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Dongguan Anzhi Electronic Technology Co., Ltd

APEX 48V 280 DIY BOX Specification （JK BMS version)

Box model: **APEX 48V 280 DIY BOX**

Material number: **240411JK280**

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Department		Department		Version	V1.0
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Version Change History Form			
Version	Major Change History Description	Editor	Effective date
V1.0	Initial release	Jingyang Shao	2024-04- 12

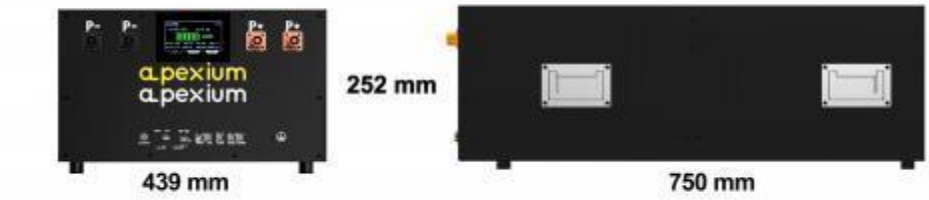
Content

1. Scope

This product specification applies to the 51.2V 280Ah lithium iron phosphate battery box independently developed by Apexium. The specification stipulates the applicable

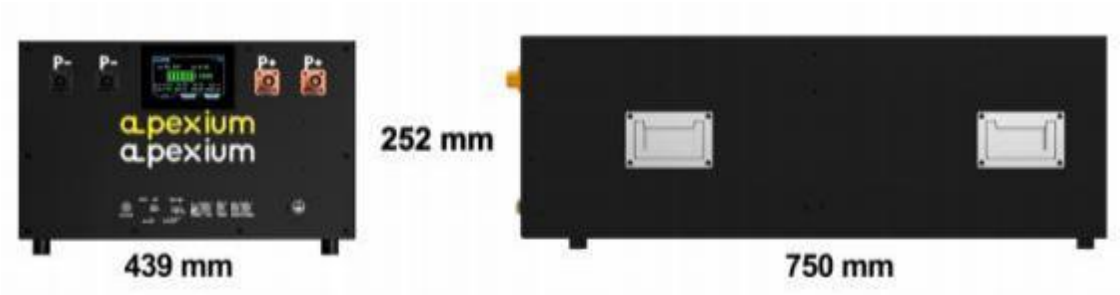
scope, technical specifications, packaging, transportation, storage and other matters needing attention of this product.

2. Specifications



Model	APEX 48V 280 DIY kits - JK
BMS	JK- PB2A16S20P 200A BMS
Display	4.3-inch touch screen
Length、Width、Height(mm)	750×439×252(mm)
Weight(kg)	23.6(KG)
Suitable for	16 pcs Lifepo4 280Ah 302Ah 304Ah cells
Material	Iron
Ambient Temperature	-30~55℃
Process	Painting
Thickness(mm)	1.5mm
Distance from Bottom to Ground	20mm
IP level	IP20

3. Dimensions and Appearance



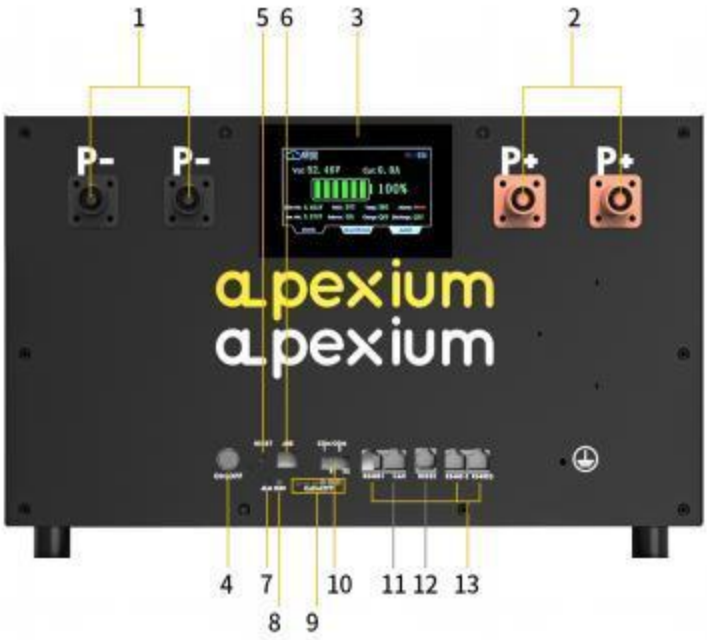
Main Accessories

Name	Quantity(pc)
Pressure Plate	2
Top Cover	1
Front Panel	1
Stopper	1
Positive and Negative Terminals	4

