



# **ROAMER** **USER MANUAL**

Roamer HOME  
LiFePO4 Leisure Battery

[www.roamer.com](http://www.roamer.com)



## Roamer Batteries

Since founding Roamer in 2020, we have strived to create and deliver exceptional products and service that give you the confidence to venture further and live without limits. The company has grown exponentially in the last three years, but our values and quality-first approach are still as strong as they were on day one.

We're committed to supporting off-grid lifestyles through the quality manufacturing of superior LiFePO4 batteries, customer care and expert support. We are confident that you'll be delighted with the quality and performance of your new Roamer battery but if you have any concerns or questions, please get in touch straight away.

Steve, Kate and the Roamer team

Roamer Batteries  
Powering your Off Grid Adventures

[www.roamer.com](http://www.roamer.com)

# Safety

Roamer have taken every precaution to ensure that our batteries are as safe as possible and give you complete peace of mind while using our products. No battery is 100% safe however, and caution should always be taken when handling or operating equipment containing, or connected to, high-capacity energy storage devices.

LiFePO<sub>4</sub> batteries should only be installed and operated by a competent person. Please read this manual carefully and pay particular attention to the recommended charge, discharge, and temperature limits as these may be different to the Battery Management System (BMS) maximum limits.

Please read the separate Safety User Guide carefully. This contains essential safety information and best practice on how to use your battery. If you have any concerns or questions about safety, please do not hesitate to contact Roamer at [support@roamer.com](mailto:support@roamer.com)

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## What else is in the box?

- User manual
- Safety information sheet
- Warranty terms and conditions
- 2x M8x16mm stainless steel terminal bolts with captive washers
- 2x M8x10mm stainless steel terminal bolts with captive washers
- Cable pack (inc. programming cable and battery link cable)

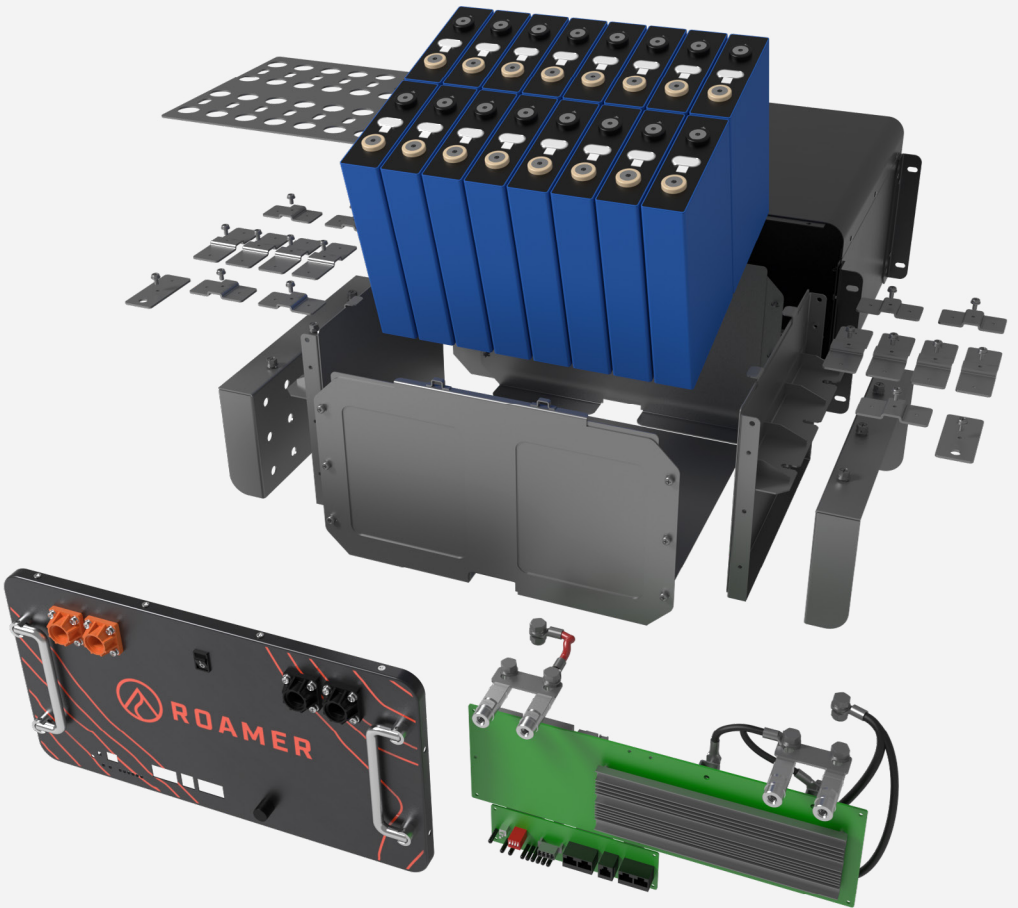
Please retain all documentation for future reference, but if you misplace them or decide to recycle them then digital versions are also available on our website. If any of these parts are missing, please contact us at [support@roamer.com](mailto:support@roamer.com) or call our technical support team on **(+44) 113 8878335** to arrange a replacement.

