SONGXIN LIGHT 3S/4S/5S 100A BMS Battery Protection Board User Manual

Model: 3S/4S/5S 100A BMS

1. Introduction

This manual provides detailed instructions for the SONGXIN LIGHT 3S/4S/5S 100A Battery Management System (BMS) protection board. This versatile board is designed for use with 3-series, 4-series, or 5-series Li-ion, LMO, Ternary Lithium battery packs, offering robust protection and balancing features.

The board features a specified chip for stable performance and incorporates 15 high-power, ultra-low resistance MOS tubes to handle high discharge and charge currents effectively.

2. Specifications

Feature	Specification
Supported Battery Types	Li-ion, LMO, Ternary Lithium (3.7V nominal for Li-ion/Ternary)
Series Configuration	3S, 4S, 5S (adjustable)
Max Discharge Current (Different Port)	80A
Max Discharge Current (Same Port)	60A
Max Charging Current	60A
MOS Tubes	15 (8 for discharge, 7 for charging)
Operating Temperature	-40 to 80 Celsius
Dimensions	60mm x 42mm

2.1. Protection Parameters (Li-ion / LMO / Ternary Lithium - 3.7V Nominal)

Parameter	Value
Single Cell Overcharge Protect Voltage	4.21-4.29 V
Single Cell Overcharge Recover Voltage	4.14-4.24 V
Overcharge Protect Delay	1.5-2.5 S
Single Cell Over-discharge Protect Voltage	2.72-2.88 V
Single Cell Over-discharge Recover Voltage	2.9-3.1 V
Over-discharge Protect Delay	0.5-1.5 S
Shortage Protect Delay	100-600 uS
Balance Function	Yes
Ampere Balance Current	60mA
Voltage Balance Accuracy	4.14-4.24 V
Temperature Protect	Yes (with Temperature control interface)
Disconnect Protect	Yes
Shortage Protect Recover Mode	Off load release

2.3. Physical Dimensions

The BMS board has the following approximate dimensions:

- Length: 60mm

- Width: 42mm

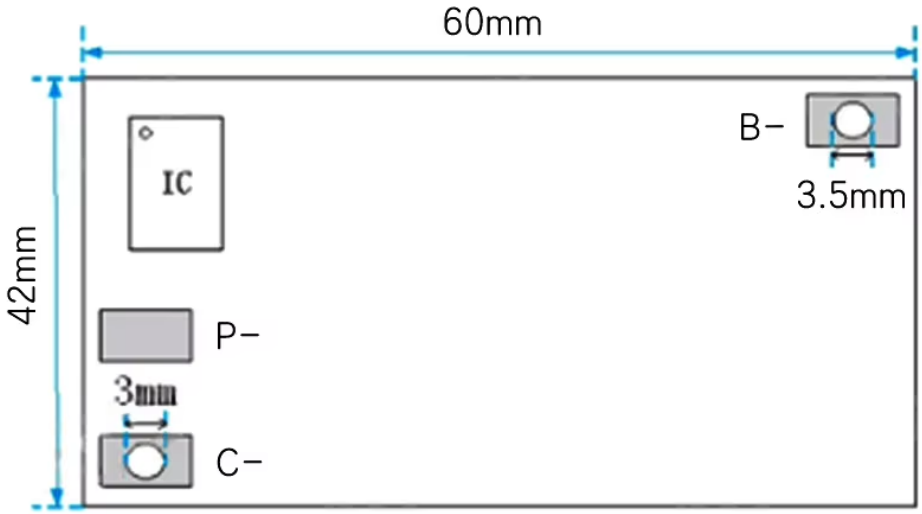


Figure 1: BMS Board Dimensions (60mm x 42mm)

3. Setup and Wiring

This BMS board supports both 'Same Port' (Synopline) and 'Different Port' (Split) wiring configurations. Ensure you select the correct wiring diagram for your application and battery series (3S, 4S, or 5S).

