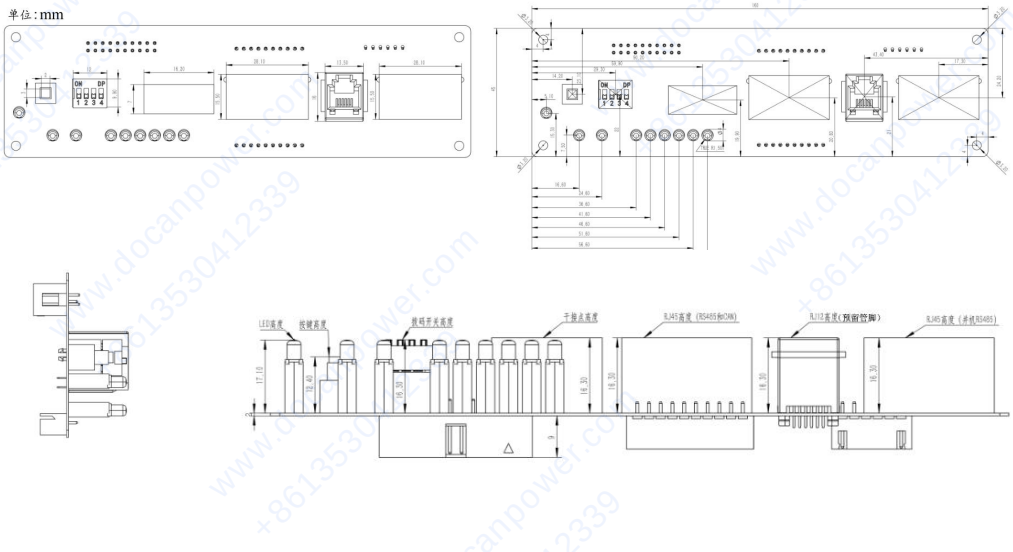
5.3. Capacity indicator instructions

Status		Charging					Discharging				
Capacity indicator light		L5	L4	L3	L2	L1	L5	L4	L3	L2	L1
Battery power (%)	0~20	off	off	off	off	on	off	off	off	off	on
	20~40	off	off	off	on	on	off	off	off	on	on
	40~60	off	off	on	on	on	off	off	on	on	on
	60~80	off	on	on	on	on	off	on	on	on	on
	80~100	on	on	on	on	on	on	on	on	on	on

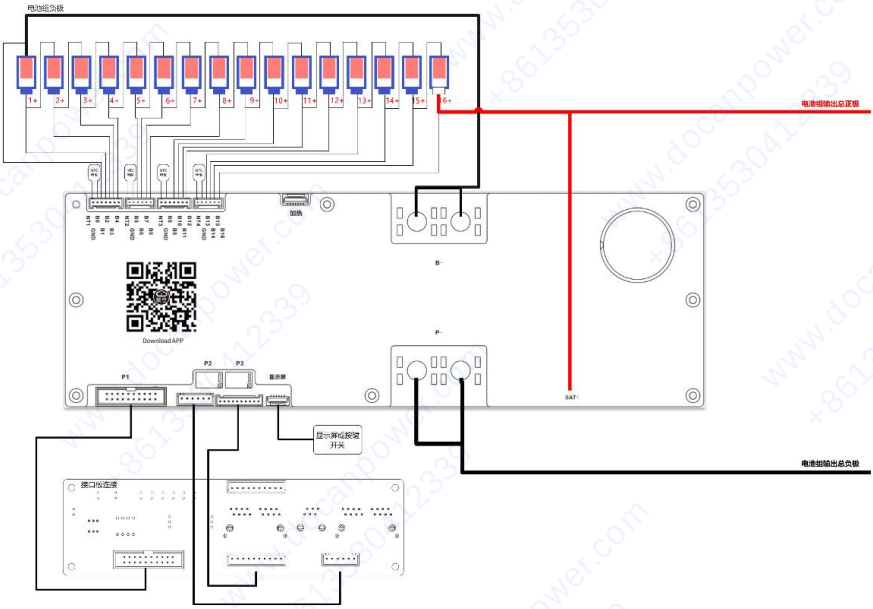
5.4. Turn on or off

Number	lllustrate
1	Insert the button into the device screen interface, you can toggle thedevice on and off through the button, press to activate the device, long press to turn off the device.
2	You can also control the device on and off through the button on the screen, press to activate the device, long press to turn off the device.

