

# BATTERY MAINTENANCE

## For Portable Gas Detectors

These recommendations have been developed to keep workers safe and protect your investment by drawing on Honeywell's experience in industrial applications and testing

Honeywell supplies lithium ion (Li-ion) batteries for many mobile devices, including portable and transportable gas monitors. Li-ion batteries feature several advantages – such as high energy density, quick charge, low rate of self-discharge, and low operating temperatures.

Proper maintenance helps avoid damage to the battery and device, and it promotes a longer useful life between battery replacements. This document provides guidelines for a) normal daily usage, b) storage, and c) disposal of batteries.

It is important to note that battery specifications and installation/replacement methods differ among devices. Before proceeding, review the devices' user guides for all applicable instructions, temperatures ranges and cautions.

### GENUINE HONEYWELL PRODUCTS

Use only batteries, accessories, chargers and power adapters manufactured (or, when specified, authorized) by Honeywell, in order to comply with the original warranty terms.

### IMPORTANT SAFETY REMINDERS



Keep children away from batteries.



If battery liquid gets into eyes, do not rub eyes. Wash with clean water and seek medical attention.



If battery leaks on skin or clothes, wash with clean water.



If fire, overheating, or odors are observed during charging, leave immediately and notify safety personnel.



Do not charge or store batteries near flammable, combustible or in close contact with conductive materials.



Never throw, drop, or crush a battery or device; fire or chemical burn hazard may result.



Example of a Lithium ion rechargeable battery pack from the BW Ultra gas detector

### KEY TERMS

**Device** – gas detector or other battery- operated equipment

**Battery** – rechargeable Li-ion dc power source

**Charger** – power source provided for charging specific battery or device

**Dock** – a cradle or docking station that provides power to the device

## INITIAL BATTERY CHARGE

Each battery ships with only a partial charge; batteries should be fully charged before use. Allow batteries to reach ambient temperature before charging, and do not charge them in direct sunlight. Always charge batteries in a well-ventilated safe area within the battery charging temperature range as indicated within the device user manual.

You can usually verify the battery's charge status most reliably by referring to the device's display.

## A: NORMAL BATTERY USAGE

Battery lifetime may be limited by the requirements of the device that it powers, the operating and storage environments, the level of charge during storage, age, and other factors.

Throughout its life, a battery tends to hold and retain less of a charge, as it is exposed to the stresses of each charge-discharge cycle. As a battery ages, the capacity may reduce and more frequent re-charging may be required. Batteries should be replaced periodically depending on the specific device and usage. Immediately discard and replace any battery with the following symptoms (see "C. Battery Disposal," below):

- The operator reports a significant reduction in the device's performance or runtime, which is solvable by a replacement battery.
- The battery is noticeably deformed, swollen, or discoloured.
- The battery or device is too hot to handle (a surface above 60 °C [140 °F]).

For improved battery life:

- Avoid allowing, where possible, a battery to discharge below 10% capacity
- Limit as much as possible, repetitive "top-up" charging
- For long term storage, store devices at 30%-50% charge capacity and in accordance with the Battery Storage guidance below
- Periodically check the battery capacity of stored devices and recharge where appropriate

Any replaceable batteries are designed to be inserted with minimal effort, so you will never need to force a battery into the device. Refer to the device's user guide for instructions for inserting or swapping a battery. Likewise, do not attempt to remove the battery from the device with an unsuitable tool which may result in damage to the battery.

Always power down the device before replacing the battery.

The bulk of normal battery maintenance involves monitoring capacity and recharging. On occasion, you may need to remove dirt from a battery or the terminals. Simply wipe them with a clean, dry cloth or brush.

## ADDITIONAL USAGE PRECAUTIONS

All personnel who handle batteries and devices should also be trained in the following guidelines:

- Do not stack anything on top of loose batteries.
- In all cases, be extremely careful not to short-circuit a battery's terminals. A short may result, for example, when battery terminals touch each other, they are placed next to conductive (metal) media, or batteries are placed in a pocket with coins or other metallic objects.
- Honeywell portable gas detectors have high water ingress protection (IP) levels due to the typical environments they are designed for, however, to limit any potential unnecessary water damage do not intentionally immerse instruments or spare batteries, or expose them to fresh or salt water.
- Do not incinerate, microwave, throw into a fire, or expose batteries to temperatures above the documented maximum rating.
- Do not disassemble a battery or try to open or penetrate its housing.

## **B: BATTERY STORAGE**

When not in use, keep instruments and batteries in a dry environment (<70% RH, non-condensing) within documented operating temperature ranges. Do not leave instruments or spare batteries in any location warmer than the documented maximum recommended operating temperature, or store them in direct sunlight. If devices with user-removable batteries are intended to be stored for extended periods of time, it is recommended to remove and store the battery separately.

Do not store batteries that are completely depleted. The recommended charge for long-term storage is 30% to 50% of capacity.

Expect batteries to self-discharge slowly over time, even when they are not attached to a device. Note that some sensor configurations e.g. those containing lead-free Oxygen sensors, consume a very small amount of power even when the gas detector is deactivated. This results in higher self-discharge rates, which means that those batteries will require more frequent charging during storage.

Periodically check stored batteries for their charge state. Recharge as needed.

## **C: BATTERY DISPOSAL**

Using tape, insulate the terminals of all obsolete, discontinued, damaged, and malfunctioning batteries and place in a clearly marked receptacle. Dispose of them as soon as possible, or within your routine maintenance schedule.

Dispose of used batteries according to any applicable regional or national hazardous materials regulations. Where available or required, recycle all Li-ion batteries.

Handle damaged batteries or leaked contents with extreme care. (Refer to "Important Safety Reminders," above.)

Kindly note that your limited warranty, maintenance and inspections of Product are subject to [Honeywell's Terms and conditions of sale and service](#).