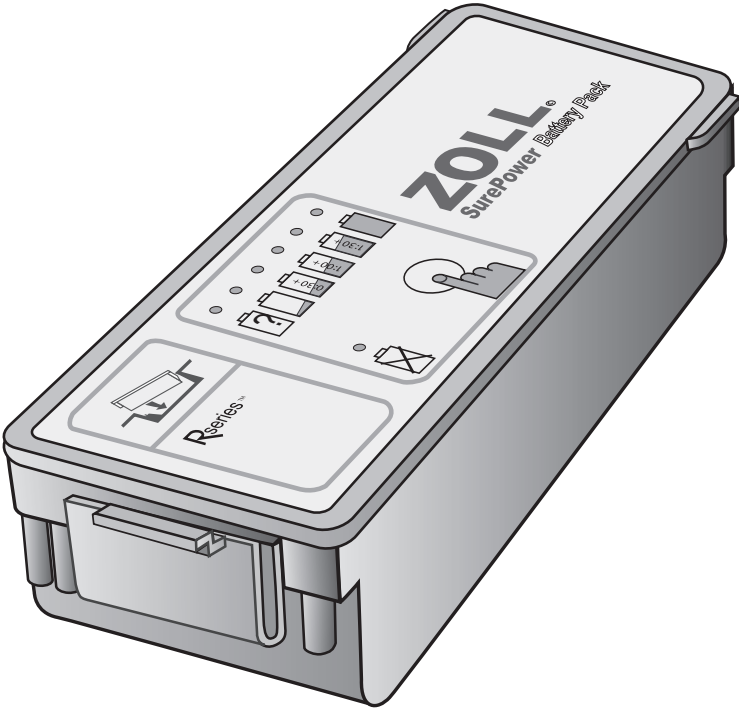


SurePower™ Battery Pack Guide



The issue date for the **SurePower™ Battery Pack Guide** (9650-0536-01 Rev. F) is **June 2024**.

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Introduction

The *SurePower™ Battery Pack* is a rechargeable, 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 *SurePower Battery Pack* is critical to the reliable operation of your ZOLL defibrillator.

Conventions

This manual uses the following conventions:

Warning!	Warning statements describe conditions or actions that can result in personal injury or death.
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Caution	Caution statements describe conditions or actions that can result in damage to the <i>SurePower Battery Pack</i> .
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Note: Notes contain additional information on using and maintaining the *SurePower 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 *SurePower Battery Pack*.

Warnings

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

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- Do not use the *SurePower 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 *SurePower 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 *SurePower Battery Pack* are not consistent with the indicators on the *SurePower Charger Station* or ZOLL defibrillator, 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 ZOLL rechargeable defibrillator batteries.
- Do not sterilize or autoclave ZOLL batteries.
- Avoid storage of fully depleted rechargeable defibrillator batteries.
- Do not install batteries into Monitor/Defibrillators or a *SurePower Charger Station* that is not plugged into live AC mains when storage may exceed 90 days. Battery damage may occur.
- If you are disposing of a *SurePower Battery Pack*, contact your local authorities to determine the requirements for the recycling and disposal of electrical equipment and follow those requirements.

Notes

- ZOLL rechargeable batteries 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 *SurePower Battery Pack* and its use from the related ZOLL charger and defibrillator manuals (for example, labeling information -- symbols used, Serial Number format, Date of Manufacture, and so on).

Using the ZOLL *SurePower Battery Pack*

The *SurePower Battery Pack* provides enhanced on-board processing that allows the battery to communicate its specific charging requirements to the ZOLL *SurePower Charger Station* or ZOLL defibrillator. 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 Faults Indications.