## What's inside a Roamer battery?

The Roamer HOME battery consists of sixteen 105Ah 3.2V grade A LiFePO4 cells connected in series to create a pack with nominal voltage of 51.2V and charge capacity of 105Ah. This provides a total energy capacity of 5.38kWh. Cells offer an industry leading 4000 cycles @ 80% depth of discharge and are rated for a continuous charge and discharge of 1C (105A).

Each battery includes a premium Battery Management System (BMS) which protects the battery cells from low voltage (over-discharge), high voltage (over charge), over-current, short-circuit, and under or over temperature. Charging and discharging are controlled separately, allowing you to discharge even when charge protection is in place. The BMS can connect to other devices via CAN protocol via one of the RJ45 ports on the front panel. This enables connection to a wide range of inverters for BMS managed charging, as well as CAN battery monitoring systems. For specific inverter protocols and set up instructions, please see the separate setup guides on our website, or contact Roamer Support.

Your battery is professionally constructed using precision engineered steel brackets, CNC-cut epoxy insulation board and high-capacity busbars and cable. We take immense pride in the quality and reliability of our batteries, but we also make them fully serviceable in case of problems or if an upgrade becomes available. While the case can be opened for repairs and upgrades, please do not try to do this yourself without speaking to Roamer Technical Support as you will invalidate your warranty.

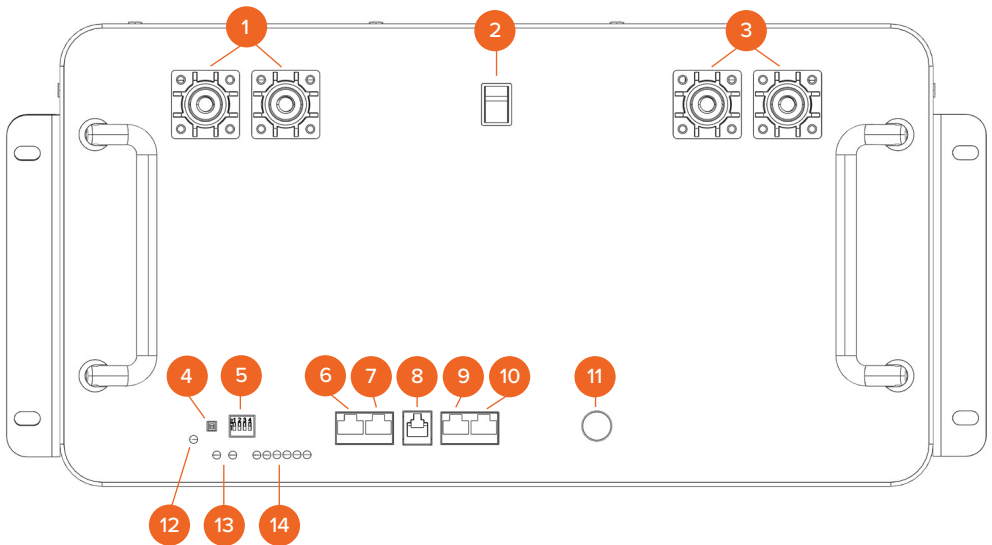


# Battery Layout

Please refer to the guide below for connection identification and use information.

