

LEAD ACID (AGM) BATTERY

MR4.5-6

Marvel MR series is a general-purpose battery with 6~8 years design life in float service. It meets with IEC, JIS, BS, GB/T AND YD/T standards. With advanced AGM valve regulated technology and high purity raw material. The Marvel MR series battery maintains high consistency for better performance and reliable standby service life. It is suitable for UPS/EPS, medical equipment, emergency light and security system applications.



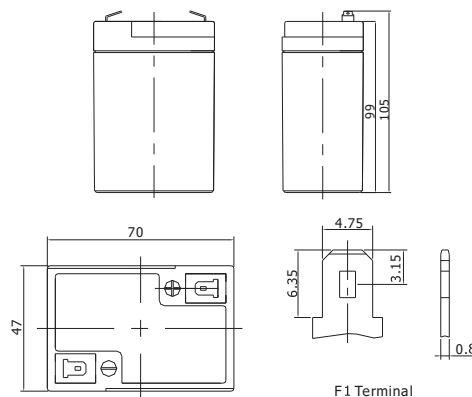
MADE IN VIETNAM / CHINA



SPECIFICATION

Dimensions

Cells Per Unit	3
Voltage Per Unit	6
Nominal Capacity	4.5Ah@20hour-rate to 1.75V per cell @25°C
Weight	Approx. 0.65 Kg (Tolerance± 5.0%)
Internal Resistance	Approx. 27 mΩ
Terminal	F1
Max. Discharge Current	45A (5 sec)
Short Circuit Current	234A
Design Life	6~8 years (Float charging)
Max. Charging Current	1.35 A
Reference Capacity	C3 3.48AH C5 3.93AH C10 4.21AH C20 4.50AH
Standby Use Voltage	6.85 V~6.94 V @ 25°C Temperature Compensation: -3mV/°C/ Cell
Cycle Use Voltage	7.30 V~7.40 V @ 25°C Temperature Compensation: -4mV/°C/ 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 charge batteries before using.
Container Material	A.B.S. UL94-HB, UL94-V0 Optional.



Length	70±1.5mm (2.76 inches)
Width	47±1.5mm (1.85 inches)
Height	99±1.5mm (3.90 inches)
Total Height	105±1.5mm (4.13 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)

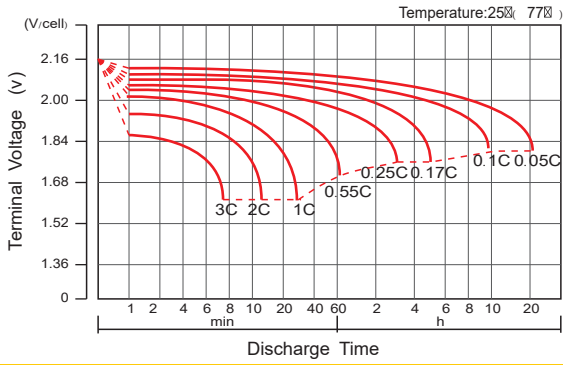
F.V/Time	5MIN	10MIN	15MIN	30MIN	1HR	2HR	3HR	4HR	5HR	8HR	10HR	20HR
1.60V	17.07	12.07	8.723	5.010	2.749	1.688	1.269	1.025	0.849	0.546	0.444	0.234
1.65V	15.88	11.40	8.339	4.810	2.655	1.634	1.230	0.997	0.827	0.540	0.438	0.231
1.70V	14.33	10.50	7.811	4.597	2.569	1.580	1.196	0.970	0.805	0.532	0.432	0.228
1.75V	12.83	9.609	7.268	4.394	2.475	1.525	1.161	0.945	0.785	0.525	0.426	0.225
1.80V	11.27	8.698	6.711	4.200	2.380	1.471	1.125	0.918	0.765	0.516	0.421	0.223
1.85V	8.945	7.108	5.569	3.617	2.135	1.347	1.040	0.853	0.713	0.484	0.396	0.212

Constant Power Discharge Characteristics : WPC (25°C)

