Capacitive Balancer for Lithium Battery

(0855A/1004A/0877A/1400/0999A16/1323)

Operation and Maintenance Manual

Heltec Energy

Content

1. Introduction 1

2. Technical Specifications 2

3. Installation and Assembly 3

3.1 Connection Description 3

3.2 Wiring Diagram 5

4. Precautions for Use 8

1. Introduction

The lithium battery active balancer is tailor-made for charging and discharging large-capacity series-parallel battery packs. It has full indiscriminate balancing of the entire pack, automatic low-voltage sleep, and temperature protection. The circuit board is sprayed with three-proof paint, which has excellent insulation, moisture-proof, leakage-proof, shock-proof, dust-proof, anti-corrosion, anti-aging, corona resistance and other properties. It can effectively protect the circuit and improve the safety and reliability of the product. The circuit board is equipped with an aluminum heat sink, which has the characteristics of fast heat dissipation and low temperature rise when working with high current. This product is suitable for ternary lithium, lithium iron phosphate, and lithium titanate batteries. The maximum equalizing voltage difference is 0.01V and the maximum equalizing current is 5.5A. When the voltage difference is 0.1V, the current is about 0.5A (actually related to the capacity and internal resistance of the battery). When the battery is lower than 2.7V (ternary lithium/lithium iron phosphate), it stops working and enters sleep, with over-discharge protection function. Appearance shown in Figure 1.



Figure 1. Product Appearance

2. Technical Specifications

The main technical indicators of the active balancer are shown in Table 1.

Table 1. The Main Technical Indicators of The Capacitive Balancer

Technical Indicators	SKU					
Applicable Number of Strings	3S-4S	4S-6S	6S-8S	9S-14S	12S-16S	17S-21S
SKU	0855A	1004A	0877A	1400	0999A16	1323
Applicable Battery Type	Ternary Lithium/Lithium Iron Phosphate/ Lithium Titanate					
Working Voltage Range	Ternary Lithium/Lithium Iron Phosphate: 2.7-4.2V Lithium Titanate: 1.8-3.0V					
Balanced Voltage Range	5mV (Typical)					
Balance Mode	The whole group of batteries participates in active balancing of energy conversion at the same time					
Balance Current	When the voltage difference is 0.01V, the equalizing current is 0.5A.The larger the voltage different, the larger the equalizing current. The maximum equalizing current is 5.5A.					
Undervoltage Protection Sleep Voltage	Ternary Lithium/Lithium Iron Phosphate: 2.7V Lithium Titanate: 1.8V					
Static Working Current	13mA	8mA	8mA	15mA	17mA	16mA
Product Size (mm)	66*46*16	69*69*16	91*70*16	125*80*16	125*91*16	145*130*16

Working Temperature	-10℃ ~ 60℃
External Power	No external power supply is required, relying on the energy transfer inside the battery to achieve the balance of the entire battery pack.

3. Installation and Assembly

3.1 Connection Description

The connection position of the active balancer is shown in Figure 2, its definition is shown in Table 2.

