SEPLOS Active Balance Board

Specification

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CONTENT

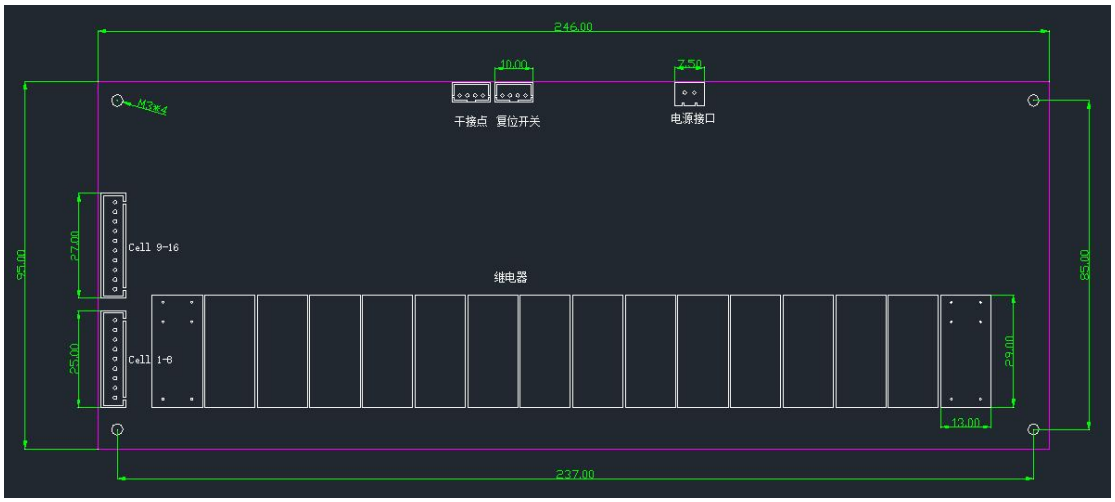
1. Application

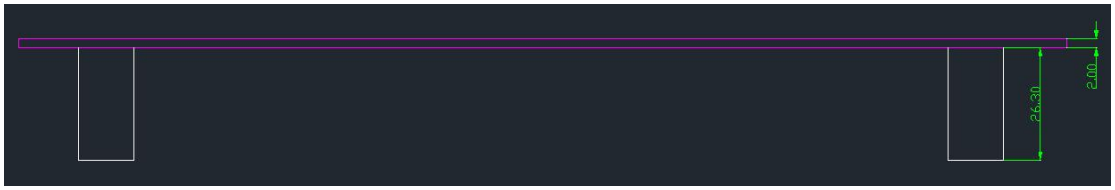
SEPLOS Active Balance Board can either be used separately, or compatible with SEPLSO BMS 3.0. When reaching threshold, BMS send signals, and the balance board start work. Thus to keep consistence of all cells in the battery pack. The board gets energy from battery pack, and 3 circuits can be activated at the same time. Each circuit offers 2A balance current.

Please operate according to user manual.

