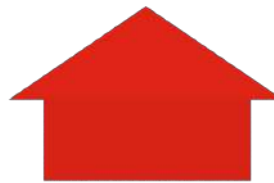




1. GP 1272 F2
3. GP 12120
4. GP 12170
5. GP 12200
6. GP 12260
7. GP12340
8. GP 12400
9. GP 12650
10. GP 121000
11. GPL 12750
12. GPL 121000
13. HR1221
14. HR1227
15. HR 1234
16. HR1251
17. HR 1290
18. HR 12120
19. HRL 12200
20. HRL12280
21. HRL 12500
22. HRL 12540

**SELECCIONA  
EL MODELO  
Y TE GUIARÁ  
A LA FICHA  
TÉCNICA**



**TE REGRESA A  
ESTA PÁGINA.**

(SE ENCUENTRA EN LA  
PARTE BAJA DERECHA  
DE TODAS LAS HOJAS)



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# GP 1272 ▶ 12V 7.2Ah

GP 1272 is a general purpose battery up to 5 years in standby service or more than 260 cycles at 100% discharge in cycle service. As with all CSB batteries, all are rechargeable, highly efficient, leak proof and maintenance free.



## ► Specification

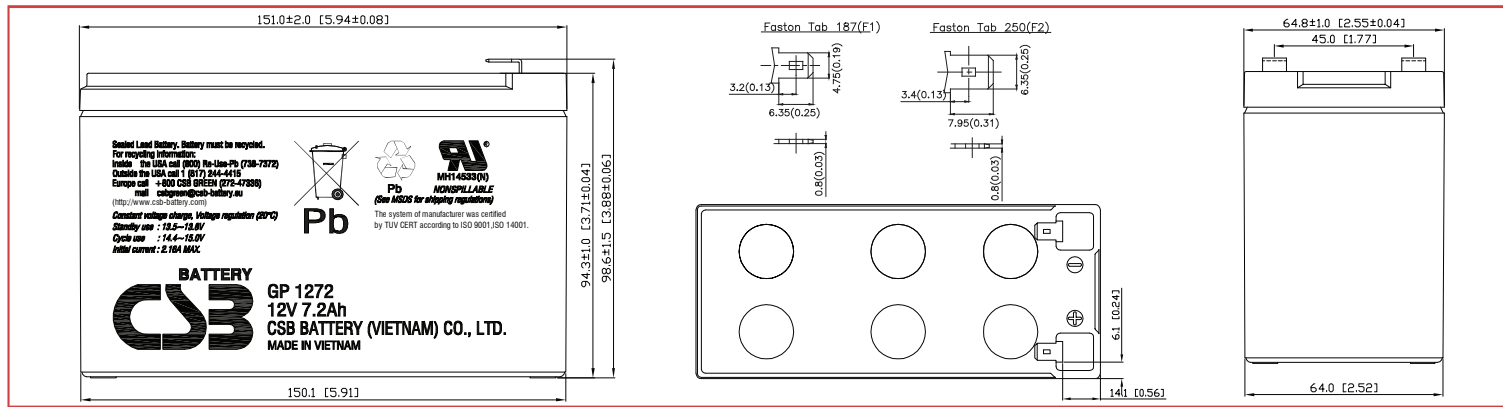
Cells Per Unit	6
Voltage Per Unit	12
Capacity	7.2Ah @ 20hr-rate to 1.75V per cell @25°C (77°F)
Weight	Approx. 2.4 kg(5.29 lbs)
Maximum Discharge Current	100A/130A(5sec)
Internal Resistance	Approx. 23 mΩ
Operating Temperature Range	Discharge: -15°C~50°C ( 5°F~122°F) Charge: -15°C~40°C ( 5°F~104°F) Storage: -15°C~40°C ( 5°F~104°F)
Nominal Operating Temperature Range	25°C±3°C (77°F±5°F)
Float Charging Voltage	13.5 to 13.8 VDC/unit Average at 25°C (77°F)
Recommended Maximum Charging Current Limit	2.16A
Equalization and Cycle Service	14.4 to 15.0 VDC/unit Average at 25°C (77°F)
Self Discharge	CSB Batteries can be stored for more than 6 months at 25°C (77°F). Please charge batteries before using. For higher temperatures the time interval will be shorter.
Terminal	F1/F2-Faston Tab187/250
Container Material	ABS(UL 94-HB) & Flammability resistance of (UL 94-V0) can be available upon request.



CSB-manufactured **VRLA** (Absorbent **G**lass **M**at type) batteries are UL-recognized components under UL1989.

CSB is also certified by ISO 9001 and ISO 14001.

► Dimensions :	Overall Height (H)	Container height (h)	Length (L)	Width (W)
	Unit: mm (inch)	98.6±1.5 (3.88±0.06)	94.3±1 (3.71±0.04)	151±2 (5.94±0.08)



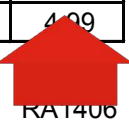
## Constant Current Discharge Characteristics Unit:A (25°C,77°F)

F.V/Time	5MIN	10MIN	15MIN	30MIN	60MIN	90MIN	2HR	3HR	5HR	8HR	10HR	20HR
1.60V	35.6	22.0	16.5	9.61	5.51	3.92	3.08	2.13	1.34	0.92	0.77	0.45
1.67V	33.1	21.0	15.9	9.36	5.41	3.85	3.02	2.08	1.31	0.90	0.76	0.44
1.70V	31.9	20.5	15.6	9.24	5.37	3.82	3.00	2.06	1.30	0.89	0.75	0.43
1.75V	29.6	19.6	15.1	9.03	5.30	3.77	2.96	2.02	1.27	0.88	0.74	0.42
1.80V	27.2	18.6	14.4	8.77	5.23	3.71	2.91	1.98	1.25	0.87	0.73	0.42
1.85V	24.5	17.4	13.7	8.44	5.14	3.66	2.87	1.95	1.22	0.86	0.71	0.40

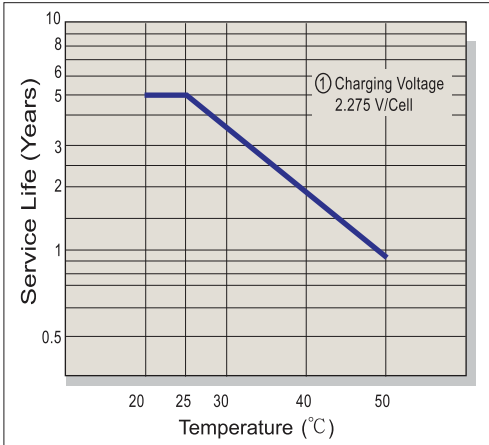
## Constant Power Discharge Characteristics Unit:W (25°C,77°F)

F.V/Time	5MIN	10MIN	15MIN	30MIN	60MIN	90MIN	2HR	3HR	5HR	8HR	10HR	20HR
1.60V	360	245	183	108	64.4	47.1	37.7	26.6	17.3	11.8	9.80	5.37
1.67V	340	235	177	106	63.6	46.4	37.1	26.3	17.0	11.6	9.68	5.27
1.70V	331	231	174	105	63.1	46.1	36.9	26.2	16.9	11.5	9.54	5.23
1.75V	313	222	170	103	62.4	45.5	36.4	25.9	16.7	11.4	9.47	5.15
1.80V	295	213	165	101	61.7	45.0	35.9	25.6	16.5	11.3	9.40	5.07
1.85V	276	202	158	99	60.8	44.3	35.4	25.2	16.3	11.2	9.29	4.99

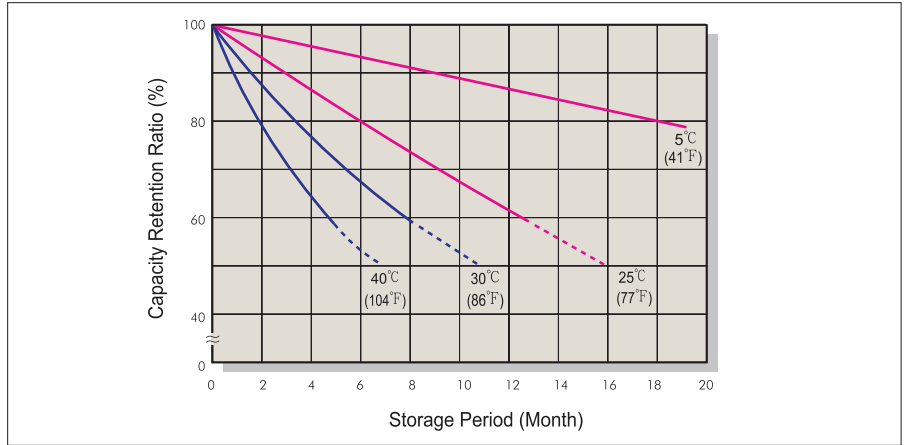
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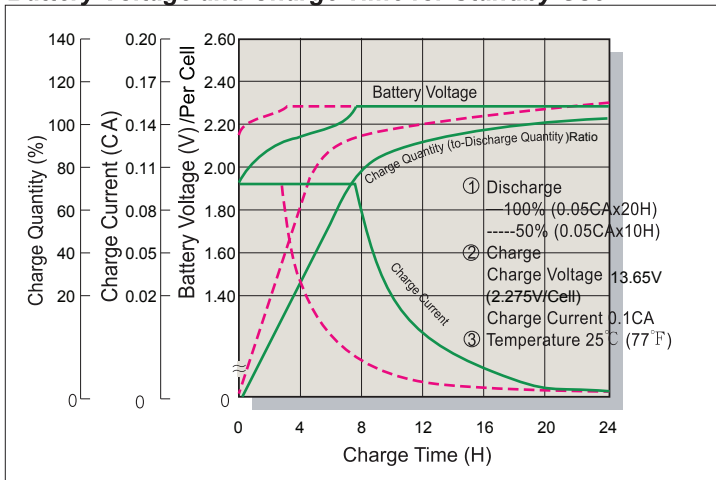
### Trickle (or Float) Service Life



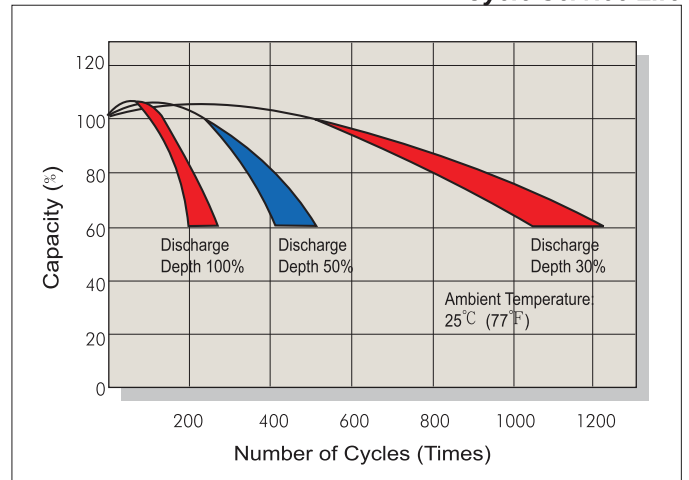
### Capacity Retention Characteristic



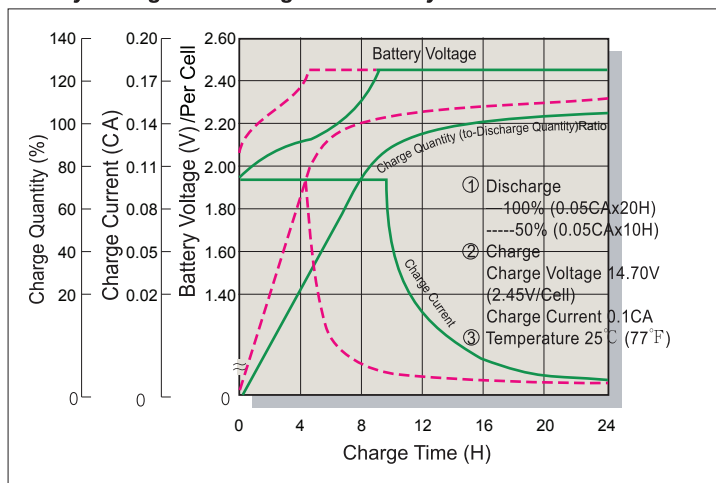
### Battery Voltage and Charge Time for Standby Use



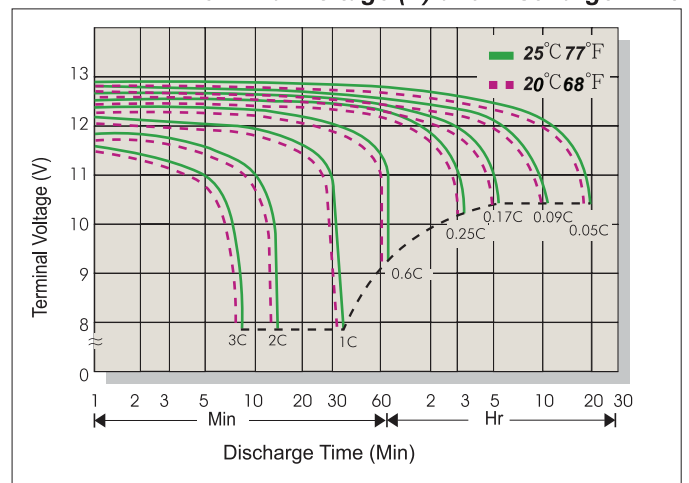
### Cycle Service Life



### Battery Voltage and Charge Time for Cycle Use



### Terminal Voltage (V) and Discharge Time



### Charging Procedures

Application	Charge Voltage(V/Cell)			Max.Charge Current
	Temperature	Set Point	Allowable Range	
Cycle Use	25°C (77°F)	2.45	2.40~2.50	0.3C
Standby	25°C (77°F)	2.275	2.25~2.30	

### Discharge Current VS. Discharge Voltage

Final Discharge Voltage V/Cell	1.75	1.70	1.60	1.30
Discharge Current(A)	0.2C>(A)	0.2C<(A)<0.5C	0.5C<(A)<1.0C	(A)>1.0C

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# GP 12120

▶ 12V 12Ah

GP 12120 is a general purpose battery up to 5 years in standby service or more than 260 cycles at 100% discharge in cycle service. As with all CSB batteries, all are rechargeable, highly efficient, leak proof and maintenance free.



## ► Specification

Cells Per Unit	6
Voltage Per Unit	12
Capacity	12 Ah @ 20hr-rate to 1.75V per cell @25°C (77°F)
Weight	Approx. 3.67 kg(8.09 lbs)
Maximum Discharge Current	150A/180A(5sec)
Internal Resistance	Approx. 16 mΩ
Operating Temperature Range	Discharge: -15°C~50°C ( 5°F~122°F) Charge: -15°C~40°C ( 5°F~104°F) Storage: -15°C~40°C ( 5°F~104°F)
Nominal Operating Temperature Range	25°C±3C (77°F±5°F)
Float Charging Voltage	13.5 to 13.8 VDC/unit Average at 25°C (77°F)
Recommended Maximum Charging Current Limit	3.6A
Equalization and Cycle Service	14.4 to 15.0 VDC/unit Average at 25°C (77°F)
Self Discharge	CSB Batteries can be stored for more than 6 months at 25°C (77°F).Please charge batteries before using. For higher temperatures the time interval will be shorter.
Terminal	F1/F2-Faston Tab187/250
Container Material	ABS(UL 94-HB) & Flammability resistance of (UL 94-V0) can be available upon request.

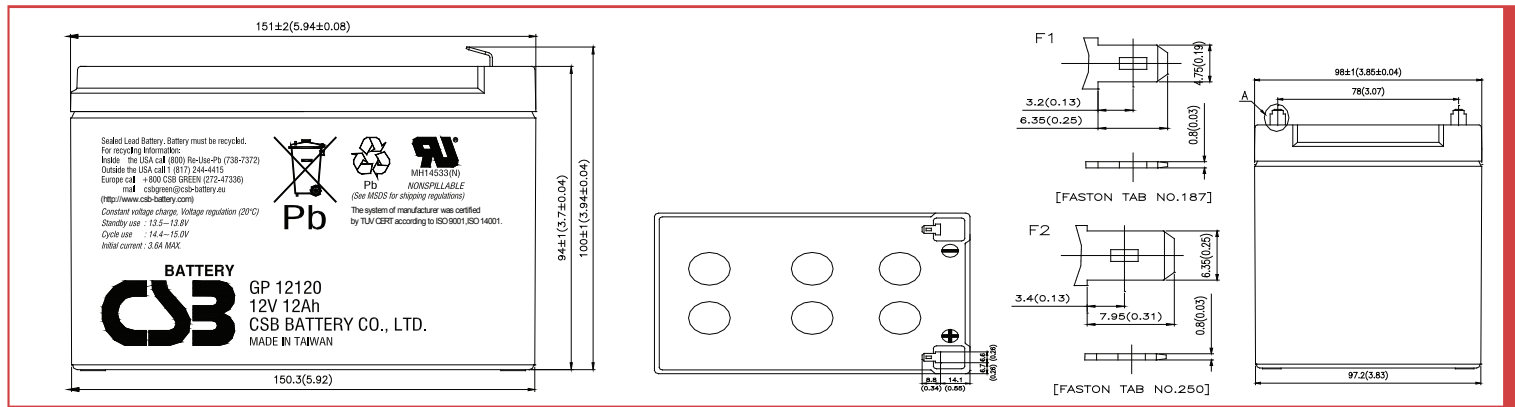


CSB-manufactured **VRLA** (Absorbent Glass Mat type) batteries are UL-recognized components under UL1989.

CSB is also certified by ISO 9001 and ISO 14001.

## ► Dimensions :

Overall Height (H)	Container height (h)	Length (L)	Width (W)
Unit: mm (inch)	100±1 (3.94±0.04)	94±1 (3.7±0.04)	151±2 (5.94±0.08)



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

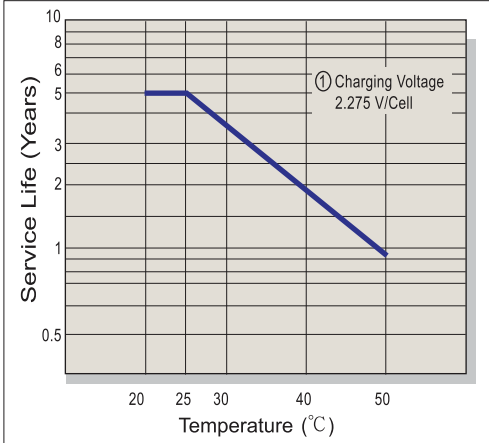
F.V/Time	5MIN	10MIN	15MIN	30MIN	60MIN	90MIN	2HR	3HR	5HR	8HR	10HR	20HR
1.60V	51.2	33.2	23.9	13.9	8.14	5.90	4.69	3.37	2.24	1.45	1.19	0.62
1.67V	48.2	32.0	23.6	13.7	8.12	5.84	4.62	3.35	2.21	1.44	1.18	0.61
1.70V	46.3	31.6	23.3	13.6	8.08	5.82	4.61	3.32	2.18	1.43	1.17	0.61
1.75V	43.3	30.0	22.6	13.4	8.03	5.77	4.57	3.26	2.13	1.40	1.15	0.61
1.80V	38.8	28.0	21.5	13.0	7.81	5.64	4.48	3.17	2.06	1.37	1.14	0.59
1.85V	34.2	25.3	19.8	12.3	7.51	5.41	4.29	3.03	1.97	1.32	1.09	0.57

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

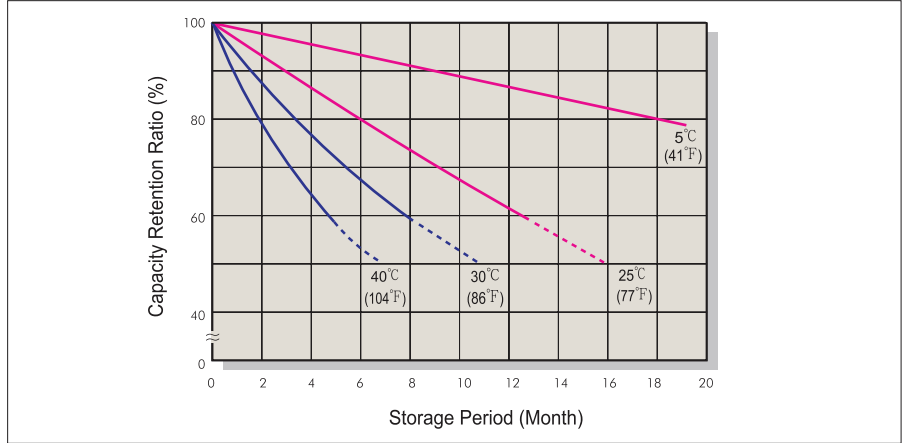
F.V/Time	5MIN	10MIN	15MIN	30MIN	60MIN	90MIN	2HR	3HR	5HR	8HR	10HR	20HR
1.60V	539	347	268	160	97.9	70.6	55.9	39.6	25.3	16.7	13.8	7.70
1.67V	515	342	265	159	97.7	70.2	55.6	39.3	25.2	16.6	13.7	7.63
1.70V	499	336	262	158	97.0	69.9	55.4	39.0	25.0	16.5	13.6	7.61
1.75V	462	326	256	156	96.1	69.3	54.9	38.5	24.4	16.2	13.4	7.54
1.80V	418	307	243	153	94.8	68.0	53.7	37.7	24.1	15.8	13.1	7.42
1.85V	369	280	221	144	91.6	66.2	52.6	36.3	23.3	15.5	12.7	7.23

Ratings presented herein are subject to revision without notice. Please refer to [www.csb-battery.com](http://www.csb-battery.com) to confirm the latest version.