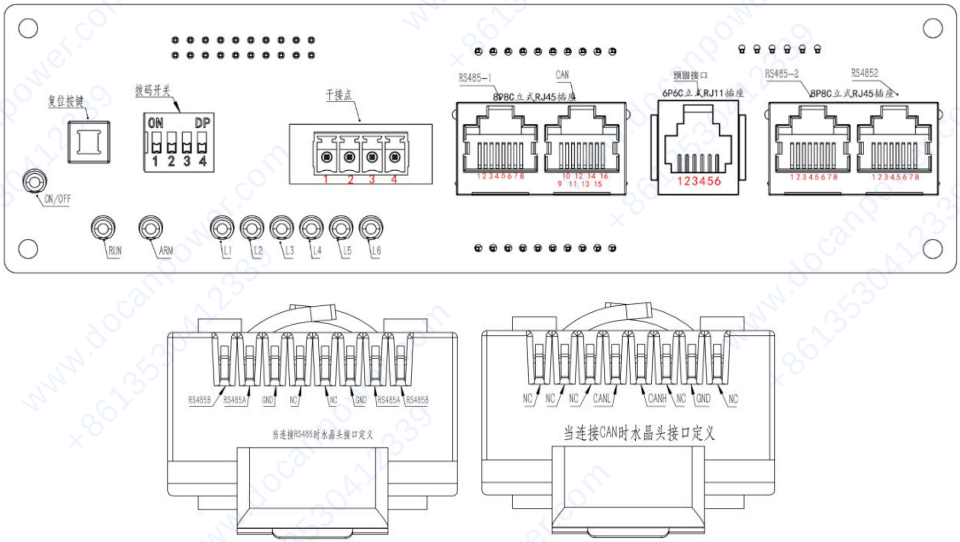
5.5. Dimensional location drawing



5.6. Wiring diagram



5.7. Interface definition



Dry contact interface definition

PIN number	PIN definition	Note
1	COM1	When there is an alarm condition, S1 and COM1 are connected.
2	S1	
3	COM2	When in low battery condition, S2 and COM2 are connected.
4	S2	

CAN and RS485- 1 interface definition

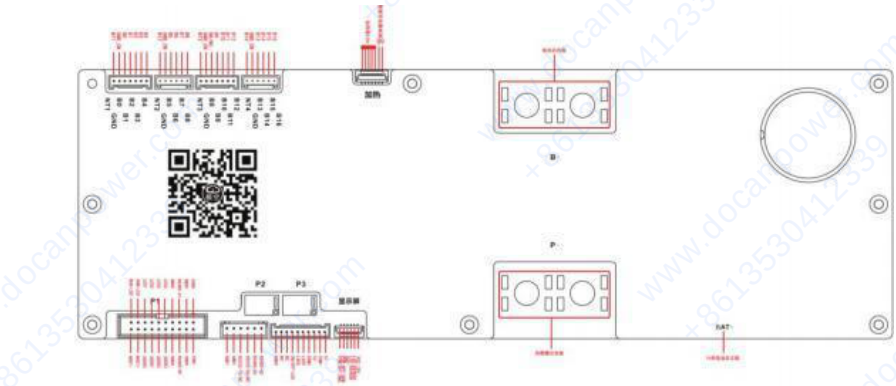
RS485 uses an 8P8C vertical RJ45 socket		CAN uses an 8P 8 C vertical RJ45 socket	
PIN number	PIN definition	PIN number	PIN definition
1、8	RS485-B1	9、10、11、14、16	NC
2、7	RS485-A1	12	CANL
3、6	GND	13	CANH
4、5	NC	15	GND

RS232 Interface Definition

RS232 uses a 6P6C vertical RJ11 socket		
PIN number	PIN definition	Note
1、2、6	NC	
3	RS232_TX	
4	RS232_ RX	
5	GND	

Rs485 -2 Parallel Interface Definition

RS485 uses an 8P8C vertical RJ45 socket		CAN uses an 8P 8 C vertical RJ45 socket	
PIN number	PIN definition	PIN number	PIN definition
1、8	RS485-B1	9、10、11、14、16	NC
2、7	RS485-A1	12	CANL
3、6	GND	13	CANH
4、5	NC	15	GND



