



The MICROLYTE RML Series

48V Lithium-Ion module

**High energy and
high power for
fast, long
lasting delivery**

SBS SOLAR

THE RIGHT ADVICE, THE RIGHT DESIGN, THE RIGHT PRODUCT

MICROLYTE RML



Specification

Positive Electrode:	Nano-LiFePO ₄ on Aluminium foil
Negative Electrode:	Nano-Carbon on Copper foil
Max. Charge Current:	0.5C for less than 180min or 1C for 65-70min at 25°C
Max. Recommended Charge Voltage:	58.4V ± 1% at 25°C
Electrolyte:	Lithium electrolyte salt LiPF ₆ with EC:DMC:EMC solvent
Safety Valve:	0.8 MPa opening pressure
Separators:	PE film
Output Port:	AWG10 x 2
Communication Port:	RS232 - COMP port / RS485 - RJ45 plug
Electrical:	48V 50/75/100Ah at C/2 to 40V @ 25°C

Design life

Years:	10 years in float service @ 25°C
Cycles:	>2000 cycles for continuous 0.5C discharge @ 100% DOD

Product compliance

IEC	62133-2002
UL	1642
UN	38.3

Company Accreditation

ISO	9001:2015
ISO	14001:2004

Product information

The MICROLYTE Rack Mounted Lithium

The MICROLYTE RML 48V is compact, robust, and incredibly reliable. It is constructed with world-class nano LiFePO₄ cathode material to produce fast-charging, stable units that are incredibly effective over a wide temperature range (-20°C to +60°C).

The series has been designed for telecom style applications and can be used with 19-inch rack mounts. The relatively small volume and high charge/discharge rates make this range an ideal choice where energy density and space are prime requirements.

The RML series is among the first in the market to utilize lithium to its true potential. SEC formed strategic alliances with world-class material and equipment suppliers to create this series, which uses patented nano-technology in both the positive and negative electrodes to increase uniformity, reliability and performance.

The RML has fast response times plus high rate discharge and charge capability. Combine this with a cycle life in excess of 2000 cycles to 100% depth of discharge and you get market-leading unmatched performance for all stationary applications.

Hardworking, small and lightweight, the RML Lithium range has multiple benefits. The uniformity of the nano-phosphate particle size provides excellent batch stability and enhanced conductivity.

Due to the patented nano material structures, the RML has very high recharge and discharge rates, higher in fact than leading competitors' Lithium-Ion technologies. Combine all of this with its ability to fully function at temperatures as low as -20°C and you'll struggle to find a competitor in both price and performance.

Product benefits

Super light and compact

Ideal for space critical applications and designed for the telecommunications industry, the RML is compact and lightweight. When fully installed it has energy densities two to three times higher than a Lead Acid battery.

Absolute reliability under harsh conditions

Suited to vibrational and high temperature environments and has a wide operational temperature range from -20°C to +60°C. The RML can operate at sub-zero temperatures and has an extended lifetime while stationary cycling at high temperatures > 20°C.

Excellent stability and conductivity

The SEC RML battery has a high uniformity nano material LiFePO₄ cathode which ensures excellent electrical conductivity.

High consistency

The RML battery from SEC is manufactured to industry standards. The precision tolerances ensure minimal variation between batteries making the RML ideal for multiple rack usage.

Quick charging

The RML has extremely low internal resistance, and lower heat generation, allowing quick recharge and operation in all temperatures. This makes it more efficient when your application demands a quick turnaround.










Prismatic cell design

Crafted with a prismatic cell design, the RML offers higher energy densities than traditional Lithium cell designs.

