

LITHIUM-ION BATTERY CHARGING REPORT

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1. ABSTRACT

This report introduces how to handle the Powerizer Li-Ion rechargeable Battery Packs. It will bring reveal battery specifications and safety guidelines. Finally, data taken from initial charging cycles will be compiled, in order to observe the amount of "de-Rating" the batteries have experienced.

2. SAFETY GUIDELINES

- Must put battery in a fireproof container.
- Never put on the surface of flammable material.
- Never leave charging battery unattended.
- Keep away from children.

3. CHARGING PROCEDURE

- (1) Ensure that you are following proper Safety Guidelines as described in Section 2 of this report.
- (2) Use the MRC Smart Brain 989 and check that the charging profile has the entered values:
 - Batteries: Li-po
 - Mode: Charge
 - Capacity: 2600 mAh
 - Cells: 7
 - Current: Between 1 and 1.5 A
- (3) After you have confirmed that the charge profile is exact as the one mentioned, connect the battery to the the charger via charging adapter. Ensure that the polarity matches (one pin is bigger than the other), otherwise you risk damaging the battery.

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- (4) Press "Start/Stop" to start the charging sequence.
- (5) Charge until you reach the peak voltage of 29.4 V. If charging fully from the discharged state, this should take an hour and 30 mins (with a charge rate of 1.5 A).
- (6) Once charged to 29.4 V, press the "Start/Stop" once again to end the charging sequence.
- (7) Disconnect the battery from the charger.
- (8) Wait a minimum of 30 minutes before using the battery, as the cells will work to balance themselves.

4. DISCHARGING PROCEDURE

- (1) Ensure that you are following proper Safety Guidelines as described in Section 2 of this report.
- (2) Use the MRC Smart Brain 989 and check that the charging profile has the entered values:
 - Batteries: Li-po
 - Mode: Discharge
 - Capacity: 2600 mAh
 - Cells: 7
 - Current: 0.5 A
- (3) After you have confirmed that the charge profile is exact as the one mentioned, connect the battery to the the charger via charging adapter. Ensure that the polarity matches (one pin is bigger than the other), otherwise you risk damaging the battery.
- (4) Press "Start/Stop" to start the discharging sequence.
- (5) Allow to discharge, the program will stop itself at around 21 V.
- (6) Press "Start/Stop" once again to shut off the program.
- (7) Disconnect the battery or recharge.
- (8) Do not allow the battery to be fully discharged for a period of time, as this may result in depletion of battery capacity over time.

5. INITIAL CHARGING CAPACITY RESULTS

Charging and discharging was performed as described in Section 4: Charging Procedure. The batteries endured three power cycles and there capacities were recorded after discharging completely from a completely charged state.

Battery Pack 1

- Cycle 1 : 2334 mAh
- Cycle 2: 2312 mAh

- Cycle 3: 2367 mAh

Battery Pack 2

- Cycle 1 : 2317 mAh
- Cycle 2: 2414 mAh
- Cycle 3: 2358 mAh

Battery Pack 1

- Cycle 1 : 2321 mAh
- Cycle 2: 2147 mAh
- Cycle 3: 2346 mAh

Battery Pack 1

- Cycle 1 : 2309 mAh
- Cycle 2: 2325 mAh
- Cycle 3: 2187 mAh