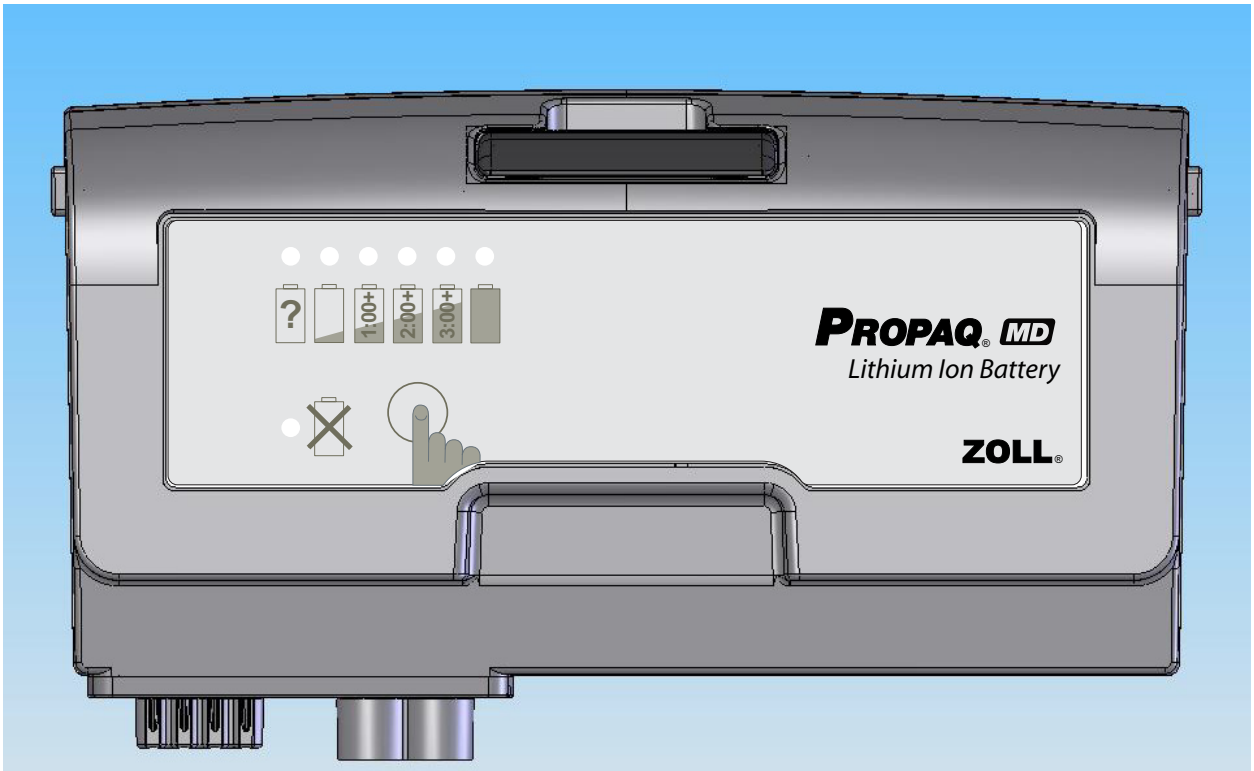
Propaq® MD Battery Pack Guide



ZOLL®

9650-0809-01 Rev. A

The issue date for the ***Propaq*** ® ***MD Battery Pack*** **Guide** (**REF** 9650-0809-01 Rev. A) is **September, 2010**.

If more than three years have elapsed since the issue date, contact ZOLL Medical Corporation to determine if additional product information updates are available.

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Introduction

The *Propaq® MD Battery Pack* is a rechargable, sealed lithium ion battery for use in compatible ZOLL® defibrillators and chargers.

It is important that you read and understand the information in this manual. The proper use of the *Propaq MD Battery Pack* is critical to the reliable operation of your ZOLL defibrillator.

Conventions

This manual uses the following conventions:

⚠	**Warning statements describe conditions or actions that can result in personal injury or death.**

Caution	Caution statements describe conditions or actions that can result in damage to the *Propaq MD Battery Pack*.

Note: Notes contain additional information on using and maintaining the *Propaq MD Battery Pack*.

The manual displays button and LED labels in **bold** face type.

Safety

The following sections provide important warnings, cautions, and notes regarding the ZOLL *Propaq MD Battery Pack*.