Innovative design

- High energy density for longer lasting service
- High power density for faster power delivery
- Superior thermal and chemical stability, which provides better safety characteristics than Lithium-Ion batteries with other cathode materials
- Long shelf life makes it ideal for backup applications
- 48V packs mean one single BMS, reducing complexity and cost
- Fast response time ideal for frequency control and UPS Safest
- batteries for disposal or landfill

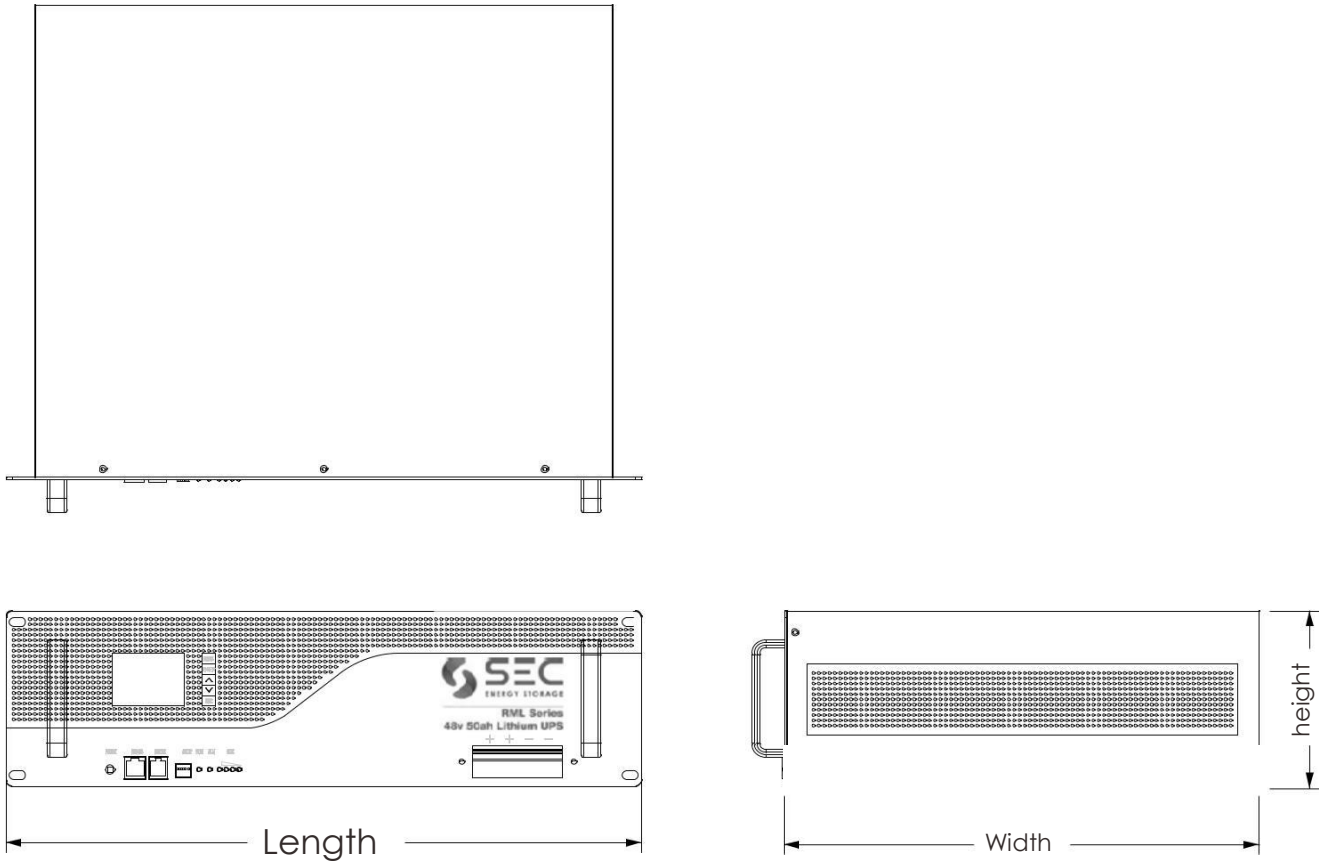
Applications

	Industrial standby		UPS		Telecommunications
	Marine		Oil and gas		Renewables
	Grid services		Deep cycle		Photovoltaic

Engineering

The following data and diagram are representative of our standard 50/75/100 ah unit.
The illustration and control system are designed uniquely for this specific UPS application.