1	Positive Battery Terminals
2	Power Switch
3	Negative Battery Terminals
4	Reset Switch
5	Address DIP Switches
6	RS485 RJ45 Socket A
7	BMS-CAN RJ45 Socket

8	RS232 RJ11 Socket
9	RS485 RJ45 Socket B1
10	RS485 RJ45 Socket B2
11	WiFi & Bluetooth Antenna
12	Power On
13	Status LEDs
14	Charge State LEDs



## Before you start

Prior to installation please check that all accessories and hardware is present, and that the battery has not been damaged during transit. Check that the battery is operating normally by switching it on using the main rocker switch on the front panel while you press and hold the RESET button on the front panel for 3 seconds to boot. During the boot process, the six capacity indicators (4), alarm indicator (5) and output indicator (6) on the front panel should all turn on. The alarm indicator should turn off while the output indicator remains on. The capacity indicators will settle to show a bar that estimates the remaining charge in the battery.

If the ALM alarm indicator flashes after the battery is turned on, it means that the battery is in an alarm state. If the alarm LED shows on first power on, press and hold the reset button for 10 seconds until all the LEDs are turned on, then release the reset button. This resets the battery allow the battery to reset and confirm whether the alarm is cleared. If the alarm LED persists after the battery as rebooted, it is likely to be a battery undervoltage flag (usually caused by the battery being left without a float charge for a long period). In this case, place the battery on charge for 30 minutes to raise the pack voltage. If the alarm is cleared, the battery can be used normally. If the alarm persists, please contact Roamer customer support for further guidance.

## Installation

Your battery should be installed lying flat with the Roamer logo the correct way up, or upright with the Roamer logo facing upwards. If the battery is installed in a vehicle, then it is crucial that the battery is securely fastened down so that it cannot slide while the vehicle is moving. It must also be accessible so it can be disconnected and removed in an emergency. We recommend always having tools available including cable cutters and a socket wrench of the correct size.

You should install the battery in a way that avoids exposing it to extreme heat or cold, and facilitates an even temperature distribution across the whole battery pack.

The Roamer HOME battery should be installed in accordance with one of the methods outlined below:

**Standard cabinet (rack) installation:** Install the battery pack and fix it with suitable bolts or fixings (not supplied) in the front and rear mounting brackets. The Roamer HOME has a size of 5U.

**Vertical mounting:** The battery can be sat on its end with the terminals pointing vertically upwards. The battery should be secured using the front and rear brackets were possible to prevent movement or the battery falling over. Alternatively, place bracing around the battery to ensure it cannot move.

If you intend to use an alternative mounting method, please contact Roamer customer support for guidance.



# Connecting power cables

Please ensure the battery is switched off before connecting cables.

Your battery comes supplied with M8 bolts with flat washers and spring washers pre-attached. You should terminate your battery cables with copper tube ring terminals with an 8mm hole. The cable termination should be placed flat, directly in contact with the battery terminal. The bolts should be tightened to a torque of 10Nm.

You should only have one main cable connected to each battery terminal bolt. There are two positive and two negative terminals on each battery to facilitate connection between multiple batteries in parallel. Both positive (or negative) terminals are directly connected internally so you can choose which is the primary and which is the secondary terminal.

## Parallel connection

Multiple batteries can be wired together in parallel to create higher capacity battery banks.

Parallel configuration is achieved by connecting the positive terminals of multiple batteries together to create one common positive node and connecting the negative terminals together to create one common negative node. The capacities and maximum current outputs are added together but the voltages are not. For example, two 48-105HOME batteries in parallel will have a total capacity of 210Ah, a peak delivery current of 200A, and a nominal system voltage of 51.2V.

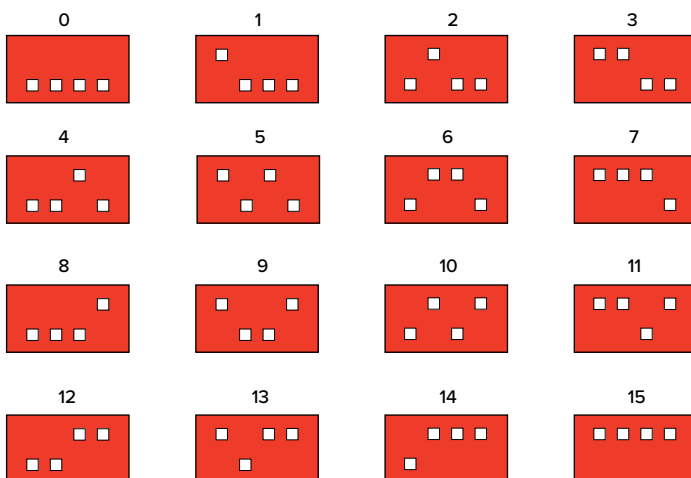
- It is possible to connect to 15 HOME batteries in parallel.
- We do not recommend connecting HOME batteries in series.
- All batteries must be fully charged and allowed to settle to within 0.05V of each other before connecting in parallel.
- Batteries in parallel series must be the same brand, voltage, capacity, and age.
- If connecting two batteries in parallel, you should take the positive cable to loads/chargers from battery A and the negative cable from loads/chargers to battery B.
- If connecting more than two batteries in parallel, you should connect each battery to a busbar rather than connecting directly.