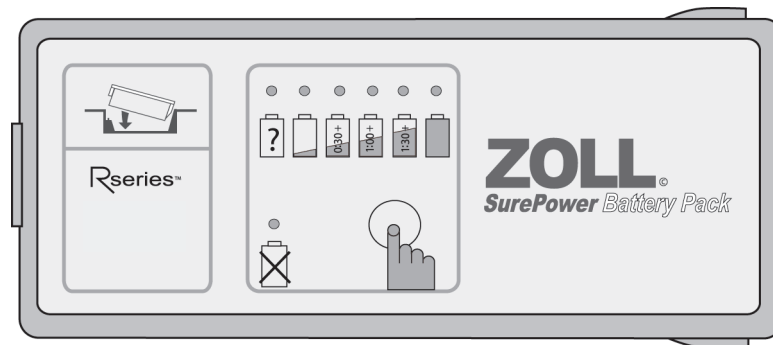


Figure 1-1 ZOLL *SurePower Battery Pack*

Note: ZOLL ships the *SurePower 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 *SurePower 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.

Displaying Battery Runtime

The *SurePower Battery Pack* can display its present status.



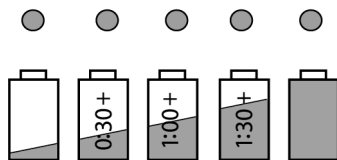
To display the status of the *SurePower Battery Pack*, press and release the **Display** button (momentary press) on the top of the battery.

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 run time, calibration status, and fault state.

We describe what these LEDs indicate in the following sections.

Note: One or more of the LEDs will light automatically when current is flowing into or out of the battery.

SurePower Battery Pack Icon LED Indications



This is the **runtime indicator** that displays the estimated runtime of the *SurePower Battery Pack* in your defibrillator.

When you momentarily press and release the **Display** button on the *SurePower 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 *SurePower 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 approximately 1 hour and 30 minutes (displayed as **1:30+**); if three LED's light, the battery can power the defibrillator for approximately 1 hour (displayed as **1:00+**), and so on.

When a battery is installed in a ZOLL defibrillator, the runtime indicator displays the run time for the battery in that specific defibrillator.

When a battery is *not* installed in a ZOLL defibrillator, the runtime indicator displays the run time for the battery, at a nominal drain rate of 2 Amperes (equivalent to a defibrillator with most options installed).

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.

SurePower 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 *SurePower Battery Pack*, you can insert the battery into the *SurePower™ Charger Station* 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 when you press the **Display** button.'

Note: For all battery packs older than three years, ZOLL recommends manual testing and recalibration every three months.



This is the **Fault** icon.

If the *SurePower 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 *SurePower Battery Pack* with a soft damp cloth and mild soap.

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

Maintenance

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

As part of your defibrillator 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 *SurePower Battery Pack* for extended periods in a fully charged state. If you must store the *SurePower Battery Pack* for an extended period:

1. Charge the *SurePower Battery Pack* until three runtime LEDs light (this takes approximately 1 hour when charging a depleted battery).
2. Every 4 months, recharge the *SurePower Battery Pack* until three runtime LEDs light.

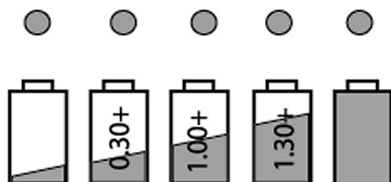
Checking Capacity Loss

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 redisplayes 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.

Over time, as you use a *SurePower 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 *SurePower 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.



The **Fault** LED will blink to indicate the code that identifies the battery fault (there may 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 *SurePower Charger Station 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.

SurePower Battery Pack Specifications

Type	Lithium Ion
Size	6.5 (Length) x 2.25 (Width) x 1.75 (Height) in 16.5 (Length) x 5.7 (Width) x 4.4 (Height) cm
Weight	1.7 lb (.77 kg)
Voltage	Refer to battery pack label
Capacity	Refer to battery pack label
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
Safety Specification	Portable, Class II, Type B
Altitude of Operation	-300 ft through 20,000 ft (below and above sea level) -91 m through 6096 m (below and above sea level) 1060 through 500 mBar

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