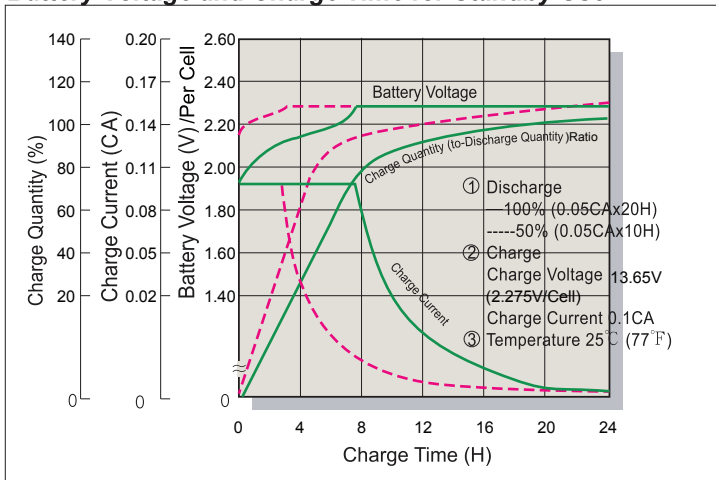
### Trickle (or Float) Service Life



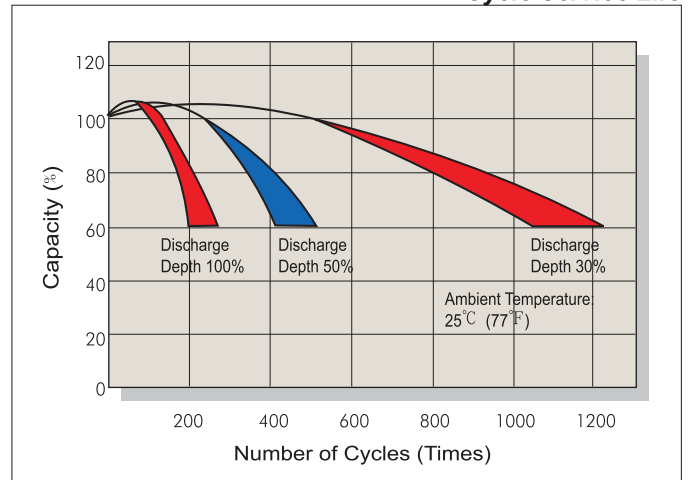
### Capacity Retention Characteristic



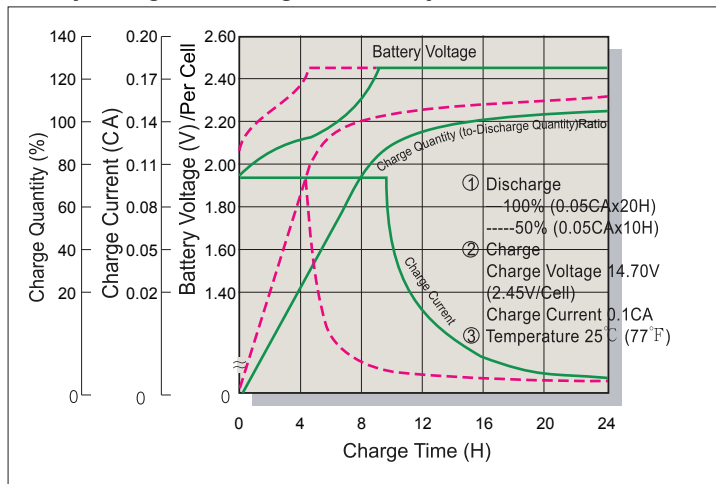
### Battery Voltage and Charge Time for Standby Use



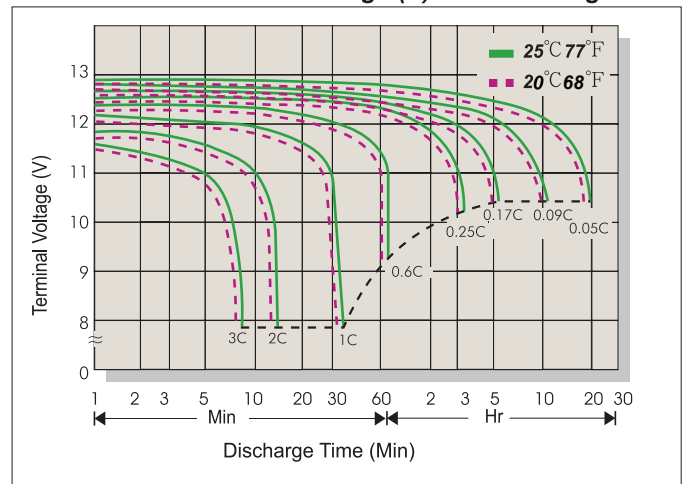
### Cycle Service Life



### Battery Voltage and Charge Time for Cycle Use



### Terminal Voltage (V) and Discharge Time



### Charging Procedures

Application	Charge Voltage(V/Cell)			Max.Charge Current
	Temperature	Set Point	Allowable Range	
Cycle Use	25°C (77°F)	2.45	2.40~2.50	0.3C
Standby	25°C (77°F)	2.275	2.25~2.30	

### Discharge Current VS. Discharge Voltage

Final Discharge Voltage V/Cell	1.75	1.70	1.60	1.30
Discharge Current(A)	0.2C>(A)	0.2C<(A)<0.5C	0.5C<(A)<1.0C	(A)>1.0C

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# GP 12170 ▶ 12V 17Ah

GP 12170 is a general purpose battery up to 5 years in standby service or more than 260 cycles at 100% discharge in cycle service. As with all CSB batteries, all are rechargeable, highly efficient, leak proof and maintenance free.



## ► Specification

Cells Per Unit	6
Voltage Per Unit	12
Capacity	17A h @ 20hr-rate to 1.75V per cell @25°C (77°F)
Weight	Approx. 5.5 kg(12.13 lbs)
Maximum Discharge Current	230A(5sec)
Internal Resistance	Approx. 16 mΩ
Operating Temperature Range	Discharge: -15°C~50°C ( 5°F~122°F) Charge: -15°C~40°C ( 5°F~104°F) Storage: -15°C~40°C ( 5°F~104°F)
Nominal Operating Temperature Range	25°C±3°C (77°F±5°F)
Float Charging Voltage	13.5 to 13.8 VDC/unit Average at 25°C (77°F)
Recommended Maximum Charging Current Limit	5.1A
Equalization and Cycle Service	14.4 to 15.0 VDC/unit Average at 25°C (77°F)
Self Discharge	CSB Batteries can be stored for more than 6 months at 25°C (77°F). Please charge batteries before using. For higher temperatures the time interval will be shorter.
Terminal	B1/B3-L terminal to accept M5 nut & bolt
Container Material	ABS(UL 94-HB) & Flammability resistance of (UL 94-V0) can be available upon request.



MH14533(N)



ISO9001  
No.:041005117

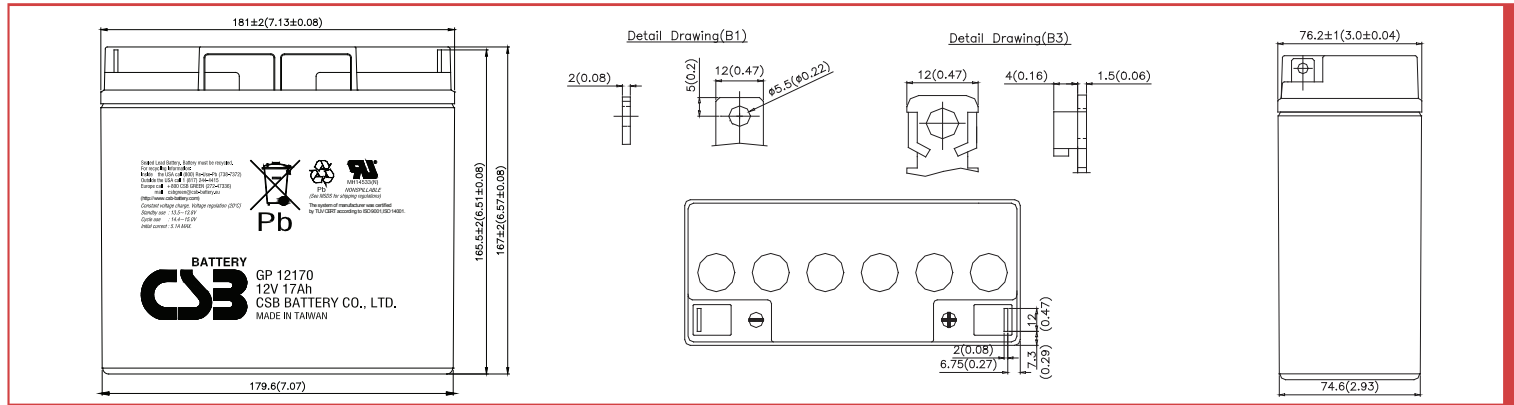


ISO 14001  
NO.UM 1-12-0045

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

CSB is also certified by ISO 9001 and ISO 14001.

Dimensions :	Overall Height (H)	Container height (h)	Length (L)	Width (W)
Unit: mm (inch)	167±2 (6.57±0.08)	165.5±2 (6.51±0.08)	181±2 (7.13±0.08)	76.2±1 (3.0±0.04)



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

F.V/Time	5MIN	10MIN	15MIN	30MIN	60MIN	90MIN	2HR	3HR	5HR	8HR	10HR	20HR
1.60V	80.2	50.9	38.5	23.4	13.8	10.1	8.03	5.72	3.63	2.37	1.93	1.00
1.67V	71.2	47.5	36.5	22.9	13.7	10.0	7.99	5.69	3.61	2.35	1.90	0.95
1.70V	67.4	45.8	35.6	22.7	13.6	10.0	7.97	5.67	3.61	2.35	1.89	0.94
1.75V	61.0	43.1	34.1	22.3	13.4	9.86	7.92	5.64	3.59	2.32	1.86	0.91
1.80V	54.5	40.2	32.7	21.8	13.3	9.79	7.87	5.61	3.58	2.30	1.83	0.88
1.85V	48.0	37.3	31.0	21.2	13.1	9.68	7.80	5.56	3.56	2.27	1.80	0.85

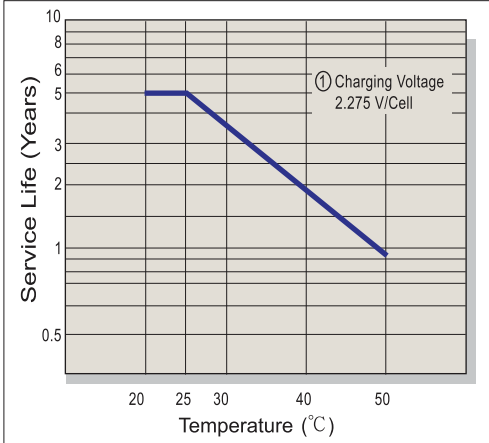
## Constant Power Discharge Characteristics Unit:W (25°C,77°F)

F.V/Time	5MIN	10MIN	15MIN	30MIN	60MIN	90MIN	2HR	3HR	5HR	8HR	10HR	20HR
1.60V	890	583	449	281	166	121	96.4	68.6	43.6	28.4	23.1	12.0
1.67V	790	544	423	275	164	120	96.0	68.5	43.4	28.3	22.8	11.5
1.70V	748	527	413	272	163	119	95.8	68.4	43.3	28.2	22.7	11.3
1.75V	677	493	395	267	161	119	95.3	67.9	43.2	27.9	22.4	10.9
1.80V	605	460	377	261	160	118	94.6	67.3	43.0	27.6	22.0	10.5
1.85V	533	427	361	254	158	116	93.8	66.8	42.9	27.3	21.7	10.1

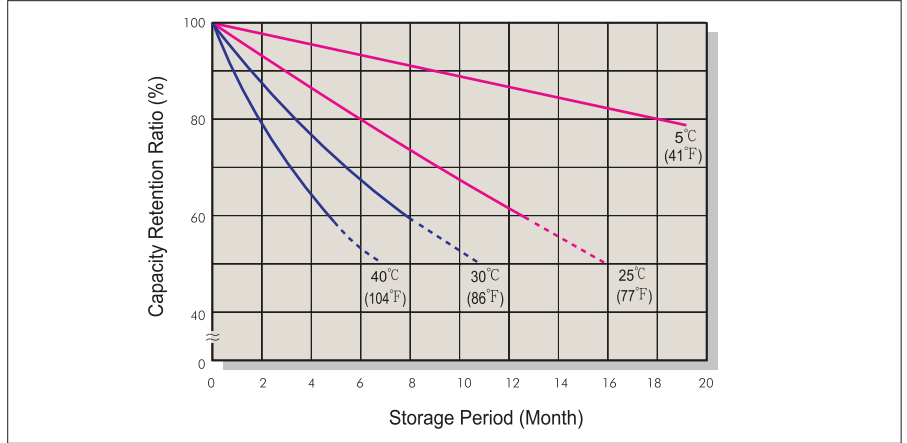
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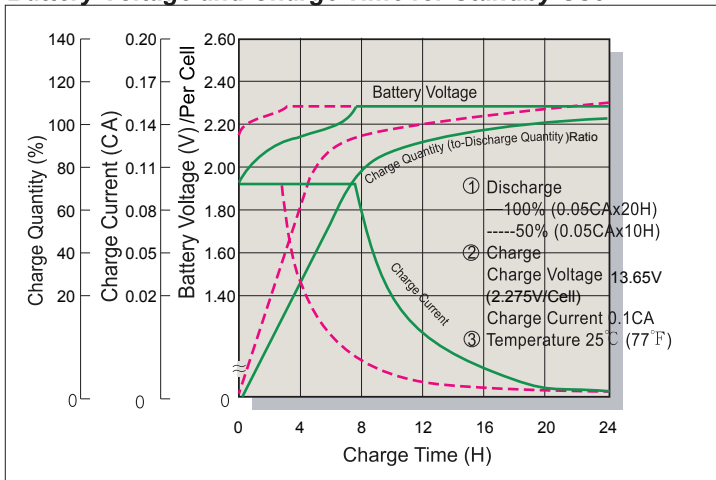
### Trickle (or Float) Service Life



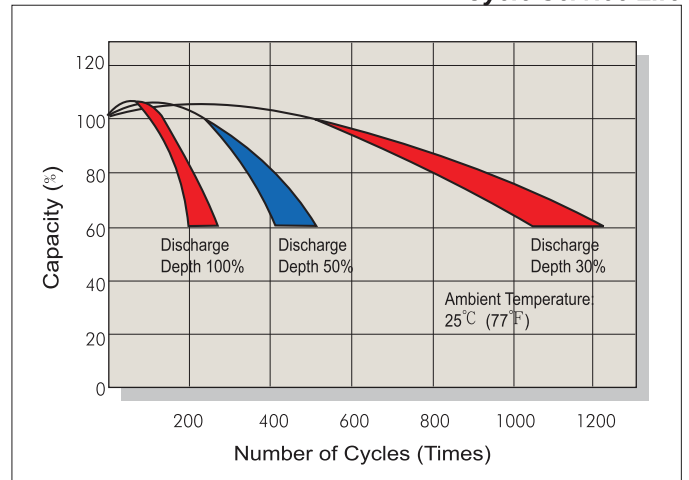
### Capacity Retention Characteristic



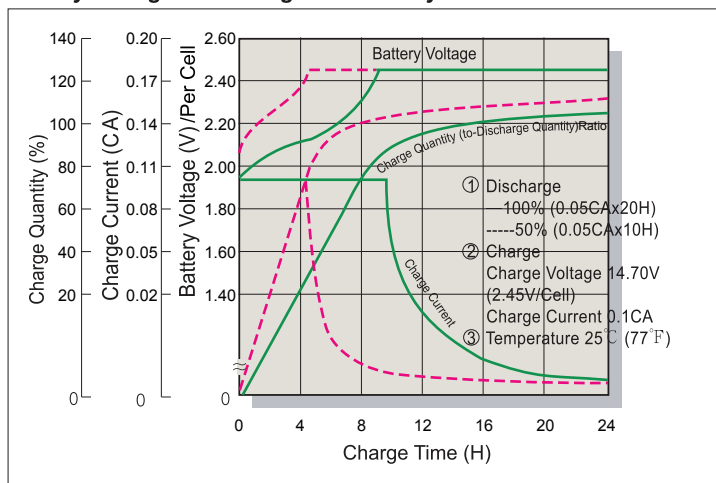
### Battery Voltage and Charge Time for Standby Use



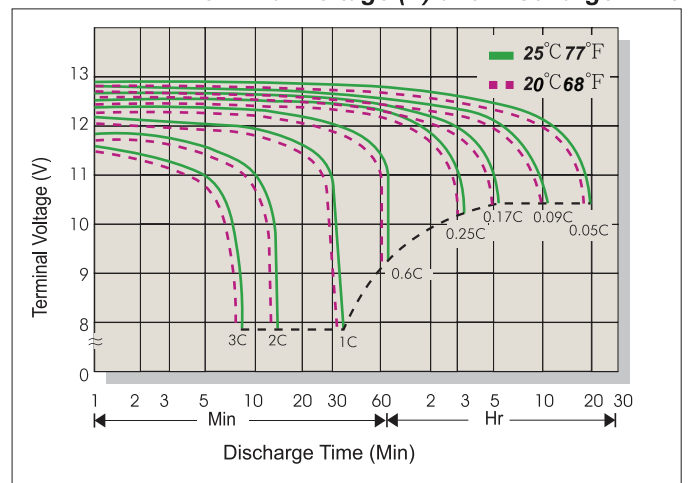
### Cycle Service Life



### Battery Voltage and Charge Time for Cycle Use



### Terminal Voltage (V) and Discharge Time



### Charging Procedures

Application	Charge Voltage(V/Cell)			Max.Charge Current
	Temperature	Set Point	Allowable Range	
Cycle Use	25°C (77°F)	2.45	2.40~2.50	0.3C
Standby	25°C (77°F)	2.275	2.25~2.30	

### Discharge Current VS. Discharge Voltage

Final Discharge Voltage V/Cell	1.75	1.70	1.60	1.30
Discharge Current(A)	0.2C>(A)	0.2C<(A)<0.5C	0.5C<(A)<1.0C	(A)>1.0C

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# GP 12200 ▶ 12V 20Ah

GP 12200 is a general purpose battery up to 5 years in standby service or more than 260 cycles at 100% discharge in cycle service. As with all CSB batteries, all are rechargeable, highly efficient, leak proof and maintenance free.