4. Box accessory

Model	Quantity
JK- BP2A16S20A BMS with Bluetooth,support RS485/Can 2A Active equalization	1
4.3inch touch screen	1
200* 175*0.7 Epoxy board	4
600* 175*0.7 Epoxy board	2
600*200*0.7 Epoxy board	2
610*60*2 EVA foam	2
180* 160*3.5 EVA foam	20
80V400A Fuse Film	1
80V400A Fuse plate base	1
130*20*2.3,2 hole diameter 8.2 Copper busbar (P+)	1
210*20*2.3, 1 hole diameter 8.2,3 small holes Copper busbar	1
305*20*2.3,2 hole diameter 8.2 Soft copper busbar (P-)	1
270*20*2.3,2 small holes Soft copper busbar(B-)	1
370*20*2.3,4 small holes Soft copper busbar(B+)	1
99*28*2.5 Aluminum row M6 screw hole	15
M6 Copper busbar and nut	1
Positive terminal with waterproof gasket	2
Gegative terminal waterproof gasket	2
160*55*3 Thermal silica gel	1
Front Panel	1
Battery voltage acquisition board	2
Rubber feet	4
Display Panel Sticker	1
6*6*2.8 Tact switch button cap	4
Display Cable	1
Battery collection wire	2
Spring automatic buckle	3
M6 Gasket	32
M6 Nuts	32
M8* 16 bolts	7
M5*8 bolts	8
M6*25 bolts	7
M4*6 bolts	12
M6* 14 bolts	6
M5* 10 bolts	12
M4*8 boltsA	26
M4*8 bolts	16
M3*6 bolts	4
M3* 10 bolts	6

5. Function Instructions



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

6. BMS parameters

6.1. 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 undervoltage 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℃	Can be set
	Overcharge temperature recovery	60℃	Can be set
	Over-discharge temperature protection	70℃	Can be set
	Over-discharge temperature recovery	60℃	Can be set
	Low-temperature charging protection	-20℃	Can be set
	Low-temperature charging recovery	- 10℃	Can be set
	MOS over-temperature protection	100℃	Can be set
	MOS over-temperature recoveryMOSFET over-temperature recovery	80℃	Can be set
	Battery alarm temperature	60℃	Can be set
	Battery alarm recovery	50℃	Can be set

