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# LTI Lithium Built-in Batteries

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Liberating Technologies, Inc. has introduced more Built-in Lithium Batteries and recharge modules for prosthetic applications. These new Lithium-Ion and Lithium-Polymer cells offer ample battery capacity in a relatively small, light-weight package. Built-in batteries provide versatility for the prosthetist because they can be installed in any convenient space within the socket, eliminating unsightly bulges in the outer shell and resulting in better cosmesis and weight distribution.

Six capacities and configurations are available:

- BP88** Lithium AA Split-cell – 750 mAh
- BP98** Lithium AA Standard – 750 mAh
- BP101** Lithium-polymer Miniature – 200 mAh
- BP102** Lithium-polymer Split-cell – 750 mAh
- BP103** Lithium-polymer Split-cell – 450 mAh
- BPI2000** Polymer Split-cell – 2000 mAh

The original Lithium-ion battery series are AA-cell configurations for maximum density in a compact space. With 750 mAh capacity, this battery is suitable for pediatric and adult prostheses. It is offered in two configurations to suit the application; the cells can be attached (BP98) or separated/split-cells (BP88).

The Miniature Lithium-Polymer battery (BP101) is intended for small pediatric prostheses such as the VASI 0-3 electric hands. This battery has a capacity of 200 mAh and is suitable for small children's upper-limb applications but generally not for adult prostheses. If more capacity is needed, the 450 mAh Split-cell Battery (BP103) is a good alternative.

The large capacity Split-Cell Lithium-Polymer battery (BP102) was designed to give the clinician the ability to separate the relatively thin cells and place them in a convenient location within the socket. This 750 mAh

battery is suitable for pediatric and adult applications.

For multi-articulating prosthetic hands (Bebionic & iLimb Ultra), the larger capacity built-in batteries (BPI1300 or BPI2000) are recommended.

Lithium batteries have several advantages over conventional Nickel-Cadmium and Nickel-Metal-Hydride. Most significant is their high-density which accounts for their large capacity, light-weight and relatively small size. Lithium cells are about 35% lighter than Ni-Cad and 50% lighter than Ni-MH cells. For a given size, they deliver more than twice the capacity of Ni-Cad and about 20% greater voltage. They have a protection circuit to prevent over-discharging and they can be recharged in about 90 minutes, depending on the state of charge. They also don't suffer from "memory" problems often encountered with Ni-Cad batteries. They can be topped-off with a brief charge at any time to assure that they are always at or near full charge.

These new built-in Lithium batteries are supplied with one of LTI's On/off Switch - Recharge Modules (Fig 1). These are available in standard with on-board connectors or with wire-mounted connectors and are compatible with all manufacturer's terminal devices. For most applications a wrist-connector cable (MC31) is required. For Otto Bock 2000 hands, a voltage regulator must be used (order MC41). This is placed in-line with the LTI battery module.



Fig 1 – On/off Switch - Recharge Modules

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Fig 2 – **BP88** Split-cell Li-ion Battery

**BP88** Split-cell AA Lithium-ion Built-in Battery

Capacity: 750 mAh  
 Voltage: 7.2 volts (nominal)  
 Current: 3 Amps  
 Weight\*: 53 grams  
 Dimensions: 14 x 27 x 50 mm (combined cells)  
 Charger: LTI model BC96  
 On/Off Module: BP011, BP018 with wires

\* total weight, including on/off switch module



Fig 3 – **BP98** Standard Li-ion Battery

**BP98** Standard AA Lithium-ion Built-in Battery

Capacity: 750 mAh  
 Voltage: 7.2 volts (nominal)  
 Current: 3 Amps  
 Weight\*: 53 grams  
 Dimensions: 14 x 27 x 50 mm  
 Charger: LTI model BC96  
 On/Off Module: BP011, BP018 with wires

\* total weight, including on/off switch module



Fig 4 – **BP101** Miniature Li-Polymer Battery

**BP101** Miniature Lithium-Polymer Built-in Battery

Capacity: 200 mAh  
 Voltage: 7.2 volts (nominal)  
 Current: 2 Amps  
 Weight\*: 23 grams *DISCONTINUED May 2013*  
 Dimensions: 10 x 27 x 32 mm  
 Charger: LTI model BC100  
 On/Off Module: BP013, BP023 with wires

\* total weight, including on/off switch module

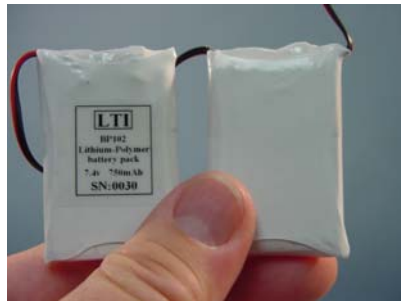


Fig 5 – **BP102** Split-cell Li-Polymer Battery

**BP102** Split-cell Lithium-Polymer Built-in Battery

Capacity: 750 mAh  
 Voltage: 7.2 volts (nominal)  
 Current: 3 Amps  
 Weight\*: 40 grams  
 Dimensions: 12.5 x 30 x 49 mm both cells  
 Charger: LTI model BC96  
 On/Off Module: BP011, BP018 with wires

\* total weight, including on/off switch module



Fig 6 – **BP103** Split-cell Li-Polymer Battery

**BP103** Split-cell Lithium-Polymer Built-in Battery

Capacity: 450 mAh  
 Voltage: 7.2 volts (nominal)  
 Current: 2 Amps  
 Weight\*: 35 grams  
 Dimensions: 12 x 18 x 52 mm  
 Charger: LTI model BC100  
 On/Off Module: BP013, BP023 with wires

\* total weight, including on/off switch module

Caution: On/off mounting nut must not be over tightened!

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