BMS interface definition

Interface	interface definition			
BAT+	Definition Explanation			
B-	Connect the positive terminal of the battery pack to supply power to theBMS board.			
P-	The negative terminal of the battery pack , also serving as both the charging and discharging negative terminal, with shared functionality for charging and discharging.			
Battery cells and temperature	NT1	Connect NTC1 temperature probe	NT3	Connect NTC3 temperature probe
	GND	Connect NTC1 temperature probe	GND	Connect NTC1 temperature probe
	B0	Negative terminal of battery cell 1	B8	NC
	B1	Positive terminal of battery cell 1	B9	Positive terminal of battery cell 9
	B2	Positive terminal of battery cell 2	B10	Positive terminal of battery cell 10
	B3	Positive terminal of battery cell 3	B11	Positive terminal of battery cell 11
	B4	Positive terminal of battery cell 4	B12	Positive terminal of battery cell 12
	NTC2	Connect NTC2 temperature probe	B13	Positive terminal of battery cell 13
	GND	Connect NTC2 temperature probe	B14	Positive terminal of battery cell 14
	B5	Positive terminal of battery cell 5	B15	Positive terminal of battery cell 15
	B6	Positive terminal of battery cell 6	B16	Positive terminal of battery cell 16
	B7	Positive terminal of battery cell 7		
	B8	Positive terminal of battery cell 8		

Heating interface definition

Interface	Definition
CD+	Charging indicator input positive terminal
CD-	Charging indicator input negative terminal
H+	Heating negative terminal

Dis la screen interface efinition

Interface	Definition
VCC_ 10V	Display power supply positive terminal
LCD_485A	Display data transmission signal
LCD_485B	Display data transmission signal
GND	Display power supply negative terminal
POW_ OFF_ COG	Device power switch positive terminal
POW_ OFF_ GND	Device power switch negative terminal

5.8. Communication Description

5.8.1 . RS232 communication

The device can communicate with the host computer via the RS232 interface, allowing monitoring of various battery information such as voltage, current, temperature, status, and battery production information . The default baud rate is 9600 bps.

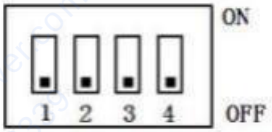
5.8.2 . CAN communication

The default communication speed for CAN communication is 250 kbps.

5.8.3. RS485 communication

There are two RS485 communication interfaces, one of which outputs two interfaces in parallel for viewing battery pack information . The default baud rate is 115200. Communication addresses can be set via DIP switches to poll all battery pack data, with address settings ranging from 0 to 15 .

DIP switch setting



When multiple battery packs are used in parallel, each battery pack needs to be assigned a unique address via DIP switches to ensure proper operation. Below is the DIP switch address table.

Address	Band switch position			
	#1	#2	#3	#4
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

06. Warranty

15 days free replacement

- Manufacturing defect bases
- Problem develop with normal use bases
- Battery pack with 10 years warranty
- Limited lifetime warranty

If problems develop out of free repair period,we will charge for parts.

07. Warnings

(1) Do not use the battery if it has been impacted or if there is noticeable deformation.

(2) Do not stack or assemble the batteries improperly. Please pay attention to the battery polarity and the connection terminals.

(3) Insulate equipment properly and use tools and instruments correctly.

(4) The battery installation area should be kept away from fire sources or any combustible materials. Ensure adequate ventilation and that the area is dry.

(5) Plugging in kits while the product is operating is strictly prohibited.

(6) Do not support series connection. Series connection will cause irreversible damage to the batteries.

(7) Please fully charge the battery with the specified charger before using new batteries or after long periods of storage.

(8) Do not disassemble, open, squeeze, bend, deform, pierce, or damage the product.

(9) Do not attempt to modify or insert any external objects into the product. Avoid exposing the product to liquids such as saltwater, freshwater, or beverages (e.g., coffee, juice, etc.). Keep it away from fire sources, explosive materials, or other hazards.

(10) Do not short-circuit the battery. Ensure the battery terminals do not come into contact with metal or other conductive materials.

(11) Do not drop the battery. If this occurs (especially if it hits a hard surface), please contact the service center immediately.

(12) If there is any electrolyte leakage, avoid contact with skin or eyes. If contact occurs, rinse the affected area thoroughly with clean water and seek medical attention.

(13) Do not disassemble the cell battery under any circumstances. This may cause an internal short circuit, fire, or other hazards.

(14) Do not burn or expose the battery to fire under any circumstances. Doing so may cause the battery to catch fire.

(15) When connecting multiple battery packs in parallel, if your load exceeds 200A, use multiple terminals for parallel output. The chassis terminals cannot withstand currents exceeding 200A. Prolonged use of high current is not recommended, as it may cause the cables and terminals to overheat.

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