6.2. 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	

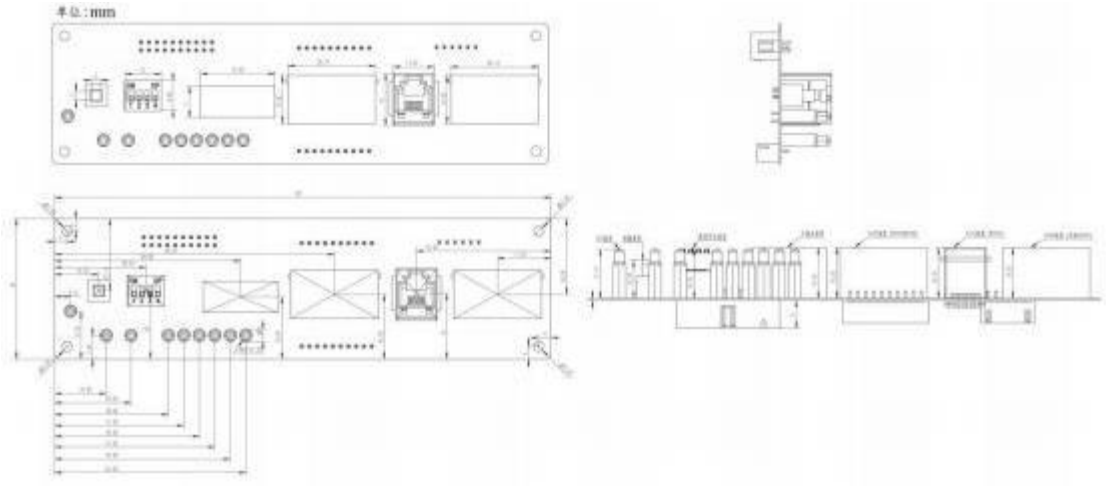
6.3. Capacity indicator instructions

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

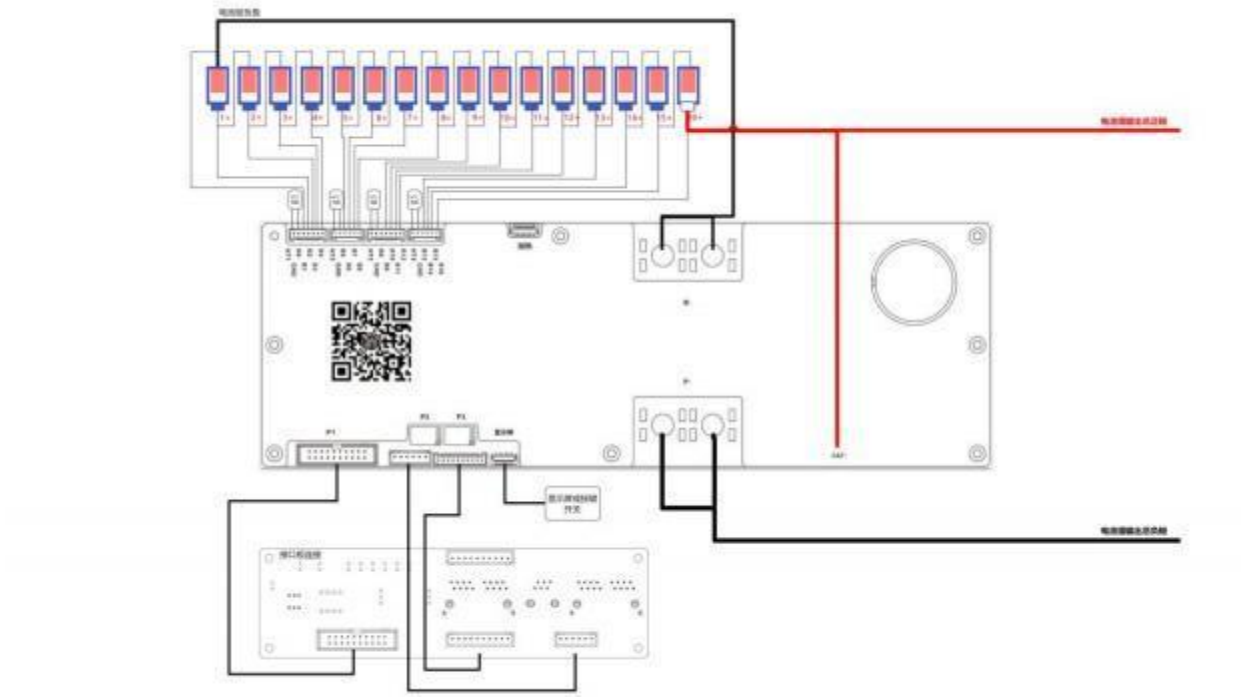
6.4. Turn on or off

Number	Illustrate
1	Insert the button into the device screen interface, you can toggle the device 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.

