REMCO LITHIUM

ENERGY ANYWHERE

Lithium Deep Cycle Series

User Guide

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1.0 Introduction

Thank you for choosing REMCO Lithium. Please take some time to read this User Guide to ensure you understand how to safely connect and operate your REMCO Lithium Deep Cycle battery. This guide covers the following battery models:

- RM12-75LFP
- RM12-100LFP
- RM12-130LFP
- RM12-200LFP
- RM12-120LFPSL

As with all batteries, you should consider the mechanical and environmental conditions that you intend to operate the battery in to maximise overall performance and achieve the longest battery life. Any damage caused by disregarding these guidelines may void your warranty.

These are general guidelines; please seek our advice or that of a qualified electrical tradesperson if you are in doubt.

2.0 General Information

Lithium Iron Phosphate (LFP) is the safest form of lithium chemistry. However, a key component of on-going safe battery operation is the integrated Battery Management System (BMS).

2.1 Battery Management System (BMS)

The REMCO Lithium integrated BMS protects the battery from improper handling, monitors and optimises performance to maximise lifetime and ensures safe operation based on a wide range of internal and external conditions.

The integrated BMS provides protection from:

- Over / Under Voltage
- Overcurrent
- Short Circuit
- Over / Under temperature
- Cell Imbalance

A BMS is essential to avoid damaging the lithium batteries. When the system is not in use, damage due to deep discharge can occur when small loads (such as alarm systems, relays, standby current, etc) slowly discharge the battery.

Note: If you are unsure of a residual current draw, disconnect the battery using the battery disconnect switch on your app or disconnect the positive terminal on the battery when the system is not in use.

2.0 General Information

2.2 Key Benefits

Smart Battery Management
The Integrated Bluetooth App functionality provides easy access to monitor and maintain your lithium battery to optimize performance and longevity.

Light Weight
Only 1/3 of the weight of traditional batteries.

3000+ recharge cycles (up to 5x more than AGM)
So much more cycle life than an equivalent AGM battery

Less maintenance and no sulfation
Does not require constant charging, unlike like traditional batteries.
Can be left in storage for a lot longer without deteriorating.

100%-amp hour capacity available
Traditional batteries should not be used past 50% of their amp hour rating and cannot be used passed 70%. Lithium batteries can be drawn completely without causing significant damage. Therefore, a 100AH lithium battery has the same available power as a 200AH AGM battery.

Faster Recharge
Up to 50% faster than traditional batteries.

2.3 Flexible Use

Motorhomes, RVs and Caravans

Solar systems and renewable energy

4x4 / Automotive Auxiliary

Fishing, electric boat engines and depth sounders

Emergency power supply / Uninterruptible Power Supply (UPS)

Mobile homes and leisure

Note: Not suitable for installation in engine bays/rooms in automotive or marine environments.

3.0 Safety

This battery contains lithium iron phosphate (LFP) cells. While LFP cells are the safest Lithium chemistry, the stored chemical energy presents a risk of fire, burns or explosion if misused. Avoid injury to yourself and others, adhere to the warnings in this guide.

- KEEP OUT OF REACH OF CHILDREN
- NOT SUITABLE FOR CRANKING OR STARTING APPLICATIONS
- AVOID SHORT CIRCUIT OF BATTERY TERMINALS
- DO NOT EXPOSE OR DISPOSE OF IN FIRE
- DO NOT OPEN THE CASE – WARRANTY IS VOID IF OPENED
- AVOID MECHANICAL SHOCK
- DO NOT DROP, IMPACT, PIERCE, OR DRILL INTO THE CASE
- DO NOT ALLOW WATER TO ENTER
- ALWAYS KEEP DRY AND CLEAN IF POSSIBLE
- NEVER EXPOSE TO DIRECT SUNLIGHT AND PROTECT FROM HEAT
- DO NOT CHARGE BATTERY BELOW 0OC
- DO NOT STORE BATTERY BELOW -20OC OR ABOVE 6OC
- ALWAYS HANDLE WITH CARE

3.1 Ensure the battery is physically secure

Although lithium batteries are light weight in comparison to lead acid, if not properly secured, they can still become a dangerous projectile in a moving vehicle, RV, cart, or boat. Ensure the battery is safely secured before travel. If in doubt seek our advice and consider the use of mounting brackets to safely secure the battery.