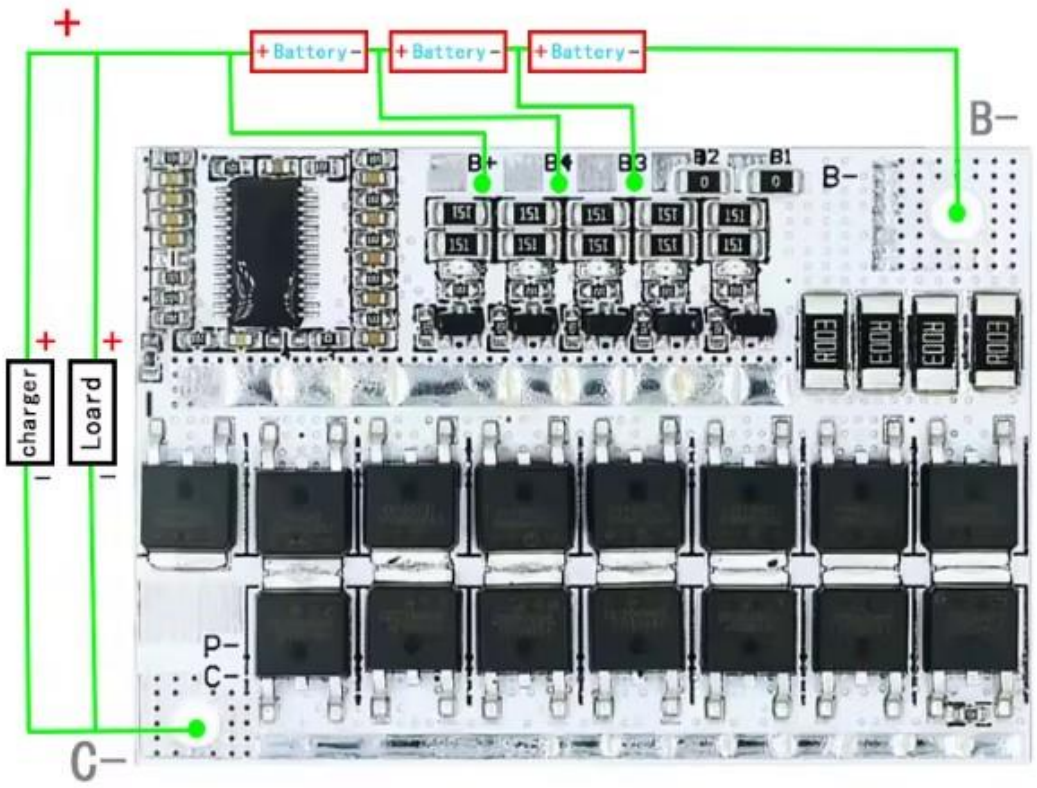
3.1. General Wiring Principles

- **B- (Thick Black Wire):** Connect to the negative terminal of the entire battery pack.
- **B+ (Thick Red Wire):** Connect to the positive terminal of the entire battery pack.
- **C- (Thick Blue Wire):** Connect to the negative terminal of the charger (and load for 'Same Port' configuration).
- **P- (Thick Yellow Wire):** Connect to the negative terminal of the load (for 'Different Port' configuration).
- **Balance Wires (Thin Wires B1, B2, B3, B4, B+):** Connect these to the individual cell positive terminals in sequence, starting from the first cell's positive (B1) up to the last cell's positive (B+). Ensure correct order and polarity.
- **Charger:** Connect the positive terminal of the charger to the B+ of the battery pack.