## ► Specification

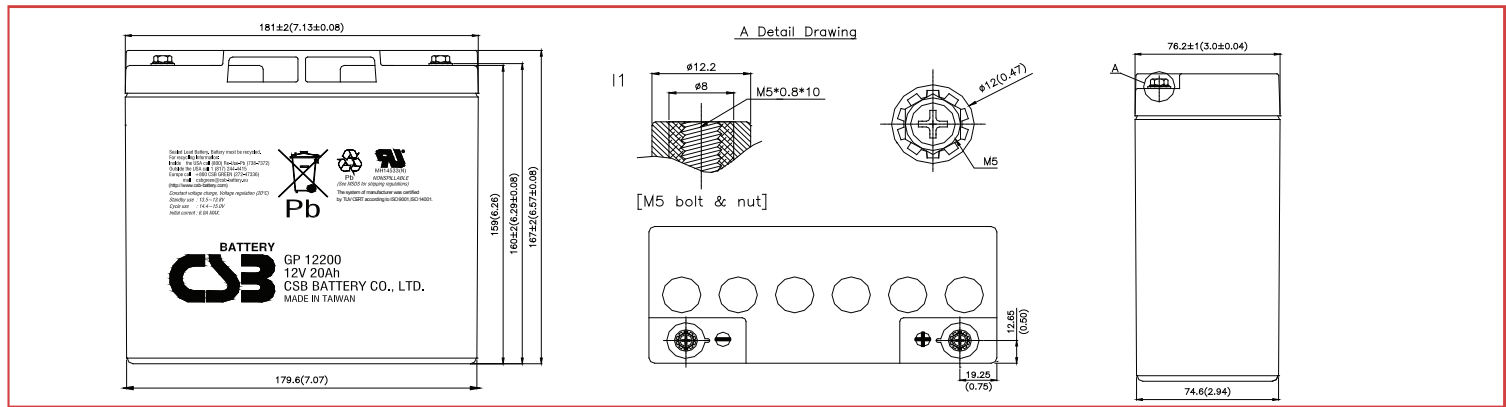
Cells Per Unit	6
Voltage Per Unit	12
Capacity	20 Ah @ 20hr-rate to 1.75V per cell @25°C (77°F)
Weight	Approx. 6.4 kg(14.11 lbs)
Maximum Discharge Current	230A(5sec)
Internal Resistance	Approx. 13 mΩ
Operating Temperature Range	Discharge: -15°C~50°C ( 5°F~122°F) Charge: -15°C~40°C ( 5°F~104°F) Storage: -15°C~40°C ( 5°F~104°F)
Nominal Operating Temperature Range	25°C±3°C (77°F±5°F)
Float Charging Voltage	13.5 to 13.8 VDC/unit Average at 25°C (77°F)
Recommended Maximum Charging Current Limit	6 A
Equalization and Cycle Service	14.4 to 15.0 VDC/unit Average at 25°C (77°F)
Self Discharge	CSB Batteries can be stored for more than 6 months at 25°C (77°F). Please charge batteries before using. For higher temperatures the time interval will be shorter.
Terminal	I1-Thread lead alloy recessed terminal to accept M5 bolt
Container Material	ABS(UL 94-HB) & Flammability resistance of (UL 94-V0) can be available upon request.



CSB-manufactured **VRLA** (Absorbent Glass Mat type) batteries are UL-recognized components under UL1989.

CSB is also certified by ISO 9001 and ISO 14001.

► Dimensions :	Overall Height (H)	Container height (h)	Length (L)	Width (W)
Unit: mm (inch)	167±2 (6.57±0.08)	167±2 (6.57±0.08)	181±2 (7.13±0.08)	76.2±1 (3.0±0.04)



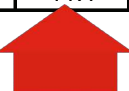
## Constant Current Discharge Characteristics Unit:A (25°C,77°F)

F.V/Time	5MIN	10MIN	15MIN	30MIN	60MIN	90MIN	2HR	3HR	5HR	8HR	10HR	20HR
1.60V	87.5	55.5	42.3	25.5	15.1	11.0	8.75	6.23	3.97	2.62	2.10	1.09
1.67V	77.7	51.8	39.7	24.9	15.0	10.9	8.69	6.22	3.94	2.60	2.07	1.04
1.70V	73.5	50.2	38.7	24.7	14.9	10.9	8.67	6.20	3.93	2.60	2.05	1.03
1.75V	66.4	47.0	37.1	24.2	14.8	10.7	8.54	6.17	3.92	2.59	2.03	1.00
1.80V	59.3	43.8	35.2	23.8	14.5	10.6	8.42	6.12	3.91	2.58	2.00	0.96
1.85V	52.2	40.5	33.7	23.2	14.3	10.4	8.29	6.07	3.90	2.57	1.96	0.92

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

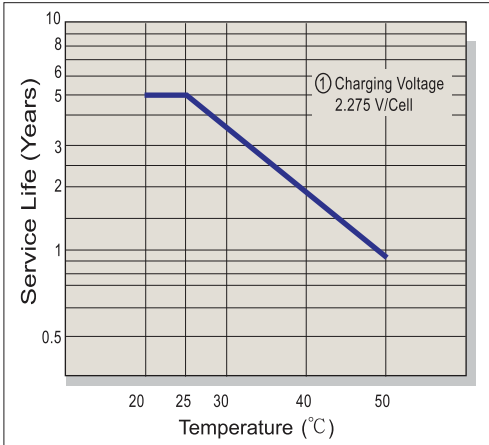
F.V/Time	5MIN	10MIN	15MIN	30MIN	60MIN	90MIN	2HR	3HR	5HR	8HR	10HR	20HR
1.60V	1050	666	507	306	181	132	105	74.7	47.6	31.4	25.2	13.1
1.67V	932	621	481	301	179	130	104	74.6	47.3	31.3	24.9	12.5
1.70V	882	602	466	299	178	129	103	74.3	47.2	31.2	24.8	12.3
1.75V	797	564	446	292	176	128	102	74.0	47.1	31.1	24.4	11.9
1.80V	712	525	421	285	174	126	101	73.4	46.9	31.0	24.0	11.5
1.85V	627	487	404	278	171	125	100	72.8	46.8	30.9	23.6	11.1

Ratings presented herein are subject to revision without notice. Please refer to [www.csb-battery.com](http://www.csb-battery.com) to confirm the latest version.

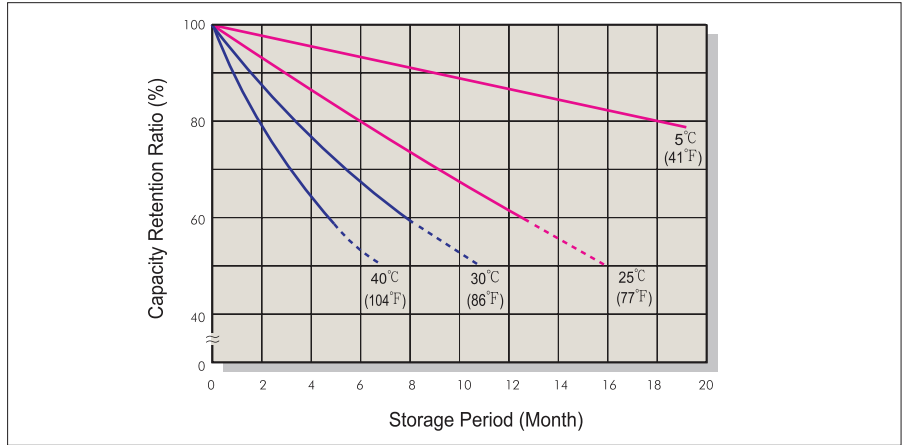




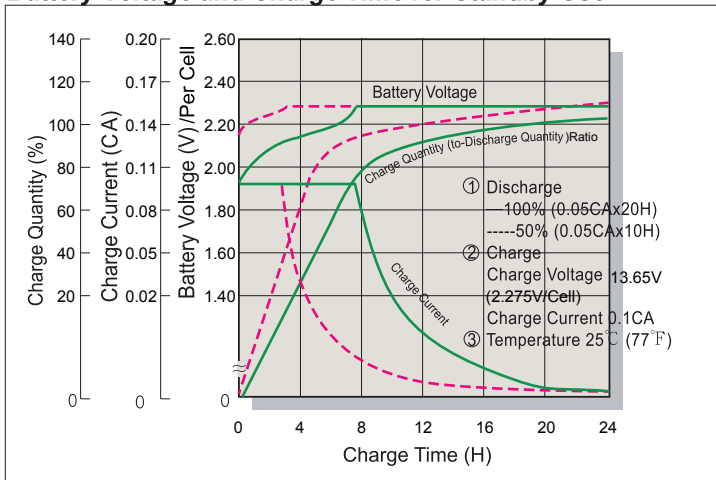
### Trickle (or Float) Service Life



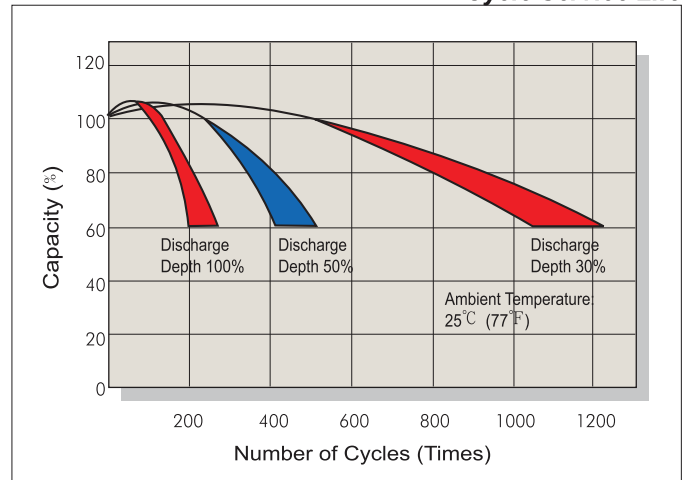
### Capacity Retention Characteristic



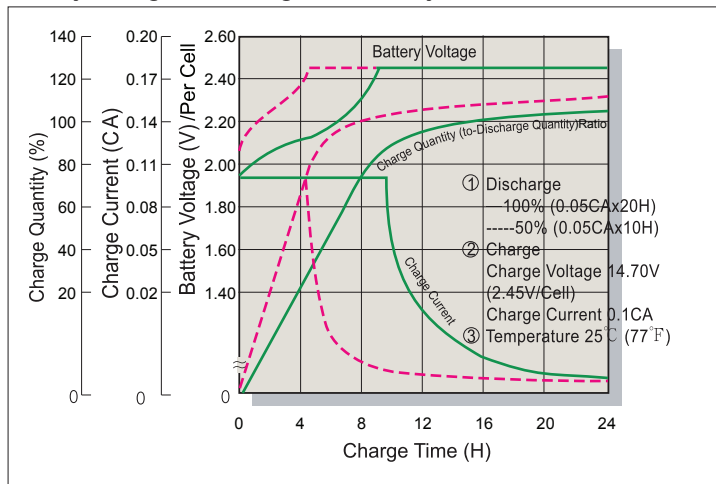
### Battery Voltage and Charge Time for Standby Use



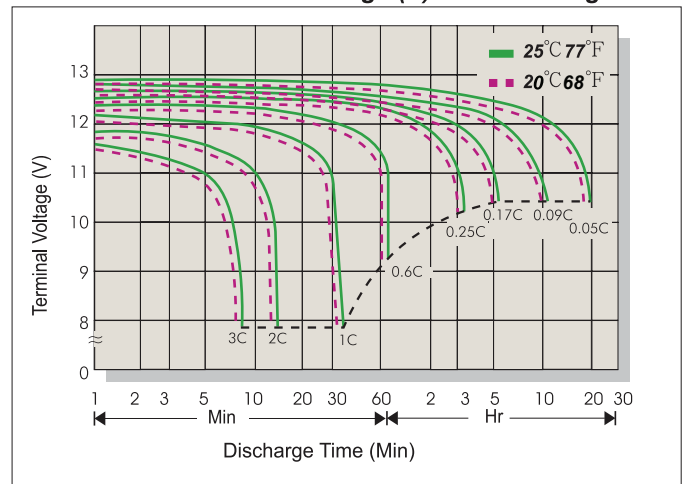
### Cycle Service Life



### Battery Voltage and Charge Time for Cycle Use



### Terminal Voltage (V) and Discharge Time



### Charging Procedures

Application	Charge Voltage(V/Cell)			Max.Charge Current
	Temperature	Set Point	Allowable Range	
Cycle Use	25°C (77°F)	2.45	2.40~2.50	0.3C
Standby	25°C (77°F)	2.275	2.25~2.30	

### Discharge Current VS. Discharge Voltage

Final Discharge Voltage V/Cell	1.75	1.70	1.60	1.30
Discharge Current(A)	0.2C>(A)	0.2C<(A)<0.5C	0.5C<(A)<1.0C	(A)>1.0C

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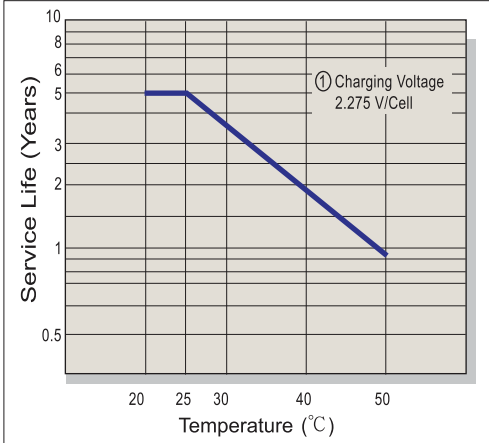
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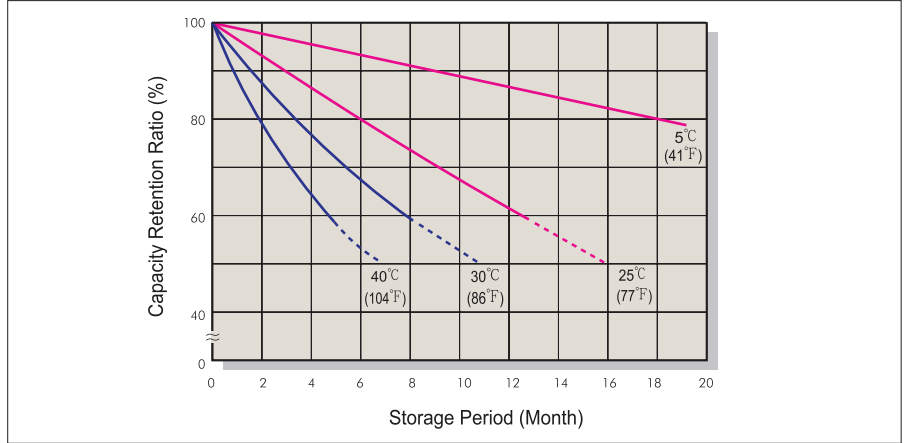
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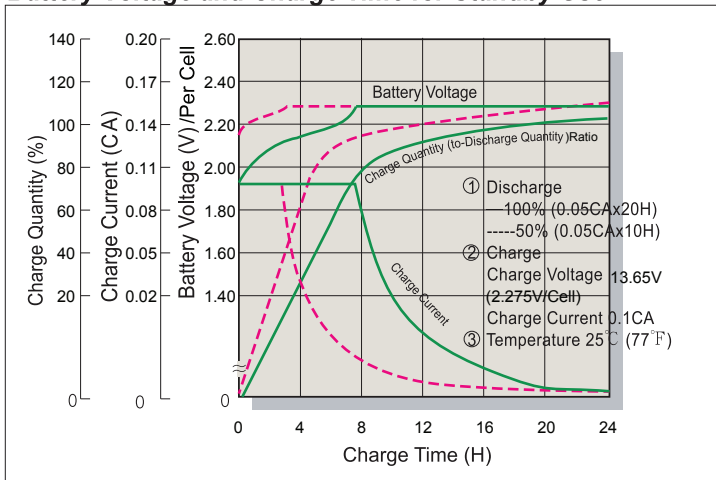
### Trickle (or Float) Service Life



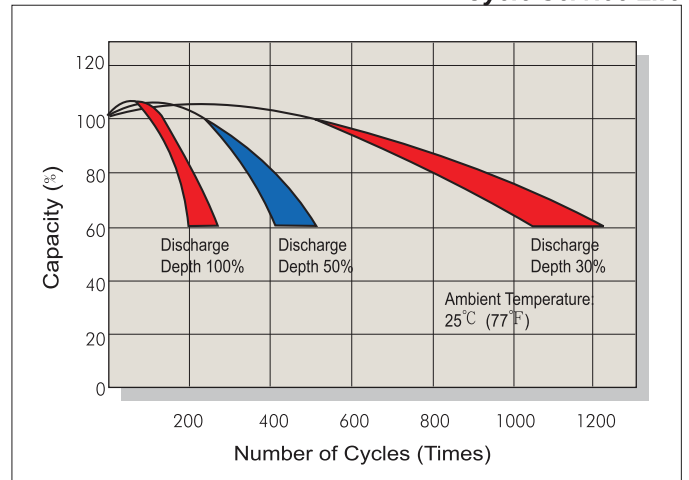
### Capacity Retention Characteristic



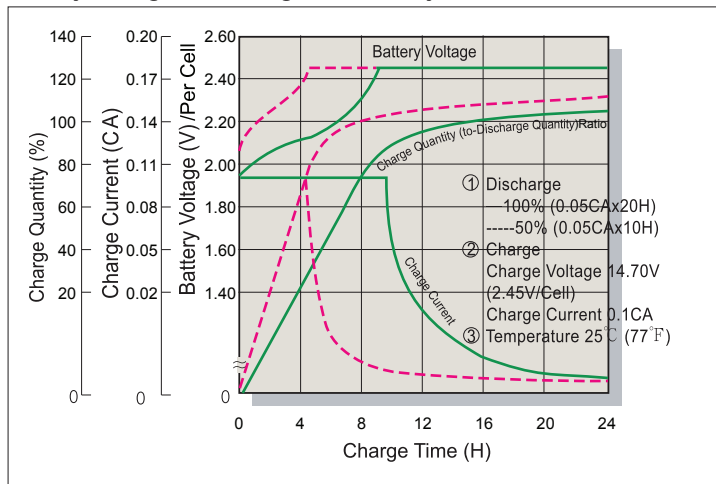
### Battery Voltage and Charge Time for Standby Use



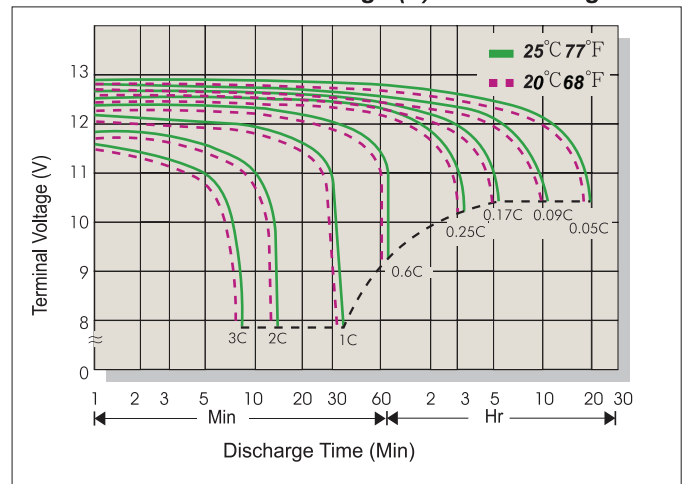
### Cycle Service Life



### Battery Voltage and Charge Time for Cycle Use



### Terminal Voltage (V) and Discharge Time



### Charging Procedures

Application	Charge Voltage(V/Cell)			Max.Charge Current
	Temperature	Set Point	Allowable Range	
Cycle Use	25°C (77°F)	2.45	2.40~2.50	0.3C
Standby	25°C (77°F)	2.275	2.25~2.30	

### Discharge Current VS. Discharge Voltage

Final Discharge Voltage V/Cell	1.75	1.70	1.60	1.30
Discharge Current(A)	0.2C>(A)	0.2C<(A)<0.5C	0.5C<(A)<1.0C	(A)>1.0C

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# GP 12340 ▶ 12V 34Ah

GP 12340 is a general purpose battery up to 5 years in standby service or more than 260 cycles at 100% discharge in cycle service. As with all CSB batteries, all are rechargeable, highly efficient, leak proof and maintenance free.