3.2 Do not penetrate or open the battery case

Doing so may inadvertently penetrate one of the cells which could cause thermal runaway and vapour emissions. Do not under any circumstances drill or penetrate the case in an attempt to open it.

3.3 Maintain an acceptable temperature range

Like all batteries, lithium batteries operate and perform the best and last the longest, in a cool and stable temperature environment between 10oC and 25oC. The window of acceptable continuous operation is 0-45oC.

If you regularly operate outside of this suggested range, you should alter the battery location or add better ventilation to preserve battery life. If the ambient temperature that the battery operates in is greater than 65oC, cease use immediately. Operating outside of these guidelines diminishes the life and performance of the battery and voids the warranty.

3.4 Avoid repeated shock and vibration

Whilst the battery is robustly constructed and protected in an ABS case, it is not designed to operate continuously in high shock or high vibration environments. Use in normal 4WD / RV environments is acceptable and the battery has been designed to perform within these expected conditions. However, dropping the battery or exposing the battery to a high number of excessive vibrations may lead to a fault or failure of the battery.

3.5 Do not short circuit the battery

Whilst the BMS will protect the internal cells from short circuit, it is highly recommended to avoid short circuiting the battery.

Pay attention when using metallic tools in the vicinity of the terminals. Accidentally contacting the positive and negative terminal with a metallic object will cause a short circuit and spark. Always keep terminals covered when not in use.

3.6 Mounting orientation

Lithium batteries are “non-spillable” and can be mounted in multiple positions, upright or on any of its sides. However, up-side down orientation (terminals facing the ground) is not recommended.

3.7 End of Life Disposal

Batteries marked with the recycling symbol must be returned to recognized recycling centres. After consultation, they can also be returned to the supplier. Lithium Batteries are not allowed in household or industrial waste.

4.0 Installation & Usage

Make sure the REMCO Lithium battery is not connected with the opposite polarity. If the battery is not connected correctly, the BMS will be irreparably damaged and must be replaced by a new BMS. This is not covered by the product warranty.

4.1 Pre-inspection

After receiving the battery, check if the case or terminals have been damaged in any way (e.g., transportation). If they have, please do not place the battery into operation and contact the retailer.

4.2 Connecting

REMCO Lithium batteries contain a positive and negative M8 terminal. Always connect the positive terminal first, followed by the negative. Reverse the order when disconnecting.

Existing battery holders can be used if sizing is suitable. Make sure that the battery is installed and fixed so that it cannot move back and forth during use. Tension the battery strap.

4.3 Connecting more than one battery

The REMCO Lithium range can be used to connect to 4 batteries in parallel and up to 4 batteries in series. The batteries must be of the same model and capacity.

Parallel connection

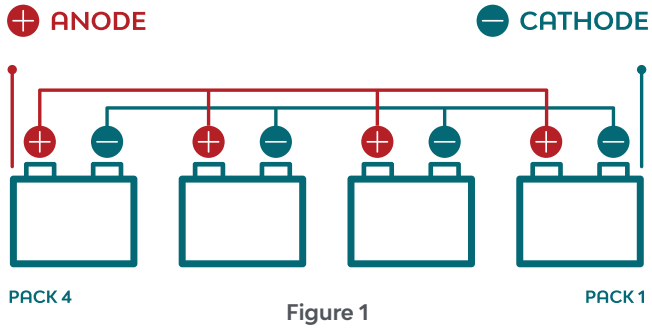


Figure 1

1. Ensure all batteries to be connected in parallel have been fully charged individually by the same rated charger
2. Ensure the Open Circuit Voltage (OCV) of each battery is less than <0.2V of each other
3. Connect the batteries using cables of sufficient width to carry current required (6 gauge <50A/10 gauge <100A) as per **Figure 1**
4. Ensure all connecting cable lengths are the same
5. Do not reverse connect the Positive and Negative
6. Ensure correct charge voltage and current is utilised for configuration (at least 0.2C of total bank)
7. Complete a full charge once every 3 months of the system
8. Once connected in parallel, the batteries must be charged and discharged as a system.