Warnings

- Locate ZOLL Propaq MD units where they cannot harm the patient or medical personnel if they fall -- accidental sliding or drop of the *Propaq MD Battery Pack* may cause physical injury. Damaged batteries may expose users to a safety hazard. Should the *Propaq MD Battery Pack* be dropped, inspect and test the unit prior to further use following the procedures described in the **Maintenance** section of this Guide.
- Avoid prolonged exposure of the *Propaq MD Battery Pack* to direct sunlight to minimize heating and damage that may occur from exposure to ultraviolet light.
- *Propaq MD Battery Packs* have been tested against interference from radio frequency emissions typical of two-way radios used in emergency service/public safety activities. Refer to the *Propaq MD Operator's Guide* to determine recommended operating distances from RF transmission equipment.
- Do not use *Propaq Battery Packs* unless they have been visually inspected, tested, and recalibrated by appropriate personnel and you have been adequately trained in the proper use of these batteries. See the **Maintenance** section of this guide for more information.
- Do not disassemble the *Propaq MD Battery Pack*.
- Charge the *Propaq MD Battery Pack* in a well-ventilated area.
- You must perform periodic inspection, capacity testing, and functional testing of rechargable defibrillator batteries to ensure the availability of safe and reliable batteries. See the **Maintenance** section of this guide for more information.
- If the battery in use on a Propaq MD unit indicates a fault condition or any operating state that can prevent the effective use of the defibrillator, replace that battery as soon as possible.

- Do not place foreign objects into battery sockets.
- Do not use the *Propaq MD Battery Pack* in the presence of flammable agents (such as gasoline), oxygen-rich atmospheres, or flammable anesthetics. Using the device in the presence of flammable agents can cause an explosion.
- Do not immerse or set the *Propaq MD Battery Pack* in liquid. Using the battery near or within puddles of water may present a shock hazard to the operator, patient, and nearby personnel.
- Use only ZOLL chargers to charge ZOLL batteries.
- If the display indicators on the *Propaq MD Battery Pack* are not consistent with the indicators on the *SurePower Charger Station*, a fault condition may be present. Remove the battery from service as soon as practical, and verify the correct operation of the charger, defibrillator, and battery.

Cautions

- Follow all recommended maintenance instructions. If a problem occurs, obtain service immediately.
- Do not use alcohol or ketones (MEK, acetone, etc.) to clean *Propaq MD Battery Pack*s.
- Do not sterilize or autoclave *Propaq MD Battery Pack*s.
- Avoid storage of fully depleted Propaq Battery Packs.
- Do not install batteries into a Propaq MD unit that is not plugged into live AC mains when storage may exceed 90 days. Battery damage may occur.
- If you are disposing of a *Propaq MD Battery Pack*, contact your local authorities to determine the requirements for the recycling and disposal of electrical equipment and follow those requirements.

Notes

- *Propaq MD Battery Packs* may feel warm to the touch following a large number of shocks delivered at maximum energy or after recharging.
- You can get additional information about the *Propaq MD Battery Pack* and its use from the *Propaq MD Operator's Manual* (for example, labeling information -- symbols used, Serial Number format, Date of Manufacture, and so on).

Using the *Propaq MD Battery Pack*

The *Propaq MD Battery Pack* provides enhanced on-board processing that allows the battery to communicate its specific charging requirements to the *SurePower ™ Charger Station* or Propaq MD unit. The battery's on-board processing also allows it to provide the following information:

- The battery's run time or capacity.
- The battery's calibration status.
- Battery Fault Indications.