## ► Specification

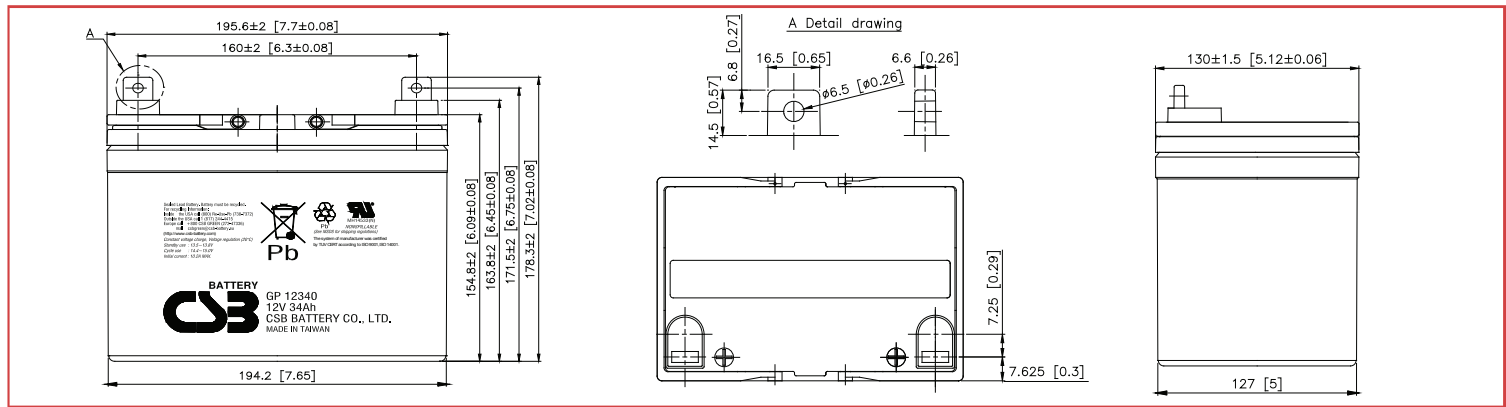
Cells Per Unit	6
Voltage Per Unit	12
Capacity	34 Ah @ 20hr-rate to 1.75V per cell @25°C (77°F)
Weight	Approx. 10.48 kg(23.06 lbs)
Maximum Discharge Current	380A(5sec)
Internal Resistance	Approx. 8 mΩ
Operating Temperature Range	Discharge: -15°C~50°C ( 5°F~122°F) Charge: -15°C~40°C ( 5°F~104°F) Storage: -15°C~40°C ( 5°F~104°F)
Nominal Operating Temperature Range	25°C±3°C (77°F±5°F)
Float Charging Voltage	13.5 to 13.8 VDC/unit Average at 25°C(77°F)
Recommended Maximum Charging Current Limit	10.2A
Equalization and Cycle Service	14.4 to 15.0 VDC/unit Average at 25°C(77°F)
Self Discharge	CSB Batteries can be stored for more than 6 months at 25°C(77°F). Please charge batteries before using. For higher temperatures the time interval will be shorter.
Terminal	B5-L terminal to accept M6 nut & bolt
Container Material	ABS(UL 94-HB) & Flammability resistance of (UL 94-V0) can be available upon request.



CSB-manufactured **VRLA** (Absorbent **G**lass **M**at type) batteries are UL-recognized components under UL1989.

CSB is also certified by ISO 9001 and ISO 14001.

Dimensions :	Overall Height (H)	Container height (h)	Length (L)	Width (W)
Unit: mm (inch)	178.3±2 (7.02±0.08)	154.8±2 (6.09±0.08)	195.6±2 (7.7±0.08)	130±1.5 (5.12±0.06)



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

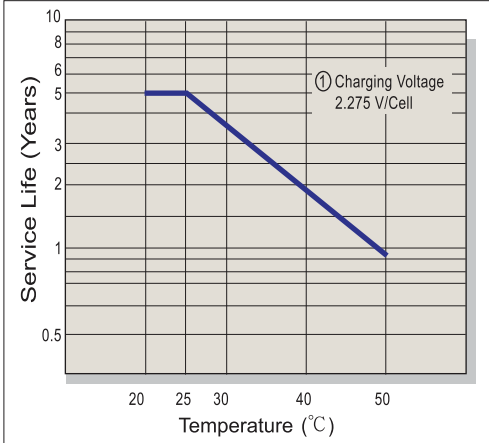
F.V/Time	5MIN	10MIN	15MIN	30MIN	60MIN	90MIN	2HR	3HR	5HR	8HR	10HR	20HR
1.60V	144	91.7	69.3	42.1	25.0	18.2	14.5	10.3	6.55	4.26	3.48	1.86
1.67V	128	85.5	65.5	41.3	24.7	18.0	14.4	10.2	6.50	4.23	3.43	1.78
1.70V	121	82.8	63.8	40.8	24.5	17.9	14.3	10.1	6.49	4.23	3.41	1.75
1.75V	110	77.5	61.2	40.0	24.4	17.8	14.2	10.0	6.47	4.18	3.35	1.69
1.80V	98.0	72.3	58.8	39.2	24.0	17.6	14.1	9.9	6.45	4.14	3.30	1.64
1.85V	86.3	67.0	55.7	38.2	23.6	17.4	14.0	9.8	6.43	4.09	3.24	1.58

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

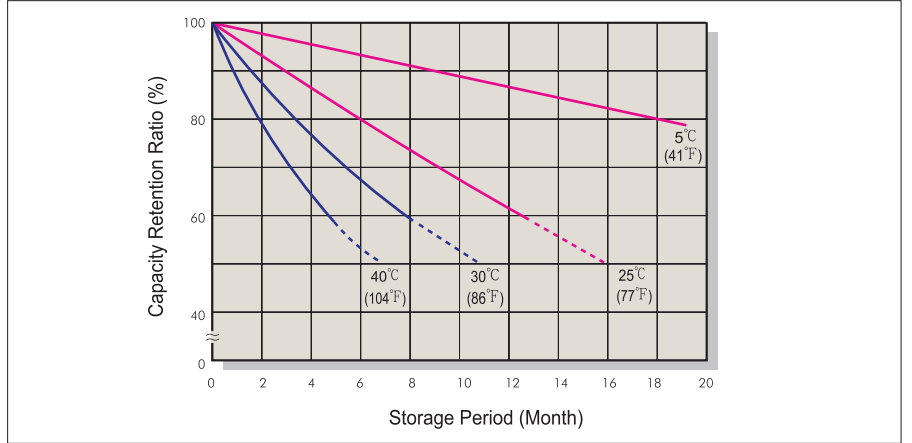
F.V/Time	5MIN	10MIN	15MIN	30MIN	60MIN	90MIN	2HR	3HR	5HR	8HR	10HR	20HR
1.60V	1732	1100	832	505	300	218	174	124	78.6	51.1	41.7	21.6
1.67V	1539	1026	788	495	297	216	173	123	78.1	50.8	41.1	20.7
1.70V	1456	994	771	490	295	215	172	122	77.9	50.7	40.9	20.3
1.75V	1316	931	739	481	292	213	171	121	77.7	50.2	40.3	19.6
1.80V	1176	867	705	470	288	212	170	120	77.4	49.6	39.6	18.9
1.85V	1036	804	669	458	283	209	169	119	77.2	49.1	39.0	18.2

Ratings presented herein are subject to revision without notice. Please refer to [www.csb-battery.com](http://www.csb-battery.com) to confirm the latest version.

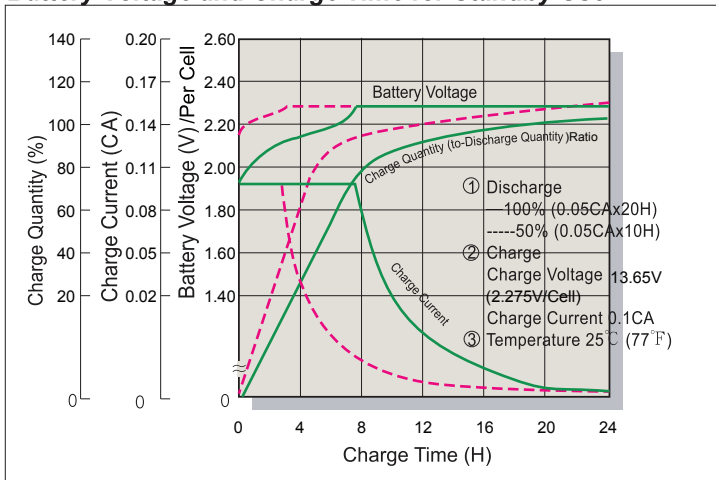
### Trickle (or Float) Service Life



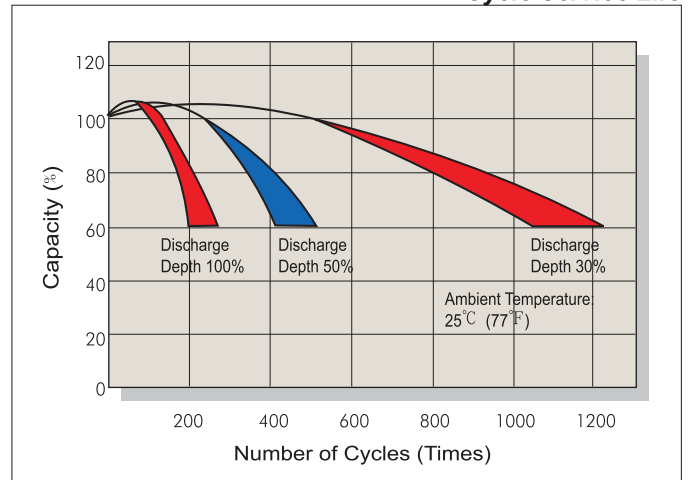
### Capacity Retention Characteristic



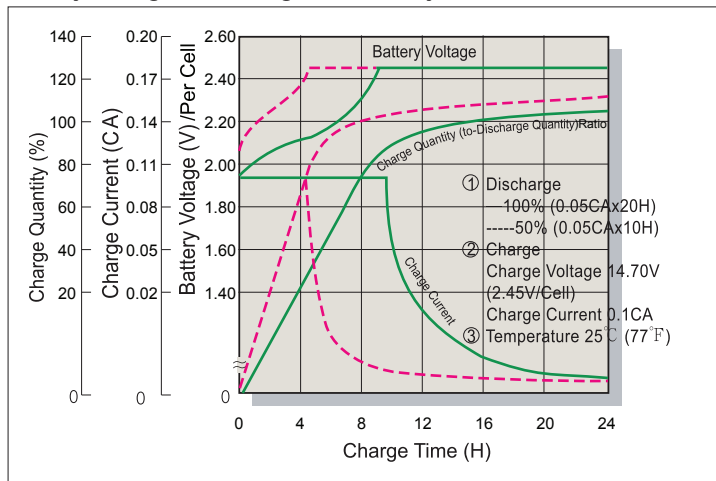
### Battery Voltage and Charge Time for Standby Use



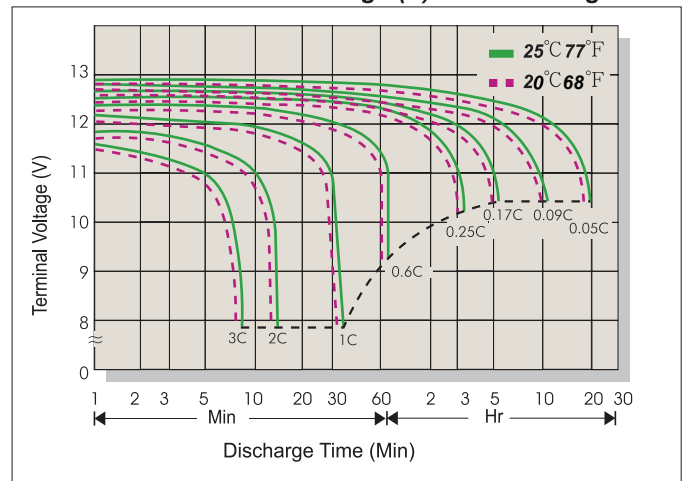
### Cycle Service Life



### Battery Voltage and Charge Time for Cycle Use



### Terminal Voltage (V) and Discharge Time



### Charging Procedures

Application	Charge Voltage(V/Cell)			Max.Charge Current
	Temperature	Set Point	Allowable Range	
Cycle Use	25°C (77°F)	2.45	2.40~2.50	0.3C
Standby	25°C (77°F)	2.275	2.25~2.30	

### Discharge Current VS. Discharge Voltage

Final Discharge Voltage V/Cell	1.75	1.70	1.60	1.30
Discharge Current(A)	0.2C>(A)	0.2C<(A)<0.5C	0.5C<(A)<1.0C	(A)>1.0C

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# GP 12400 ▶ 12V 40Ah

GP 12400 is a general purpose battery up to 5 years in standby service or more than 260 cycles at 100% discharge in cycle service. As with all CSB batteries, all are rechargeable, highly efficient, leak proof and maintenance free.



## ► Specification

Cells Per Unit	6
Voltage Per Unit	12
Capacity	40A h @ 20hr-rate to 1.75V per cell @25 °C(77°F)
Weight	Approx. 12.63 kg(27.84 lbs)
Maximum Discharge Current	400A(5sec)
Internal Resistance	Approx. 8.1mΩ
Operating Temperature Range	Discharge: -15°C~50°C ( 5°F~122°F) Charge: -15 °C~40°C ( 5°F~104°F) Storage: -15°C~40°C ( 5°F~104°F)
Nominal Operating Temperature Range	25°C±3°C(77°F±5°F)
Float Charging Voltage	13.5 to 13.8 VDC/unit Average at 25°C(77°F)
Recommended Maximum Charging Current Limit	12A
Equalization and Cycle Service	14.4 to 15.0 VDC/unit Average at 25°C(77°F)
Self Discharge	CSB Batteries can be stored for more than 6 months at 25°C(77°F). Please charge batteries before using. For higher temperatures the time interval will be shorter.
Terminal	B2-L terminal or Recessed type to accept M6 bolt
Container Material	ABS(UL 94-HB/File E50263)*Flammability resistance of (UL 94-V0/File E88637) can be available upon request.



MH14533(N)



No.:041005117



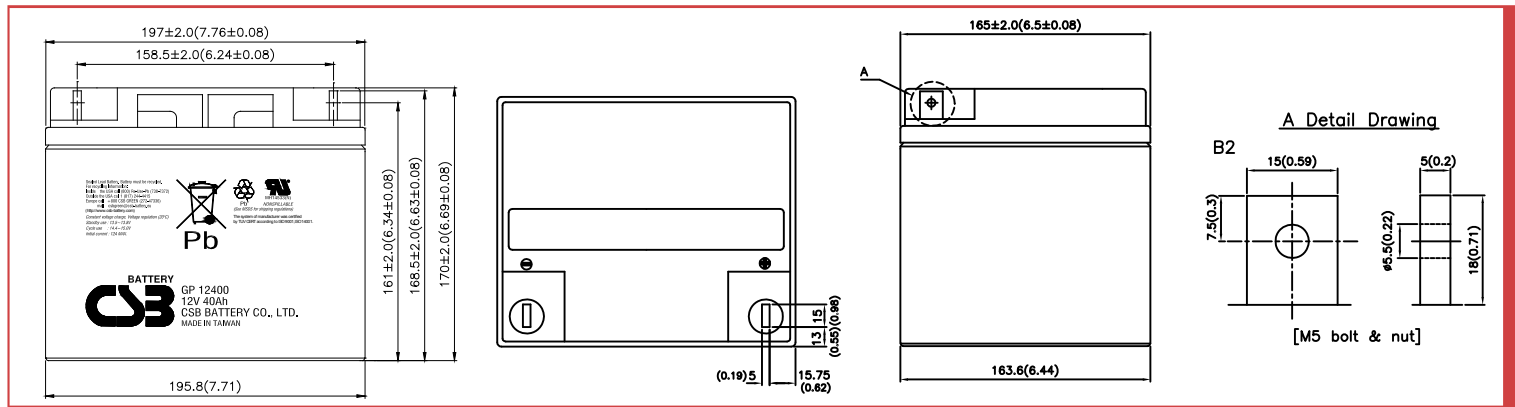
NO.UM 1-12-0045

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)
	170±2 (6.69±0.08)	168.5±2 (6.63±0.08)	197±2 (7.76±0.08)	165±2 (6.5±0.08)



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

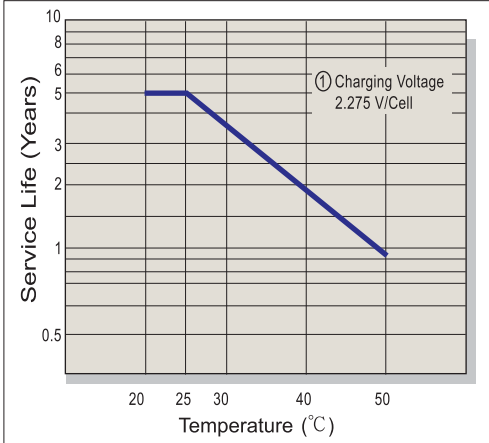
F.V/Time	5MIN	10MIN	15MIN	30MIN	1HR	2HR	3HR	4HR	5HR	8HR	10HR	20HR
1.60V	176	113	85.0	51.8	30.6	17.7	12.6	9.83	8.01	5.25	4.28	2.21
1.67V	157	105	81.0	50.8	30.3	17.6	12.5	9.77	7.98	5.19	4.20	2.12
1.70V	149	101	78.7	50.1	30.2	17.5	12.4	9.75	7.96	5.17	4.16	2.08
1.75V	135	95.0	75.5	49.0	30.0	17.4	12.3	9.71	7.93	5.10	4.09	2.01
1.80V	121	88.3	71.7	47.6	29.8	17.3	12.2	9.67	7.89	5.03	4.03	1.93
1.85V	107	81.7	67.8	46.2	29.4	17.2	12.1	9.63	7.85	4.96	3.96	1.86

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

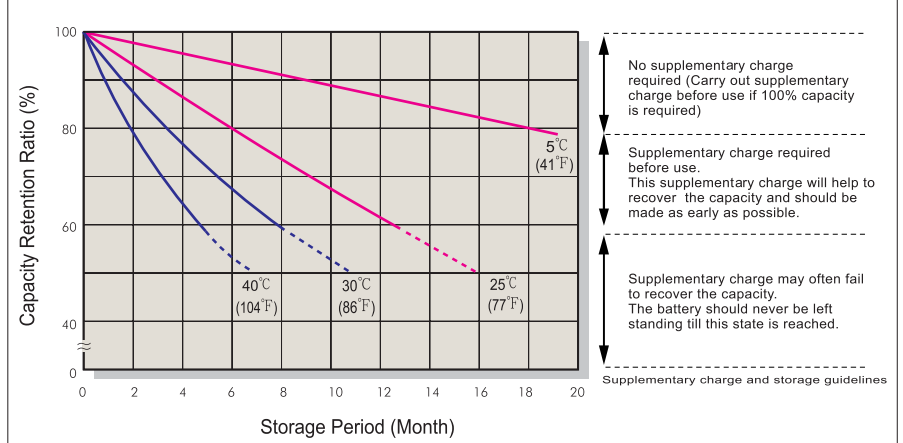
F.V/Time	5MIN	10MIN	15MIN	30MIN	1HR	2HR	3HR	4HR	5HR	8HR	10HR	20HR
1.60V	2,110	1,350	1,020	622	367	212	151	118	96.1	63.0	51.3	26.5
1.67V	1,886	1,259	972	606	364	211	150	117	95.7	62.3	50.4	25.4
1.70V	1,790	1,214	945	600	363	210	149	116	95.5	62.0	50.0	24.9
1.75V	1,620	1,140	902	585	360	209	148	115	95.2	61.2	49.2	24.1
1.80V	1,450	1,060	860	571	357	208	147	114	94.8	60.4	48.3	23.2
1.85V	1,280	980	814	555	353	207	146	113	94.2	59.6	47.5	22.4



