

USER MANUAL

M1 LiFePo Battery Pack 300Ah





USER MANUAL FOR:

M1 LiFePo Battery Pack 300Ah

MODEL NO: KS-M1-300AH

P/N: KS-CS-M1QMAN-D-001 Rev: A01



1. DESCRIPTION

M1 is the latest KS2 model **Lithium-Ion (LiFePO₄)** battery. Available in capacities of **200AH/2400W** or **300AH/3600W**. It contains KS2's proprietary internal battery management system (**BMS**).

The M1 has been designed to be more efficient than previous models and is equipped with more advanced communication features. It contains the same internal heating system to allow for use in cold climates.

This battery has one set of connectors that acts as both the **Charge** and **Discharge** functions.

The M1 battery can be managed with either KS2's standard **Switch Panel**, **Battery Display**, or **LFP Dongle**. Both the LFP dongle and battery display allow Bluetooth connectivity via KS2's Battery Display app. The app allows control of the battery and access to the BMS for data and performance information.

The M1's management system will automatically reduce power consumption when its power level is low or if it has been inactive for an extended period of time.

2. BATTERY EXTERIOR



1 – POS (+) / GND(-) – Positive (red) / Ground (black) Connectors

2 – Communication Cable Connector (to Control Switch / Battery Display / LFP Dongle)

3 – Serial Number & Label

4 – Battery Mount Brackets

5 – Positive / Ground Connector Covers



USER MANUAL FOR:

M1 LiFePo Battery Pack 300Ah

MODEL NO: KS-M1-300AH

P/N: KS-CS-M1QMAN-D-001 Rev: A01

3. KEY FEATURES

The M1 Battery can be “**Always On**” when connected; This is significantly different than previous KS2 model batteries.

The M1 will wake, connect, and disconnect based on parameters programmed into the on-board **Battery Management System (BMS)**.

Deep Sleep – Power Save Mode: The M1 will go into “deep sleep mode” to preserve battery power. This occurs after an extended period of idle time. Once the BMS detects any current (charge or discharge), it will “wake up” per normal operation.

Smart Features: The M1 has a built-in BMS4 system. It includes enhanced the controls, communication, and features.

The M1 communicates with other M1 batteries when connected via the **KS2 Battery Display, LFP Dongle**, or hardwired via communication cables and custom harness. This feature allows the batteries to work together to reduce load and improve charging/discharging performance.

The KS2 Battery Display and LFP Dongle can control the M1 battery through the physical display or the **BT Connected App**.

The BT Connected App allows data logs from the M1 battery to be downloaded for review and sent via email.

4. INSTALLATION



ATTENTION: Wear all applicable safety equipment (ie: rubber gloves, safety glasses etc). Disconnect all cables before starting installation or dismantling battery.

When **installing**, first connect the positive battery cable, then the negative (ground).

When **dismantling**, disconnect in reverse order of installing process.

Install the battery using the integrated mounting brackets.

Verify polarity. Connect the power wires to the terminals, then connect the communication cable. Please refer to the **KS2 M1 Wiring Diagram** before Installation.

IMPORTANT: *Installation is recommended between the vehicle frame and crash protection barriers.*

If the battery or batteries are installed inside of the vehicle, installer should ensure that the location is protected by a crash tested & approved appliance (some examples are: a folding rear sofa, or between the rear wheels and forward of rear bumper).

DO NOT Connect the M1 Battery in Serial with any other battery. It is designed for 12V Usage only. ALWAYS use Parallel connections. Please see “Wiring Diagram”

5. TURNING THE BATTERY ON

The M1 can be turned on using 3 different methods:

- The Switch Panel - using the push button. In the case of an autonomous setup, the communication cable can be unplugged after the button is pressed and the contactor is closed.
- The Battery Display's user interface (or Bluetooth connected app).
- The LFP dongle via the Bluetooth connected app



ATTENTION: Make sure there is no significant load on the power wires during startup.



USER MANUAL FOR:

LFP M1 BATTERIES 200Ah & 300Ah

MODEL NO: KS-M1-300AH

P/N: KS-CS-M1QMAN-D-001 Rev: A01

6. TURNING THE BATTERY OFF



ATTENTION: Before installation, the M1 should always be turned off.

The M1 can be turned off using 3 different methods:

- The Switch Panel - connect the communication cable to the M1. Press and hold the button for at least 5 seconds
- The Battery Display - connect the communication cable to the M1. Turn off using the Battery Display's user interface or by the app.
- The LFP Dongle - connect the communication cable to the M1. Turn off using the app.

The Contactor will then open (if it was previously closed). Verify that there is no power on the terminals.

7. USAGE

****PLEASE NOTE****

- The internal heaters will activate if cell temperature is below 2°C (36°F) and there is external power available (i.e. engine running, inverter connected to shore power and turned on, etc.)
- The charging equipment is NOT recommended to exceed 14.1V
- It is NOT recommended to leave a discharged battery unattended for an extended period of time (no more than one week)

8. CHARGING

It's recommended to charge a few batteries at a time. Under-hood generators can charge the batteries within a reasonable time frame. Settings for the generator can be adjusted to maximize the system's life.

Solar charging also extends the time you can be away from shore power. The settings for your solar charger should be adjusted to match the entire system.

Your inverter/charger is designed to charge your batteries at a rate specified by the installer. It is important that your inverter be set to **Charge Program 1**.

ATTENTION: If the battery is stored without any intended use for an extended period, charge the battery every 3 months.