## Connecting RS485 link cables

When using multiple batteries in parallel, you should use the link cables provided (or any other standard RJ45 ethernet cable). You should use the two ports on the right side of the battery as you look at it, labelled as RS485 / Link in the diagram. Connect one end of the link cable to one RJ45 socket on the first battery, and the opposite end of the link cable to the corresponding RJ45 socket on the next battery. Repeat this process by alternating pairs of RJ45 sockets until all batteries have been linked.

## Configuring DIP switches

When multiple batteries are connected together, you need to allocate each battery a unique address so that any connected devices and monitoring equipment are able to identify each one separately (by default they will all be set to address 0). Do this by changing the DIP switches (the little red and white selector switches) on the front panel. These use binary encoding, so up to 16 unique addresses can be set using just four switches. You should set the address of the first battery as '1' and then increase incrementally as per the diagram below.



## Connecting your battery to a PC

Roamer provide windows PC utility software to monitor the status of your battery and configure system parameters. First, you'll need to connect the provided USB to RS485 adapter to the 9-pin D-SUB to RJ45 cable. They should mate together easily using the captive screws to make a secure connection. The resulting cable should now effectively be USB to RJ45. When connecting to a PC, you should use the far left RS485 port, as shown in the connection diagram. The PC software can be downloaded from [roamer.com](http://roamer.com) along with a detailed programming guide.

## Connecting your battery to an inverter

There are two methods of controlling charging via a solar inverter or solar charger. The first is to set it up like you would with a lead acid battery, where there is no direct communication between the inverter and battery. Charging and discharging are controlled using a voltage and current-based system and a 3-stage charge profile. When using this method, it is important to configure charge voltages as per the recommended settings given later in the manual. Charging will therefore be controlled via the inverter/charger, it will charge up to the preset voltage and then stop. If there are any issues, the battery BMS will protect the battery by preventing charging or discharging as required. Alarm signals can be communicated to a smart controller, such as a Victron Cerbo, via CAN; or to a PC using RS232 or RS484 serial.

The second way is to switch to battery-controlled charging, where the BMS takes control the inverter or charger's charging and discharging parameters. This has advantages and disadvantages, and it may not suit all applications. The main benefit of this method is to provide expanded battery data and alarm flags to the inverter and monitoring system. When using this method, you should ALWAYS configure the default charge settings on the inverter or charger to match the recommended voltage settings for the battery. This ensures that in the event of a communication failure the battery will not be over charged or over discharged.

Roamer HOME batteries can communicate with almost any CAN enabled inverter, although some may require a firmware update on the inverter. It may also be necessary to make a custom RJ45 cable with an alternative pinout depending on the specific hardware. Please check the Roamer website for inverter specific set-up guides. If we do not have instructions for your inverter then please contact us and we can provide further guidance.



# Discharging

Your Roamer HOME battery can deliver extremely high continuous discharge currents and allows the operation of high-power appliances either directly at DC 48V or at mains AC voltages (230V in the UK and mainland Europe) via an inverter. You should ensure that all connecting cables and the main battery cables are sized appropriately for the expected current draw, and the correct size and type of protective fuse is used. Please refer to the inverter manual for guidance.

	48-105HOME
BMS Max Discharge Current [A]	210 (continuous), 250 (<10s)
Battery Max Recommended Discharge Current [A]	105
Battery Max Recommended Inverter Power [VA]	5000

The recommended maximum inverter size that can be used with multiple Roamer HOME batteries are given in the table below. If you are installing multiple batteries in parallel, you can connect a larger inverter. To allow for unbalanced loading on the batteries, we recommend limiting the total discharge current to 80% of the total rating from all batteries added together.

