

How Safe Is a Uniross Lithium Battery?

Stable and Safe

When it comes to batteries, safety is without a doubt the most important aspect. We've all read about the dangers of batteries or watched a YouTube video of a battery fire. So it's only normal to be concerned about putting a Lithium battery into your Alarm, Gate Motor or Electric Fence. But there's no need to be concerned if you're using a Uniross Lithium battery.

Uniross makes use of one of the safest Lithium chemistries on the market today – Lithium Iron Phosphate (Li-FePO₄). It will withstand abuse like no other battery chemistry. Even if you were to subject a Uniross Lithium battery to extreme temperatures, Short Circuits or worse still, crushing the battery, it won't catch fire or explode.

Independent Testing

If that's still not enough to put your mind at ease, you don't have to take our word for it, we've had our batteries independently tested by an international test company and certified in accordance with the United Nations Transport standard - UN38.3.

During this certification process, the Uniross Lithium 12v 7Ah battery was subjected to a multitude of abusive and destructive tests and passed with flying colours.

External Short Circuit Test

Our battery was subjected to a direct short circuit across the battery terminals for a minimum period of one hour.

In order to pass, our battery had to withstand this short circuit for at least one hour without the battery temperature exceeding 170°C. In addition, our battery was not allowed to rupture or catch fire during the test as well as within six hours after the test.

If we compare this to an old Lead type battery that is usually found in an Alarm, Gate Motor or Electric Fence, the Lithium battery is far safer. A Lead battery under these conditions would most certainly pose a severe safety hazard.

Overcharge Test

Our battery was subjected to a charge current of more than twice our recommended continuous charge current, for a period of 24 hours. Our battery was not allowed to catch fire during the test, nor within seven days after the test.

How long will a Lithium 12v 7Ah Last in an Alarm

Crush Test:

This test required the test company to crush the cells between two flat surfaces until the first of three results were reached:

- The applied force reached 13kN
- The voltage of the cell dropped by at least 100mV
- The cell was deformed by 50% or more of its original thickness.

For our cells to have passed this Crush test, the external temperature was not allowed to exceed 170°C and there could be no fire during the test or within six hours after the test.

Impact Test:

Our cells were placed on a flat smooth surface and a 9.1Kg mass was dropped from a height of 61cm directly onto the cells. The cells external temperature was not allowed to exceed 170°C and there could not be any fire during the test as well as within six hours after the test.

Thermal Test

First, our battery was stored for a period of 6 six hours at 72°C, followed by a further six hours storage at a temperature of -40°C, with a 30-minute interval between the test temperature extremes. This procedure was repeated 10 times.

Our battery was not permitted to show any signs of leakage. Nor was it allowed to vent, rupture or catch fire. In addition, the open circuit voltage of the battery was not permitted to drop by less than 90% of its voltage prior to testing.

Vibration Test:

Our battery was firmly secured onto a special vibration machine in which the battery was subjected to number of sever vibrations for a period of 15 minutes. This cycle was then repeated 12 times for a total of three hours for each mounting position of the battery.

In order to pass this test, our battery could not show any signs of leakage, venting or rupture and was not allowed to catch fire during and or after the test. The open circuit voltage of the battery was then measured directly after testing and was not allowed to be less than 90% of its voltage prior to testing.

Shock Test:

Our battery was secured to the test machine and subjected to a half-sine shock of peak acceleration of 150gn and pulse duration of 6 milliseconds. Each battery was subjected to three shocks in the positive direction and three shocks in the negative direction in each of the three mounting positions for a total of 18 shocks.

How long will a Lithium 12v 7Ah Last in an Alarm

The battery was considered to have passed the test if no leakage, no venting, no rupture and no fire was experienced during and or after the test and the open circuit voltage of the battery directly after testing, was not less than 90% of its voltage prior to testing.

Conclusion:

If our batteries can withstand these sorts of abusive and destructive conditions without posing any safety hazard, we are fully confident that they are perfectly safe to use in your Alarm, Gate Motor or even Electric fence.