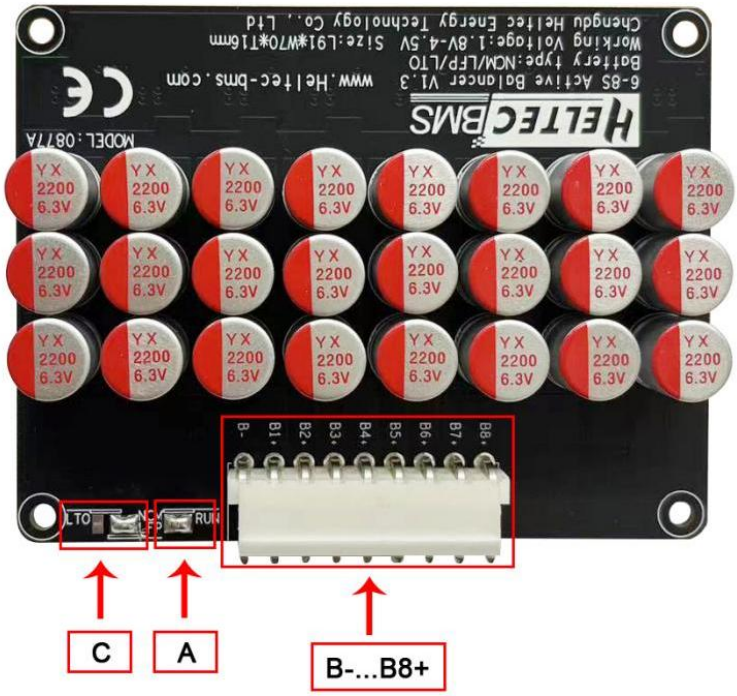


Figure 2. (0877A) Connection Location Diagram

Table 2. Connection Definition

Connector	0877A	
	Name	Definition
A	RUN	The default is shorted, and an external switch can be connected to control the balance function switch

B- ~ B8+	B-	The negative pole of the 1st string
	B1+	The positive pole of the 1st string
	B2+	The positive pole of the 2nd string
	B3+	The positive pole of the 3rd string
	B4+	The positive pole of the 4th string
	B5+	The positive pole of the 5th string
	B6+	The positive pole of the 6th string
	B7+	The positive pole of the 7th string
	B8+	The positive pole of the 8th string
C	LTO/NCM and LFP	(from left to right) 1+2 pad short: Select LTO (lithium titanate) battery type. 2+3 pad short: Select NCM and LFP (ternary lithium/lithium iron phosphate) battery type.

*** Precautions:**

1. The circuit solder joints (LTO/NCM/LFP) for mode selection (run) are strictly prohibited from being soldered together with RUN. This will cause short circuit and damage the balance board;

2. In addition to the 3/4S designed specifically for NCM / LFP (ternary lithium / lithium iron phosphate), other new versions with connectors are available in NCM / LFP / LTO (ternary lithium / lithium iron phosphate / lithium titanate) used on;

3. The RUN indicator light indicates the continuous working state of the balance, and it will only go out when the battery under-voltage protection or the balance board fails.

