

# LEAD ACID (DEEP CYCLE) BATTERY

## MD55-12

Marvel MD series is specially designed for frequent discharge deep cycle applications. By using the specially designed active material, strong grids and thick plate construction, the series battery offers reliable performance in high load situations and could provide competitive cycle performance. Suitable for electric vehicles and golf carts; industrial equipment, floor machines, forklifts, aerial lifts, and robotics; marine, RV, and no-idle solutions; mobility and medical equipment; and most outdoor application.

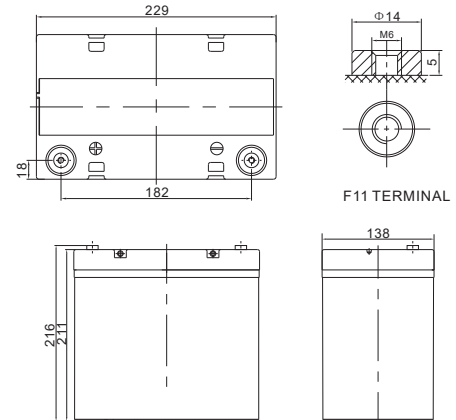


MADE IN VIETNAM / CHINA

### SPECIFICATION

Cells Per Unit	6
Voltage Per Unit	12
Capacity	55Ah@20hr-rate to 1.75V per cell @25
Weight	Approx. 17.5 Kg (Tolerance±3%)
Internal Resistance	Approx. 6.0 mΩ
Terminal	F15(M6)/F11(M6)
Max. Discharge Current	550A (5 sec)
Design Life	12 years (floating charge)
Maximum Charging Current	16.5 A
Reference Capacity	C3 42.0AH
	C5 47.4AH
	C10 52.4AH
	C20 55.0AH
Float Charging Voltage	13.6 V~13.8 V @ 25°C Temperature Compensation: -3mV/ /Cell
Cycle Use Voltage	14.6 V~14.8 V @ 25°C Temperature Compensation: -4mV/ /Cell
Operating Temperature Range	Discharge: -20°C~60°C Charge: 0°C~50°C Storage: -20°C~60°C
Normal Operating Temperature Range	25°C±5°C
Self Discharge	Marvel Valve Regulated Lead Acid (VRLA) batteries can be stored for up to 6 months at 25°C and then recharging is recommended. Monthly Self-discharge ratio is less than 3% at 25°C. Please charged batteries before using.
Container Material	A.B.S. UL94-HB, UL94-V0 Optional.

### Dimensions



Length	229±2mm (9.02 inches)
Width	138±2mm (5.43 inches)
Height	211±2mm (8.31 inches)
Total Height	216±2mm (8.50 inches)
Terminal	Value
M5	6~7 N*m
M6	8~10 N*m
M8	10~12 N*m

Unit: mm

#### Constant Current Discharge Characteristics :A(25°C)

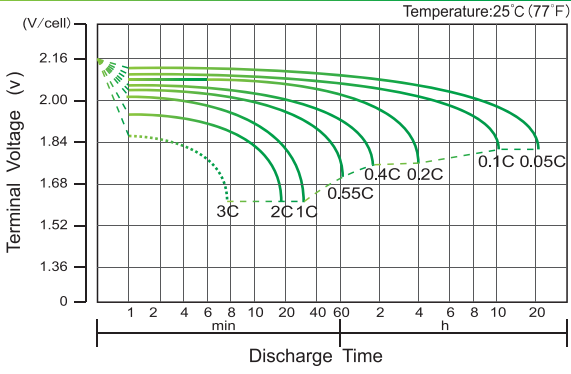
F.V/Time	10MIN	15MIN	30MIN	1HR	2HR	3HR	4HR	5HR	8HR	10HR	20HR
1.60V	133.5	101.5	59.90	33.40	19.89	15.50	12.16	10.34	6.632	5.500	2.850
1.65V	123.0	94.93	56.74	32.27	19.23	15.02	11.79	10.01	6.579	5.448	2.835
1.70V	114.0	89.27	53.80	31.23	18.71	14.38	11.43	9.744	6.475	5.343	2.800
1.75V	104.6	83.62	51.67	30.25	18.00	14.01	11.12	9.473	6.371	5.290	2.750
1.80V	95.19	76.57	49.77	28.91	17.38	13.75	10.86	9.350	6.266	5.238	2.723
1.85V	74.48	63.36	42.20	25.80	15.89	12.80	10.18	8.607	5.901	4.924	2.698