How long will a Lithium 12v 7Ah Last in an Alarm

How long will a Uniross 12v 7Ah Lithium battery last in an Alarm System?

A question we frequently get asked, is: *“How long will a Uniross 12v 7Ah Lithium battery last in an Alarm System?”*

It may sound like a simple question, but it’s actually a lot more complex than that. Its like asking *“how long will my cellphone battery last?”* It all depends on how much you use the phone, how many apps you have open, how charged the battery was to start with and also how old the battery is.

The same applies when it comes to an alarm system. It depends on the make and model of alarm panel you have and what else the panel supplies power to (like Keypads, Expander modules, Detectors etc.)

The bottom line is, in general, hardwire alarm panels are developed to provide between 700mA and 750mA for powering ancillary devices such as keypads expander modules, detectors and other 3rd party devices. Based on this and allowing a budgetary 200mAh for the Panel itself, a total of 950mA could be drawn from the panel’s standby battery during mains failures or Loadshedding. Provided no other equipment like a radio, for example, has been directly connected to the battery, a fully charged Uniross 12v 7Ah Lithium battery should last at least 4 hours.




LITHIUM BATTERY TRAINING

What is a Lithium Battery

Lithium batteries are the new standard in battery technology. They're lighter, smaller, longer-lasting and more efficient than the traditional batteries.

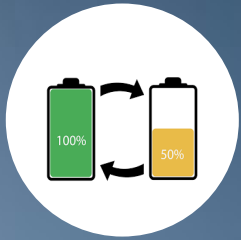
Lithium Batteries can already be found in devices such as:

- Cellphones
- Laptops
- Vehicle Tracking devices
- Solar Systems
- Electronic Cigarettes (Vapes)

A white thought bubble with a blue outline, containing text about lithium battery usage.

**90% of people are
already using
Lithium Batteries
today!**

LEAD vs LITHIUM



CYCLE LIFE:

(cycle life is the number of times a battery can be charged & discharged before it dies)

LEAD BATTERIES



500 – 1000 cycles

VS

LITHIUM BATTERIES



3000 – 5000 cycles

LEAD vs LITHIUM



WEIGHT:

LEAD 12v 7Ah



2.1Kg

VS

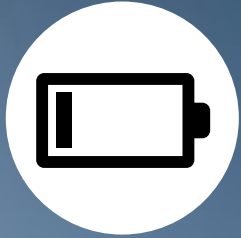
LITHIUM 12v 7Ah



1.1Kg



LEAD vs LITHIUM



DEPTH OF DISCHARGE:

Depth of Discharge (DOD) is how much energy you can safely take out of a battery

LEAD 12v 7Ah



50% DOD

VS

LITHIUM 12v 7Ah



100% DOD

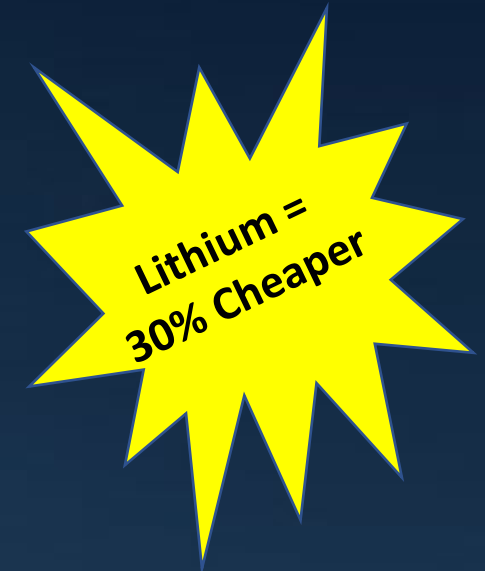
This means that a Lead battery will last for half the time of a similar size Lithium battery.