Number of Parallel 48-105HOME Batteries	1x	2x	3x	4x
Bank Max Recommend Discharge Current [A]	105	168	252	336
Max Recommended Inverter Power [VA]	5000	8000	12000	16000

# Charging

You should choose a charger or inverter-charger with an appropriate default (or configurable) LiFePO4 charge profile. The Roamer BMS will automatically prevent you from overcharging the battery by blocking further charging when the high voltage threshold is reached. This is an emergency protection however and should not be relied upon as a substitute for an appropriate LiFePO4 charger.

The ideal charge profile for your battery includes a bulk charging phase at a constant current up to the target absorption voltage of 56.8V, followed by an absorption phase up to 1 hour. A float phase is not required.

Most multistage chargers have bulk, absorption and float stages that can be configured via a Bluetooth app or selector switches. Some brands use different terminology, but the purposes are the same. You should choose the profile that most closely matches the parameters given below, with ideal and acceptable charge voltages also shown:

- Bulk/Absorption/Boost/Target Voltage: 56.8V
- Float/Storage Voltage: 54V or Off
- Absorption Time: 1 hour (0 to 2 hours is ok)
- Equalisation: Off (or equal to boost voltage with equalisation time 0)
- Temperature Compensation: Off

Note that when the battery is new, you may see Cell Overvoltage (COV) warnings when the battery is almost at 100% state of charge. This is usually due to the cells drifting slightly out of balance during extended periods of storage or transit. The solution is to reduce charge voltage to 55.8V then continue to use the battery as normal. After 20-30 cycles the cells will come back into balance, after which you can then increase charge voltage back to 56.8V.

# Low temperature charging

Standard LiFePO4 batteries should not be charged at temperatures below 0°C as this can permanently damage the cells. Roamer batteries therefore include a low temperature charge protection function in the BMS which will prevent you charging if the internal battery temperature reaches below this point. This protection will remain in place until the internal temperature rises back above 5°C. Due to the size and bulk of the prismatic battery cells, it can take several hours for the internal temperature to match the external ambient temperature, and for all cell temperatures to equalise.

We do not recommend applying an external source of direct heat to either the cells or the battery casing as this can change the temperature of the sensors in the battery, but not the temperatures within the cells themselves, leaving them at risk of permanent damage. If you need to warm the battery, gently heat the air around the battery and leave the battery to acclimatise for at least two hours.

To maintain a long and healthy life for your battery and to minimise safety risks, you should also reduce charge currents according to the battery temperature. Please pay attention to the recommended charge currents are given below, failure to adhere to this advice could lead to premature battery failure and will increase the risk of a battery fire.

	48-105HOME
BMS max rated current [A]	210
Max recommended charge current at 25°C [A]	105
Max recommended charge current at 10°C [A]	50
Max recommended charge current at 5°C [A]	25

# Monitoring state of charge

The state of charge (SoC) is tracked by the BMS by monitoring the current flowing in and out of the battery, combined with additional information about self-discharge, internal losses, and cell condition. This can be viewed through the PC software or via a connected monitoring system. You could also install an external shunt-based battery monitor. As a second point of reference the battery capacity can be roughly estimated from the cell or pack voltage.

There are subtle differences in the voltage profiles of different cells and batteries, so the below parameters are for reference purposes only. The table below shows the approximate SoC at different voltages for a single cell, and the full 48V 16S cell pack. Except for the first line, all voltages are 'resting' voltages i.e., after the battery has been sat without charging or discharging for 30 minutes.

State of Charge at 25°C	Single Cell LiFePO4 [V]	48V LiFePO4 [V]
100% (Charging)	3.55	56.80
100% (Resting)	3.40	54.40
99%	3.35	53.60
90%	3.33	53.20
80%	3.31	52.88
70%	3.29	52.64
60%	3.28	52.40
50%	3.26	52.20
40%	3.25	52.00
30%	3.24	51.80
20%	3.20	51.20
10%	3.03	48.40
0%	2.50	40.00

Note how the voltage at 99% is very different to 100% but there is hardly any difference in voltage between 20% and 80%. Voltage is therefore more useful as a guide when the battery is nearly full, or nearly empty. For example, you can consider any resting voltage of 53.6V or above as being full. You can also consider anything below 51.2V to be very low and if you see this as a resting voltage, you should aim to recharge as soon as possible.



