

Powered by



MSV 650 ▶ 2V 650Ah

MSV 650 is a long service life battery up to 15 years expected life under normal float charge. As with all CSB batteries, all are rechargeable, highly efficient, leak proof and maintenance free.

► Specification

Cells Per Unit	1
Voltage Per Unit	2
Capacity	650Ah @ 10hr-rate to 1.80V per cell @25 °C (77°F)
Weight	Approx. 41.4 kg(91.27 lbs)
Maximum Discharge Current	3900A(5sec)
Internal Resistance	Approx. 0.40 mΩ
Operating Temperature Range	Discharge: -20°C~50°C (-4°F~122°F) Charge: 0°C~40°C (32°F~104°F) Storage: -20°C~40°C (-4°F~104°F)
Nominal Operating Temperature Range	25°C±3°C (77°F±5°F)
Float Charging Voltage	2.23±0.02/Cell at 25 °C (77°F) Temp. Coefficient ±3.3mV/°C (±1.8mV/°F)
Recommended Maximum Charging Current Limit	195A
Equalization / Cycle Use Charging Voltage	2.35V Temps coefficient ±3.3mV/°C (±1.8mV/°F)
Terminal	Pb-Ca-Sn Alloy(L / Recessed Terminal)
Container Material	The container and cover are made of flame retardant plastics which meet ABS(UL 94-V0/File E88637) specifications. The oxygen index level is higher than 28



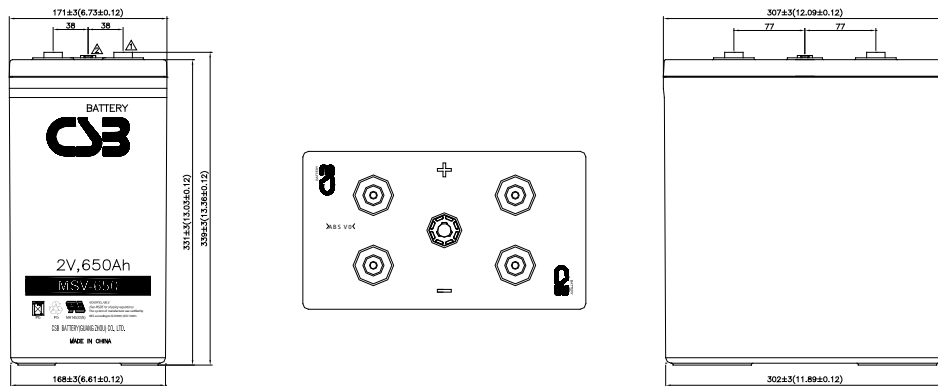
CSB-manufactured VRLA batteries are UL-recognized components under UL924 and UL1989.

CSB is also certified by ISO 9001 and ISO 14001.

► Dimensions :

Unit: mm (inch)

Overall Height (H)	Container height (h)	Length (L)	Width (W)
339±3 (13.35±0.12)	331±3 (13.03±0.12)	307±3 (12.09±0.12)	171±3 (6.73±0.12)



Constant Current Discharge Characteristics Unit:A (25°C, 77°F)