LEAD vs LITHIUM



TOTAL COST OF OWNERSHIP:

(How much this battery costs per cycle over its lifetime)



LEAD BATTERIES



R0.60

R300 / 500 cycles = R0.60 / cycle

VS

LITHIUM BATTERIES



R0.23

R700 / 3000 cycles = R0.23 / cycle

THE RANGE



UNIROSS LITHIUM – LFP12-7

- 12.8v 7Ah Li-FePO4 Battery.
- 100% DOD
- 3000 Cycles



UNIROSS LITHIUM – LFP12-7HD

- 12.8v 7Ah Li-FePO4 Battery.
- 100% DOD
- 3000 Cycles



UNIROSS LITHIUM – LFP12-20

- 12.8v 20Ah Li-FePO4 Battery.
- 100% DOD
- 3000 Cycles



UNIROSS LITHIUM – LFP12-50

- 12.8v 50Ah Li-FePO4 Battery.
- 100% DOD
- 3000 Cycles



UNIROSS LITHIUM – LFP12-100

- 12.8v 100Ah Li-FePO4 Battery.
- 100% DOD
- 3000 Cycles

THE RANGE



- UC2016 Lithium Charger**
- 2 Amp charge current
 - Aluminium case



- UC2017 Lithium Charger**
- 5 Amp charge current
 - Aluminium case



- UC2018 Lithium Charger**
- 10 Amp charge current
 - Aluminium case



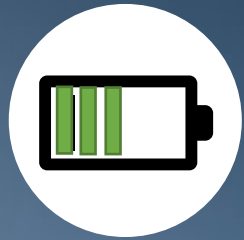
- 2606BP MPPT Charge Controller**
- 12v / 24v
 - 15 Amp Current



- 3906BP MPPT Charge Controller**
- 12v / 24v
 - 15 Amp Current



- 5206BP MPPT Charge Controller**
- 12v / 24v
 - 15 Amp Current



CHARGING LITHIUM BATTERIES

Lithium & Lead Batteries actually use the same charging protocol.
However, the voltage parameters differ slightly between the two.



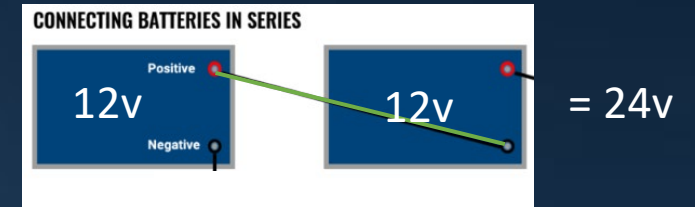
What this means is.....

A Uniross Lithium Battery can be charged by a Lead charger!

SERIES & PARALLEL CONNECTIONS

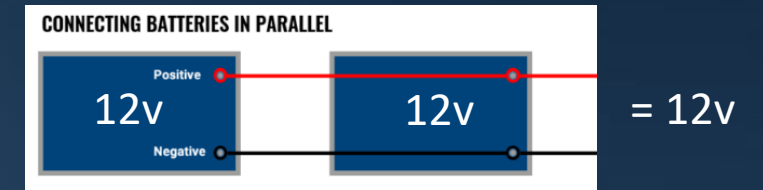
SERIES:

A Series Connection increases the battery voltage.



Parallel:

A Parallel connection increases the battery capacity (*amount of energy*)



Why would you want to connect in series or parallel?

- Some devices need higher voltage than 12v – in this case they would connect in series – e.g. 2 x 12v 7Ah connected in series = 24v 7Ah.
- Some users want a battery to run for longer – in this case, they would connect in parallel. Eg. 2 x 12v 7Ah in parallel = 12v 14Ah



SERIES & PARALLEL CONNECTIONS

PROBLEMS WITH SERIES & PARALLEL CONNECTION IN LITHIUM BATTERIES

The BMS in Lithium Batteries can cause complications when connecting in series and or parallel.

Below is a guideline to series & parallel connections in Uniross Lithium Batteries.

