



MSV 960

2V 960Ah

MSV 960 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	960 Ah @ 10hr-rate to 1.80V per cell @25 °C (77°F)
Weight	Approx. 44.8 kg(98.77 lbs)
Maximum Discharge Current	5760A(5sec)
Internal Resistance	Approx. 0.37 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	288A
Equalization and Cycle Service	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



MH14533(N)



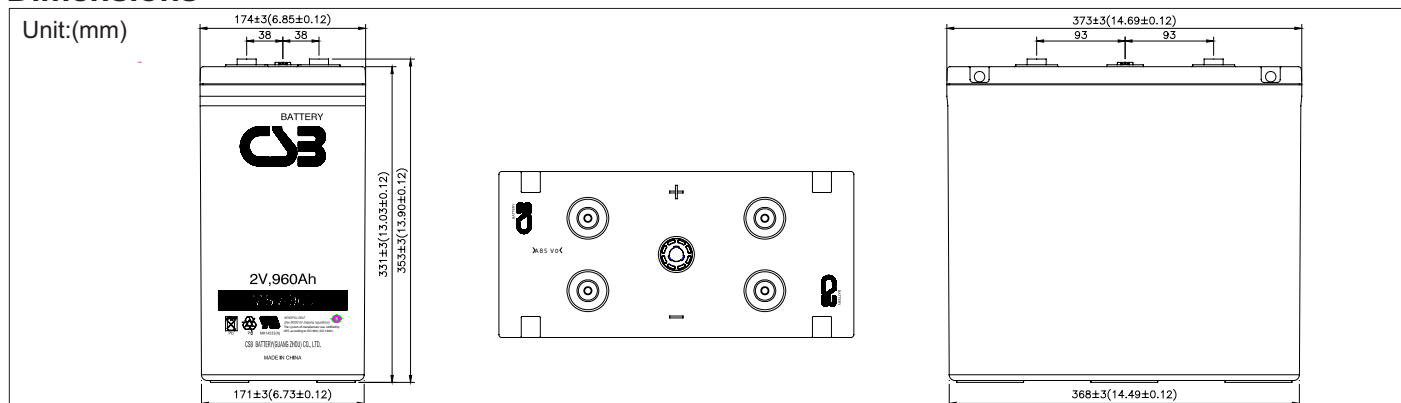
ISO 9001
No.:041005117



ISO 14001
NO. UM 1-12-0045

CSB-manufactured batteries are UL-recognized components under UL924 and UL1989. CSB is also certified by ISO 9001 and ISO 14001.

Dimensions



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

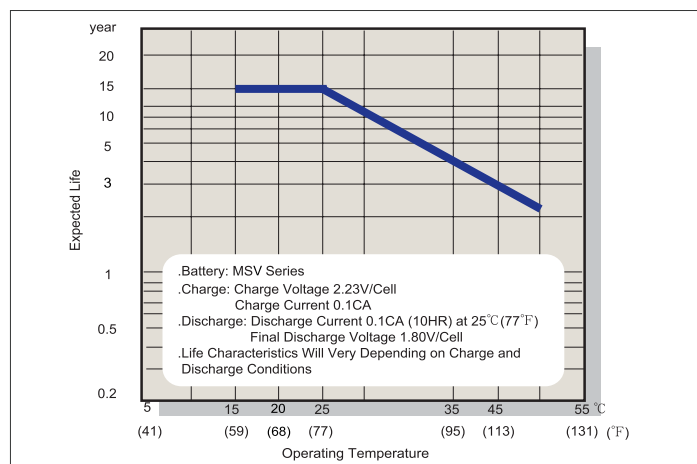
F.V/Time	15MIN	30MIN	60MIN	2HR	3HR	4HR	5HR	6HR	8HR	10HR
1.60V	1524	1012	620	368	275	218	185	160	128	108
1.65V	1450	972	593	355	263	211	176	156	122	103
1.70V	1352	916	582	349	257	209	175	151	121	102
1.75V	1200	814	535	330	244	198	167	144	118	99.6
1.80V	1033	751	505	314	234	196	161	142	115	96.0
1.83V	874	676	467	298	223	180	154	134	109	92.4

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

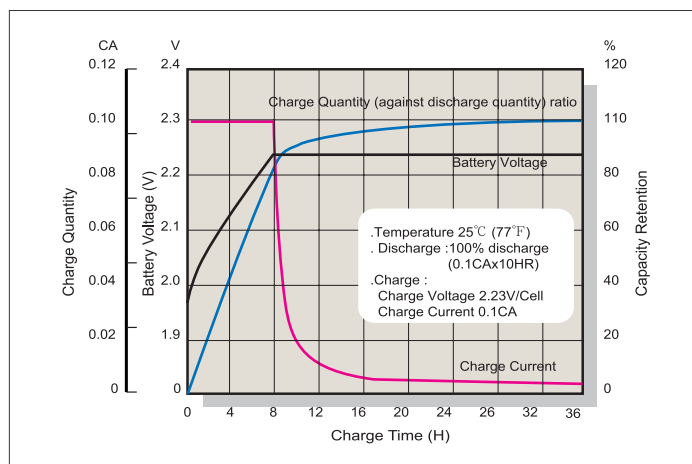
F.V/Time	15MIN	30MIN	60MIN	2HR	3HR	4HR	5HR	6HR	8HR	10HR
1.60V	2669	1799	1108	666	499	401	340	301	240	204
1.65V	2644	1789	1104	656	497	397	336	298	238	202
1.70V	2433	1665	1069	647	482	391	332	292	234	199
1.75V	2187	1500	998	618	464	378	319	278	228	194
1.80V	1882	1382	941	592	445	367	310	272	221	188
1.83V	1592	1246	868	557	425	338	295	257	211	182