3.2 Wiring Diagram

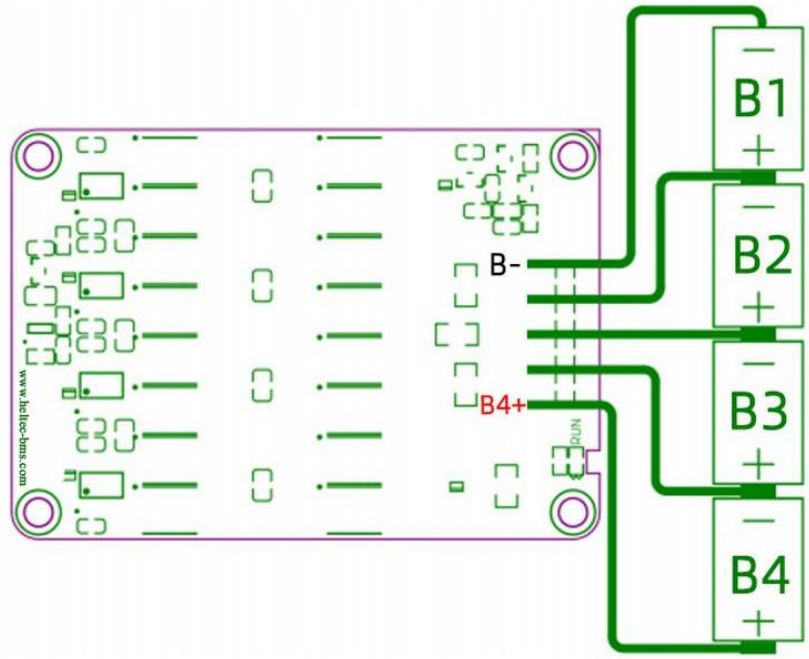


Figure 3. (3S-4S) - Wiring Diagram

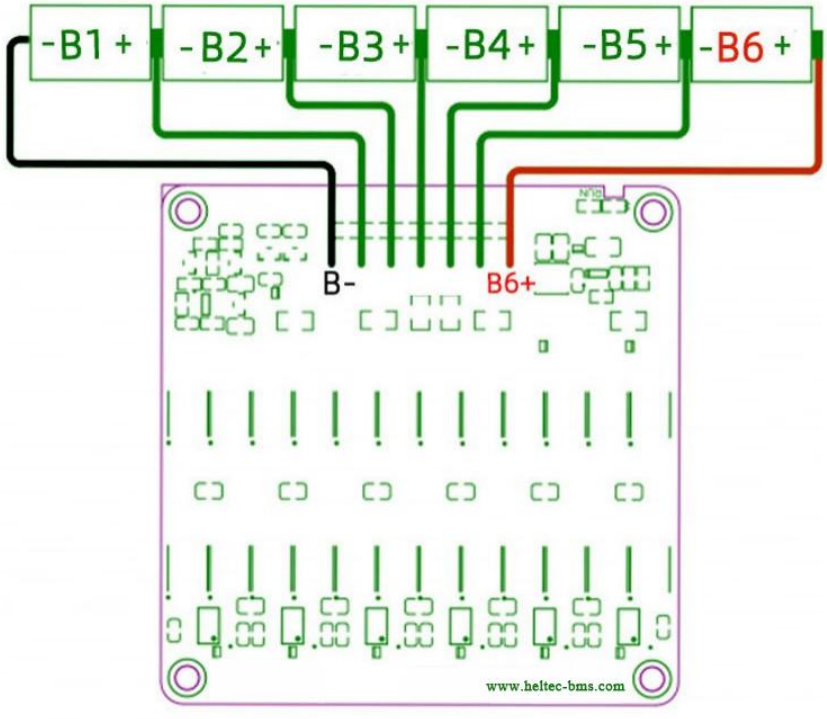


Figure 4. (4S-6S) - Wiring Diagram

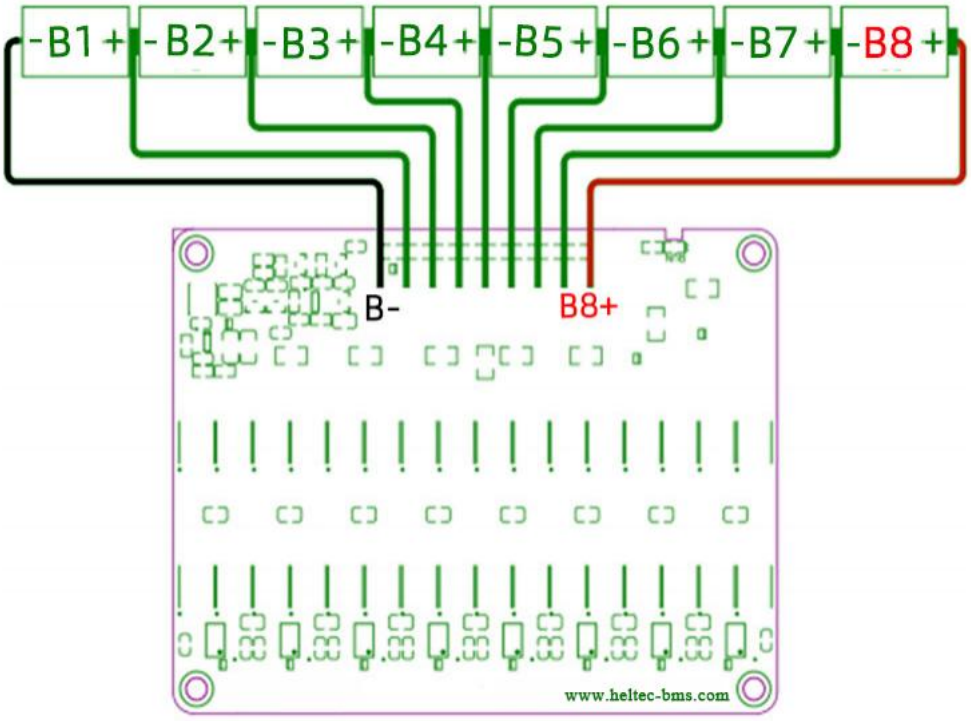


Figure 5. (6S-8S) - Wiring Diagram

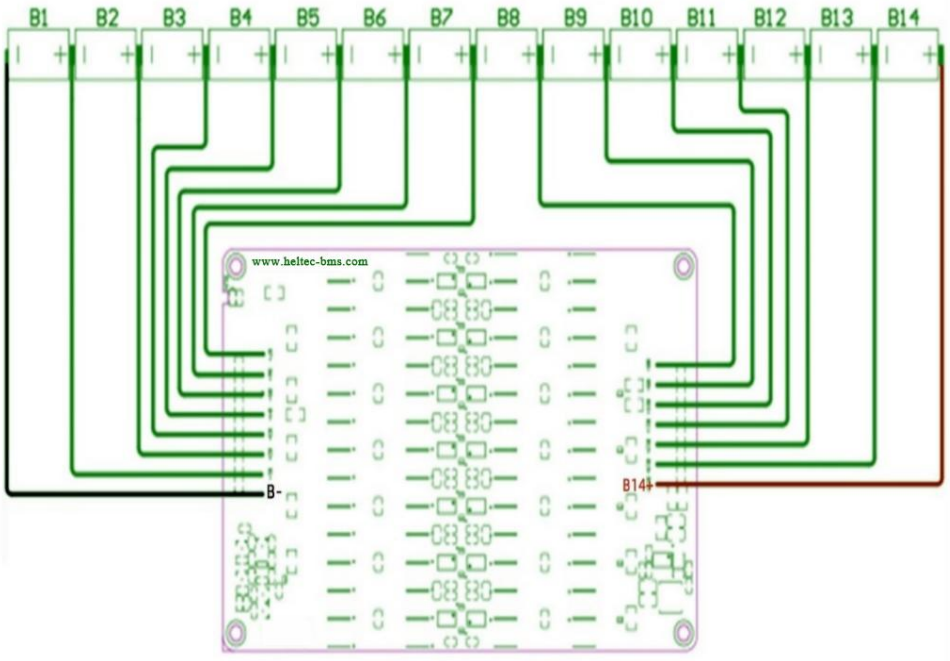


Figure 6. (9S-14S) - Wiring Diagram

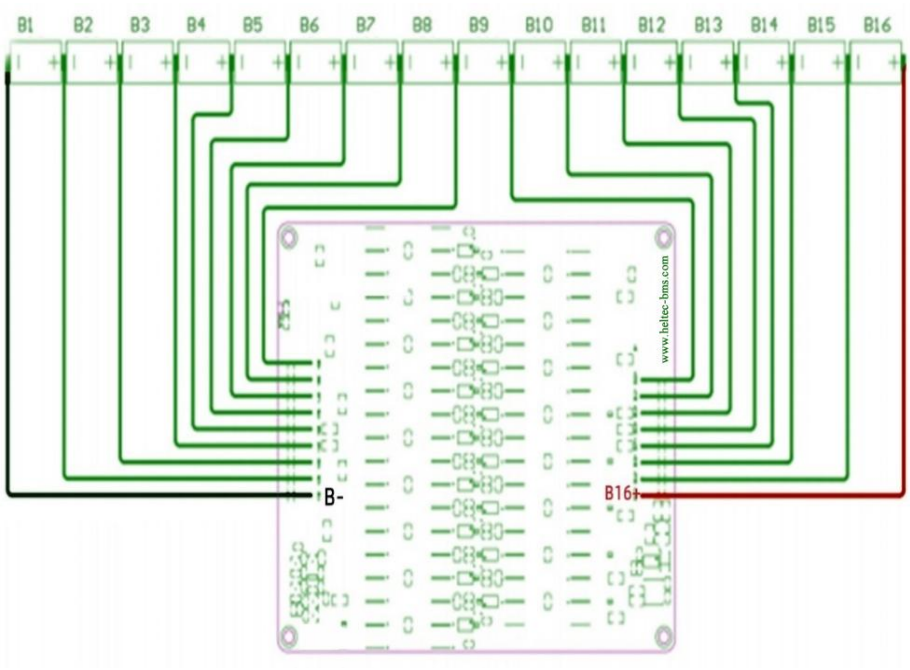


Figure 7. (12S-16S) - Wiring Diagram

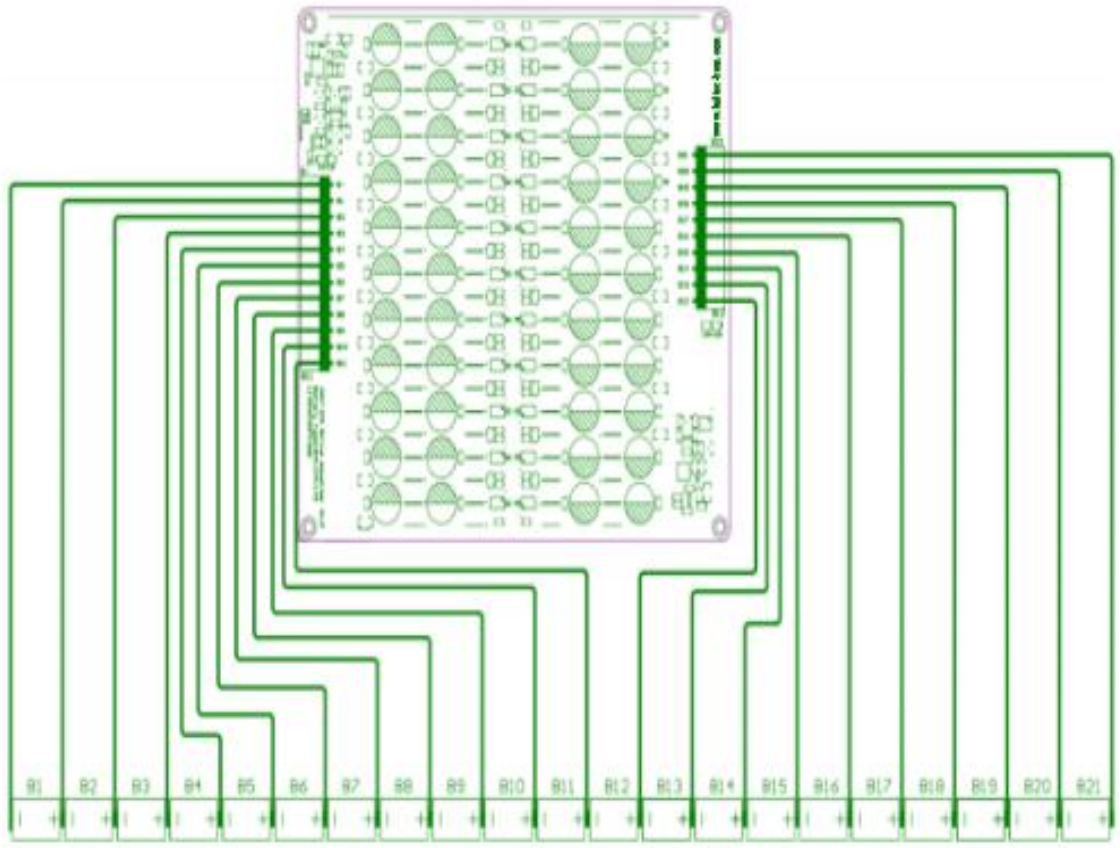


Figure 8. (17S-21S) - Wiring Diagram

4. Precautions for Use

- During use, you must follow the design parameters and usage conditions, and do not use it contrary to the parameters in this specification, otherwise it will easily damage the balancing board, and then damage the battery pack.
- Anti-static during use, when testing, installing, and touching the equalization board, there must be corresponding anti-static measures.
- Be careful not to touch the components on the circuit board with lead wires, electric soldering iron, tin slag, etc. during use, otherwise the balance board may be damaged.
- If any abnormality occurs during use, please stop using it immediately and return it to the original factory or ask professional maintenance personnel for repair.
- This balance board has done a lot of reliability tests, the reliability is much higher than the general balance board on the market, and the technology of the battery cell must be guaranteed at the same time, so as to reduce the occurrence of combustion as much as possible.

* Safety Precautions:

Our company is committed to the improvement of quality and reliability, but generally speaking, electrical components will have a certain probability of failure. The use environment and conditions are different, and the durability will be different. The redundant design is used to avoid overloading. Abnormal heat, smoke, and even personal accidents, fire accidents, social damage, etc.