## Storing your battery

If you happen to need to store your battery for an extended period – for example through the winter months – we have a few recommended tips to prolong the life of your battery.

- Before putting into storage, you should discharge it to between 52.0V and 53.0V (equivalent to 40% to 80% state of charge) and fully isolate the battery from any chargers or loads.
- Never store your battery at 100% state of charge or continuously charge the battery via solar or a trickle charger. This is one of the worst things you can do to a lithium battery as it will degrade the LiFePO<sub>4</sub> cells and reduce the life of your battery. If you need to leave the battery connected and on charge, then set the charger to a storage voltage of 52.8V.
- Keep it in a dry location with a stable temperature. While cold temperatures are generally ok for storage, you should avoid very warm temperatures (above 40 °C).
- Your battery will self-discharge by approximately 3% every month so it is normal to find it in a lower condition than you left it but do not let it drop too far.
- Cells will be damaged if you allow voltage to drop below 2.5V per cell. You should check the battery app regularly and top up the charge if needed.
- Note that the BMS app will not record any self-discharge while in storage so you should use voltage as a guide, not the percentage shown on the app. The State of Charge calibration may also need to be reset when using the battery again after a long period of storage.



# Troubleshooting

## LED indicators

- 1x green power on indicator
- 6x green capacity indicators
- 1x red warning indicator

## Capacity indication

State	Charge				Discharge			
	L1	L2	L3	L4	L1	L2	L3	L4
Capacity Indicator (SOC)								
0-25%	OFF	OFF	OFF	BLINK	OFF	OFF	OFF	ON
25-50%	OFF	OFF	BLINK	ON	OFF	OFF	ON	ON
50-75%	OFF	ON	ON	ON	OFF	ON	ON	ON
75-100%	BLINK	ON	ON	ON	ON	ON	ON	ON
Run Indicator	ON				BLINK			

## Status indication

System status	Event	RUN LED	ALARM LED	SOC LED			
		R1	A1	L1	L2	L3	L4
Shutdown	OFF	OFF	OFF	OFF			
Standby	Normal	BLINK1	OFF	OFF			
	Alert	BLINK1	BLINK2	OFF			
	Protect	ON	OFF	BLINK 2 ACCORDING TO SOC			
	Normal	ON	OFF	BLINK 2 ACCORDING TO SOC			
	Overvoltage Alarm	ON	OFF	BLINK 2 ACCORDING TO SOC			
Charge	Overcurrent Temperature Alarm	ON	BLINK 2	BLINK 2 ACCORDING TO SOC			
	Overvoltage Protection	BLINK 1	OFF	ON			
	Overcurrent Protection	ON	OFF	BLINK 2 ACCORDING TO SOC			
Discharge	Normal	BLINK 3	OFF	BLINK 1 ACCORDING TO SOC			
	Alert	BLINK 3	BLINK 2	BLINK 1 ACCORDING TO SOC			
	Undervoltage Protection	BLINK 1	BLINK 2	BLINK 1 ACCORDING TO SOC			
	Overcurrent/Short-circuit/Reverse	OFF	ON	OFF			

Blink 1 = 0.25S On 3.75S Off

Blink 2 = 0.5S On 0.5S Off

Blink 3 = 0.5S On 1.5S Off

You can view fault codes via the PC software.

If you have a persistent alarm signal showing and are unable to resolve it yourself, please contact Roamer customer support.

# Tech Specs

Each table contains detailed technical parameters for our batteries including charging information, operating conditions and more.

Do not use the battery outside of the recommended ranges.

	48-105HOME2
<b>Battery Specification</b>	
Nominal Voltage [V]	51.2
Current Capacity [Ah]	105
Energy Capacity [Wh]	5376
Cell Chemistry	Lithium Iron Phosphate / LFP / LiFePO4 Prismatic Cells
<b>Physical Specification</b>	
Length [mm]	435
Width [mm]	370
Depth [mm]	230
Weight [kg]	45
<b>Electrical Specification</b>	
Min/Max Safe Voltage [V]	40.0/58.4
Recommended Absorption Charge [V]	56.8
Recommended Float Charge [V]	54.0
Max BMS Discharge Current [A]	210
Max Recommended Discharge [A]	100
Max Recommended Inverter Power [VA]	5000
Max. BMS Charge Current [A]	100
Recommended Max Charge Current >25°C [A]	50
Recommended Max Charge Current >10°C [A]	20
Recommended Max Charge Current >5°C [A]	10
Max Charge Current <0°C [A]	0
<b>Operating Specification</b>	
Storage Temperature [°C]	-20 to 40 (10 – 35 recommended)
Charging Temperature [°C]	0 to 60
Discharge Temperature [°C]	-20 to 60
Average Cycle Life	6500 cycles @ 50% Depth of Discharge (25°C) 3500 cycles @ 80% Depth of Discharge (25°C) 2000 cycles @ 100% Depth of Discharge (25°C)