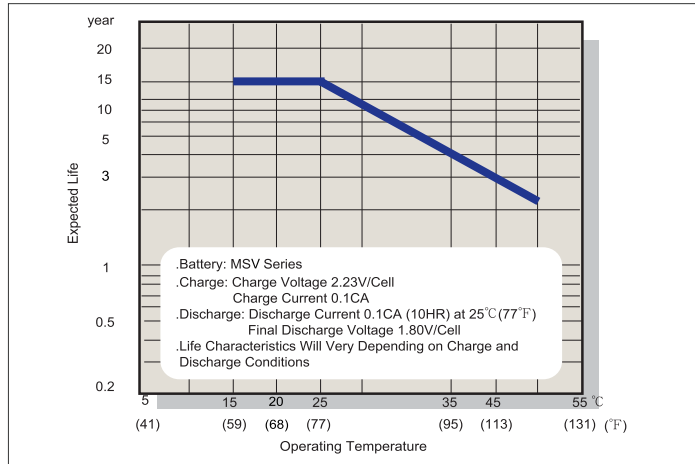
F.V/Time	15MIN	30MIN	60MIN	2HR	3HR	4HR	5HR	6HR	8HR	10HR
1.60V	925	636	421	249	187	148	125	109	86.1	73.1
1.67V	844	606	401	241	177	143	120	104	84.5	71.5
1.70V	784	591	395	236	176	141	119	102	82.9	69.9
1.75V	684	545	364	223	164	134	112	97.5	79.6	66.6
1.80V	594	477	343	215	158	128	109	95.9	78.0	65.0
1.83V	517	422	317	202	151	122	104	91.0	74.1	63.4

Constant Power Discharge Characteristics Unit:W (25°C, 77°F)

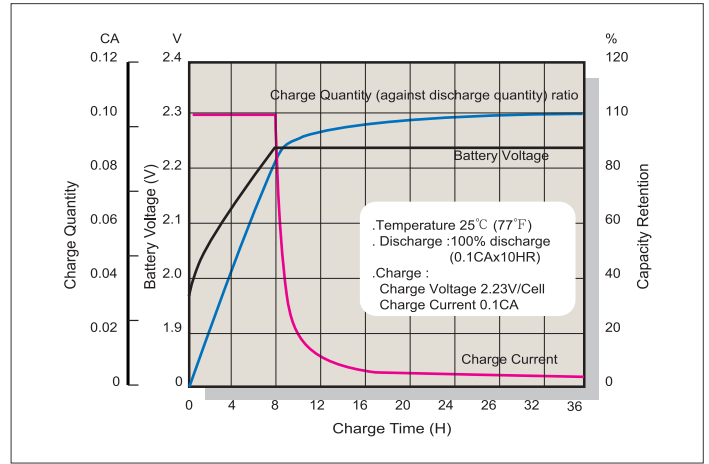
F.V/Time	15MIN	30MIN	60MIN	2HR	3HR	4HR	5HR	6HR	8HR	10HR
1.60V	1516	1119	749	450	338	271	229	202	163	137
1.67V	1387	1071	748	447	333	268	228	200	161	135
1.70V	1322	1037	723	437	327	267	226	197	158	133
1.75V	1197	968	676	418	314	255	216	189	154	130
1.80V	1091	866	637	401	301	245	210	184	150	128
1.83V	929	751	587	377	288	234	200	176	143	124

Ratings are preliminary and subject to change.