Module outline



Cell dimensions

Dimensions/ Weights/ Data

SEC model type	Nominal capacity C/2 to 40V	Battery weight	Overall battery dimension			Internal resistance (mΩ)	Supporting maximum charging current (A) *	Supporting Maximum discharge current (A) *	Max. pulse discharge current (A)
			Length	Width	Height				
		kg	mm	mm	mm				
48-RML-50	51.2V 50Ah	30	482.6	360.0	133.2	60	50	50	105 (20ms)
48-RML-75	51.2V 75Ah	44	482.6	400.0	177.6	60	75	75	120 (100ms)
48-RML-100	51.2V 100Ah	60	482.6	400.0	222.0	60	50	50	145 (20ms)

* Standard MICROLYTE RML series lithium-ion module is not designed for series connection, while maximum parallel connection is 16.
** MICROLYTE RML series lithium-ion module can only be continuously discharged/charged strictly under the stated current.
SEC will not take any responsibility of any potential accidents resulted from incorrect operation.

Capacity

Ampere hour at 25°C

SEC bloc type	End volts	Discharge ampere hour at 25°C				
		Discharge time				
		2hr @	60min @	30min @	20min @	12min @
48-RML-50	40V	50.11	50.05	49.97	49.81	49.39
48-RML-75	40V	74.25	74.16	74.03	73.79	73.17
48-RML-100	40V	100.2	100.1	99.94	99.63	98.78

Current

Amps at 25°C

SEC bloc tpe	End volts	Discharge AMPS at 25°C				
		Discharge time				
		2hr @	60min @	30min @	20min @	12min @
48-RML-50	40V	25.0	50.0	BMS limited in standard model, upgradeable upon request		
48-RML-75	40V	37.1	74.2	BMS limited in standard model, upgradeable upon request		
48-RML-100	40V	50.0	BMS limited in standard model, upgradeable upon request			

Power

Watts at 25°C

SEC bloc type	End volts	Discharge watt at 25°C				
		Discharge time				
		2hr @	60min @	30min @	20min @	12min @
48-RML-50	40V	1268	2496	BMS limited in standard model, upgradeable upon request		
48-RML-75	40V	1882	3704	BMS limited in standard model, upgradeable upon request		
48-RML-100	40V	2540	BMS limited in standard model, upgradeable upon request			

Operating condition

Recommended operating condition	0 to +45°C at 45-85% RH
Cell exterior when charging	<65°C at ambient temp 25°C
Discharge	-20 to +60°C at 45-85% RH
Cell exterior when discharging	<80°C at ambient temp 25°C
Storage	-20 to +35°C at 45-85% RH

Charging method *

End of charge voltage	58.4V at CC mode
Maximum charge voltage	58.4V at CC mode
End of charge current	0.05C at CV mode
Standard charge method	Max. 58.4V, 0.5C charging current at CC/CV mode for less than 180min
Fast charge method	Max. 58.4V, 1C charging current at CC/CV mode for 65-70min

Battery management system

Over-charge protection cutoff	60.8V
Over-charge protection delay time	1s
Over-charge protection restart	58.4V
Over-discharge protection cutoff	40.0V
Over-discharge protection delay time	1s
Over-discharge protection restart	40.0V
Over-discharge current protection cutoff	95A for 48-RML-50 and 145A for 48-RML-100
Over-discharge current protection delay time	20ms
Over-temperature protection	65°C
Over-temperature recovery	55°C
Recover from over current protection	Recover after cutting off the load
Recover from short circuit protection	Recover after cutting off the load
Recover from over temperature protection	Drop below the recovery temperature
Recover from over charge protection	Drop below the over-voltage recovery voltage
Recover from over discharge protection	Recover through charging