# Warranty

The period of warranty is TEN years from the date of shipment. Faults and manufacturing defects can occur with any electrical device, and we aim to make the process as simple and pain free as possible. Roamer guarantees to give a free repair or replacement in cases where cells or the BMS have defects proven to be due to manufacturing process (instead of misuse, accidental damage, or general wear & tear).

It is important that you contact us as soon as you notice a fault with your battery. We can talk you through a few simple tests that will help identify any issues or even resolve the problem remotely. If we cannot resolve the problem remotely then we will arrange to collect the battery from you and return it to our warehouse for testing. Any shipping fees incurred for approved warranty returns will be covered by Roamer. In the event of a repair that falls outside of the warranty, we will still be very happy to help but it will result in a charge to the customer agreed upon at the time based on the scope of the work required.

In the event of a proven manufacturing defect or battery failure that meets the warranty terms and conditions, we will either repair the battery (usually by replacing an internal component such as a cell or the BMS) or replace the entire battery with an equivalent (or better) product from our current range. If we are unable to repair or provide a suitable replacement, then we will refund the original purchase price. Please note that Bluetooth and Wi-Fi are not essential features for battery operation and any issues with Bluetooth or Wi-Fi (such as no signal or weak signal) are not covered under warranty.

If we cannot reproduce the problem or if the defect or failure is found to have been caused by customer abuse or misuse then we will return the battery to you, or if you prefer, we can recycle the battery. Depending on the state of the battery, we may be able to offer a credit towards an upgrade. Any shipping costs incurred because of a rejected warranty claim will be charged to you.

This Limited Warranty is to the original purchaser of the Product and is not transferable to any other person or entity. If you did not purchase from Roamer directly then please contact the place of purchase regarding any warranty claim. Warranty Service is only available for products residing within the UK or Europe. Any warranty claims made from without the stated regions will require the claimant to return the products at their own expense to a location convenient to Roamer within the UK or Europe. Return shipping is only offered to similar locations within the above stated regions.

For full Limited Warranty terms and conditions, refer to the included warranty slip delivered with your battery.



## Returns & Refund policy

We hope you are happy with your purchase. However, if you are not completely satisfied with your purchase for any reason, you may return it to us for a full refund or an exchange, subject to our standard terms and conditions of sale. All return requests must be within 14 days of the purchase date. You have another 14 days to return the item after the initial request. Batteries must be in new and unused condition (we will check the case for scratches and the BMS for usage history). If you have installed or cycled your battery then we may still be able to accept your return, however we may offer a reduced amount instead of the full refund.

### How to return

Please email customer service [support@roamer.com](mailto:support@roamer.com) to obtain a Return Material Authorisation (RMA) number. Place the item securely in its original packaging and return your battery to the address below. If you are using a courier, then it is your responsibility to ensure that they are aware of the relevant Dangerous Goods transport restrictions. Please note, you will be responsible for all return shipping charges. Alternatively, we can arrange for collection via our Dangerous Goods shipping service (we will charge £50 shipping fees, per battery).

### Returns

After receiving your return and inspecting the condition of your item, we will process your return or exchange. Please allow up to 14 days from the receipt of your item to process your return or exchange. We will notify you by email when your return has been processed.

### Disposing of your battery

Although we hope your battery will keep you running off-grid for many years, it will eventually reach a point where it must retire. Batteries and electrical components should be recycled responsibly and must not be disposed of in domestic waste. If in any doubt, please get in touch with us and we'll be more than happy to advise you on how best to go about this. As a responsible manufacturer we can handle this process for you. Simply get in touch with us through the usual routes and we'd be more than happy to help arrange disposal and recycling for you.



## Contact Roamer

General Enquiries

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**Roamer Batteries**

**Powering your Off Grid Adventures**

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