

# ML10-12.8

ML LFP Lead Acid Replacement Series



The lead-acid replacement series of MARVEL LiFePO<sub>4</sub> battery has the same standard structural specifications as of the lead-acid battery, comparatively having the advantages of high safety, good reliability, long cycle life, good high/low temperature performance, etc

ML LFP Lithium batteries are constructed with either cylindrical or prismatic lithium iron phosphate (LiFePO<sub>4</sub>) cells inside. Both types provide the benefits of LiFePO<sub>4</sub> battery.

## This Model Is Used Widely In The Following Applications:

computer backup, emergency lighting, security system backup, robots, industrial equipment, RV, telecommunication, marine, small electronics, solar backup, and other deep cycle applications.



### Up to 5 to 6 Times Life:

the Life span of ML LFP Battery is 5 to 6 times longer than Lead acid battery.



### 60% Faster Charge:

ML LFP battery can be charged to 100% full in one hour, save Time thanks to superior charge /discharge efficiency.



### High energy Density & 70% Lighter in Weight:

ML LFP battery provide more Wh/Kg ,it is one-third weight of Lead acid batteries.



### Long Service Life & Reliability:

6000 cycles @0.2C 80% DoD (25°C) of original capacity, longer service life than Lead acid to reduce maintenance costs.



### Built In Protection:

Built-in intelligent BMS protects battery from over-charge, over-discharge, charge/discharge over-current, short circuit, high/low temperature, off-line, delay protection, etc.



### Better Shelf Life:

Storage is not a problem thanks to extremely low self discharge (LSD) and no risk of sulphation.



### Safe Battery:

No potential safety hazard of explosions and fires



### Function:

Supports maximum of 4 batteries in parallel or 4 in series connection.



### Warranty:

3 years

## Electrical Performance

Rated Voltage	12.8V, 4 string
Battery Voltage Range	10-14.6V , According to the single cell is 2.5V-3.65V
Rated Capacity	10 Ah
Total Energy	128Wh
Soc Range	10%-100%
Cycles	More than 6000 times (0.2C cycle, 25°C, 80%Dod, capacity retention rate: 80%) More than 4000 times (0.5C cycle, 25°C, 80%Dod, capacity retention rate: 80%) More than 2000 times (1C cycle, 25°C, 80%Dod, capacity retention rate: 80%)
Charge-discharge Capacity Efficiency	≥96%
Cells	A Grade LFP cell 3.2V 5Ah
Standard Charging Current (A)	5A, 0.5C and below are recommended.
Standard Discharge Current (A)	5A, 0.5C and below are recommended.
Maximum Continuous Charging And Discharging Current (A)	10 A

## Mechanical Performance

Gross Weight	1.5KG (Estimated Value)
Shell Material	Abs Rubber Shell
Product Size (mm)	151*99*94mm (L*W*H)
Input-Output Mode	T2 terminal
Enclosure Protection	IP 54
Composition Mode of Battery Pack	4 series and 2 parallel, a total of 1 battery pack.

## Temperature Performance

Battery System Charging And Discharging Ambient Temperature	Charge at -10°C~ 60°C and Discharge at -20°C~ 60 °C
Environmental Relative Humidity	10%-90%

## BMS Performance

### Charging Protection

Recommended Charge Voltage	14.2 V ± 0.25
BMS Charge Cut-Off Voltage	<15.2 V (0.5 ~ 1.5 s)
Overcharge Protection Voltage Per Cell	3.7 V ±25 (mv)
Overcharge Protection Delay	1000±500(ms)
Overcharge Protection Recovery Voltage Per Cell	3.5 V ±50 (mv)
Charging Overcurrent Delay	1000 ±500 (ms)

### Balanced

Balanced Turn-On Voltage	3.5 V ±50 (mv)
Balanced Current	40 ±10 (mA)

### Discharge Protection

Overdischarge Protection Voltage Per Cell	2.2 V ±80 (mv)
Overdischarge Protection Delay	1000 ±500 (ms)
Overdischarge Protection Recovery Voltage Per Cell	2.7 V ±100 (mv)
Delay Of Discharge Overcurrent Protection	200 ±100 (ms)
Short Circuit Protection Delay	100-800 (us)

### Max Batteries Connection

Maximum Batteries in Series	4
Maximum Batteries in Parallel	4

## WARNINGS

- Use a lithium charger (5A recommended, 10A max) to preserve capacity and warranty.
- Lead-acid chargers harm the battery and reduce the warranty to 18 months.
- You can only connect 4 batteries max in series and 4 in parallel.
- Series connection reduces warranty to 18 months.
- The product is non-disassembling, with no unauthorized dismantling and maintenance only by Marvel Technical team.
- Using a Lithium battery provides 30~40% more effective capacity than its Lead-Acid Equivalent.

## Cells:

A Grade LFP cell 3.2V 5Ah