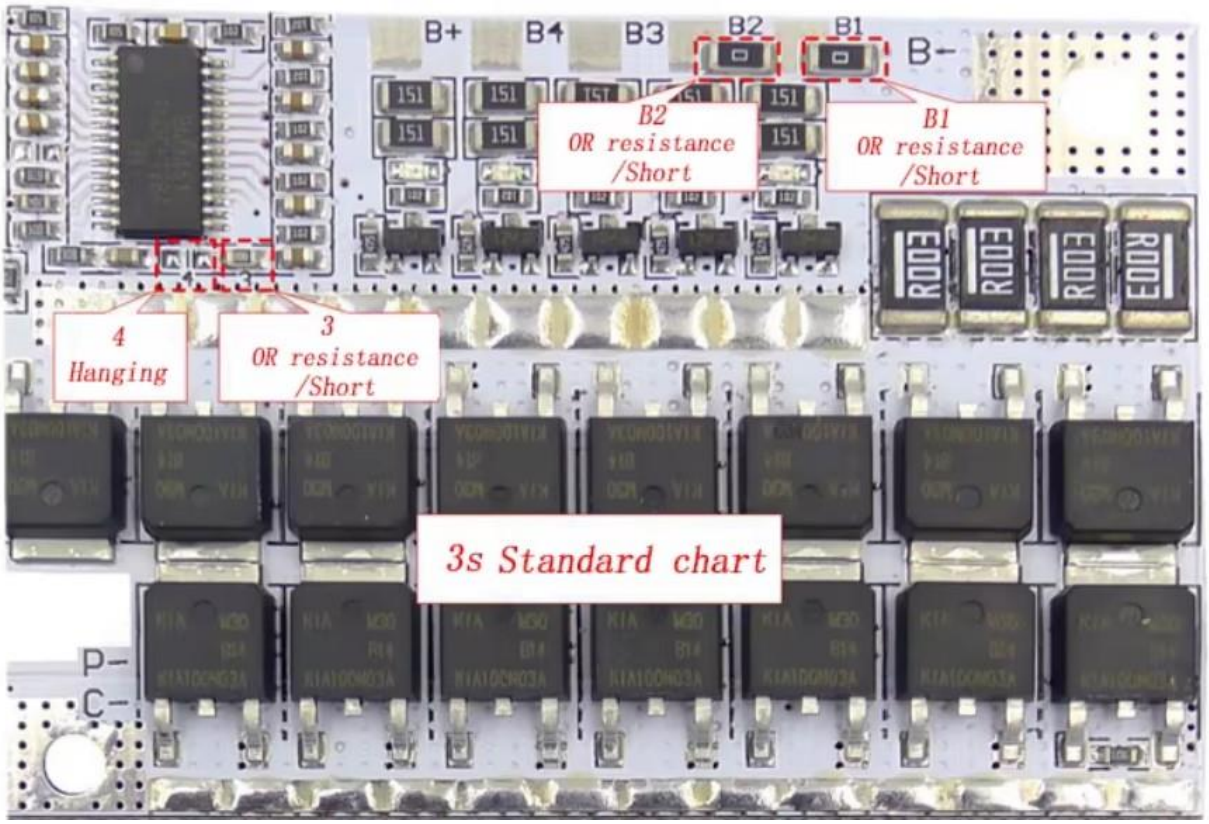
- **Load:** Connect the positive terminal of the load to the B+ of the battery pack.

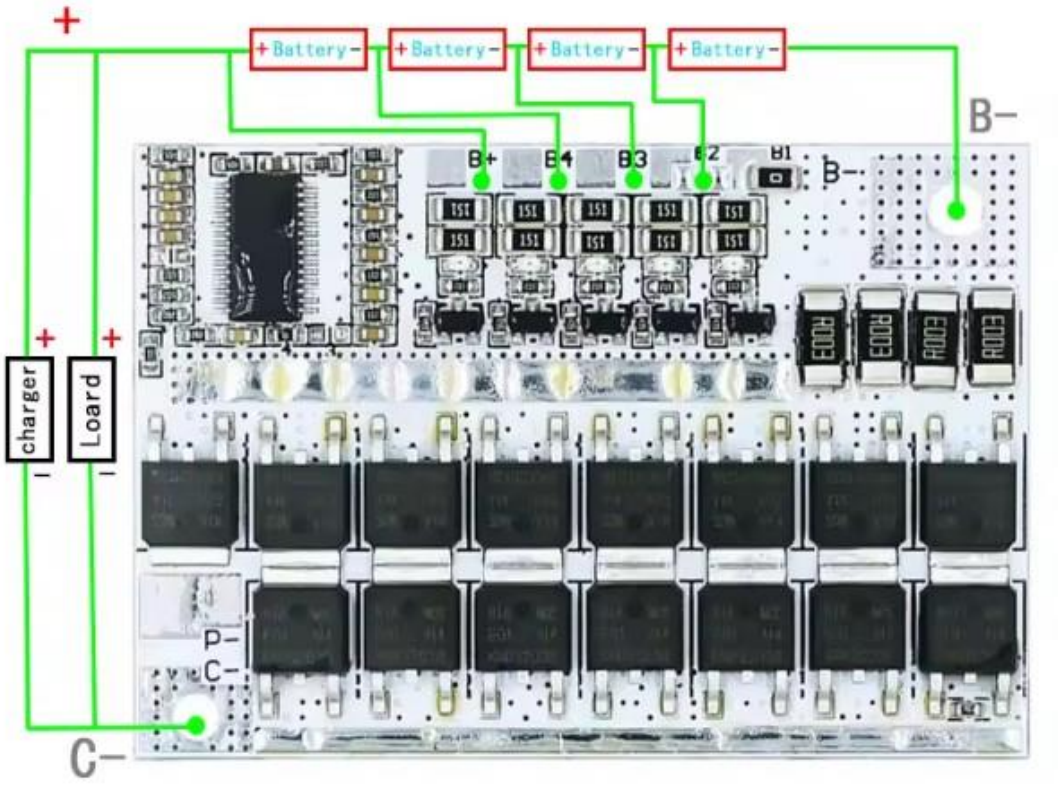
3.2. Same Port (Synopline) Wiring Diagrams

