

CAUTION:

Lithium polymer rechargeable batteries subject to abusive conditions can cause damage to the battery and/or personal injury.

Read and observe the standard battery precautions below.

STANDARD BATTERY PRECAUTIONS

- Do not expose the battery to extreme heat or flame
- Do not short circuit, overcharge or overdischarge the battery
- Do not immerse the battery in water
- Do not reverse the polarity of the battery for any reason
- Do not disassemble or modify the battery
- Do not remove charge/discharge protection circuitry

BATTERY OPERATING INSTRUCTIONS

A. CHARGING

General

1. Charge the battery in a temperature range of 0°C to + 45°C.
2. Charge the battery at a constant current of C/2 until 4.20V ($\pm 0.05V$) per cell is attained. Charge rates greater than 1C are NOT recommended. (C=Rated Capacity of Battery)
3. Maintain charge voltage at 4.20V per cell until current diminishes to C/10 (recommended for maximum capacity).
Note: Allowing the current to diminish to less than C/20 is NOT recommended.

Charge Control and Battery Pack Protect Electronics

1. Use a constant voltage, constant current (CVCC) lithium-ion (Li+) battery charge controller. Charge controller manufacturers include: Benchmarq Electronics, Mitsumi Electric, Unitrode, National Semiconductor and Maxim.
2. A battery protection circuit to control overvoltage, undervoltage and current surges is required. The circuit must be applied to the battery pack or cell stack using ultrasonic or resistance welding. Backup protection can also be applied to the device being powered or to the charger. Protection circuit manufacturers include: Benchmarq Electronics, Mitsumi Electric, National Semiconductor, Patco Electronics, Powersmart, and Seiko Instruments.

To ensure peak battery performance and maximum cycle life, the circuit must include:

Overcharge Protection:

- A maximum voltage threshold of 4.25V ($\pm 0.025V$).
- If the maximum charging voltage is surpassed, the protection circuit interrupts or stops charging.

Overdischarge Protection:

- Voltage threshold of $< 2.3 V$ is NOT recommended.
- If the battery is discharged below the cutoff voltage, the protection circuit stops discharging.

Overcurrent Protection:

- If current exceeding the battery rating or recommendations flows during charging or discharging, the charge or discharge process stops.

B. DISCHARGING

1. Recommended cut-off voltage to 3.0V. Recommended maximum discharge rate is 2C at constant current.
2. For maximum performance, discharge the battery in a temperature range of $-20^{\circ}C$ to $+45^{\circ}C$.

C STORAGE RECOMMENDATIONS

Recommended shelf storage conditions are ambient temperatures between $+5$ to $+30^{\circ}C$ at 3.7V equivalent to 20 % state-of-charge (SOC). Avoid or limit exposure to temperatures greater than $+45^{\circ}C$ and high humidity ($> 85\% RH$ at $+45^{\circ}C$).

All information provided herein is subject to change without notice.