This is indicated on each battery

Model	Description	Series Connection		Parallel Connection	
		Y/N	Max Qty	Y/N	Max Qty
LFP12-7	12v 7Ah Lithium	Yes	2	No	N/A
LFP12-7HD	12v 7Ah Gate Motor	Yes	2	No	N/A
LFP12-20	12v 20Ah Lithium Battery	Yes	4	No	N/A
LFP12-50	12v 50Ah Lithium Battery	Yes	4	No	N/A
LFP12-100	12v 100Ah Lithium Battery	Yes	4	No	N/A

APPLICATIONS

- Alarm Panels
- Gate Motors
- Garage Doors
- Electric Fences
- Solar backup
- CCTV Camera Backup



BATTERY MANAGEMENT SYSTEMS

What is a Battery Management System?

A Battery Management System (BMS) is a piece of electronics that is built into the battery to protect and safeguard the battery.

Why do Lithium Batteries need a Battery Management System?

Lithium batteries can be dangerous if misused or abused. The BMS is in place to prevent the battery from becoming unsafe in these instances.

The BMS provides the following safeguards:

- Low Voltage Protection - Automatically disconnects at 8V
- Over Voltage Protection - Automatically disconnects at 15.6V
- **Short Circuit Protection** – (Requires battery to be connected to charger to reset)
- Reverse Polarity Protection
- Internal cell balancing - Automatically balances cells



PRO's & CON's of LITHIUM BATTERIES

PRO's

- Longer lifespan (3000 – 5000 cycles)
- Cheaper in the long run (30% Cheaper)
- Can handle deep discharge (100% DOD)
- Lighter than lead batteries
- Can handle fast charging

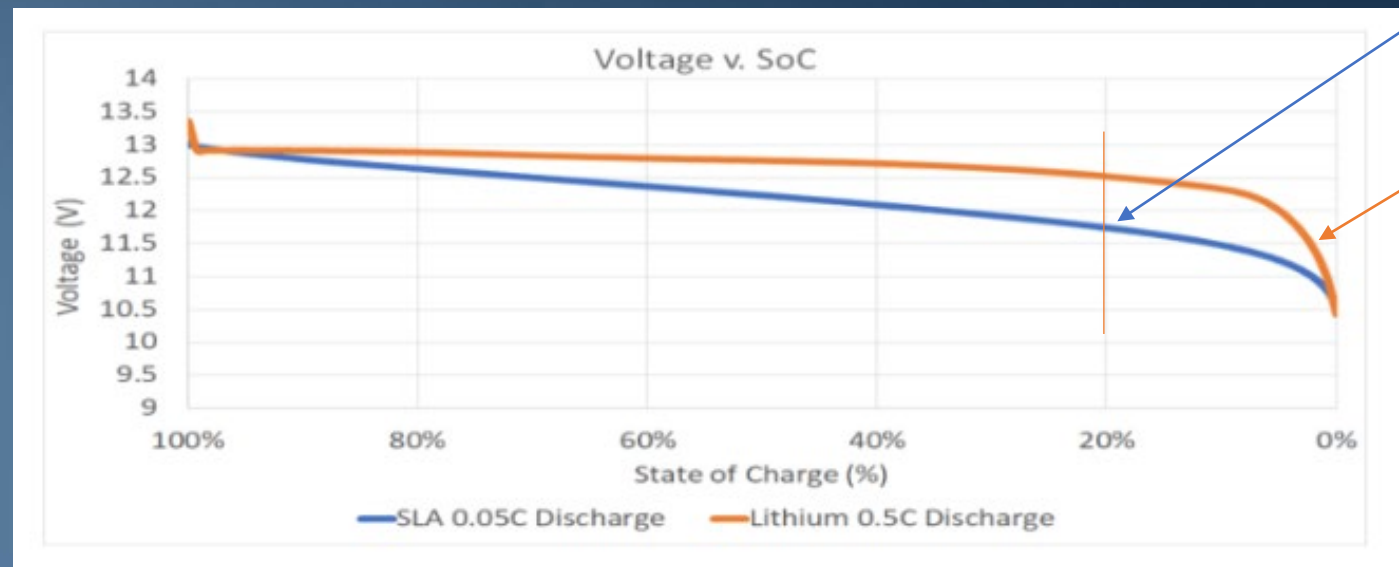
CON's

- Cost – Initial outlay is more than Lead
- Can't connect in parallel (standard version)
- Series connections are limited (standard version)
- Flat discharge curve – little warning before running flat



Low voltage warning

Due to Lithium's flat discharge curve, the low voltage warning is much later than Lead % therefore does not provide the same warning time before the battery runs flat.