In the 'Same Port' configuration, the charging and discharging share the same negative terminal (C-). This configuration supports a discharge current of up to 60A.

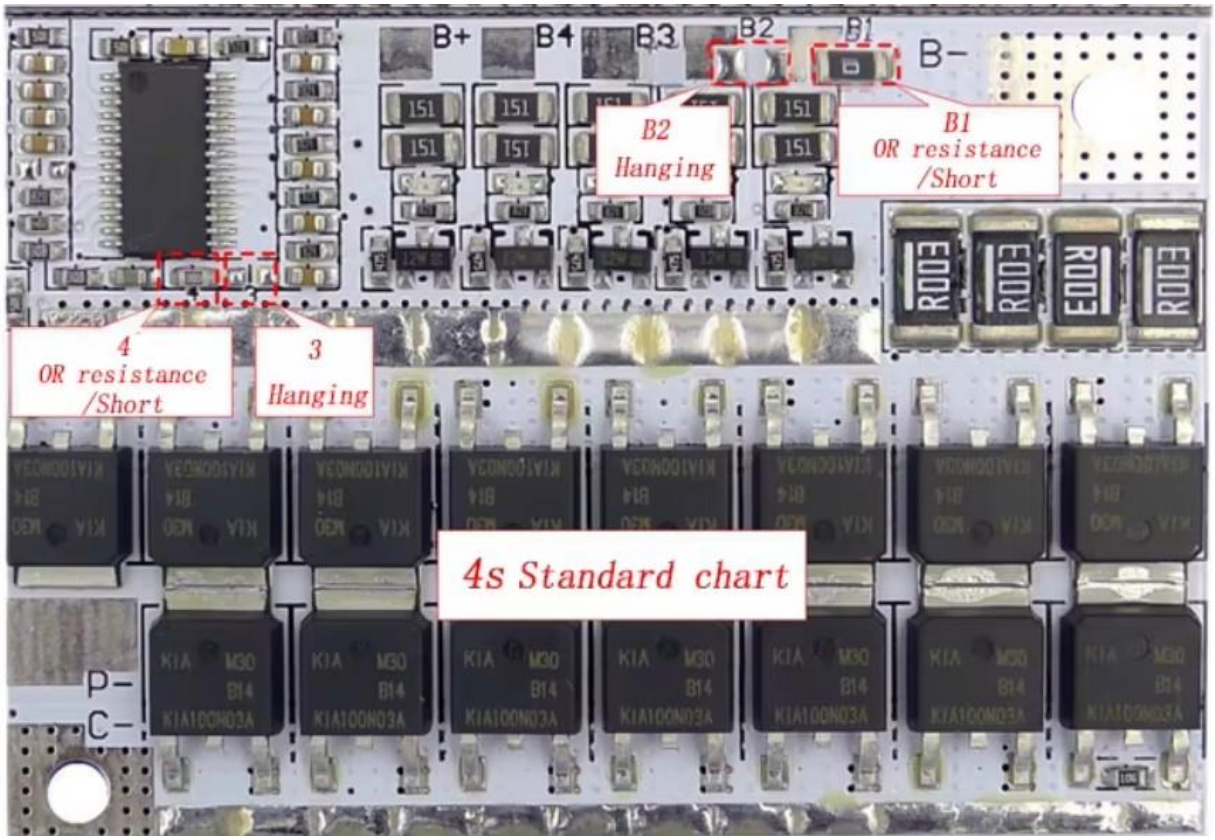


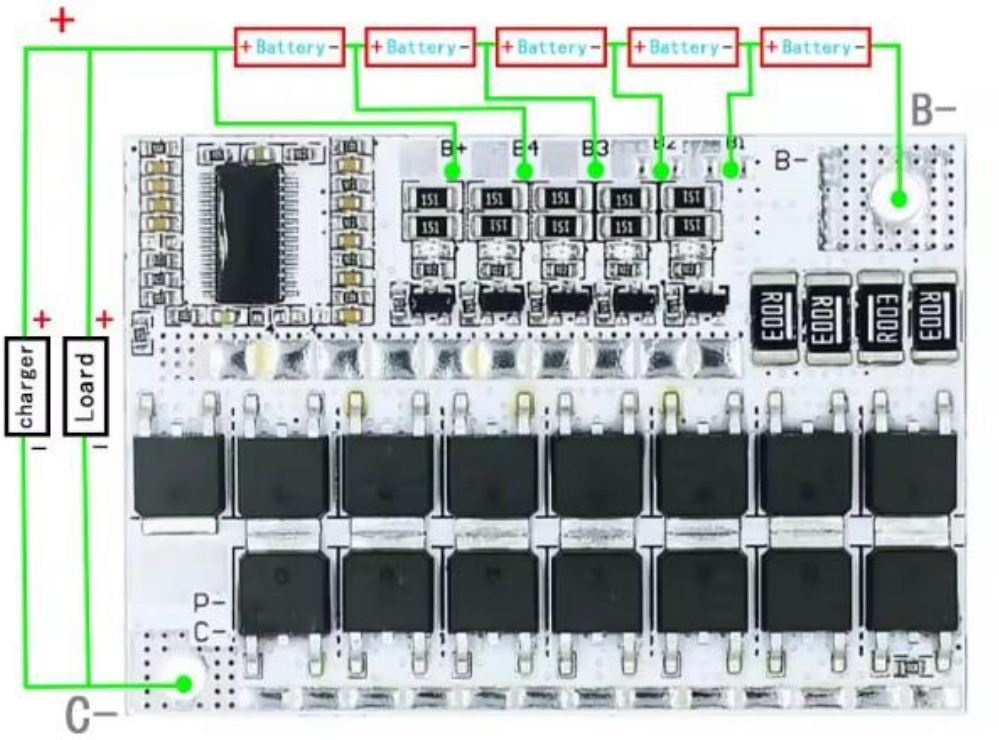
3S 12V 100A Wiring Diagram


B+
B4
B3
B2
B1
B-
B2
OR resistance
/Short
B1
OR resistance
/Short
4
Hanging
3
OR resistance
/Short
3s Standard chart
P-
C-



4S 16.8V 100A Wiring Diagram


B+
B4
B3
B2
B1
B-
B2
Hanging
B1
OR resistance
/Short
4
OR resistance
/Short
3
Hanging
4s Standard chart
P-
C-