USER MANUAL FOR:

M1 LiFePo Battery Pack 300Ah

MODEL NO: KS-M1-300AH

P/N: KS-CS-M1QMAN-D-001 Rev: A01

9. DISCHARGING

To ensure maximum lifespan of the batteries, it's always best to keep all batteries active. This allows the batteries to share both the charge (incoming current), and the load.

If you are going to run appliances in the RV for an extended period of time without charging (sleeping with the air conditioner on, for example), you can turn on the batteries in pairs (2, 4, etc.). It is advised to have your batteries full for these scenarios. If both pairs of batteries are within 0.2-0.3V difference, there will be little current rush between them when turning them on at the same time. A large difference in voltage between the batteries can lead to a larger current rush from the "full set" to the "empty set."

Should one set of batteries be empty, you should charge them before you require power from them.

The M1 has a lower cut-off at 12.2V for the battery. When the voltage reaches this level, you will need to supply charge power from either the inverter (shore power) or the generator.

The contactors' full operation is 300A with no time limit.

Peak operation is set at 300A. It can operate for 60 minutes.

If you plan on placing it in storage for an extended period, shut down the battery - **please refer to Section 4: TURNING THE BATTERY OFF.**

10. TECHNICAL SPECIFICATIONS CHARTS

GENERAL CHARACTERISTICS		
ITEM	DESCRIPTION	UNITS
Nominal Voltage	12.8	V
Operating Voltage Range	14.4 ~ 11.3	V
Nominal Capacity	300 (3800)	Ah (Wh)

MECHANICAL CHARACTERISTICS		
ITEM	DESCRIPTION	UNITS
Weight	37 (16.8)	kg (lbs)
Length	457 (18.3)	mm (inch)
Width	258 (10.2)	mm (inch)
Height	246 (9.7)	mm (inch)



USER MANUAL FOR:

M1 LiFePo Battery Pack 300Ah

MODEL NO: KS-M1-300AH

P/N: KS-CS-M1QMAN-D-001 Rev: A01H

11. TECHNICAL SPECIFICATIONS CHARTS (continued)

ELECTRICAL CHARACTERISTICS		
CHARGE		
Maximum Charging Voltage	14.4	V
Charge Overcurrent Protection	300	A
DISCHARGE		
Discharging Temperature Range	-20 (-4) ~ 55 (131)	°C (°F)
Minimum Voltage	11.3	V
Discharge Short Circuit Protection	1800	A
Discharge Overcurrent Protection	300	A
Maximum Current	300	A

RECOMMENDED PERFORMANCE OF BATTERY VOLTAGE LEVEL VERIFICATION EVERY 3 MONTHS.
RECOMMENDED LEVEL IS 12.6v TO 13.2v

STORAGE		
ITEM	DESCRIPTION	CONDITIONS
Storage Temperature - °C (°F)	-10 ~ 35 (14 ~ 95)	≥ 1 month
	-5 ~ 30 (23 ~ 86)	1~6 months
	0 ~ 30 (32 ~ 86)	≥ 6 months
Storage SOC - %	50 ~ 80	
Storage Humidity - %RH	≤ 45	

12. COLD WEATHER STORAGE

Each KS2 Battery is equipped with temperature sensors and built-in heaters. These components monitor cell temperature and provide heat to the cell through EXTERNAL power. Your KS2 LFP will **not charge the cells** if they are less than 2°C or 35°F.

The battery can **provide power** in this temperature range
- 20°C to + 55°C / -4°F to 131°F

The battery can **accept a charge** in this temperature range:
2°C to +55°C / 35.6°F to 131°F



USER MANUAL FOR:

M1 LiFePo Battery Pack 300Ah

MODEL NO: KS-M1-300AH

P/N: KS-CS-M1QMAN-D-001 Rev: A01

12. COLD WEATHER STORAGE (continued)

When the vehicle is not in use for an extended period of time, turn the batteries OFF. Charge the batteries to about 70%-80% capacity (approximately 13.2V). When the battery is sufficiently charged, it can be left in this status for over 90 days. NEVER try to charge a frozen battery. Turn the battery ON to activate the battery heater and apply an EXTERNAL power source. Charging will commence once the internal temperature reaches 2°C/35°F.

****Please note that air temperature and battery temperature may not be the same due to several different factors.**

The heaters will warm a frozen battery in approximately 30-45 minutes, depending on wind speed, location of the batteries, and the starting temperature once heating.



13. ATTENTION

New battery pack must be fully charged before use. To reduce risks of injury read instructions in product quick guide/manual before installation, operation, and maintenance of the battery pack. Installation to be performed by trained personnel only.

- DO NOT short terminals, swap polarity, connect in series, charge over 14.4 VDC, or discharge below 10.0 VDC.
- DO NOT attempt to disassemble, open, or service the battery pack.
- In case of smoke, disconnect all power.
- DO NOT crush, short external contacts, or dispose of in fire or water.
- The recommended storage temperature range is 0°C - 30°C (32°F - 86°F)
- After installation and during storage, The COMM connector should be covered with its own cover or matting housing at all times
- Series connection of the batteries is PROHIBITED. Only parallel connections are permitted.

14. WARRANTY

KS2 Corp Inc. hereby supports and warrants M1 LiFePo Battery Pack. KS2 Corp Inc. will replace the unit free-of-charge (shipping and labor not included), if defective within 4 years from the date of sale, due to manufacturing defects or materials and workmanship. External causes excluded from warranty coverage (i.e. connection and wiring, road accidents brought on by the user).