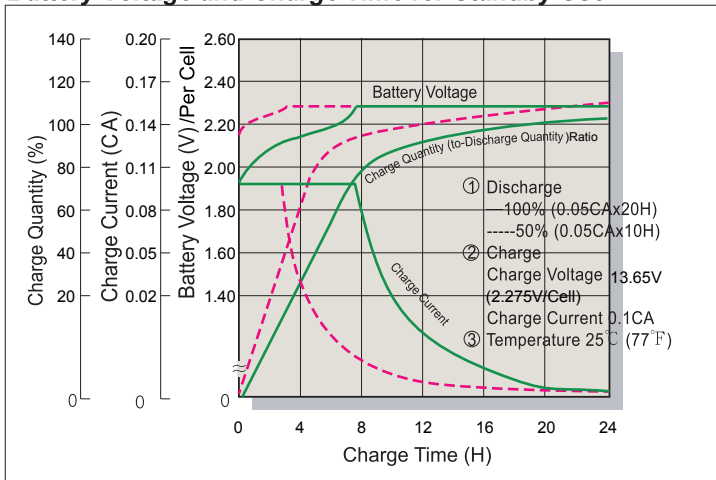
### Trickle (or Float) Service Life



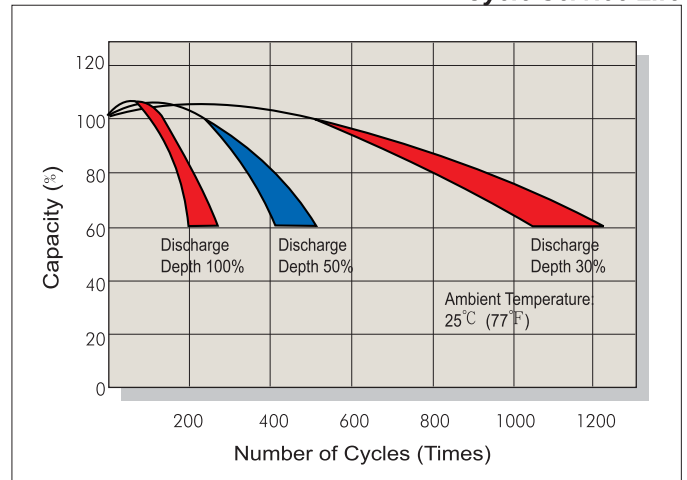
### Capacity Retention Characteristic



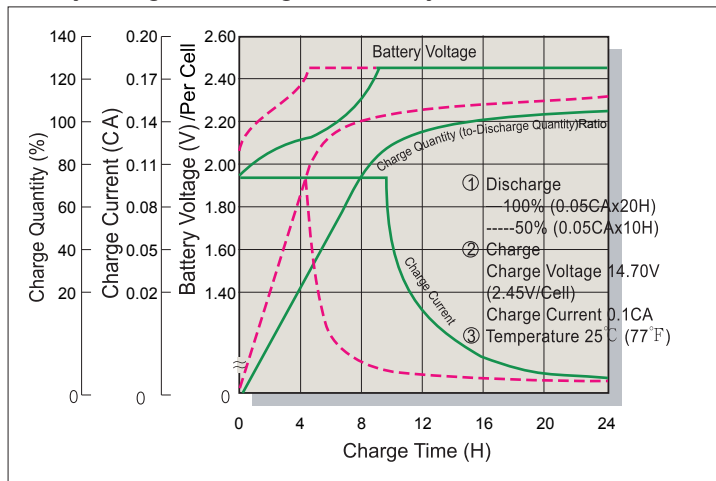
### Battery Voltage and Charge Time for Standby Use



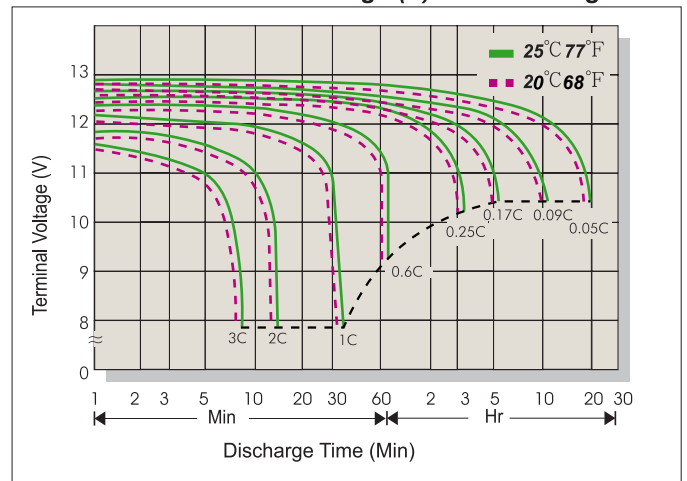
### Cycle Service Life



### Battery Voltage and Charge Time for Cycle Use



### Terminal Voltage (V) and Discharge Time



### Charging Procedures

Application	Charge Voltage(V/Cell)			Max.Charge Current
	Temperature	Set Point	Allowable Range	
Cycle Use	25°C (77°F)	2.45	2.40~2.50	0.3C
Standby	25°C (77°F)	2.275	2.25~2.30	

### Discharge Current VS. Discharge Voltage

Final Discharge Voltage V/Cell	1.75	1.70	1.60	1.30
Discharge Current(A)	0.2C>(A)	0.2C<(A)<0.5C	0.5C<(A)<1.0C	(A)>1.0C

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# GP 12650 ▶ 12V 65Ah

GP 12650 is a general purpose battery up to 5 years in standby service or more than 260 cycles at 100% discharge in cycle service. As with all CSB batteries, all are rechargeable, highly efficient, leak proof and maintenance free.



## ► Specification

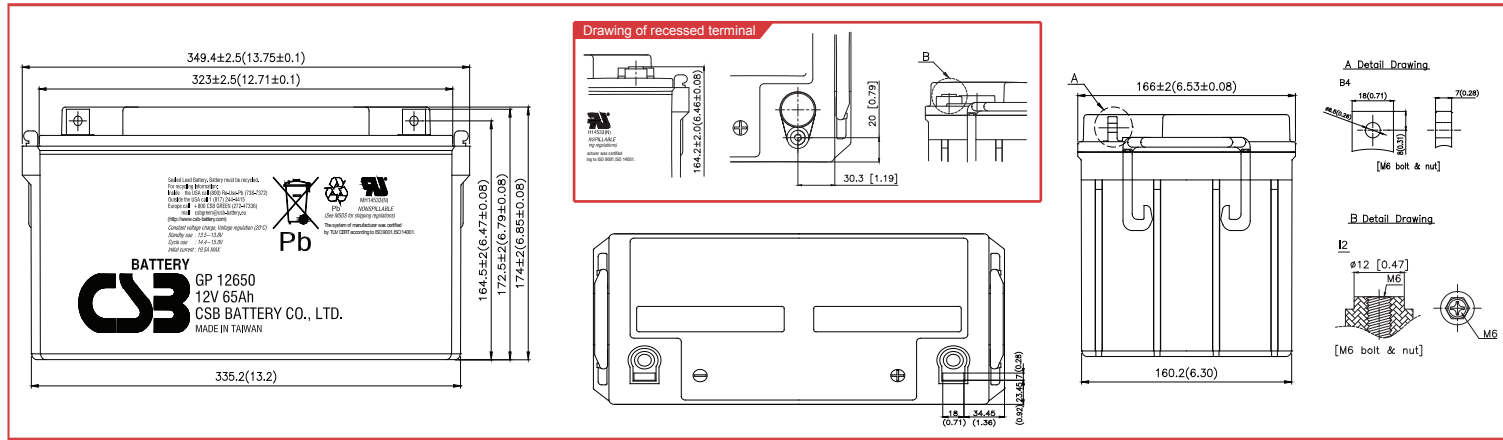
Cells Per Unit	6
Voltage Per Unit	12
Capacity	65A h @ 20hr-rate to 1.75V per cell @25°C (77°F)
Weight	Approx. 20 kg(44.09 lbs)
Maximum Discharge Current	500A(5sec)
Internal Resistance	Approx. 5.5 mΩ
Operating Temperature Range	Discharge: -15°C~50°C ( 5°F~122°F) Charge: -15°C~40°C ( 5°F~104°F) Storage: -15°C~40°C ( 5°F~104°F)
Nominal Operating Temperature Range	25°C±3°C ( 77°F±5°F)
Float Charging Voltage	13.5 to 13.8 VDC/unit Average at 25°C (77°F)
Recommended Maximum Charging Current Limit	19.50A
Equalization and Cycle Service	14.4 to 15.0 VDC/unit Average at 25°C (77°F)
Self Discharge	CSB Batteries can be stored for more than 6 months at 25°C (77°F). Please charge batteries before using. For higher temperatures the time interval will be shorter.
Terminal	B4-L terminal or Recessed Type to accept M6 nut & bolt
Container Material	Polypropylene(UL 94-HB) & Flammability resistance of (UL 94-V0) can be available upon request.



CSB-manufactured **VRLA** (Absorbent Glass Mat type) batteries are UL-recognized components under UL1989.

CSB is also certified by ISO 9001 and ISO 14001.

Dimensions :	Overall Height (H)	Container height (h)	Length (L)	Width (W)
Unit: mm (inch)	174±2 (6.85±0.08)	174±2 (6.85±0.08)	349.9±2.5 (13.75±0.1)	166±2 (6.53±0.08)



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

F.V/Time	5MIN	10MIN	15MIN	30MIN	60MIN	90MIN	2HR	3HR	5HR	8HR	10HR	20HR
1.60V	271	173	132	79.9	47.2	34.2	27.3	19.4	12.4	8.08	6.58	3.57
1.67V	242	162	124	78.3	46.9	34.1	27.2	19.3	12.3	7.97	6.47	3.42
1.70V	229	157	121	77.3	46.7	34.0	27.1	19.2	12.2	7.93	6.43	3.36
1.75V	208	147	117	75.4	46.4	33.8	27.0	19.1	12.1	7.86	6.32	3.25
1.80V	186	137	111	73.4	45.9	33.6	26.9	19.0	12.0	7.76	6.21	3.14
1.85V	164	127	105	71.3	45.4	33.3	26.8	18.9	11.9	7.66	6.10	3.03

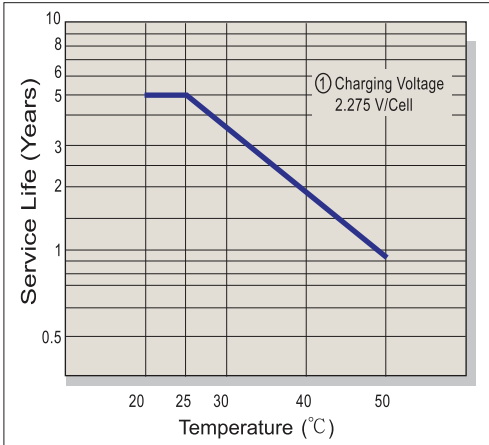
## Constant Power Discharge Characteristics Unit:W (25°C,77°F)

F.V/Time	5MIN	10MIN	15MIN	30MIN	60MIN	90MIN	2HR	3HR	5HR	8HR	10HR	20HR
1.60V	3250	2080	1580	959	566	411	327	232	148	97.0	79.0	40.9
1.67V	2900	1940	1503	935	562	409	326	231	147	96.0	77.7	39.2
1.70V	2750	1871	1460	924	560	407	325	230	146	95.5	77.1	38.4
1.75V	2490	1760	1400	903	555	405	324	229	145	94.3	75.8	37.1
1.80V	2230	1640	1330	881	550	403	323	228	144	93.1	74.5	35.7
1.85V	1970	1520	1260	856	545	400	322	227	143	91.9	73.2	

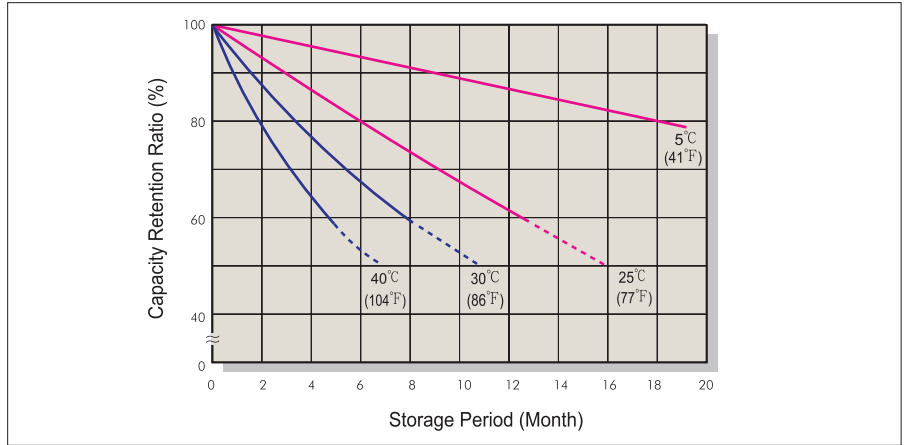
Ratings presented herein are subject to revision without notice. Please refer to [www.csb-battery.com](http://www.csb-battery.com) to confirm the latest version.



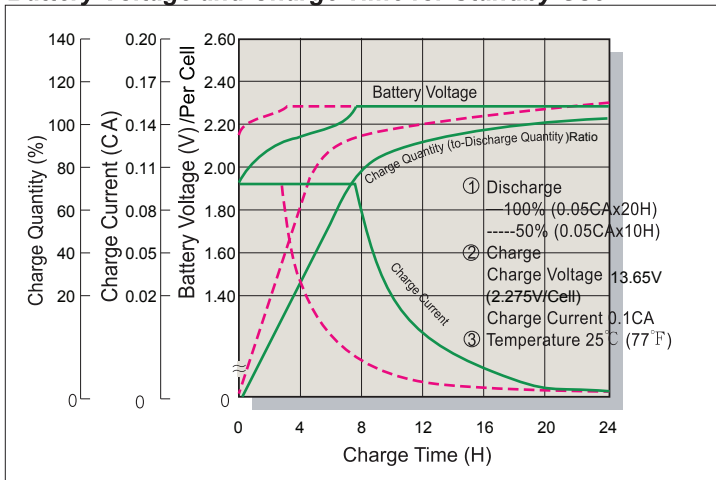
### Trickle (or Float) Service Life



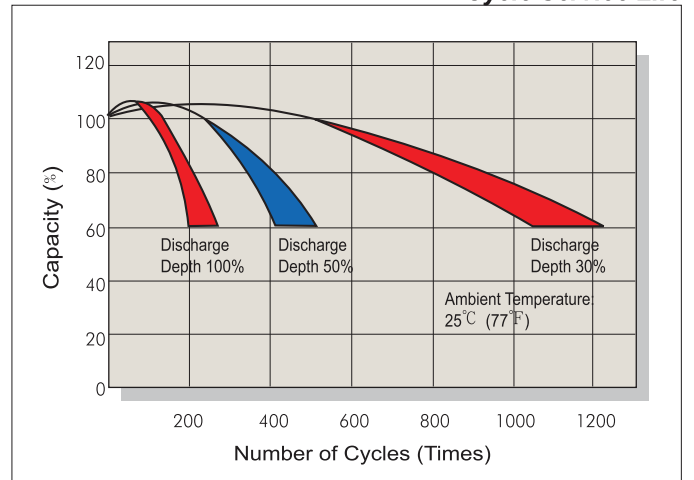
### Capacity Retention Characteristic



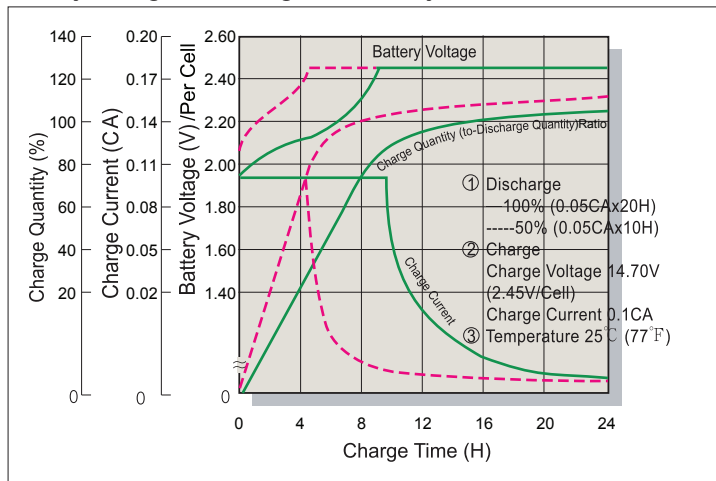
### Battery Voltage and Charge Time for Standby Use



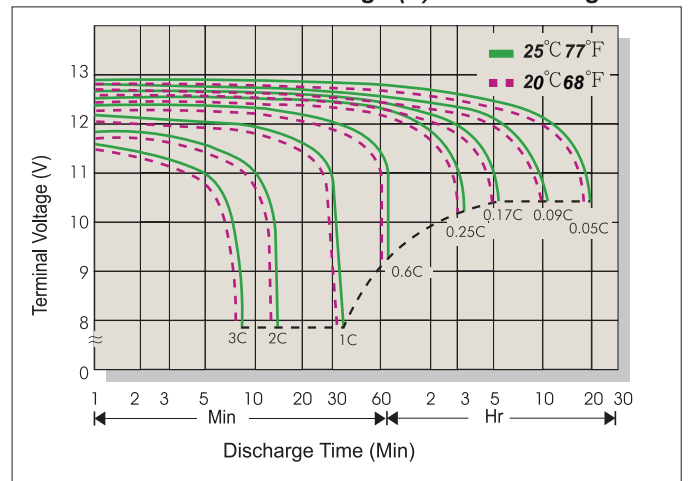
### Cycle Service Life



### Battery Voltage and Charge Time for Cycle Use



### Terminal Voltage (V) and Discharge Time



### Charging Procedures

Application	Charge Voltage(V/Cell)			Max.Charge Current
	Temperature	Set Point	Allowable Range	
Cycle Use	25°C (77°F)	2.45	2.40~2.50	0.3C
Standby	25°C (77°F)	2.275	2.25~2.30	

### Discharge Current VS. Discharge Voltage

Final Discharge Voltage V/Cell	1.75	1.70	1.60	1.30
Discharge Current(A)	0.2C>(A)	0.2C<(A)<0.5C	0.5C<(A)<1.0C	(A)>1.0C

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# GP 121000

## 12V 100.0Ah

GP 121000 is a general purpose battery with 3-5 years in standby service or more than 260 cycles at 100% discharge in cycle service. As with all CSB batteries, all are rechargeable, highly efficient, leak proof and maintenance free.