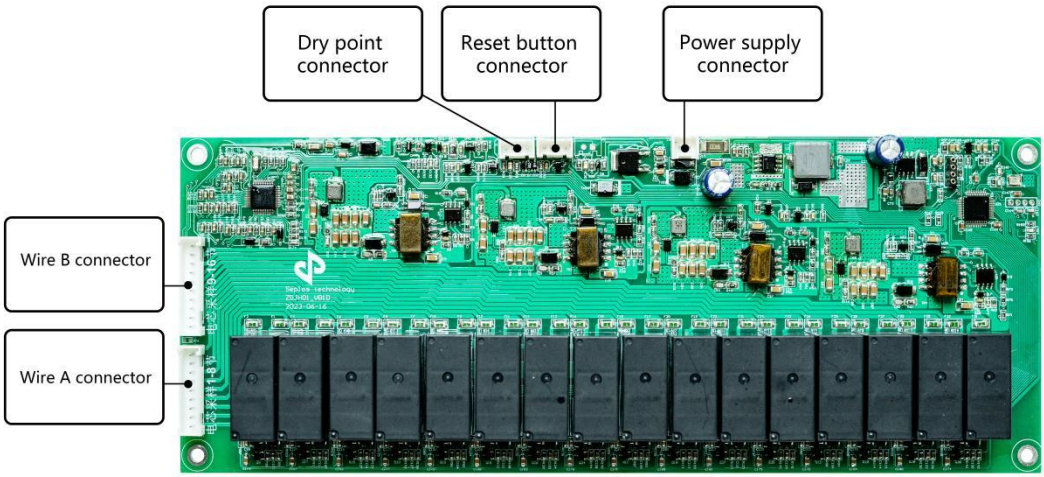
2. Specification

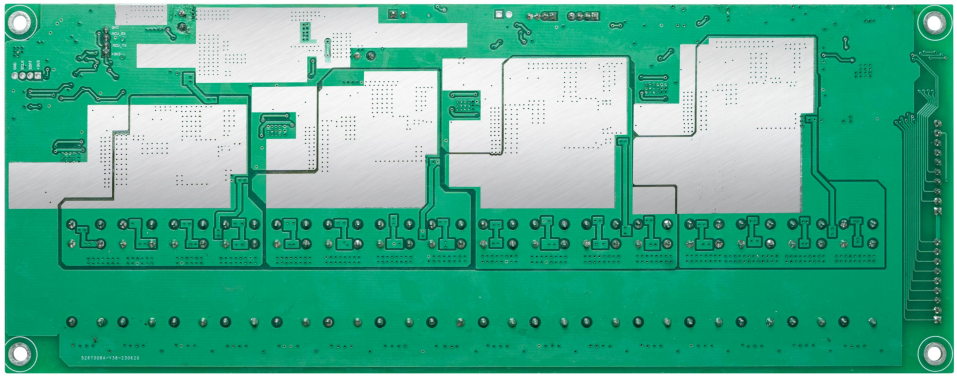
2.1 Dimension



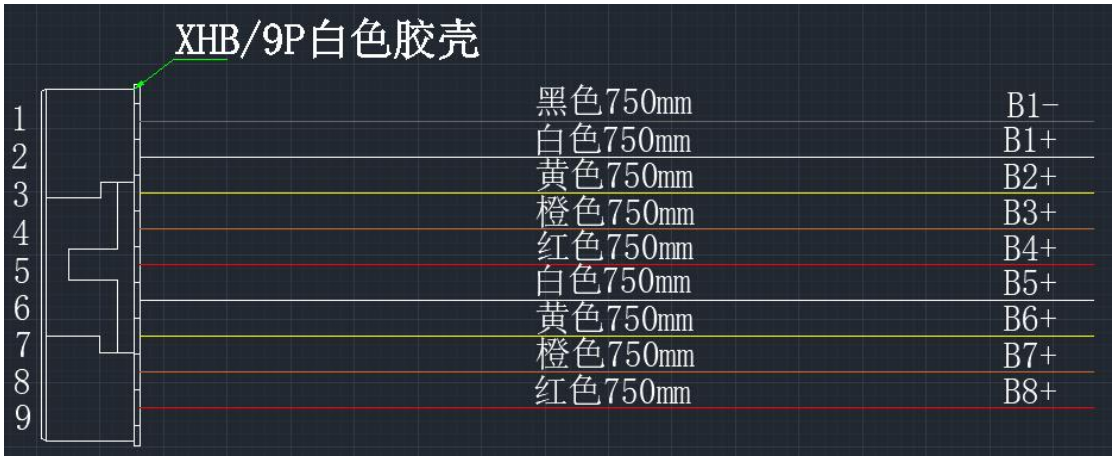


2.2 Interface

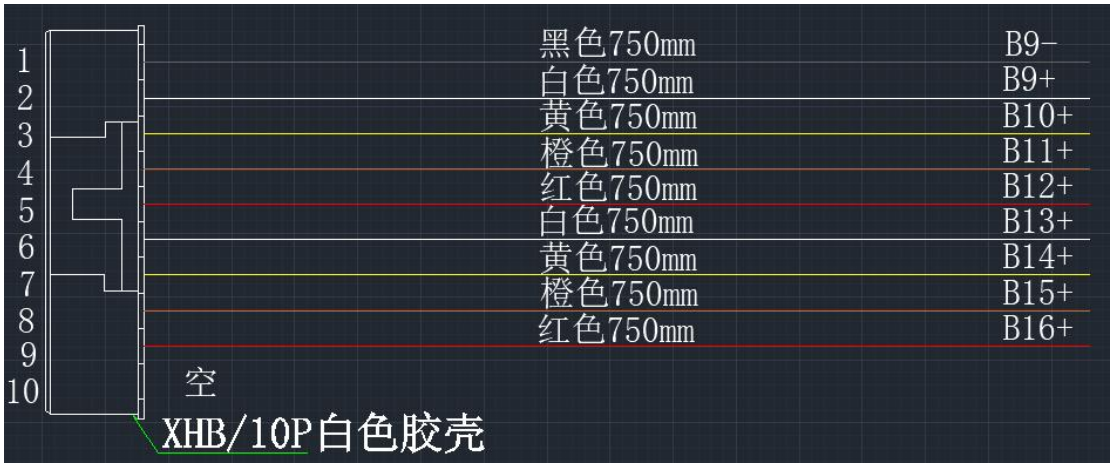




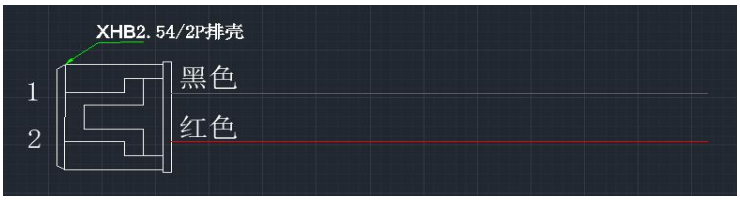
2.3 Wire Pin-out



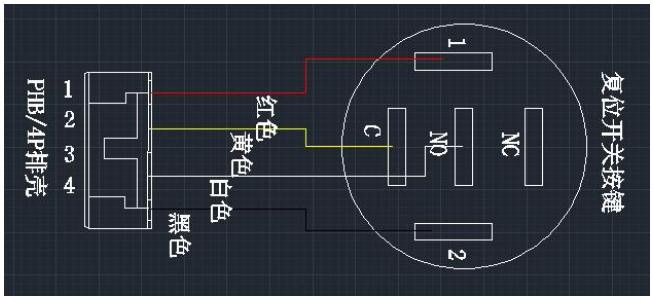
Wire A for cell 1-8		
No.	Definition for board	Definition for cells
1	CELL1-	The cathode of cell 1
2	CELL1+	The anode of cell 1
3	CELL2+	The anode of cell 2
4	CELL3+	The anode of cell 3
5	CELL4+	The anode of cell 4
6	CELL5+	The anode of cell 5
7	CELL6+	The anode of cell 6
8	CELL7+	The anode of cell 7
9	CELL8+	The anode of cell 8



Wire B for cell 9-16		
No.	Definition for board	Definition for cells
1	CELL9-	The cathode of cell 9
2	CELL9+	The anode of cell 9
3	CELL10+	The anode of cell 10
4	CELL11+	The anode of cell 11
5	CELL12+	The anode of cell 12
6	CELL13+	The anode of cell 13
7	CELL14+	The anode of cell 14
8	CELL15+	The anode of cell 15
9	CELL16+	The anode of cell 16
10	NC	NC



Power Supply Wire (2 PINS)		
No.	Definition for board	Definition for cells
1	B-	The negative of battery pack
2	B+	The positive of battery pack



Reset Button Wire (4 PINS)	
No.	Definition for board
1	12V anode
2	KEY signal
3	GND
4	12V cathode

3. Functions

3.1 Differences of active balance and passive balance

Passive balance:

To drains a small amount of energy from high SOC cells using a switch and resistor in parallel with each cell. Passive balance allows all cells to have the same SOC. And it provides a fairly low cost method for balancing the cells. But it waste energy in the process due to the discharge resistor.

With a balance current normally at 35mA to 80mA, passive balance is generally less accurate and slower than active balance.

Active balance:

Batteries designed around active balancing include advanced circuitry that works to balance energy between cells without bleeding extra energy off to a resistor. As such, no energy is wasted in order to achieve balance. The circuitry moves energy around as needed to keep the batteries perfectly balanced.

Where charging is concerned, active balancing is the most efficient way to guarantee a set of batteries fully charges without any risks of overheating. As soon as full charge is achieved, on board circuitry stops the charging process. No batteries are in danger of overheating while the rest in the set catch up.