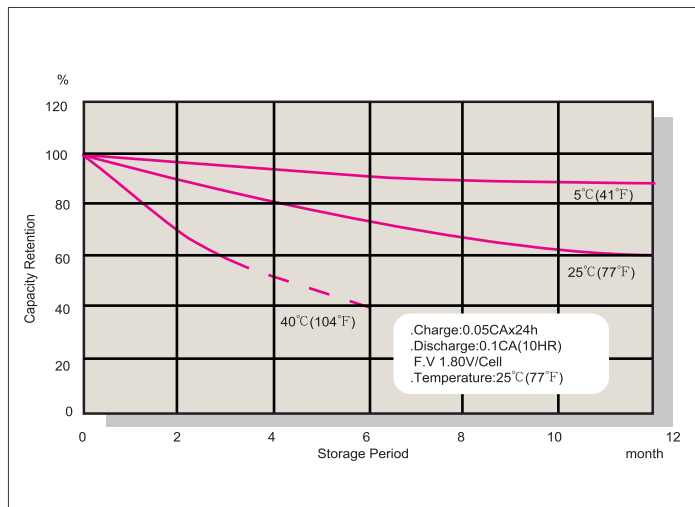
Expected Life V.S Operating Temperature



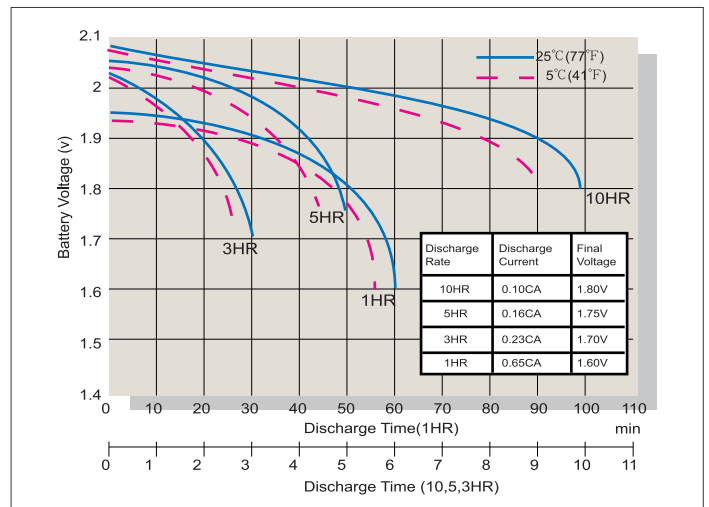
Typical Constant Voltage Charge Characteristics



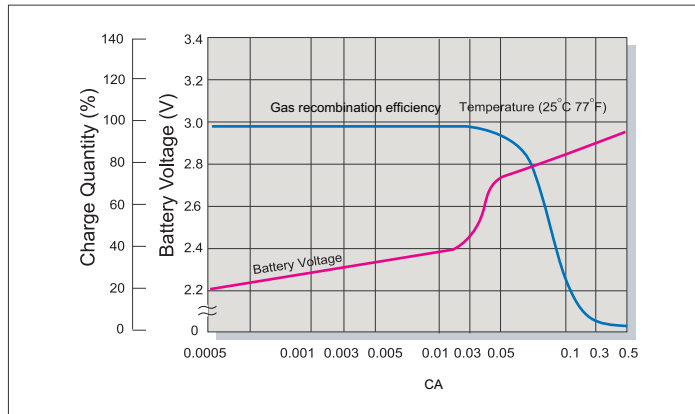
Capacity Retention Characteristics



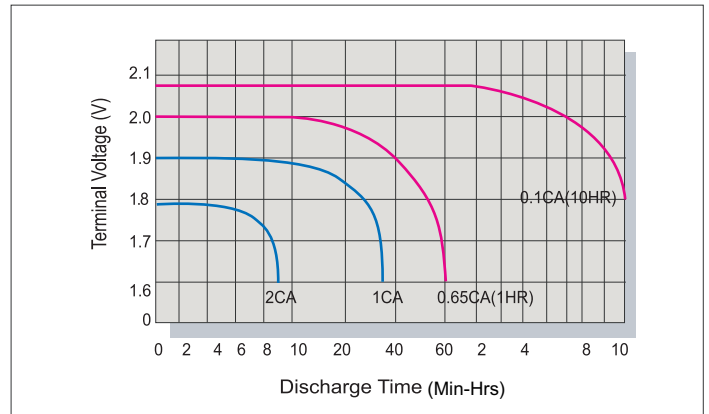
Discharge Characteristics



Oxygen Recombination Efficiency Chart



Terminal Voltage (V) and Discharge Time 25°C (77°F)



Charging Procedures

Application	Charge Voltage (V/Cell)			Max. Charge Current
	Temperature	Set Point	Allowable Range	
Standby	25°C (77°F)	2.23	2.21-2.25	0.3C

Discharge Current VS. Discharge Voltage

Discharge Current (A)	Final Discharge Voltage (V/Cell)
0.05C > A	1.90
0.15C > A ≥ 0.05C	1.80
0.20C > A ≥ 0.15C	1.75
0.40C > A ≥ 0.20C	1.70
A > 0.40C	1.60

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