### Specification

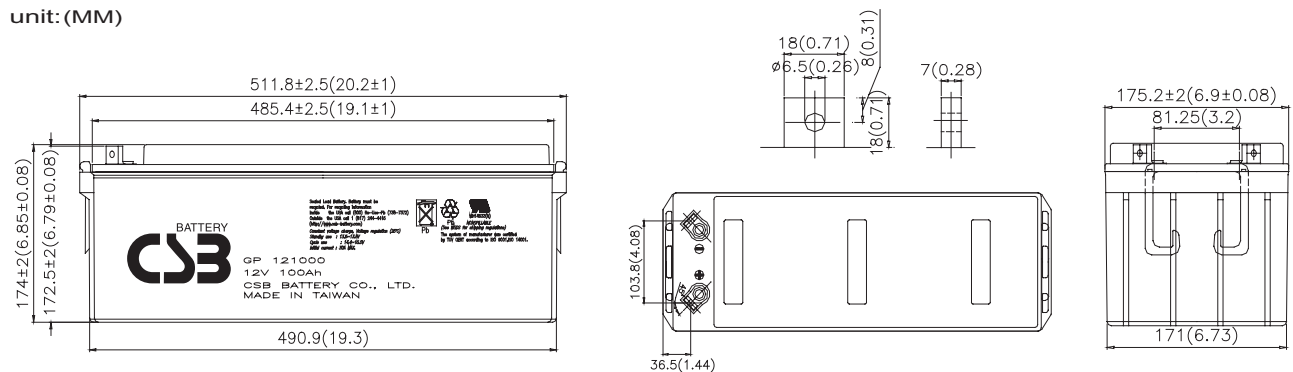
<b>Cells Per Unit</b>	6
<b>Voltage Per Unit</b>	12
<b>Capacity</b>	100Ah @ 20hr-rate to 1.75V per cell @25 °C (77°F)
<b>Weight</b>	Approx. 35kg(77.1 lbs)
<b>Maximum Discharge Current</b>	500A(5sec)
<b>Internal Resistance</b>	Approx. 7mΩ
<b>Operating Temperature Range</b>	Discharge: -20°C~50°C (-4°F~122°F) Charge: 0°C~40°C (32°F~104°F) Storage: -20°C~40°C (-4°F~104°F)
<b>Nominal Operating Temperature Range</b>	25°C±3°C (77°F±5°F)
<b>Float Charging Voltage</b>	13.5 to 13.8 VDC/unit Average at 25°C (77°F)
<b>Recommended Maximum Charging Current Limit</b>	30A
<b>Equalization and Cycle Service</b>	14.4 to 15.0 VDC/unit Average at 25°C (77°F)
<b>Self Discharge</b>	CSB Batteries can be stored for more than 6 months at 25°C (77°F). Please charge batteries before using. For higher temperatures the time interval will be shorter.
<b>Terminal</b>	Bolt & Nut
<b>Container Material</b>	-Polypropylene (94-HB)



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

### Dimensions

unit: (MM)



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

F.V/Time	5MIN	10MIN	15MIN	30MIN	1HR	2HR	3HR	4HR	5HR	8HR	10HR	20HR
1.60V	388	253	193	119	71.4	42.0	29.8	23.4	19.3	12.6	10.3	5.37
1.67V	364	243	188	118	71.4	41.7	29.7	23.3	19.2	12.5	10.2	5.22
1.70V	353	238	186	118	71.3	41.6	29.7	23.3	19.2	12.5	10.2	5.16
1.75V	329	228	180	115	70.9	41.5	29.6	23.2	19.1	12.4	10.0	5.02
1.80V	305	217	173	113	70.5	41.5	29.6	23.2	19.0	12.3	9.83	4.87
1.85V	281	206	167	111	70.1	41.5	29.6	23.1	18.9	12.1	9.66	4.73

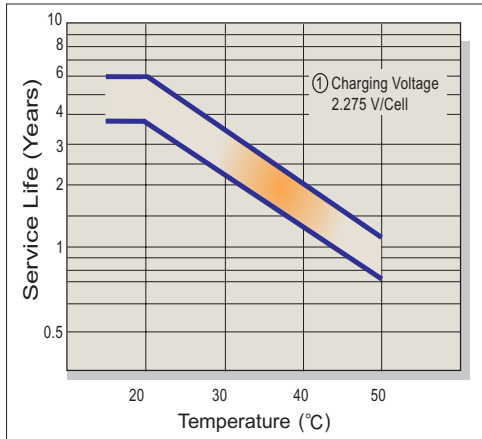
### Constant Power Discharge Characteristics Unit:W (25°C, 77°F)

F.V/Time	5MIN	10MIN	15MIN	30MIN	1HR	2HR	3HR	4HR	5HR	8HR	10HR	20HR
1.60V	4650	3030	2320	1430	857	504	357	280	231	151	124	64.4
1.67V	4363	2911	2257	1416	856	501	356	279	230	150	123	62.7
1.70V	4240	2860	2230	1410	856	499	356	279	230	150	122	61.9
1.75V	3950	2730	2155	1385	851	499	356	279	229	149	120	60.2
1.80V	3660	2600	2080	1360	846	498	356	278	228	147	118	58.4
1.85V	3370	2470	2005	1335	841	498	356	278	227	146	116	56.7

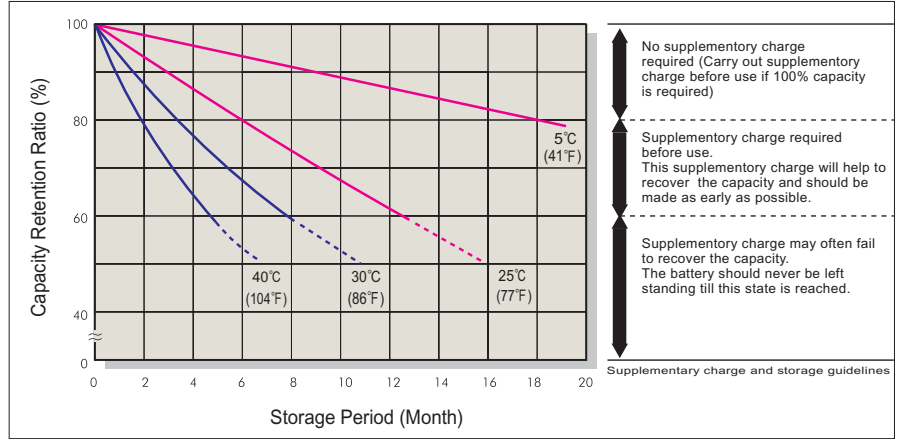
• All mentioned values are average values.



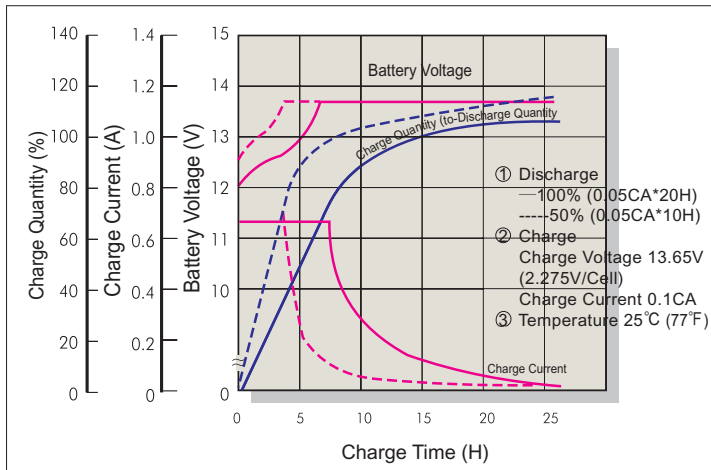
### Trickle (or Float) Service Life



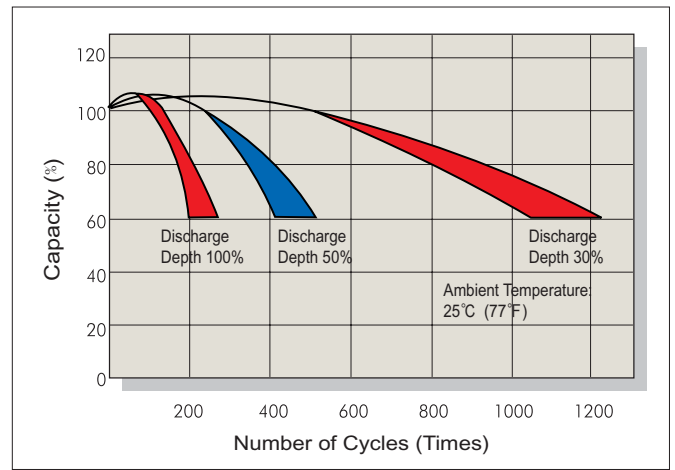
### Capacity Retention Characteristic



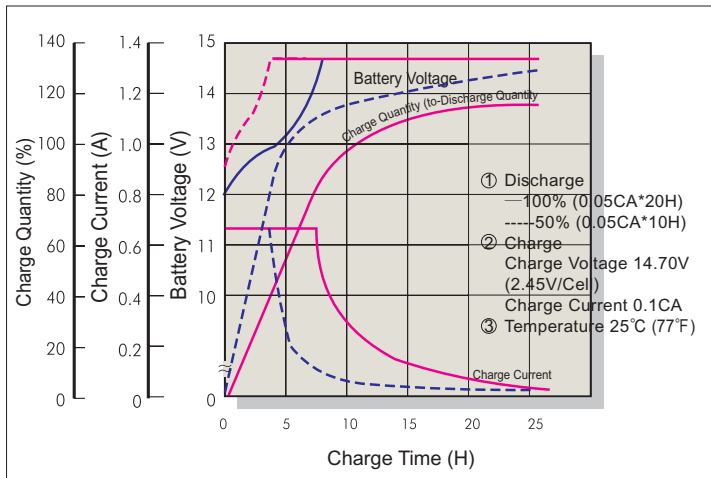
### Battery Voltage and Charge Time for Standby Use



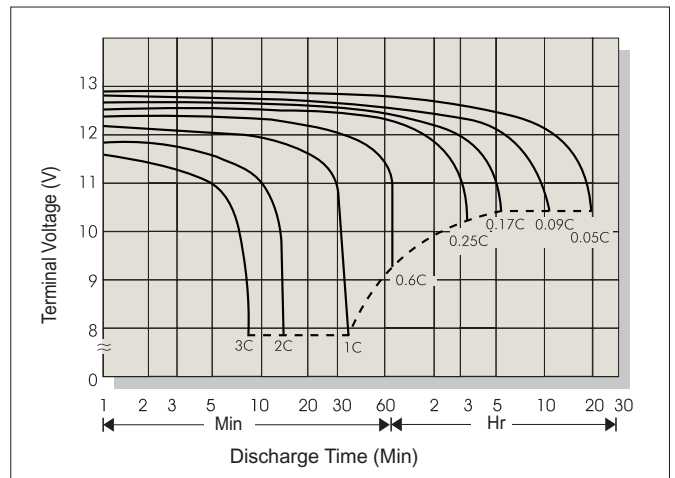
### Cycle Service Life



### Battery Voltage and Charge Time for Cycle Use



### 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	
Cycle Use	25°C (77°F)	2.45	2.40~2.50	0.3C
Standby	25°C (77°F)	2.275	2.25~2.30	

### Discharge Current VS. Discharge Voltage

Final Discharge Voltage V/Cell	1.75	1.70	1.55	1.30
Discharge Current (A)	0.2C>(A)	0.2C<(A)<0.5C	0.5C<(A)<1.0C	(A)>1.0C

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# GPL 12750 ▶ 12V 75Ah

GPL 12750 is a general purpose battery up to 10 years in standby service or more than 260 cycles at 100% discharge in cycle service . As with all CSB batteries, all are rechargeable , highly efficient , leak proof and maintenance free.



## ► Specification

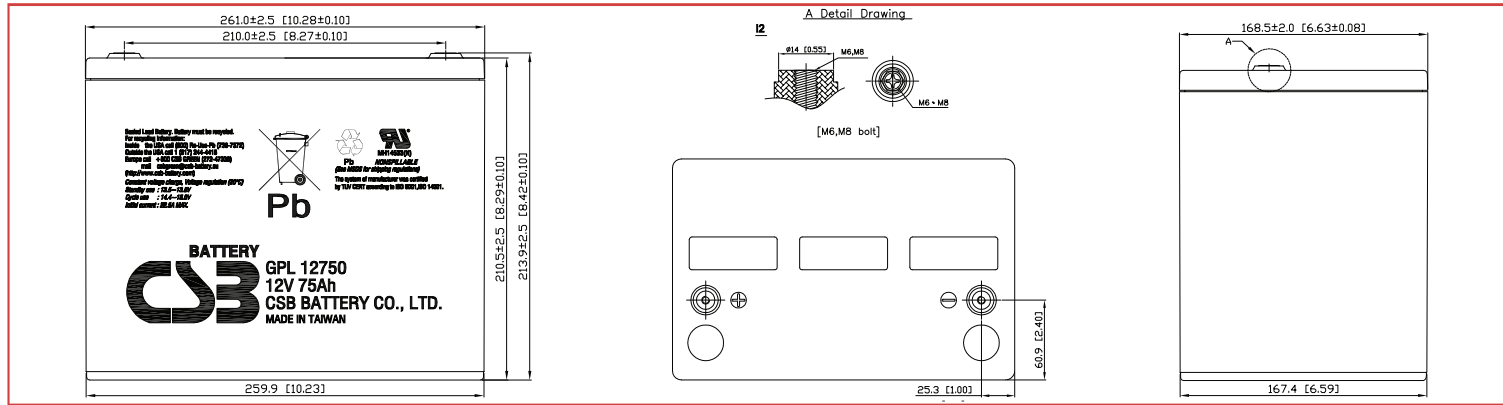
<b>Cells Per Unit</b>	6
<b>Voltage Per Unit</b>	12
<b>Capacity</b>	75 Ah @ 20hr-rate to 1.75V per cell @25°C (77°F)
<b>Weight</b>	Approx. 25.6 kg(56.44 lbs)
<b>Maximum Discharge Current</b>	800A(5sec)
<b>Internal Resistance</b>	Approx. 4.5 mΩ
<b>Operating Temperature Range</b>	Discharge: -15°C~50°C ( 5°F~122°F) Charge: -15°C~40°C ( 5°F~104°F) Storage: -15°C~40°C ( 5°F~104°F)
<b>Nominal Operating Temperature Range</b>	25°C±3°C (77°F±5°F)
<b>Float Charging Voltage</b>	13.5 to 13.8 VDC/unit Average at 25°C (77°F)
<b>Recommended Maximum Charging Current Limit</b>	22.5 A
<b>Equalization and Cycle Service</b>	14.4 to 15.0 VDC/unit Average at 25°C (77°F)
<b>Self Discharge</b>	CSB Batteries can be stored for more than 6 months at 25°C (77°F). Please charge batteries before using . For higher temperatures the time interval will be shorter.
<b>Terminal</b>	I2-Thread lead alloy recessed terminal to accept M6/M8 bolt
<b>Container Material</b>	Polypropylene(UL 94-HB) & Flammability resistance of (UL 94-V0) can be available upon request.



CSB-manufactured **VRLA** (Absorbent **G**lass **M**at type) batteries are UL-recognized components under UL1989.

CSB is also certified by ISO 9001 and ISO 14001.

Dimensions :	Overall Height (H)	Container height (h)	Length (L)	Width (W)
Unit: mm (inch)	213.9±2.5 (8.42±0.1)	210.5±2.5 (8.29±0.1)	261.0±2.5 (10.28±0.1)	168.5±2 (6.63±0.08)



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

F.V/Time	5MIN	10MIN	15MIN	30MIN	60MIN	90MIN	2HR	3HR	5HR	8HR	10HR	20HR
1.60V	298	198	149	87.5	53.5	38.8	30.9	21.9	14.5	9.51	7.85	4.15
1.67V	274	191	146	86.7	53.2	38.6	30.7	21.7	14.4	9.40	7.78	4.13
1.70V	265	187	144	86.1	52.4	38.1	30.5	21.5	14.3	9.34	7.76	4.11
1.75V	234	170	139	84.4	51.4	37.4	29.9	21.4	14.1	9.32	7.63	4.04
1.80V	210	158	131	81.9	50.2	36.8	29.5	21.0	13.8	9.17	7.55	3.97
1.85V	183	145	118	77.0	47.5	34.9	28.1	20.3	13.5	8.88	7.26	3.82

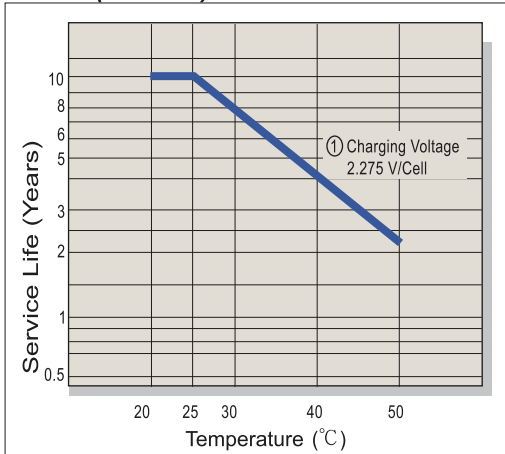
## Constant Power Discharge Characteristics Unit:W (25°C,77°F)

F.V/Time	5MIN	10MIN	15MIN	30MIN	60MIN	90MIN	2HR	3HR	5HR	8HR	10HR	20HR
1.60V	3013	2127	1654	1003	614	456	370	261	173	116	93.5	49.7
1.67V	2818	2060	1635	996	612	452	365	260	172	115	92.9	49.4
1.70V	2729	2022	1609	994	610	450	363	259	171	114	92.7	49.3
1.75V	2553	1927	1558	976	603	447	361	257	170	113	92.3	49.0
1.80V	2371	1815	1478	949	592	440	356	254	168	111	91.0	48.7
1.85V	2075	1667	1348	904	572	422	341	245	162	107	87.5	47.1

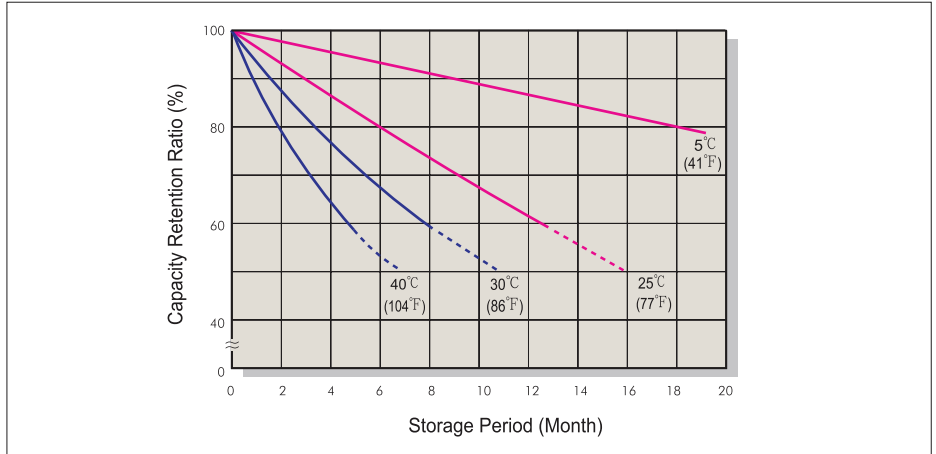
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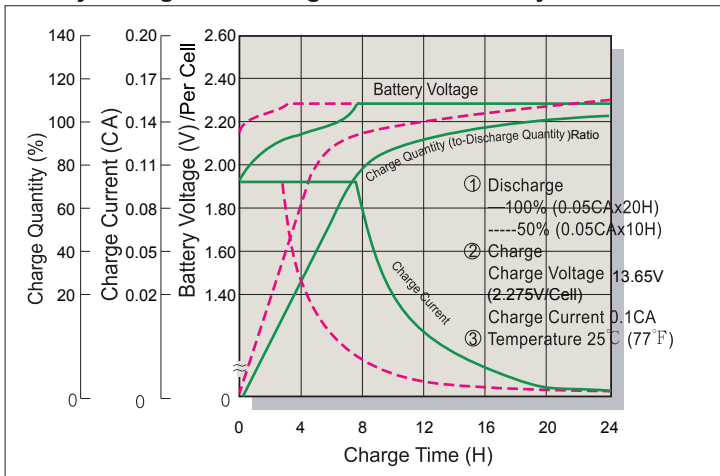
### Trickle (or Float) Service Life