Lead low voltage point

Lithium low voltage point

In applications where low voltage warning is critical (e.g. commercial alarm systems) – we have developed an electronic device which attaches to the battery and will eliminate this problem.

“Drop-In Replacement”

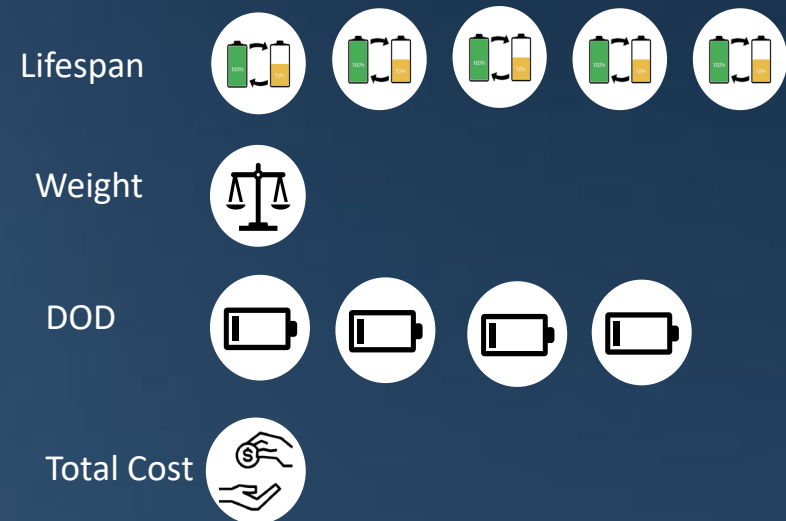
The term “Drop in Replacement” is often used in the industry. However, you should be aware that not all Lithium Batteries are “Drop-in Replacements” and cannot necessarily be used to replace any Lead Battery.

Lead batteries, although not the greatest battery technology around, do have a few good traits, some of which, Lithium batteries cannot match (unless specifically catered for in the design).

The Gate Motor is a good example of this. A standard lead battery can easily deliver the high currents that the Gate Motor requires to open the gate. However, the Lithium Battery needs very specific cells and BMS in order to do the same. The cost of which, is higher. It is for this reason that we have two 12v 7Ah batteries – One for alarm panels and one for Gate Motors.

As can be seen in the above example, the Alarm Panel 12v 7Ah Lithium battery could not be called a “Drop-in replacement”, since it cannot be used in all applications (ie Gate Motors).

HOW TO SELL LITHIUM BATTERIES





WARRANTY

**3 YEAR
WARRANTY**

- All Uniross Lithium batteries carry a 3-year limited warranty.
- Every battery has a code engraved on it so we can trace the date of manufacture from this code
- In addition, there is also a Barcode Label on the top of the battery which provides further information. If this label is removed, warranty is void.

FREQUENTLY ASKED QUESTIONS

“Is the Uniross Lithium battery safe?”

Yes, we use the highest quality cells in the battery pack. In addition, we also fit a state-of-the-art Battery Management System (BMS) to ensure your safety.

“What is the operating temperature of a Uniross Lithium Battery?”

Operating temperature is between -20°C & +60°C, but charging can only take place between 0°C & 40°C.

“Can I use a Lead Acid Charger to charge a Uniross Lithium battery?”

Yes, you can use a Lead charger to charge a Uniross Lithium Battery. It will not charge up fully (approximately 95%), but it can be done.

“Can a Lead battery and a Lithium battery be used together?”

No. This is not recommended at all.

“Can an Alarm Panel charge a Lithium Battery?”

Yes, you can use a Lithium battery in an Alarm Panel. We have tested all major brands of panels and they all work.