5S 21V 100A Wiring Diagram

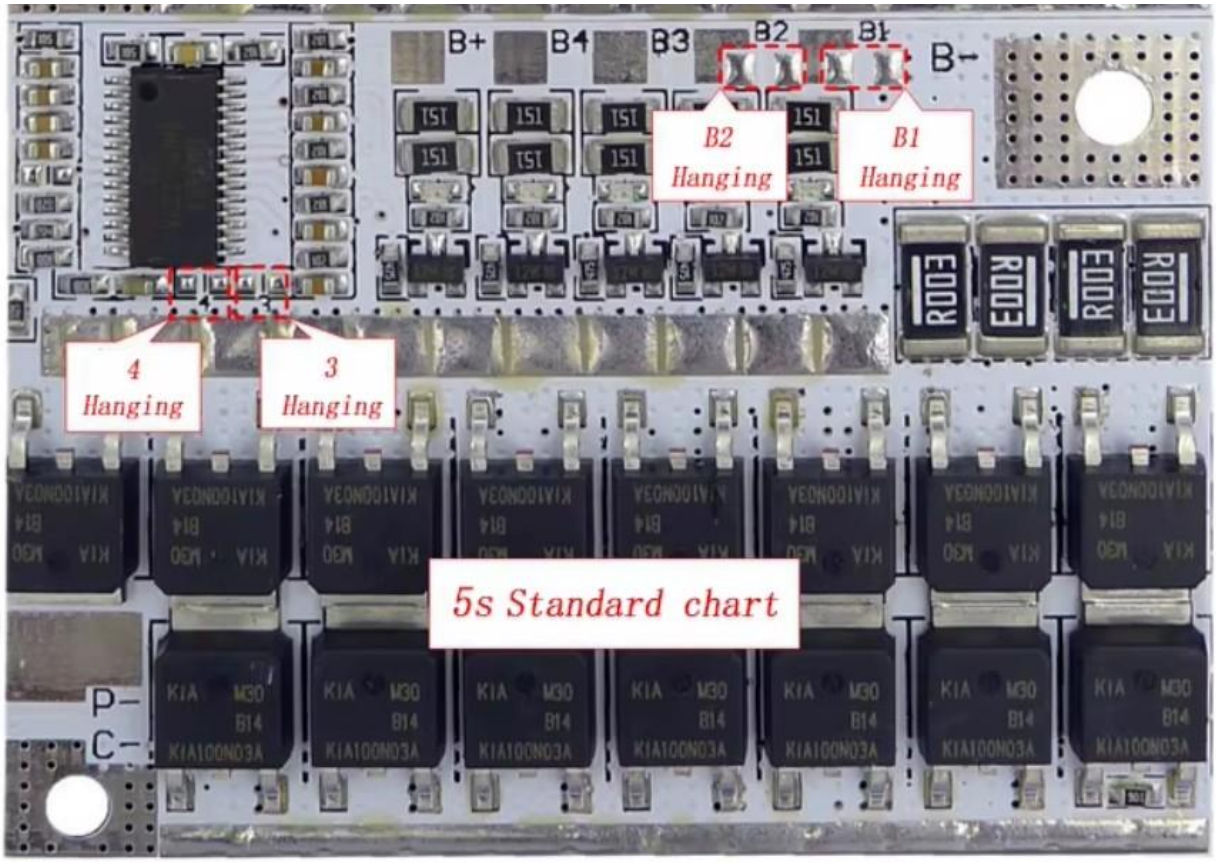


Figure 2: Overview of Same Port Wiring Diagrams for 3S, 4S, 5S (21V)

3.3. Different Port (Split) Wiring Diagrams

In the 'Different Port' configuration, the charging negative (C-) and discharging negative (P-) terminals are separate. This configuration supports a discharge current of up to 80A.

4. Operating Instructions

Once the BMS board is correctly wired to your battery pack, it will automatically begin to monitor and protect the cells. No additional configuration is typically required for basic operation.

- **Charging:** Connect your compatible charger to the designated charging terminals (C- and B+). The BMS will manage overcharge protection and cell balancing.
- **Discharging:** Connect your load to the designated discharge terminals (C- or P- and B+). The BMS will manage over-discharge and over-current protection.

- **Cell Balancing:** The integrated balance function will automatically work to equalize the voltage across individual cells during charging, ensuring optimal battery health and longevity.

5. Maintenance

- Keep the BMS board clean and free from dust and moisture.
- Avoid exposing the board to extreme temperatures outside its operating range (-40 to 80 Celsius).
- Regularly inspect wiring connections for any signs of corrosion or loose contacts.
- Ensure adequate ventilation around the battery pack and BMS, especially during high current operation, to prevent overheating.

6. Troubleshooting

- **No Output/Charging:**
    - Check all wiring connections for correctness and secure contact.
    - Verify that the battery pack voltage is within the safe operating range (not severely over-discharged or overcharged).
    - The BMS may have entered a protection state (e.g., over-discharge, over-current, short circuit). Disconnect the load/charger, wait a few moments, and then try to reconnect. A short circuit protection typically recovers upon load release.
- **Uneven Cell Voltages:**
    - Ensure the balance wires are correctly connected to each cell.
    - Allow the battery pack to charge fully; the balancing function is most active during the latter stages of charging.
- **Overheating:**
    - Reduce the load or charging current if the board becomes excessively hot.
    - Ensure proper ventilation around the BMS and battery pack.

7. Important Considerations

- Always double-check wiring before applying power to prevent damage to the BMS or battery pack.

- This BMS is designed for specific battery chemistries (Li-ion, LMO, Ternary Lithium). Do not use it with other battery types unless explicitly stated as compatible.
- For high-current applications, ensure that all connections, especially the main power lines (B-, C-, P-), are made with appropriately thick gauge wires to minimize resistance and heat generation.

8. Warranty and Support

For any technical assistance or warranty inquiries, please contact your original point of purchase or the manufacturer, SONGXIN LIGHT, directly. Please have your product model and purchase details ready when contacting support.