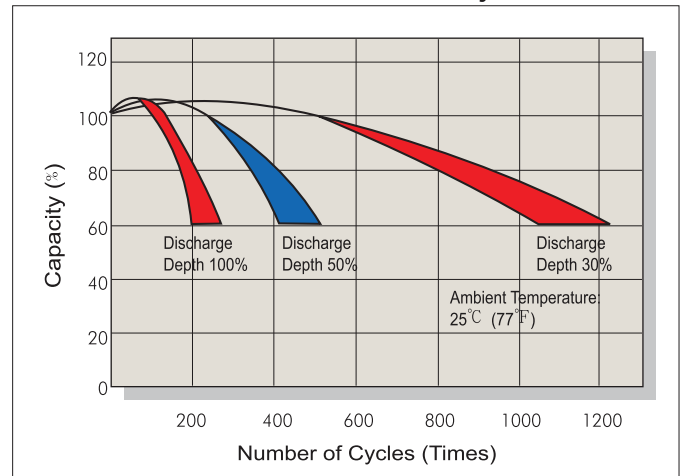
### Capacity Retention Characteristic



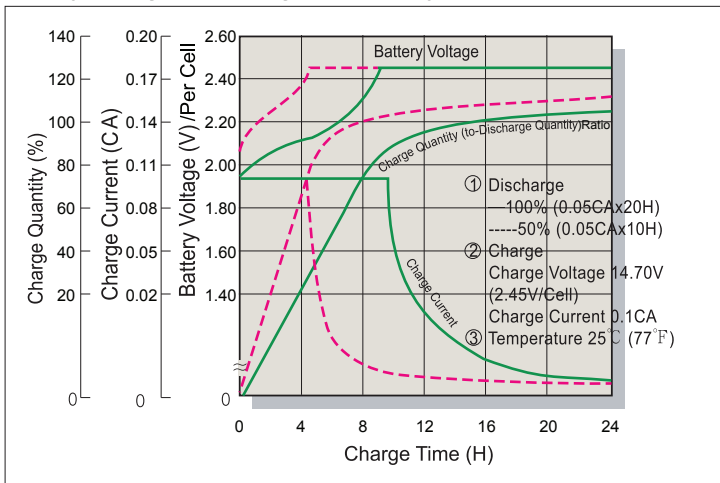
### Battery Voltage and Charge Time for Standby Use



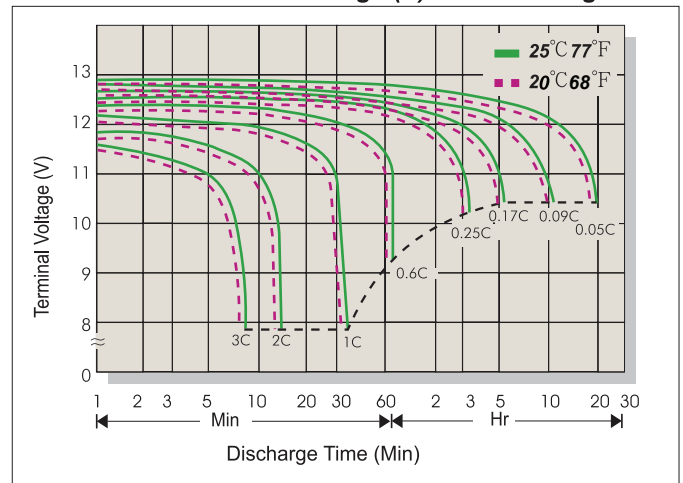
### Cycle Service Life



### Battery Voltage and Charge Time for Cycle Use



### Terminal Voltage (V) and Discharge Time



### Charging Procedures

Application	Charge Voltage(V/Cell)			Max.Charge Current
	Temperature	Set Point	Allowable Range	
Cycle Use	25°C(77°F)	2.45	2.40~2.50	0.3C
Standby	25°C(77°F)	2.275	2.25~2.30	

### Discharge Current VS. Discharge Voltage

Final Discharge Voltage V/Cell	1.75	1.70	1.60	1.30
Discharge Current(A)	0.2C>(A)	0.2C<(A)<0.5C	0.5C<(A)<1.0C	(A)>1.0C

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# GPL 121000 ▶ 12V 100Ah

GPL 121000 is a general purpose battery up to 10 years in standby service or more than 260 cycles at 100% discharge in cycle service . As with all CSB batteries, all are rechargeable , highly efficient , leak proof and maintenance free.



## ► Specification

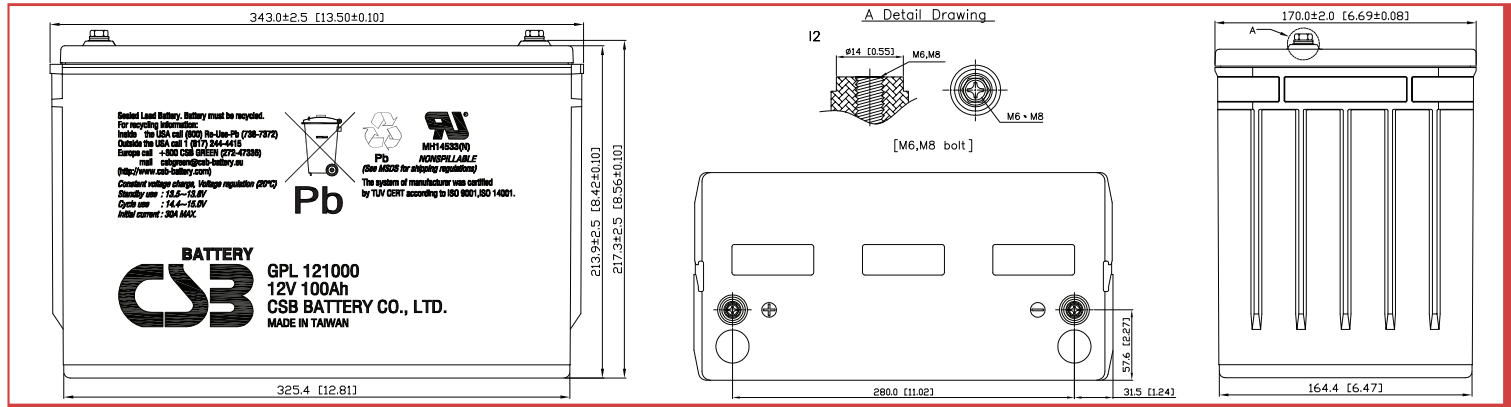
<b>Cells Per Unit</b>	6
<b>Voltage Per Unit</b>	12
<b>Capacity</b>	100Ah @ 20hr-rate to 1.75V per cell @25°C (77°F)
<b>Weight</b>	Approx. 33.5 kg(73.86 lbs)
<b>Maximum Discharge Current</b>	800A(5sec)
<b>Internal Resistance</b>	Approx. 3.5 mΩ
<b>Operating Temperature Range</b>	Discharge: -15°C~50°C ( 5°F~122°F) Charge: -15°C~40°C ( 5°F~104°F) Storage: -15°C~40°C ( 5°F~104°F)
<b>Nominal Operating Temperature Range</b>	25°C±3°C (77°F±5°F)
<b>Float Charging Voltage</b>	13.5 to 13.8 VDC/unit Average at 25°C (77°F)
<b>Recommended Maximum Charging Current Limit</b>	30 A
<b>Equalization and Cycle Service</b>	14.4 to 15.0 VDC/unit Average at 25°C (77°F)
<b>Self Discharge</b>	CSB Batteries can be stored for more than 6 months at 25°C (77°F). Please charge batteries before using . For higher temperatures the time interval will be shorter.
<b>Terminal</b>	I2-Thread lead alloy recessed terminal to accept M6/M8 bolt
<b>Container Material</b>	Polypropylene(UL 94-HB) & Flammability resistance of (UL 94-V0) can be available upon request.



CSB-manufactured **VRLA (Absorbent Glass Mat type)** batteries are UL-recognized components under UL1989.

CSB is also certified by ISO 9001 and ISO 14001.

► Dimensions :	Overall Height (H)	Container height (h)	Length (L)	Width (W)
	Unit: mm (inch)	217.3±2.5 (8.56±0.1)	213.9±2.5 (8.42±0.1)	343.0±2.5 (13.50±0.1)



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

F.V/Time	5MIN	10MIN	15MIN	30MIN	60MIN	90MIN	2HR	3HR	5HR	8HR	10HR	20HR
1.60V	423	277	212	127	73.0	52.1	41.1	29.1	18.9	12.2	10.0	5.27
1.67V	375	266	207	125	72.4	51.7	40.7	29.0	18.8	12.1	9.93	5.22
1.70V	355	258	203	124	71.8	51.4	40.6	28.7	18.6	12.0	9.88	5.20
1.75V	317	240	194	120	71.1	50.9	40.2	28.6	18.5	11.9	9.81	5.19
1.80V	283	219	183	115	68.9	49.6	39.3	27.9	18.2	11.8	9.66	5.09
1.85V	245	196	164	106	65.2	47.2	37.6	26.8	17.4	11.4	9.45	4.92

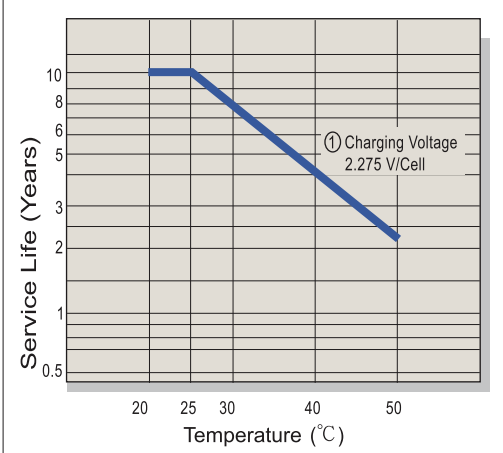
## Constant Power Discharge Characteristics Unit:W (25°C,77°F)

F.V/Time	5MIN	10MIN	15MIN	30MIN	60MIN	90MIN	2HR	3HR	5HR	8HR	10HR	20HR
1.60V	4159	2950	2331	1436	849	610	482	342	223	153	125	63.5
1.67V	4008	2837	2273	1417	843	607	480	340	222	152	124	63.3
1.70V	3863	2772	2252	1404	840	604	478	339	221	151	123	63.2
1.75V	3572	2623	2181	1372	830	599	475	337	220	150	122	62.4
1.80V	3184	2442	2049	1316	809	585	465	331	217	148	121	61.4
1.85V	2769	2227	1856	1234	767	557	444	320	210	142	117	60.0

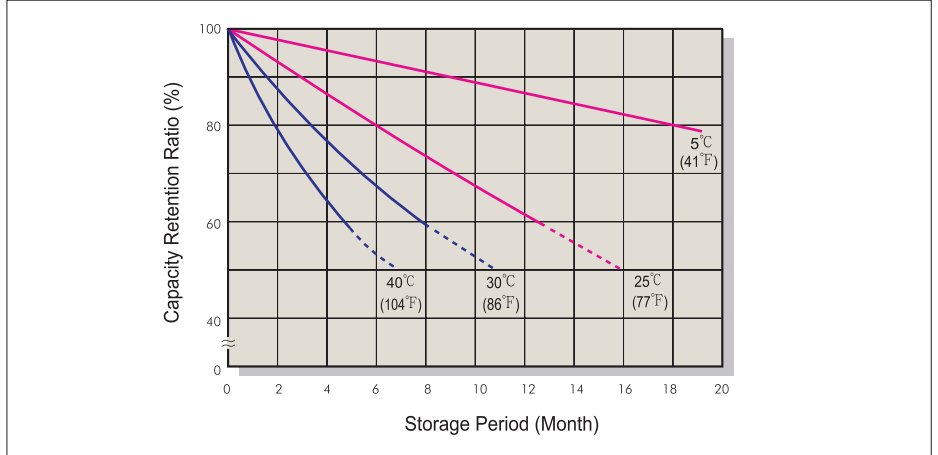
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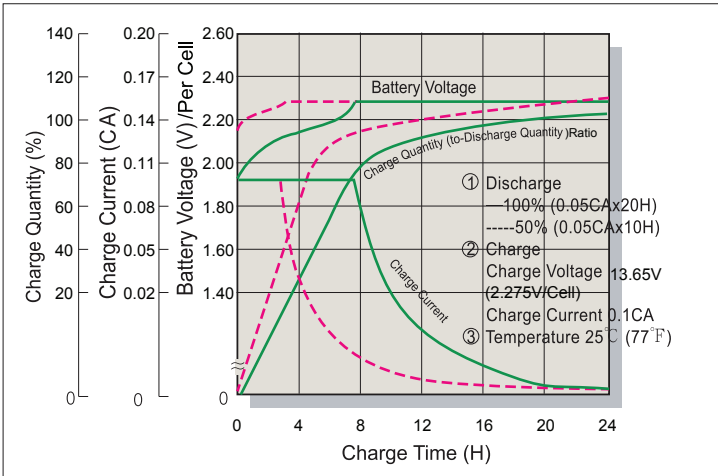
### Trickle (or Float) Service Life



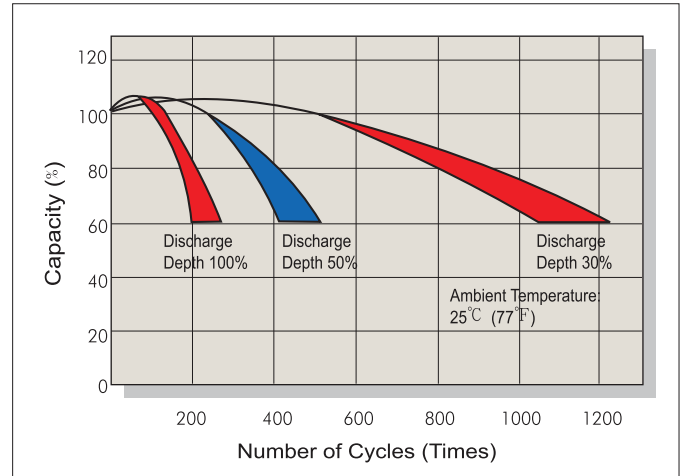
### Capacity Retention Characteristic



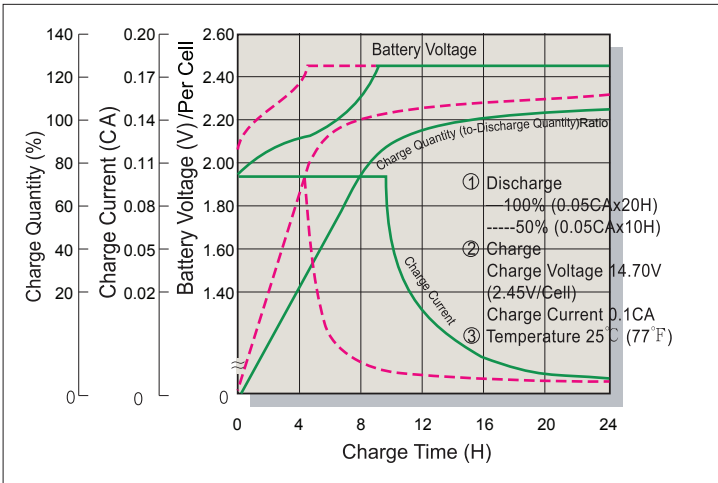
### Battery Voltage and Charge Time for Standby Use



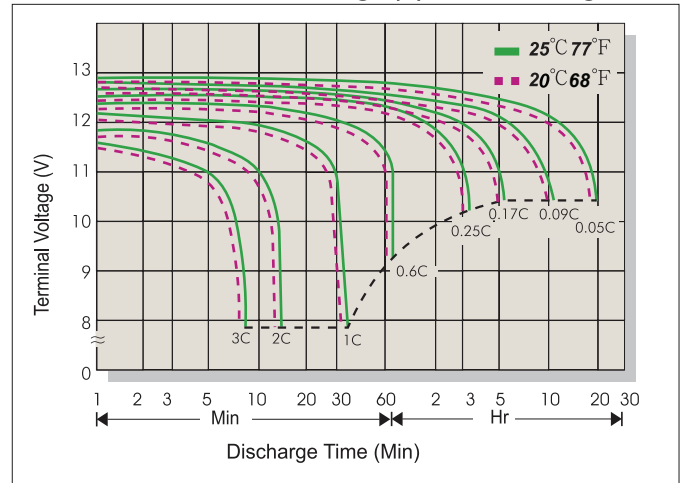
### Cycle Service Life



### Battery Voltage and Charge Time for Cycle Use



### Terminal Voltage (V) and Discharge Time



### Charging Procedures

Application	Charge Voltage(V/Cell)			Max.Charge Current
	Temperature	Set Point	Allowable Range	
Cycle Use	25°C(77°F)	2.45	2.40~2.50	0.3C
Standby	25°C(77°F)	2.275	2.25~2.30	

### Discharge Current VS. Discharge Voltage

Final Discharge Voltage V/Cell	1.75	1.70	1.60	1.30
Discharge Current(A)	0.2C>(A)	0.2C<(A)<0.5C	0.5C<(A)<1.0C	(A)>1.0C

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# HR 1221W ▶ 12V 21W

HR 1221W is specially designed for high efficient discharge application. Its characteristics are high energy density, small footprint and high discharge efficiency. It can be used for more than 260 cycles at 100% discharge in cycle service, up to 5 years in standby service.



CSB-manufactured **VRLA (Absorbent Glass Mat type)** batteries are UL-recognized components under UL1989.

CSB is also certified by ISO 9001 and ISO 14001.

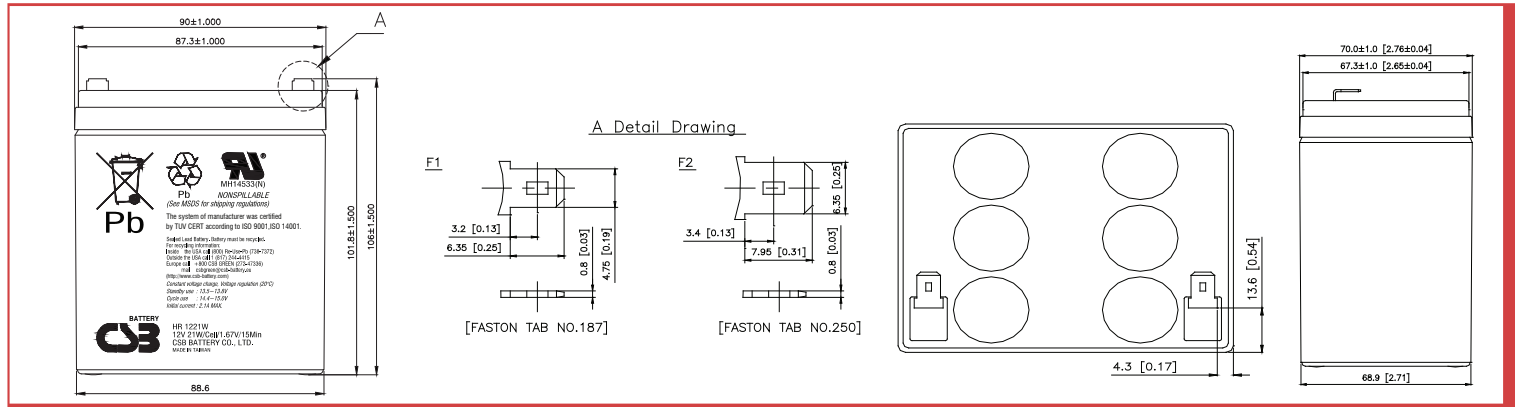
## Specification

Cells Per Unit	6
Voltage Per Unit	12
Capacity	21W @ 15min-rate to 1.67V per cell @25 °C (77°F)
Weight	Approx. 1.80 kg(3.97 lbs)
Maximum Discharge Current	60A/90A(5sec)
Internal Resistance	Approx. 25 mΩ
Operating Temperature Range	Discharge: -15°C~50°C ( 5°F~122°F) Charge: -15 °C~40°C ( 5°F~104°F) Storage: -15°C~40°C ( 5°F~104°F)
Nominal Operating Temperature Range	25°C±3°C(77°F±5°F)
Float Charging Voltage	13.5 to 13.8 VDC/unit Average at 25°C(77°F)
Recommended Maximum Charging Current Limit	2.1A
Equalization and Cycle Service	14.4 to 15.0 VDC/unit Average at 25°C(77°F)
Self Discharge	CSB Batteries can be stored for more than 6 months at 25°C(77°F). Please charge batteries before using. For higher temperatures the time interval will be shorter.
Terminal	F1/F2-Faston Tab187/250
Container Material	ABS(UL 94-HB) & Flammability resistance of (UL 94-V0) can be available upon request.