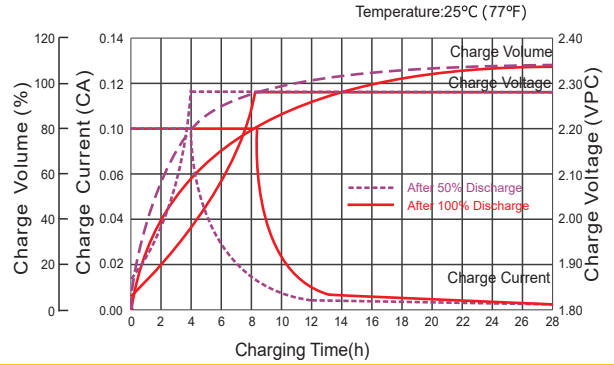
F.V/Time	5MIN	10MIN	15MIN	30MIN	1HR	2HR	3HR	4HR	5HR	8HR	10HR	20HR
1.60V	28.30	20.51	15.25	9.100	5.167	3.199	2.424	1.967	1.636	1.067	0.872	0.461
1.65V	26.62	19.76	14.79	8.828	5.018	3.112	2.359	1.921	1.600	1.057	0.863	0.455
1.70V	24.57	18.52	14.06	8.522	4.885	3.026	2.305	1.876	1.564	1.043	0.851	0.450
1.75V	22.50	17.26	13.28	8.229	4.735	2.934	2.246	1.835	1.529	1.031	0.841	0.445
1.80V	20.18	15.90	12.43	7.945	4.580	2.843	2.185	1.788	1.495	1.016	0.831	0.441
1.85V	16.35	13.22	10.46	6.911	4.133	2.619	2.029	1.668	1.399	0.956	0.783	0.419

(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.

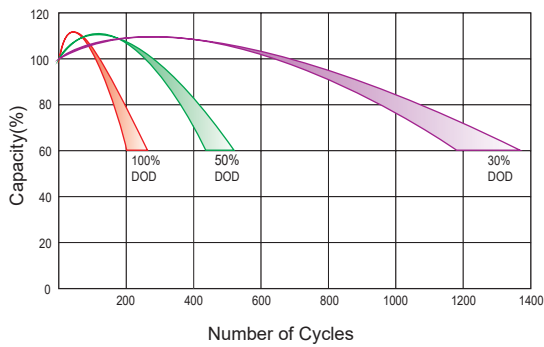
Discharge Characteristics Curve



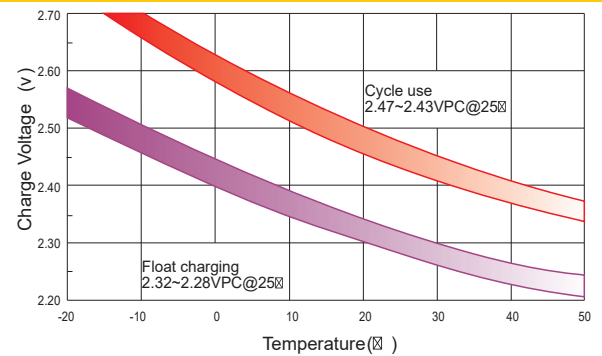
Charge Characteristic Curve For Standby Use



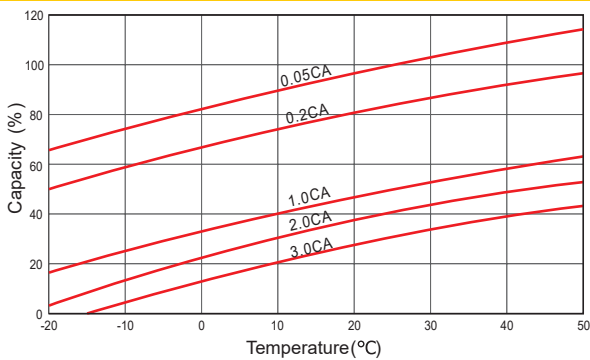
Cycle Life In Relation To Depth Of Discharge



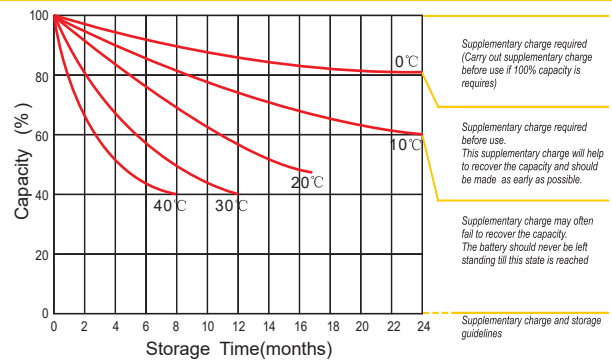
Relationship Between Charging Voltage And Temperature



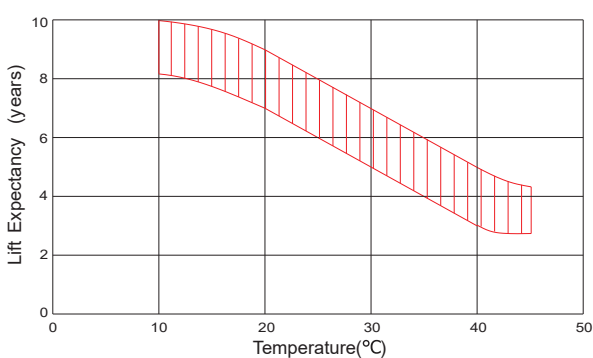
Temperature Effects On Capacity



Storage Characteristics



Effect Of Temperature On Long Term Life



Life Characteristics Of Standby Use

