

# Roamer 105SMART5 MAX

## 12.8V 105AH 300A LIFEPO4

The Roamer 105SMART5 MAX is a high power replacement for a standard Group 24 size lead acid leisure battery. It can deliver a significant improvement in power, weight, and storage capacity compared to equivalent FLA, gel, AGM and other lithium leisure batteries. The LiFePO4 cells used in this model are capable of discharging at up to 3C continuously and charging at 2.2C (at 25 degrees Celcius) and the BMS is able to charge and discharge at 300A, making it one of the highest 'power to capacity' batteries on the market. NOTE this battery model cannot be connected in series. Doing so could permanently damage the BMS. For more information, visit [www.roamer.com/products/105smart](http://www.roamer.com/products/105smart)

### General Description

All Roamer batteries utilise Lithium Iron Phosphate (LFP or LiFePO4) cell chemistry combined with an intelligent, Bluetooth connected Battery Management System (BMS). Roamer only use Grade A cells direct from the manufacturer, matched at the factory to ensure coherent operation and maximise service life and safety. The batteries are constructed around a custom fabricated steel chassis which supports and protects the cells from mechanical impacts and vibration and facilitates high levels of serviceability, ensuring that our batteries can be upgraded or serviced to maximise the service of the product.

Fire retardant materials including fibreglass resin panels and high-density carbon-impregnated EVA foam are used to provide high quality electrical and thermal insulation, and mechanical protection. All batteries are fitted with female M10x1.25 terminals with large contact surface area. All batteries have multi-layered safety features as standard including over and under voltage, over and under temperature for both charge and discharge, short circuit detection, cell balance monitoring and more. High specification components are used to provide passive protection from accidental extreme DC overvoltage, reverse polarity, and momentary overcurrent.