4.3 Connecting more than one battery (Continued)

Series connection

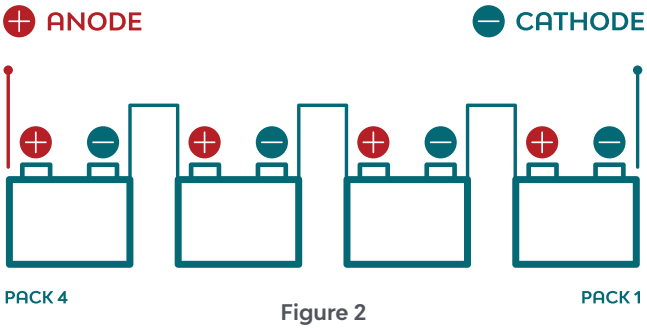


Figure 2

1. Ensure all batteries to be connected in parallel have been fully charged individually by the same rated charger
2. Ensure the Open Circuit Voltage (OCV) of each battery is less than <0.2V of each other
3. Connect the batteries using cables of sufficient width to carry current required (6 gauge <50A/10 gauge <100A) as per **Figure 2**
4. Ensure all connecting cables are thesame length
5. Do not reverse connect the Positiveand Negative.

4.4 Charging before use

The battery is charged between 30-50% of its capacity when shipped from the factory. It is recommended to fully discharge and charge the new battery before use and only use automatic battery chargers or solar controllers specified with a lithium charge profile.

Battery chargers with an AGM profile can be used provided they meet the following criteria:

- Charge voltage: must be set between 14.4-14.6V
- Equalization Mode: must be able to be switch off

Note: There is no memory effect when charging lithium batteries.

4.5 Maintenance

To maintain the battery, keep connections and surfaces clean, tighten clamps, and lightly grease periodically.

It is recommended check the State of Charge (SOC) of your battery every 3 months (made easy with the Remco Lithium App!)

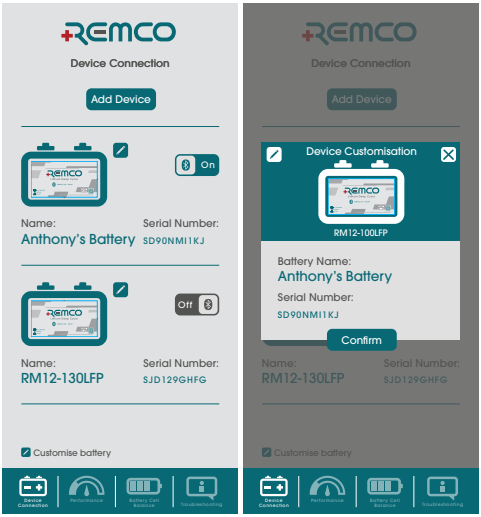
- If in storage, maintain SOC between 30-50%.
- If in regular use, it is recommended that batteries are given a full charge at least once every 3 months.

4.6 Smart Battery Management App (Optional)

The Smart Battery Management Bluetooth App can be downloaded from the Google Play or Apple Store.

1. Go to the App Store on your mobile
2. Type in "Remco Lithium" in the search field
3. The REMCO Lithium app icon will appear, select download
4. Once downloaded, open the app (when within 10m of your lithium battery)
5. The app will automatically detect Remco lithium batteries within range
6. Select the battery with matching serial number

Note: You can personalise the 'name' of your batteries, so they are easily identifiable by selecting the 'edit' icon as shown below.



4.7 Storage

Store in a cool, dry, well-ventilated area, away from fire and heat sources.