#### Constant Power Discharge Characteristics : WPC(25°C)

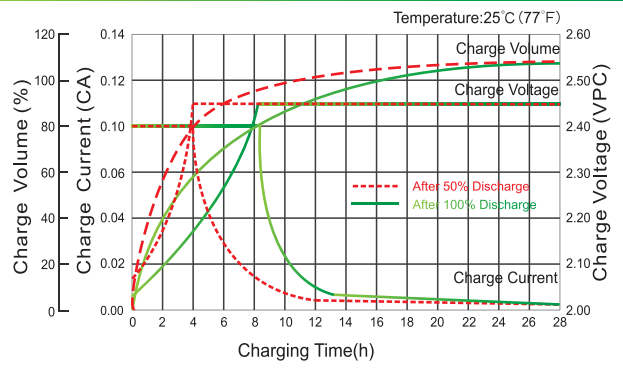
F.V/Time	10MIN	15MIN	30MIN	1HR	2HR	3HR	4HR	5HR	8HR	10HR	20HR
1.60V	227.4	177.1	108.8	62.71	37.61	29.42	23.43	19.57	12.92	10.79	5.691
1.65V	219.0	172.2	106.3	61.64	36.60	28.69	22.86	19.04	12.82	10.68	5.640
1.70V	204.4	163.0	101.2	59.83	35.68	27.59	22.13	18.57	12.67	10.48	5.589
1.75V	190.2	153.8	97.63	58.17	34.41	26.91	21.61	18.14	12.46	10.37	5.487
1.80V	175.2	142.2	94.47	55.79	33.63	26.76	21.19	17.90	12.25	10.27	5.437
1.85V	139.0	119.5	81.02	50.11	30.97	24.96	19.95	16.56	11.58	9.697	5.386

(Note) The above characteristics data are average values obtained within three charge/discharge cycle not the minimum values. The battery must be fully charged before the capacity test. The Cm should reach 95% after the first cycle and 100% after the third cycle.

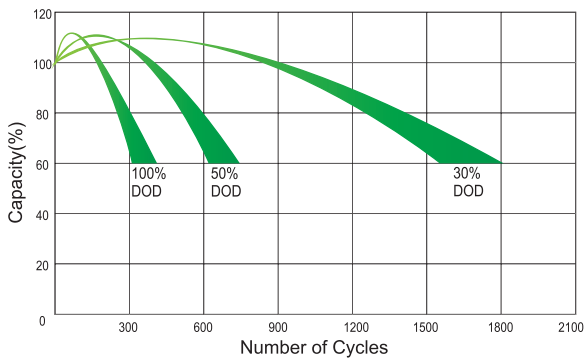
### Discharge Characteristics Curve



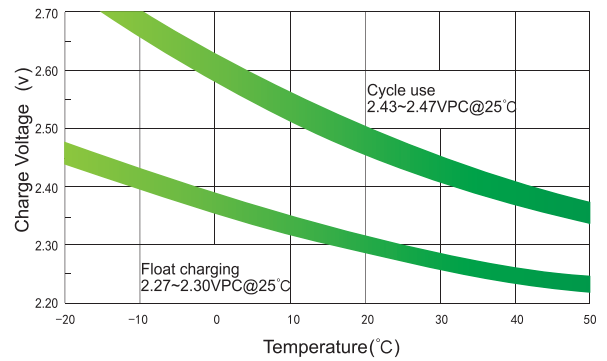
### Charge Characteristic Curve for Cycle Use(IU)



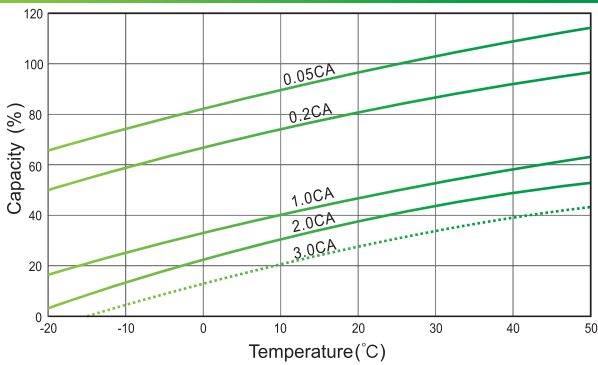
### Cycle Life in Relation to Depth of Discharge



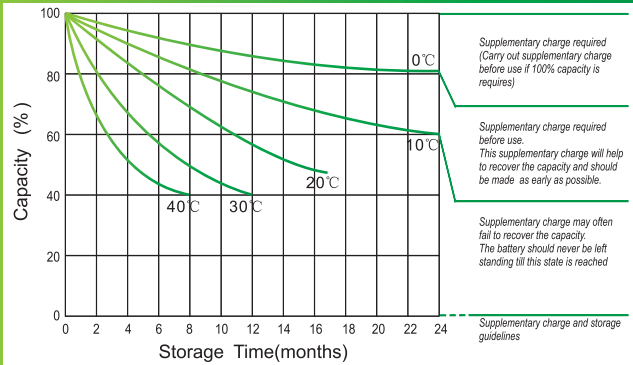
### Relationship Between Charging Voltage and Temperature



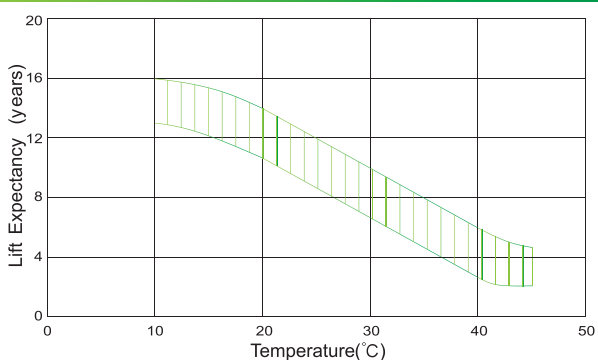
### Temperature Effects on Capacity



### Storage Characteristics



### Effect of Temperature on Long Term Life



### Relationship of OCV And State of Charge(20°C)

