

LEAD ACID (DEEP CYCLE) BATTERY

MD33-12

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 applications.



MADE IN VIETNAM / CHINA



OHSAS 18001

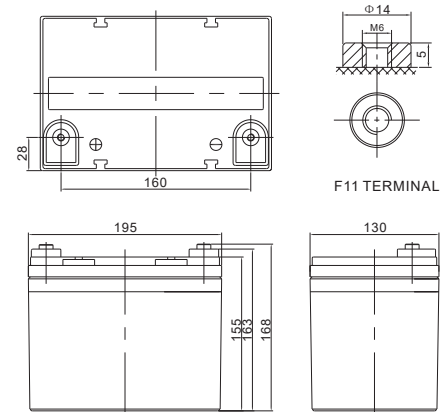
ISO 14001

ISO 9001

SPECIFICATION

Cells Per Unit	6
Voltage Per Unit	12
Capacity	33Ah@10hr-rate to 1.80V per cell @25°C
Weight	Approx. 10.2 Kg (Tolerance±3.0%)
Internal Resistance	Approx. 9.0 mΩ
Terminal	F7(M8)/F11(M6)
Max. Discharge Current	330A (5 sec)
Design Life	230A
Maximum Charging Current	9.9A
Reference Capacity	C3 25.6AH
	C5 28.8AH
	C10 33.0AH
	C20 35.0AH
Float Charging Voltage	13.6 V~13.8 V @ 25°C Temperature Compensation: -3mV/°C/Cell
Cycle Use Voltage	14.6 V~14.8 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 charged batteries before using.
Container Material	A.B.S. UL94-HB, UL94-V0 Optional.

Dimensions



Length	195±2mm (7.68 inches)
Width	130±2mm (5.12 inches)
Height	155±2mm (6.10 inches)
Total Height	168±2mm (6.61 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	111.0	83.76	63.02	36.86	20.36	12.02	9.32	7.32	6.23	4.19	3.48	1.82
1.65V	107.0	79.15	60.25	35.39	19.67	11.64	9.03	7.12	6.07	4.14	3.44	1.79
1.70V	101.8	72.87	56.43	33.82	19.03	11.26	8.78	6.93	5.91	4.08	3.39	1.77
1.75V	95.1	66.70	52.51	32.33	18.33	10.86	8.52	6.75	5.76	4.02	3.34	1.75
1.80V	86.62	60.38	48.49	30.90	17.63	10.48	8.26	6.56	5.62	3.95	3.30	1.73
1.85V	76.23	49.35	40.24	26.61	15.81	9.60	7.63	6.10	5.24	3.71	3.11	1.64

Constant Power Discharge Characteristics : WPC(25°C)

F.V/Time	5MIN	10MIN	15MIN	30MIN	1HR	2HR	3HR	4HR	5HR	8HR	10HR	20HR
1.60V	191.1	142.4	110.2	67.0	38.3	22.8	17.8	14.1	12.0	8.18	6.84	3.59
1.65V	189.0	137.1	106.9	64.9	37.2	22.2	17.3	13.7	11.7	8.10	6.77	3.53
1.70V	181.8	128.6	101.6	62.7	36.2	21.6	16.9	13.4	11.5	8.00	6.68	3.50
1.75V	172.9	119.8	95.9	60.5	35.1	20.9	16.5	13.1	11.2	7.90	6.60	3.46
1.80V	160.3	110.3	89.8	58.5	33.9	20.3	16.0	12.8	11.0	7.79	6.52	3.43
1.85V	143.6	91.8	75.6	50.8	30.6	18.7	14.9	11.9	10.3	7.33	6.15	3.26

(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.