- Voltage should be kept above 12.8V and below 13.6V
- Recommended temperature range between -5 to 35 °C
- Remember to check battery every 3 months and charge accordingly to maintain SOC between 30-50%

4.8 Transportation

Separate lithium batteries from other products. Keep dry ensure temperature does not exceed 60°C.

5.0 Longevity & Depth of Discharge

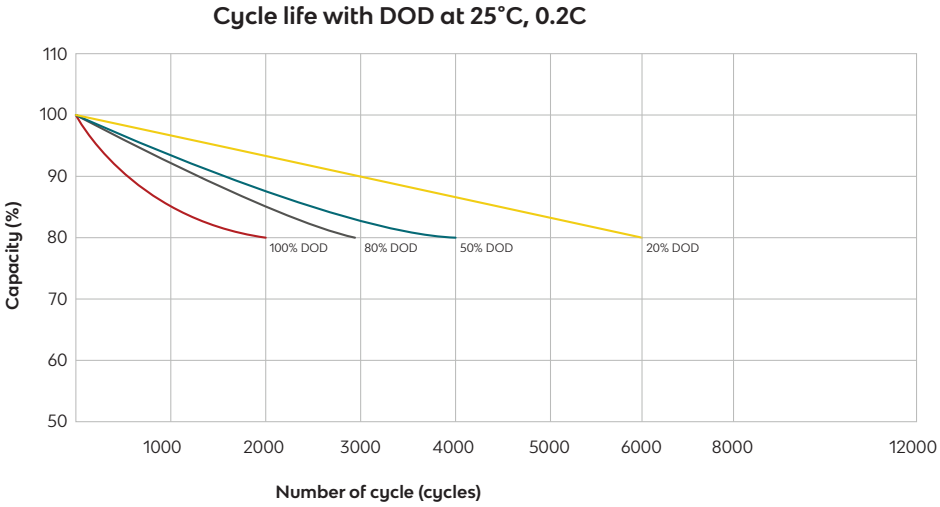
One of the advantages of lithium as opposed to lead-acid batteries, is longevity. To realise the battery's long life potential, consideration must be given to depth of discharge.

What is depth of discharge (DoD)?
Basically, how much battery capacity you have used before you recharge it. A deep cycle battery lifespan is rated by the number of cycles (i.e. discharge then recharge = 1 cycle) it can perform before the original capacity has reduced below 70%.

For example: REMCO Lithium batteries are rated to provide 2000 cycles at 100% DoD. However, if you were to recharge after using 80% of the battery capacity instead of 100%, they are rated to achieve 3000 cycles. That is an extra 1000 cycles due to better battery charge maintenance.

The more frequently you recharge your battery, before capacity has been drained, the more the cycles you will get from your battery, therefore the longer it will last.

The graph below illustrates the amount of cycles you can achieve by recharging more frequently.



6.0 Technical Specification

Code	Case	Term	Volts	Ah C20	IP Rating
RM12-75LFP	GRP 24	M8	12	75	65
RM12-100LFP	GRP 31	M8	12	100	65
RM12-130LFP	GRP 31	M8	12	130	65
RM12-200LFP	GRP 8D	M8	12	200	65
RM12-120LFPSL	Slimline	M8	12	120	54

	Max continuous current		Temperature range (“C)			L	W	TH	Weight
Code	Discharge	Charge	Discharge	Charge	Storage	MM			KG
RM12-75LFP	100A	40A	-20 to 65	0 to 45	-5 to 35	360	168	209	9.5
RM12-100LFP	100A	50A	-20 to 65	0 to 45	-5 to 35	330	172	223	11.7
RM12-130LFP	120A	50A	-20 to 65	0 to 45	-5 to 35	330	172	223	13
RM12-200LFP	150A	50A	-20 to 65	0 to 45	-5 to 35	522	240	218	23.5
RM12-120LFPSL	100A	60A	-20 to 65	0 to 45	-5 to 35	395	110	286	13.5

Contact Us

Please contact us if you have any questions regarding the purchase or use of your battery.

www.hcb.co.nz

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