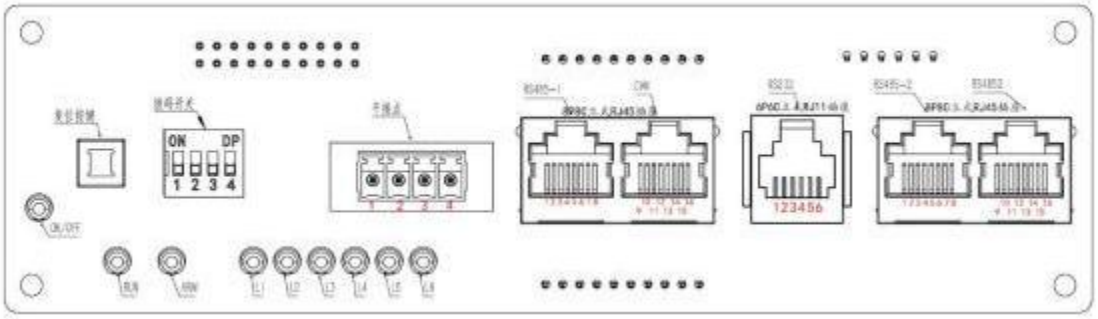
6.5. Dimensional location drawing

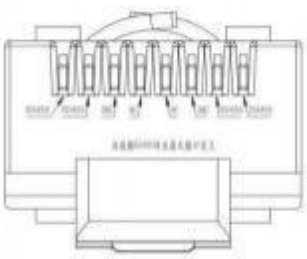


6.6. Wiring diagram



6.7. 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

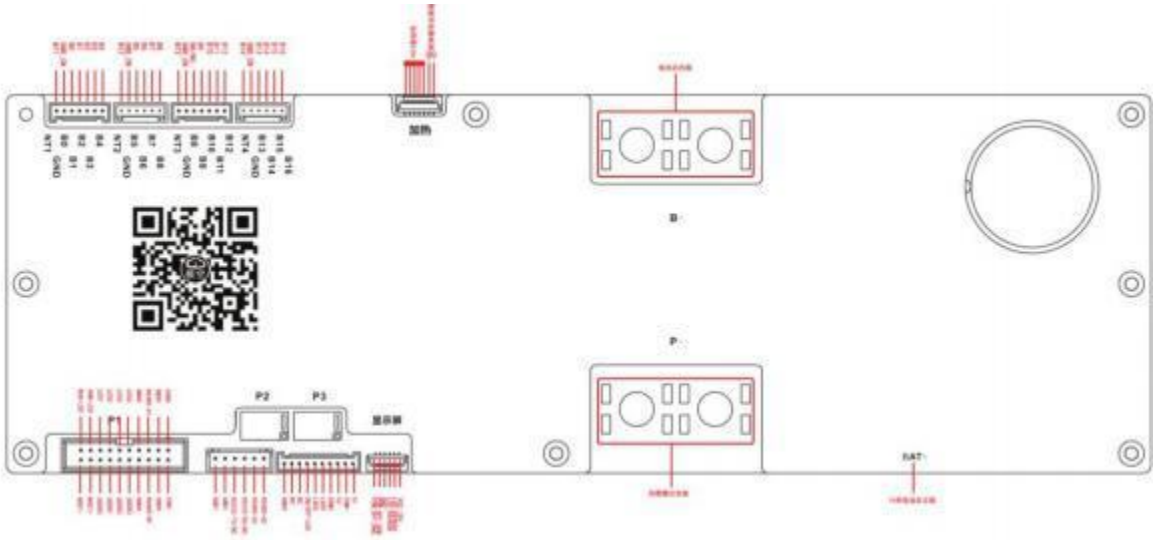
RS485 uses an 8P8C vertical RJ45 socket		CAN uses an 8P8C vertical RJ45 socket	
PIN number	PIN definition	PIN number	PIN definition
1、8	RS485- B1	9、10、11、14、16	NC
2、7	RS485-A1	12	CANL
3、6	GND	13	CANH
4、5	NC	15	GND

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 8P8C vertical RJ45 socket	
PIN number	PIN definition	PIN number	PIN definition
1、8	RS485-B2	9、16	RS485-B2
2、7	RS484-A2	10、15	RS484-A2
3、6	GND	11、14	GND
4、5	NC	12、13	NC



BMS interface definition

Interface	interface definition			
BAT+	Definition Explanation			
B-	Connect the positive terminal of the battery pack to supply power to the BMS 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

Display screen interface definition

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

6.8. Communication Description

6.8.1. 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.

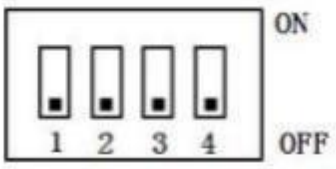
6.8.2. CAN communication

The default communication speed for CAN communication is 250 kbps.

6.8.3. 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
1	OFF	OFF	OFF	OFF
2	ON	OFF	OFF	OFF
3	OFF	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

7. Warranty

15 days free replacement:
Manufacturing defect bases

1- 11 years free repair

Problem develop with normal use bases
Battery with 5 years warranty

BMS with 1 years warranty

Battery pack with 11 years warranty
Limited lifetime warranty

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

8. Warnings

(1) Do not use the battery if it has been pounded or if there is noticeable deformation.
(2) Do not stack and assemble the batteries. Please be aware of the polarity of the battery and the connection ends.
(3) Insulate equipment and utilize the tools and instruments properly.
(4) Battery installation place should be away from fire source or any combustible objects. Make sure there is air flow and the air is dry enough in the place.
(5) Plugging kits while the product is operating is strictly forbidden.
(6) Employees other than technicians of our company is prohibited to operate any function module . Anyone violating the rule is at your own.
(7) Please fully charge the battery with specific charger before using new batteries or using for a long duration.
(8) Do not disassemble, open, squeeze, bend, deform, pierce or break the product.
(9) Do not try to retrofit or plug in any exterior objects. Do not soak or expose the product in liquid such as salt or fresh water, beverage (coffee, juice and so on) . Keep it away from fire source, explosive material or other dangers.
(10) Do not short- circuit the battery. Do not let the battery connection ends have any contact with metal or other conductors.
(11) Do not drop the battery. If it does happen (especially hitting a hard ground) , please contact the service center.
(12) If there is any electrolyte leakage, do not let the battery have any contact with skin or eyes. If it does happen, flow the contact area with large quantity of fresh water or asking for medical stuff.
(13) Do not disassemble the cell battery in any circumstance. It may lead to interior short circuit , even fire or other problems.
(14) Do not burn the battery or put it to the fire in any circumstance. Otherwise, the battery may get into fire.