- All mentioned values are average values.
- Cycle Information : 300~400 cycles@DOD80%, 600~700 cycles@DOD50%, 900~1200 cycles@DOD30%

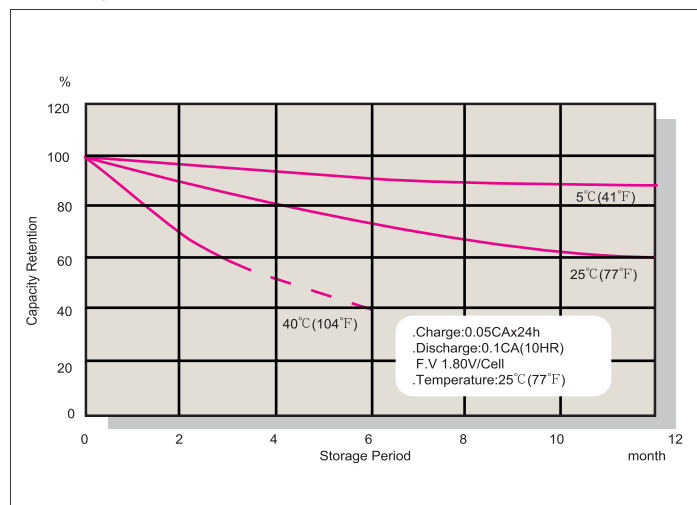
Expected Life V.S Operating Temperature



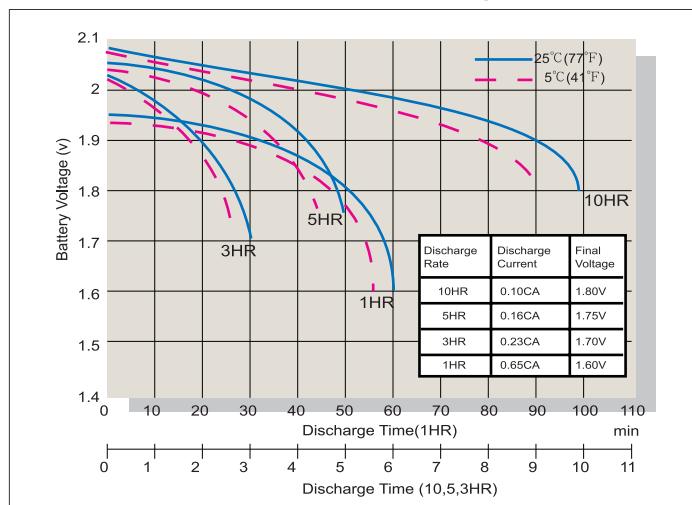
Typical Constant Voltage Charge Characteristics



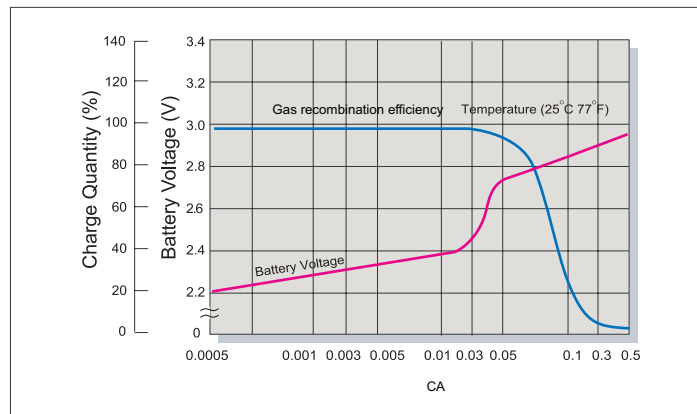
Capacity Retention Characteristics



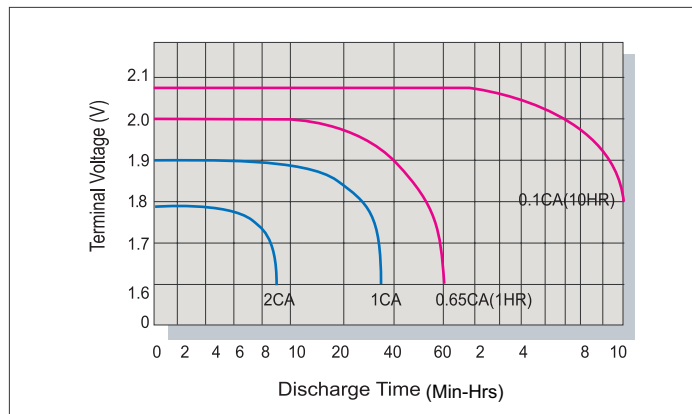
Discharge Characteristics



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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