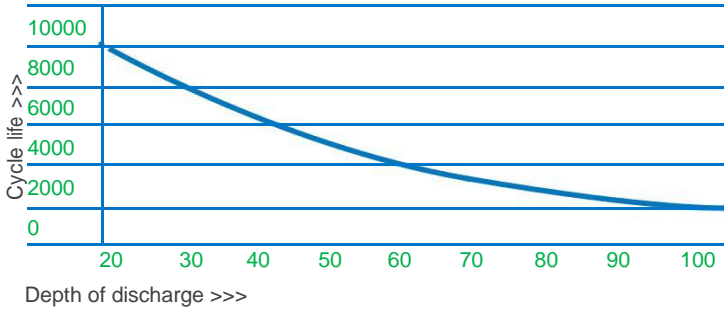
Working condition of BMS

Temperature range	-20 to 60°C
Relative humidity	< 75%

Cycle life

Relationship between depth of discharge and life

Ambient temperature 25°C

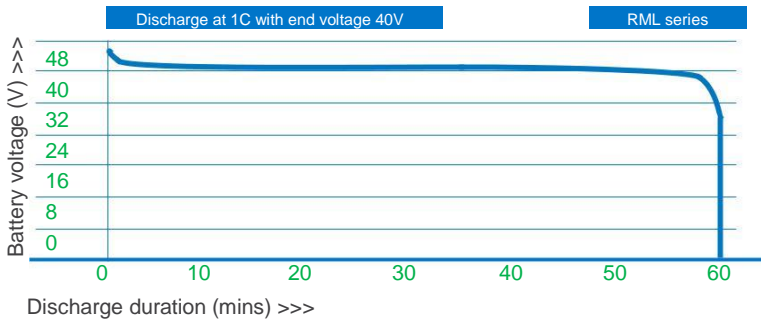


The depth of discharge critically affects the number of cycles which a battery will complete during its life time. The Lithium-Ion battery outperforms conventional Lead Acid by at least a factor of two.

Discharge characteristic

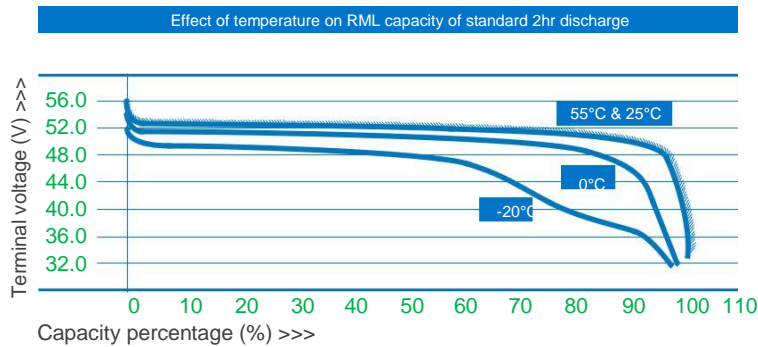
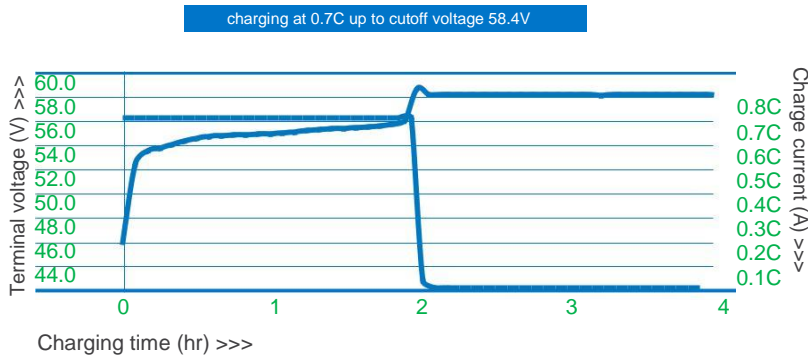
Discharge current VS Discharge time curve

Ambient temperature 25°C



Charge method

Continuous current/voltage charge characteristic



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