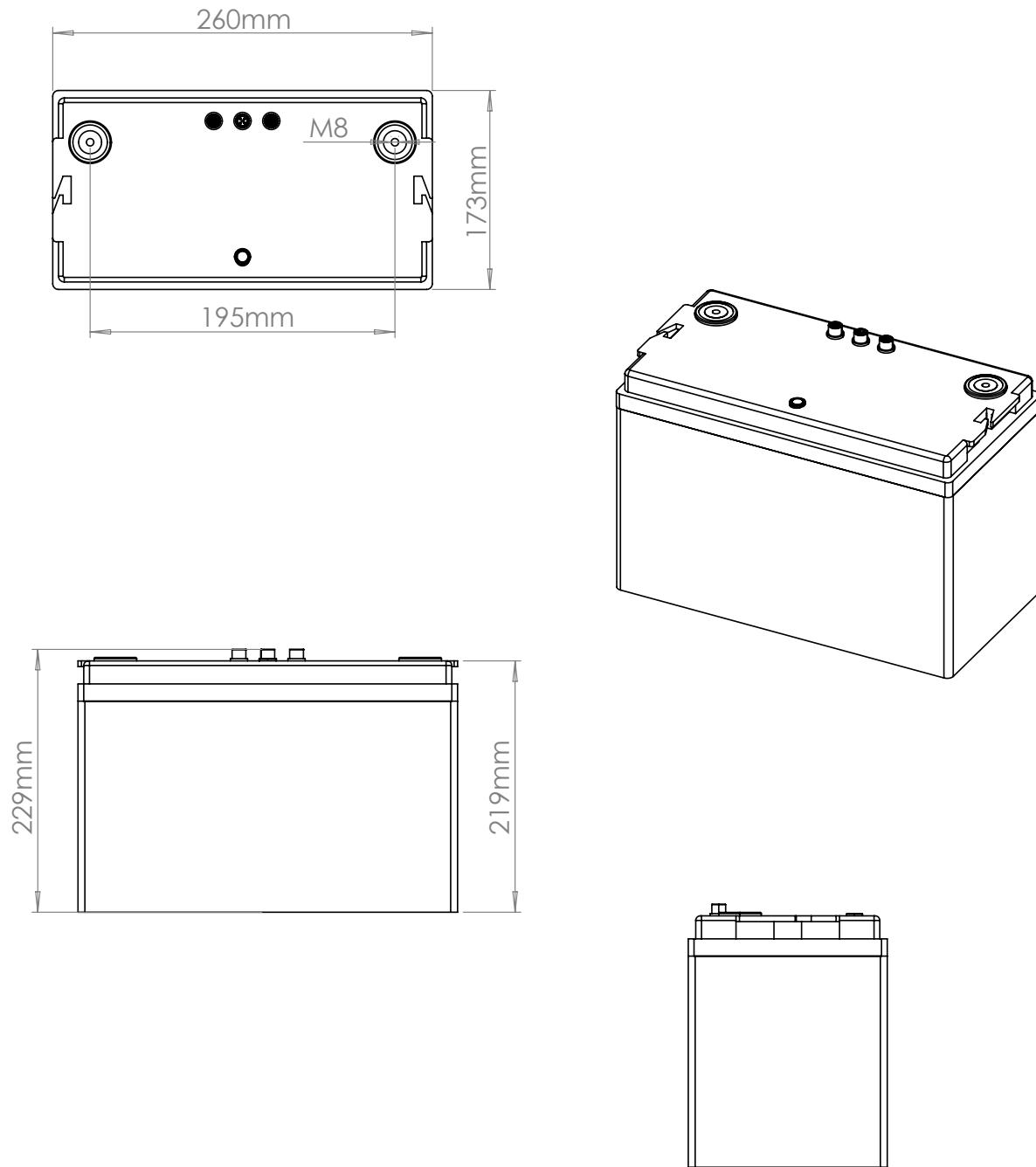
### PRODUCT FEATURES

- 105Ah capacity at 12.8V
- Intelligent cell balancing up to 2A
- Grade A Prismatic LFP cells
- Up to 300A continuous discharge (3.6kW)
- Supports up to 16 batteries in parallel for increased capacity, current delivery, voltage, or supply redundancy. No series connection.
- Discharge between -20 °C and 60 °C, charge between 0 °C and 60 °C



## Battery Dimensions

Dimensions subject to manufacturing variation. Products may vary from those illustrated. This drawing is subject to change without notice.



## Battery Specification

	Identifier	Min	Typical	Max	Unit
Nominal Voltage	$V_N$	-	12.8	-	V
Nominal Capacity	$C_N$	-	105	116	Ah
Energy Capacity	$E_N$	-	1344	-	W
Cell Chemistry	-	-	LiFePO4	-	-
Cell Type	-	-	Prismatic	-	-
Cell Capacity	$C_C$	-	105	-	Ah
Cell Configuration	-	-	4S 1P	-	-
Pack Internal Resistance	$R_I$	-	-	20	$m\Omega$
Parallel Limit	$N_P^{MAX}$	-	-	16	-
Series Limit	$N_S^{MAX}$	-	-	NOT ALLOWED	-
Cycle Life at 80% DoD	-	-	8000	-	-

## Physical Specification

	Identifier	Min	Typical	Max	Unit
Length	$L_L$	-	260	-	mm
Width	$L_W$	-	173	-	mm
Depth	$L_D$	-	229	-	mm
Mass	$M$	-	11	-	kg
Case Type	-	-	ABS Serviceable	-	-
Terminal Type	-	-	M8 Female	-	-
Terminal Torque Rating	$T_{MAX}$	10	12	14	Nm
IP Rating	-	-	IP54	-	-

## Charging Parameters

	Identifier	Min	Recommended	Max	Unit
Battery Safe Voltage	$V_{BS}$	10	-	14.6	V
Battery Working Voltage	$V_{BW}$	10.8	-	14.2	V
Nominal Cell Voltage	$V_{CN}$	2.8	-	3.7	V
Absorption Voltage	$V_{CA}$	13.8	14.2	14.6	V
Float Voltage	$V_{CF}$	-	13.5	-	V
Maintenance Voltage	$V_{CS}$	-	13.25	-	V
BMS Charge Current Limit	$I_c$	5	-	105	A
Recommended Max Charge Rate	$R_c$	-	-	210	A
Charge Temperature	$T_c$	0	-	60	°C
Charge Current >25°C	$I_{CMAX}^{25}$	-	-	110	A
Charge Current @ 10°C	$I_{CMAX}^{10}$	-	-	42	A
Charge Current @ 5°C	$I_{CMAX}^5$	-	-	21	A
Charge Current < 0°C	$I_{CMAX}^0$	-	-	0	A
Charge Current < -20°C	$I_{CMAX}^{-20}$	-	-	0	A

## Discharging Parameters

	Identifier	Min	Recommended	Max	Unit
BMS Peak Discharge Current (30s)	$I_{CP}$	0	-	350	A
BMS Max Continuous Discharge Current	$I_{CC}$	0	-	300	A
Recommended Max Discharge Rate	$R_d$	-	-	210	A
Discharge Temperature	$T_d$	-20	-	60	°C