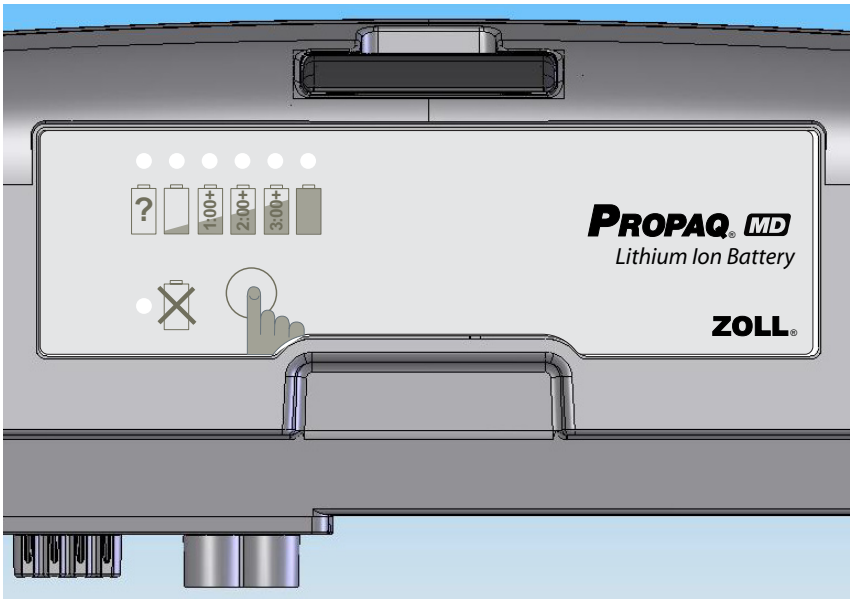


Figure 1-1 ZOLL *Propaq MD Battery Pack*

Note: ZOLL ships the *Propaq MD Battery Pack* in a partially charged state and you must fully charge the battery before first use.

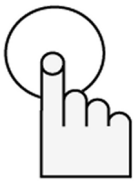
It is very important that you recharge a depleted *Propaq MD Battery Pack* as soon as possible.

Caution Do not store fully depleted batteries or damage can result.

Caution Do not store fully charged batteries for more than 90 days. Should you need to store a battery for 90 days or longer, see the **Extended Storage** section of this guide for information on how to do so.

Displaying Battery Runtime

The *Propaq MD Battery Pack* can display its present status.

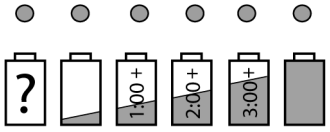


To display the status of the *Propaq MD Battery Pack*, press and release the **Display** button (momentary press) on the top of the battery.

When you press and release the **Display** button, all LEDs blink to indicate that they work. The battery then lights specific LEDs for approximately 10 seconds to indicate the battery's runtime, calibration status, and fault state.

We describe what these LEDs indicate in the following sections.

Note: The Propaq Battery Pack's LEDs light *only* when the **Display** button is pressed.

Propaq MD Battery Pack **Icon**	**LED Indications**
	This is the **runtime indicator** that displays the estimated runtime of the *Propaq MD Battery Pack* in your defibrillator. When you momentarily press and release the **Display** button on the *Propaq MD Battery Pack*, the LEDs above these icons light for approximately 10 seconds to indicate the battery's estimated run time. If the battery is fully charged, the LED over each of the five runtime indicator icons illuminates. As the battery discharges, the number of illuminated LEDs decreases. As the *Propaq MD Battery Pack* discharges, pressing the **Display** button will light, from left to right, the LED's that indicate the battery's run time. For example, if four LED's light, the battery can power a defibrillator for at least 3 hours (displayed as **3:00+**); if three LED's light, the battery can power the defibrillator for at least 2 hours (displayed as **2:00+**), and so on. When you press the **Display** button on a battery that is installed and powering a Propaq MD unit, the runtime indicator displays the run time for the battery in that specific defibrillator. When a *Propaq MD Battery Pack* is *not* installed in a Propaq MD unit, the runtime indicator displays the runtime for the battery at a nominal drain rate for a Propaq MD Unit. **Note:** If the left-most LED of the runtime indicator blinks, the battery has less than fifteen minutes of use left, and defibrillator shutdown will soon occur. Recharge the battery as soon as possible.

Propaq MD Battery Pack **Icon**	**LED Indications**
	This is the **Recalibration** icon. This LED lights for approximately 10 seconds (after you press and release the **Display** button) if the battery needs to be calibrated. If the **Recalibration** LED lights, the runtime indicator will *not* display run time for that battery. For best performance of the battery, you should recalibrate the battery as soon as possible. To manually recalibrate the *Propaq MD Battery Pack*, you can insert the battery into the *SurePower Charger Station* (using the *Propaq Battery Adaptor*) and perform a **ManualTest** (for more information, see the **ZOLL *SurePower Charger Station* Operator's Guide**). After you recalibrate the battery, the **Recalibration** LED will only flash momentarily when you press the **Display** button.
	This is the **Fault** Icon. If the *Propaq MD Battery Pack* detects a battery fault, this LED lights for approximately 10 seconds after you press the **Display** button. If the **Fault** LED lights, the runtime indicator will *not* display run time for that battery. See the following section for more information on battery faults.

Cleaning

Clean the *Propaq MD Battery Pack* with a soft damp cloth and mild soap.

Do not immerse or set the *Propaq MD Battery Pack* in fluids of any kind. *Do not* use alcohol or ketones to clean the *Propaq MD Battery Pack*.