When batteries are discharging, active balancing can actually extend battery life quite a bit. Again, this is because excess energy is not bled off. It is simply redistributed so that all of the cells discharge at the same rate. You get longer life between charges and very little risk of any single battery in a set fully discharging.

For customers that wish to maximize system run-time and charge more efficiently, active balancing is the best option.

3.2 Parameters

Items	Threshold	Description
Individual cells under voltage trip	2800mV	Balance will stop 1min later if any of the cell voltage under threshold.
Min. Voltage to start balance (the highest cell voltage)	3000mV	Min. Voltage to start or stop balance is set to ensure balance functions at all status when charging, discharging, and standby.
Min. Voltage to stop balance (the highest cell voltage)	2900mV	
Voltage difference for balance start	50mV	Balance starts when the voltage difference higher than 50mV.
Voltage difference for balance stop	30mV	Balance stops when the voltage difference lower than 30mV.
Balance duration	60S	Balance starts and keep for 60s, then it will stop for 3s to check if the voltage gets balance start/stop threshold.
Balance intermittence	3S	
Balance timeout	24H	After continuously balance for 24H, Balance will stop.
Temperature for balance continue	70℃	When the balance board temperature exceeds threshold, balance function will stop/recovery accordingly.
Temperature for balance stop	90℃	
Standby duration	10H	Balance board will turned off automatically if no balance for over 10 hours.
Balance current	2A	Each circuit get 2A balance current.
Power consumption	15mA	Power consumption less than 15mA at standby status.

3.3 LED lights indicator

Status	Description
Standby	LED light blink
Balance start	LED light stay solid green
Power on	Click reset button, LED light blink for once
Power off	Click reset button, LED light blink for six times
Balance stop	Click reset button at balance start status, LED light blink for 4 times
Balance recovery	Click reset button at balance stop status, LED light blink for 4 times

3.4 Active balance

The power consumption of balance board comes from battery pack. With a current of 2A, max. 3 circuits of balance can be turned on at the same time.