## Storage Parameters

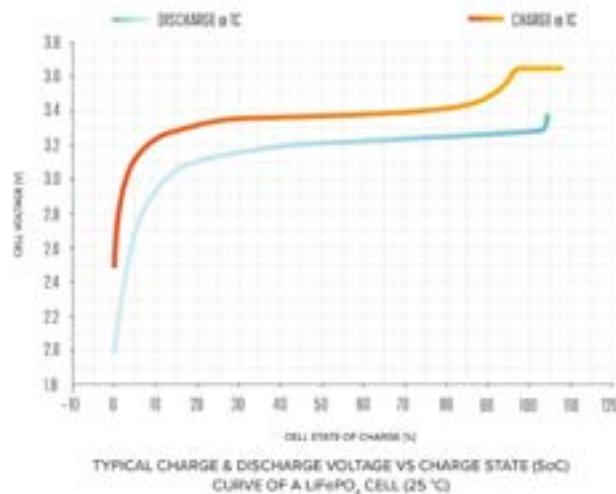
	Identifier	Min	Recommended	Max	Unit
Recommended Storage Temperature	$T_s$	10	-	35	°C
Recommended Storage SoC	$S_s$	30	50	80	%
Recommended Storage Voltage	$V_s$	13	13.25	13.3	V

## BMS Parameters

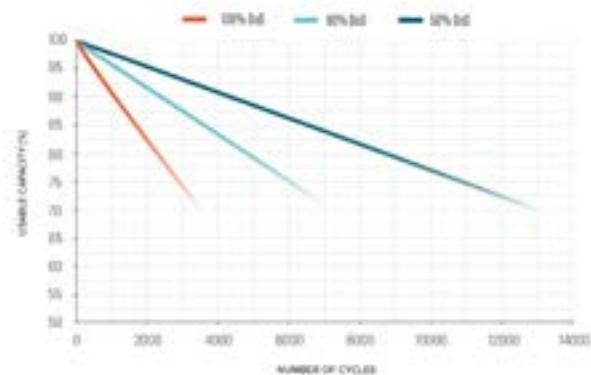
	Identifier	Min	Typical	Max	Unit
Cell Overcharge Detection Voltage	$V_{COD}$	-	3.70	-	V
Cell Overcharge Release Voltage	$V_{COR}$	-	3.4	-	V
Pack Overcharge Detection Current	$I_{BOD}$	-	100	-	A
Pack Overcharge Release Current	$I_{BOR}$	-	0	-	A
Overcharge Detection Time	$t_{OD}$	-	1	-	s
Cell Undercharge Detection Voltage	$V_{CUD}$	-	2.5	-	V
Cell Undercharge Release Voltage	$V_{CUR}$	-	2.7	-	V
Undercharge Detection Time	$t_{UD}$	-	1	-	s
Cell Balance Transfer Current	$I_{CB}$	-	2	-	A
Cell Balance Trigger Delta Threshold Voltage	$V_{CBD}$	-	0.01	-	V
Short Circuit Detection Current	$I_{SCD}$	-	2200	-	A
Short Circuit Protection Release Current	$I_{SCR}$	-	5	-	A
Short Circuit Detection Time	$t_{SC}$	-	150	200	$\mu$ s
Charge Temperature Protection	$T_{CPD}$	0	-	60	$^{\circ}$ C
Charge Temperature Protection Release	$T_{CPR}$	5	-	55	$^{\circ}$ C
Discharge Temperature Protection	$T_{DP}$	-20	-	60	$^{\circ}$ C
Discharge Temperature Protection Release	$T_{DPR}$	-15	-	55	$^{\circ}$ C
BMS Working Current Consumption	$I_{WRK}$	-	30	-	mA
BMS Standby Current Consumption	$I_{STBY}$	-	800	-	$\mu$ A

## Battery Characteristics

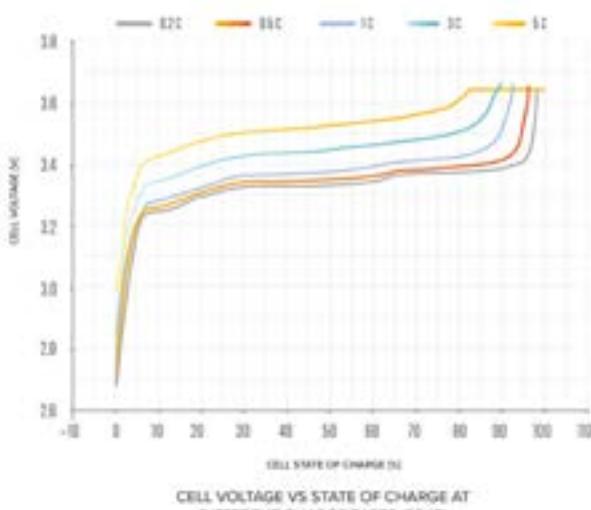
The following graphs demonstrate the operational characteristics of LiFePo4 cells under a variety of conditions. Many factors play a role in the exact capacity, performance, lifetime and safety of a lithium battery so every installation varies depending on the exact setup and use case. These serve only as a guide and do not reflect the exact characteristics of any individual battery.