Maintenance -- Testing and Inspection

Perform a battery check, which verifies that the battery is fully charged and fault free, as part of any regularly scheduled unit test. Press the battery's **Display** button to perform the battery check.

As part of your defibrillator/monitor maintenance program, verify that the battery's LEDs work (press the **Display** button to test LEDs) -- if the LEDs do not work, remove the battery from service. Also check the battery casing for cracks or other damage -- if the battery is cracked or damaged, remove it from service.

Extended Storage

Do not store the *Propaq MD Battery Pack* for extended periods in a fully charged state. If you must store the *Propaq MD Battery Pack* for an extended period

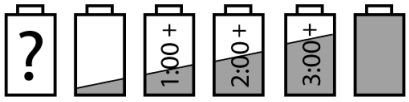
1. Charge the *Propaq MD Battery Pack* until three runtime LEDs light (this takes approximately 1.5 hours when charging a fully depleted battery).
2. Recharge the *Propaq MD Battery Pack* until three runtime LEDs light every 4 months.

Checking Capacity Loss

To check battery capacity (the amount of charge the battery can hold), press and hold down the **Display** button for *at least* 5 seconds.

Press and hold down the **Display** button for *at least* 5 seconds.

While you hold down the **Display** button, the runtime indicator displays the battery runtime. When you release the **Display** button, the runtime indicator displays the battery capacity for 2 seconds, then redisplays the battery runtime.



During the 2 seconds after you release the **Display** button, the runtime indicator displays battery capacity and will light five LEDs to indicate that the capacity is equal or close to that of a new battery.

After displaying battery capacity for 2 seconds, all LEDs blink and then display the battery's runtime.

Over time, as you use a *Propaq MD Battery Pack*, the battery capacity decreases and this capacity check will light fewer LEDs. When the capacity check lights only a single LED, the battery is at or near 60% of its original capacity, and you should remove the battery from service.

If the **Recalibration** or **Fault** LED lights after you release the **Display** button, the runtime indicator will *not* display the capacity or run time for that battery.

Understanding Battery Faults

The *Propaq MD Battery Pack* can detect one or more simultaneously occurring faults that render the battery unfit for use.

To determine the faults that affect a battery, follow this procedure when the fault light is on:

Press and hold down the **Display** button for *at least* 15 seconds.

If the battery does not detect any battery faults, all of the LEDs will light for 10 seconds.

The **Fault** LED will blink to indicate the code that identifies the battery fault (there will be a brief delay before the LED blinks).

The fault codes number from 1 to 29. To indicate fault code 1, the **Fault** LED blinks once. To indicate fault code 2, the LED blinks twice, and so on.

If the battery detects multiple battery faults, it displays the first fault code, pauses briefly, and then displays the next fault code, and so on.

The following table lists battery temperature faults and actions you can take to clear these fault conditions. All other fault codes require you to remove the battery from service. For more information on these fault codes, see the *Propaq MD Service Manual*.

Fault ID	Fault Type	Recommended Action
13	Battery Over Temperature During Charge. The battery is at or above its maximum temperature for charging (140°F/60°C).	Move the battery to a cooler room or out of direct sunlight, if possible, and allow the battery to cool before continuing to charge the battery. If the ambient temperature was low when the battery reached or exceeded its maximum temperature, do not use this battery.
14	Battery Under Temperature during Charge. The battery is at or below the minimum temperature for charging (32°F/0°C).	Move the battery to a warmer room (above 32°F / 0°C) and allow the battery to warm up before charging again.

Propaq MD Battery Pack Specifications

Type	Lithium Ion
Size	7 (Length) x 3.7 (Width) x 1.2 (Height) in 17.8 (Length) x 9.3 (Width) x 3 (Height) cm
Weight	1.4 lb (.64 kg)
Voltage	11.1 V
Capacity	6.6 Ah when charged to 12.6V
Operating Temperature	32°F to 122°F 0°C to 50°C
Optimal Charging Temperature	59°F to 95°F 15°C to 35°C
Short Term Storage/ Transportation Temperature *	-22°F to 158°F -30°C to 70°C
Particle and Water Ingress Protection	IP 55
Altitude of Operation	-557.7 ft through 15,000 ft (below and above sea level) -170 m through 4572 m (below and above sea level) 103 kPa through 57 kPa

*For *extended* storage periods, store the *Propaq MD Battery Pack* between 60°F to 77°F (15°C to 25°C) to minimize capacity loss.