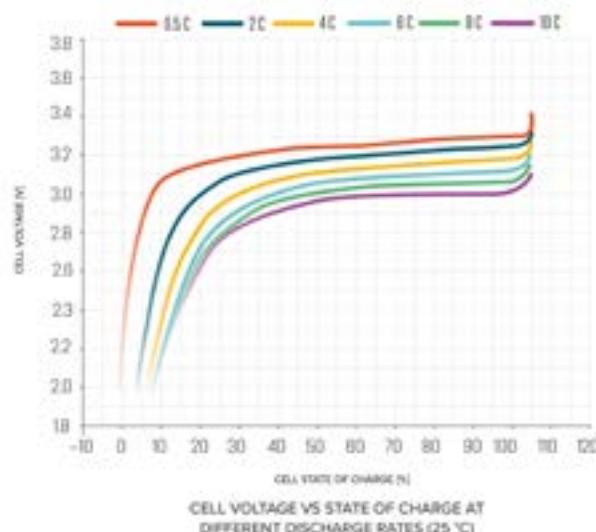
TYPICAL CHARGE & DISCHARGE VOLTAGE VS CHARGE STATE (SoC)  
CURVE OF A LiFePo<sub>4</sub> CELL (25 °C)



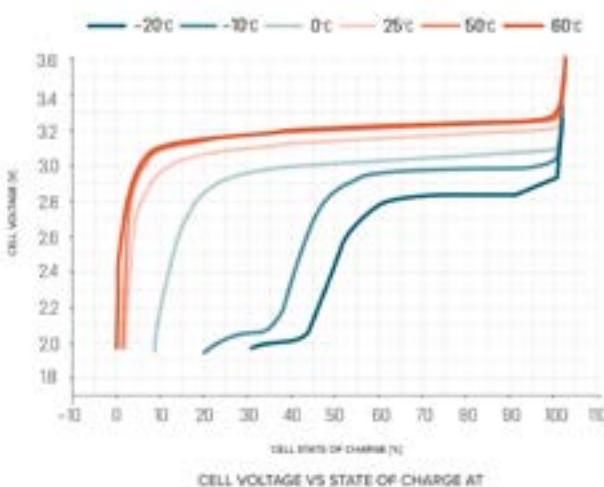
TYPICAL USABLE CAPACITY VS CYCLE LIFE FOR  
DIFFERENT DEPTHS OF DISCHARGE (0.5C, 25 °C)



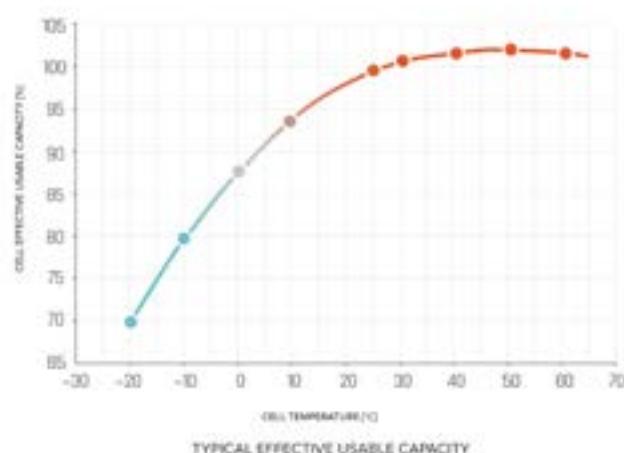
CELL VOLTAGE VS STATE OF CHARGE AT  
DIFFERENT CHARGE RATES (25 °C)



CELL VOLTAGE VS STATE OF CHARGE AT  
DIFFERENT DISCHARGE RATES (25 °C)



CELL VOLTAGE VS STATE OF CHARGE AT  
DIFFERENT TEMPERATURES



TYPICAL EFFECTIVE USABLE CAPACITY  
VS CELL TEMPERATURE