## Dimensions :

Unit: mm (inch)

Overall Height (H)	Container height (h)	Length (L)	Width (W)
106.0±1.5 (4.17±0.06)	101.8±1.5 (4.01±0.06)	90.0±1.0 (3.54±0.04)	70.0±1.0 (2.76±0.04)



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

F.V/Time	2MIN	4MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	60MIN	90MIN
1.60V	46.4	31.2	24.4	20.3	17.4	12.9	10.4	7.29	4.02	2.83
1.67V	43.1	29.7	23.6	19.9	17.1	12.5	10.1	7.18	4.00	2.71
1.70V	41.3	28.9	23.2	19.7	16.8	12.3	9.93	7.14	3.99	2.65
1.75V	37.4	27.4	22.2	19.0	16.3	12.1	9.70	7.07	3.98	2.56
1.80V	33.1	25.2	21.0	18.2	15.7	11.8	9.51	7.00	3.96	2.46
1.85V	28.6	22.8	19.2	16.9	14.8	11.5	9.29	6.92	3.95	2.36

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

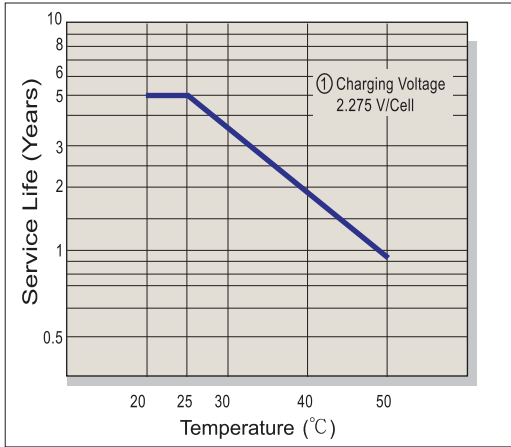
F.V/Time	2MIN	4MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	60MIN	90MIN
1.60V	557	374	293	244	209	154	123	87.5	48.2	33.9
1.67V	515	357	284	238	203	150	120	86.6	48.1	32.5
1.70V	495	348	279	234	200	149	119	86.2	48.0	31.9
1.75V	451	329	266	226	194	145	116	85.8	47.9	30.7
1.80V	397	302	250	216	188	141	113	85.4	47.8	29.5
1.85V	343	275	237	208	181	138	111	85.3	47.7	28.3

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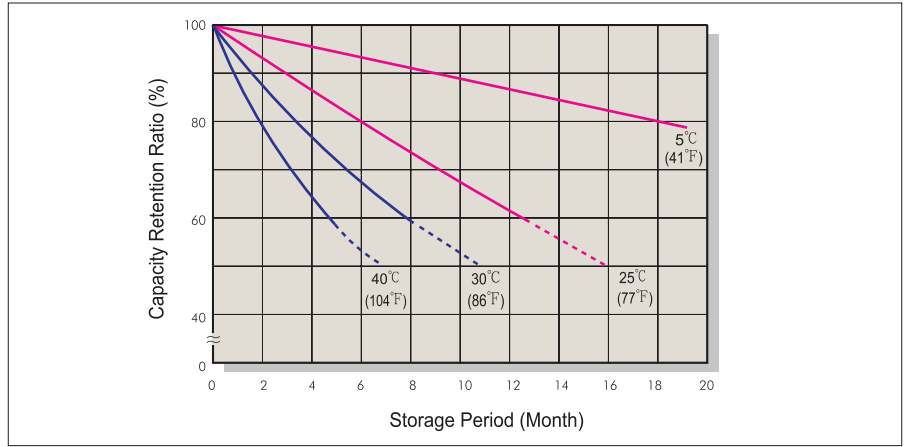




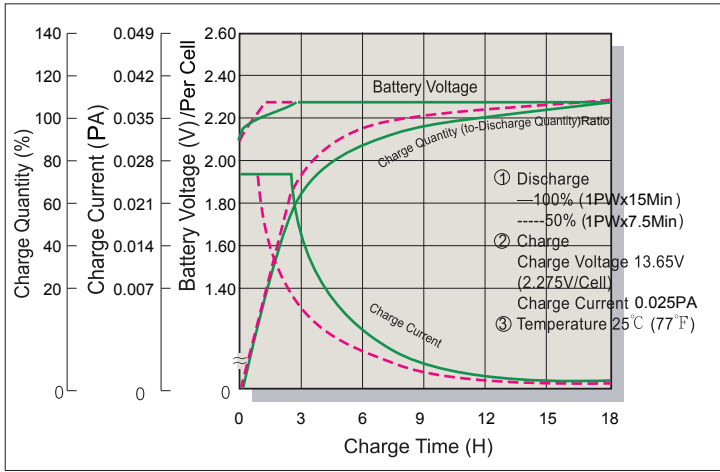
### Trickle (or Float) Service Life



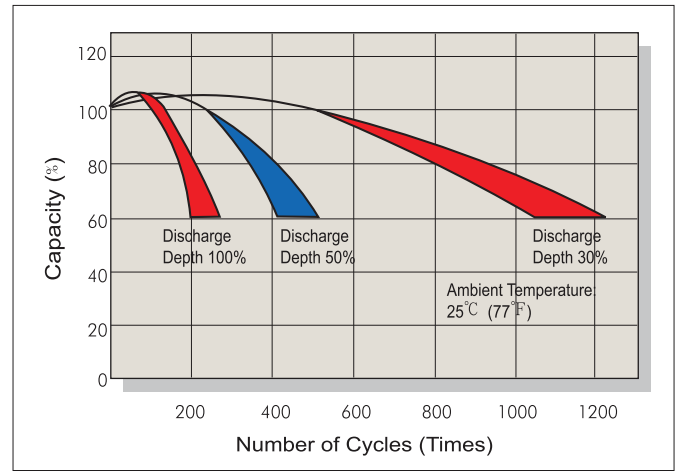
### Capacity Retention Characteristic



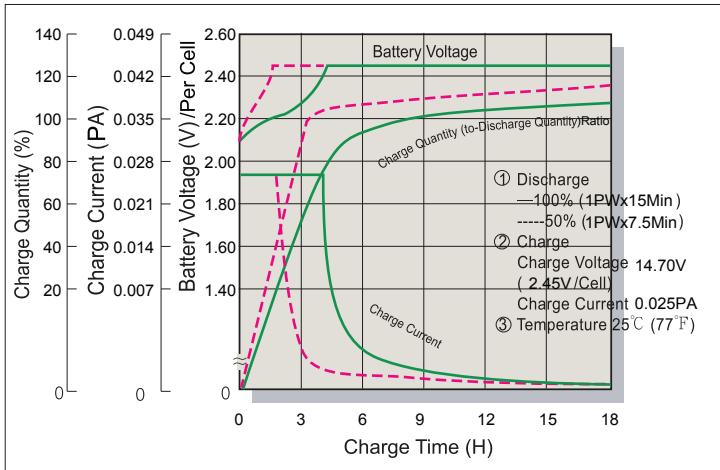
### Battery Voltage and Charge Time for Standby Use



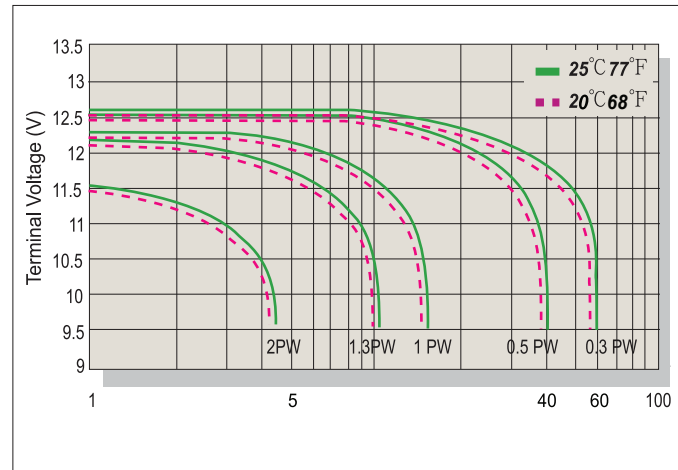
### Cycle Service Life



### Battery Voltage and Charge Time for Cycle Use



### Terminal Voltage (V) and Discharge Time



### Charging Procedures

Application	Charge Voltage(V/Cell)			Max.Charge Current
	Temperature	Set Point	Allowable Range	
Cycle Use	25°C(77°F)	2.45	2.40~2.50	0.1PA
Standby	25°C(77°F)	2.275	2.25~2.30	

### Discharge Current VS. Discharge Voltage

Final Discharge Voltage V/Cell	1.75	1.70	1.60	1.30
Discharge Power(W)	0.1P>(W)	0.1P≤(W)<0.25P	0.25P≤(W)<1.0P	(W)≥1.0P

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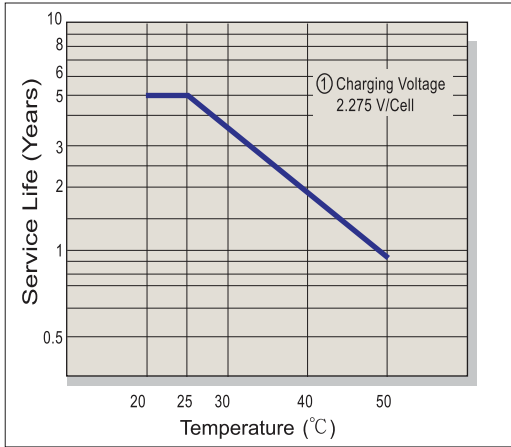
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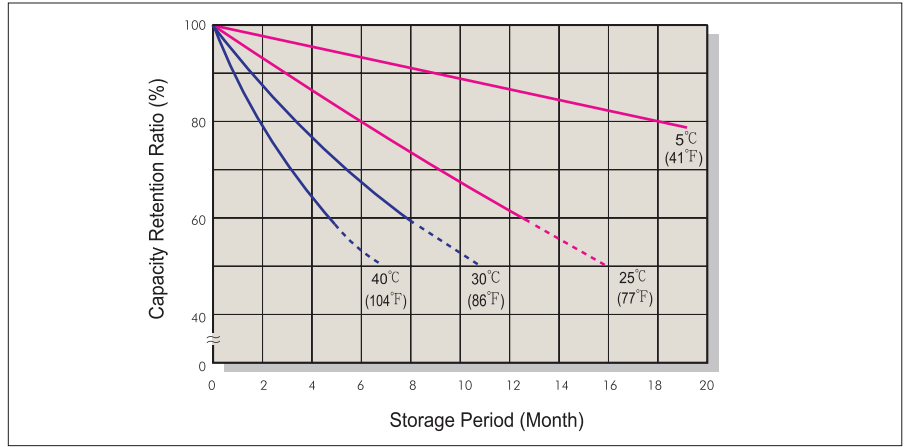
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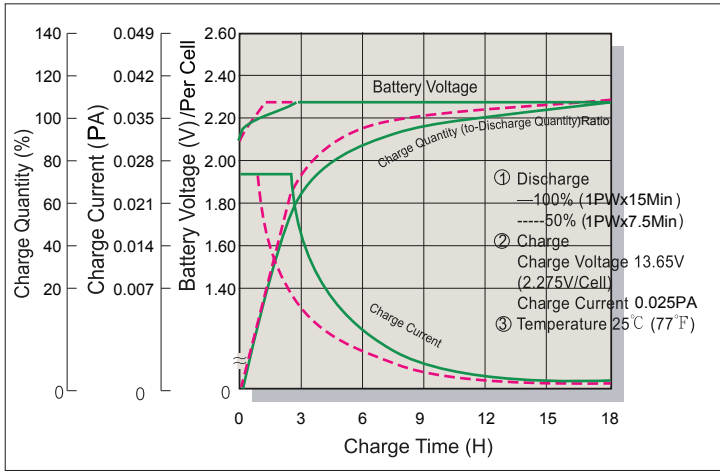
### Trickle (or Float) Service Life



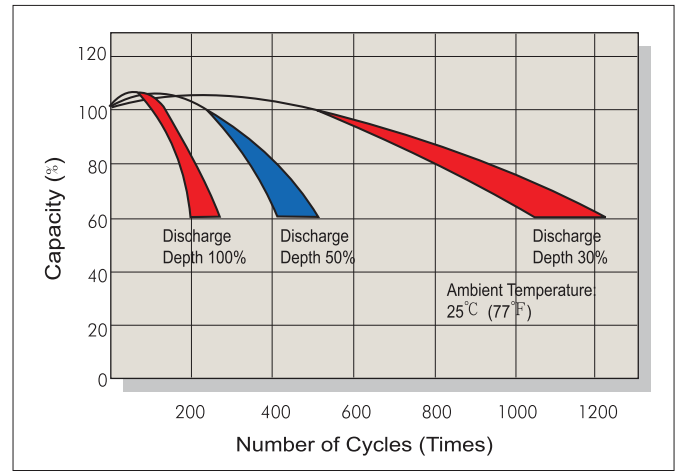
### Capacity Retention Characteristic



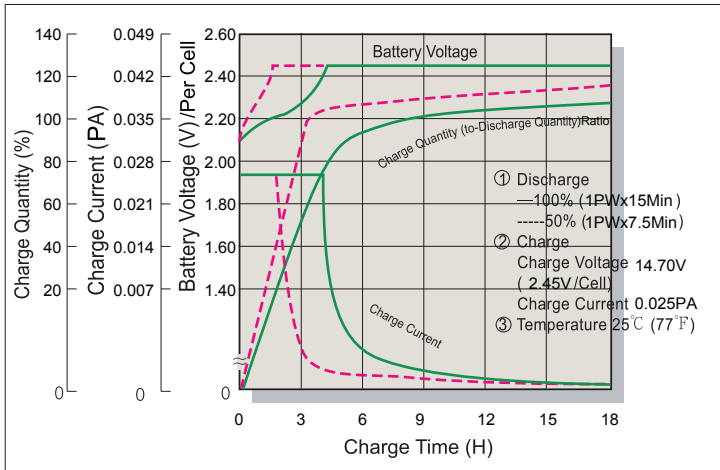
### Battery Voltage and Charge Time for Standby Use



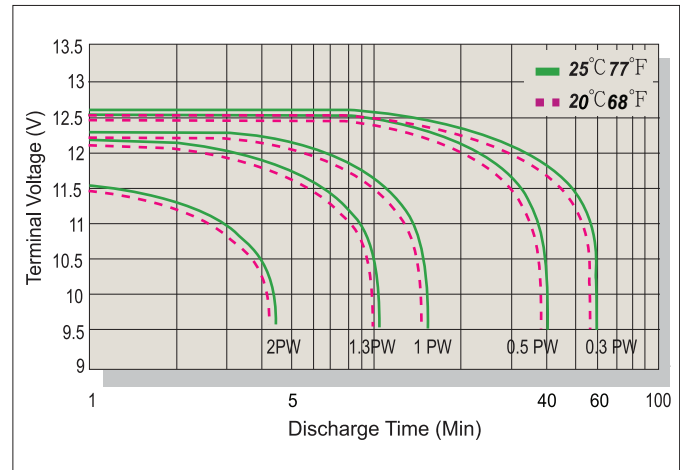
### Cycle Service Life



### Battery Voltage and Charge Time for Cycle Use



### Terminal Voltage (V) and Discharge Time



### Charging Procedures

Application	Charge Voltage(V/Cell)			Max.Charge Current
	Temperature	Set Point	Allowable Range	
Cycle Use	25°C(77°F)	2.45	2.40~2.50	0.1PA
Standby	25°C(77°F)	2.275	2.25~2.30	

### Discharge Current VS. Discharge Voltage

Final Discharge Voltage V/Cell	1.75	1.70	1.60	1.30
Discharge Power(W)	0.1P>(W)	0.1P≤(W)<0.25P	0.25P≤(W)<1.0P	(W)≥1.0P

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# HR 1234W F2

## 12V 34W

HR 1234W F2 is specially designed for high efficient discharge application. Its characteristics are small volume, light weight and high discharge efficiency. It can be used for more than 260 cycles at 100% discharge in cycle service, or three to five years in standby service.



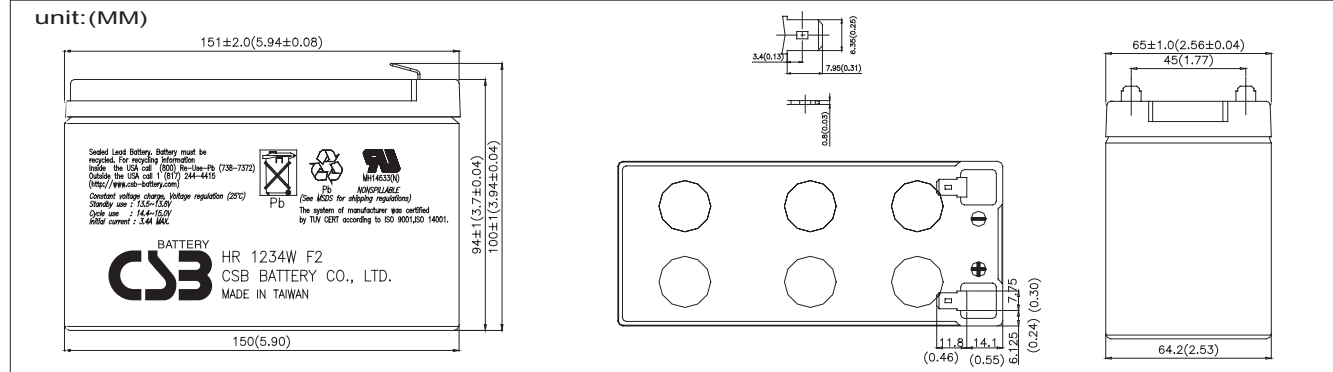
### Specification

<b>Cells Per Unit</b>	6
<b>Voltage Per Unit</b>	12
<b>Capacity</b>	34W @ 15minute-rate to 1.67V per cell @25 °C(77°F)
<b>Weight</b>	Approx. 2.60kg(5.73 lbs)
<b>Maximum Discharge Current</b>	130A(5sec)
<b>Internal Resistance</b>	Approx. 20mΩ
<b>Operating Temperature Range</b>	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)
<b>Nominal Operating Temperature Range</b>	25°C±3°C(77°F±5°F)
<b>Float Charging Voltage</b>	13.5 to 13.8 VDC/unit Average at 25°C(77°F)
<b>Recommended Maximum Charging Current Limit</b>	3.4A
<b>Equalization and Cycle Service</b>	14.4 to 15.0 VDC/unit Average at 25°C(77°F)
<b>Self Discharge</b>	CSB Batteries can be stored for more than 6 months at 25°C(77°F). Please charge batteries before using. For higher temperatures the time interval will be shorter.
<b>Terminal</b>	Faston Tab 250
<b>Container Material</b>	-ABS (UL94-HB)*Flammability resistance of UL94-V2 can be available upon request.



CSB-manufactured batteries are UL-recognized components under UL924 as well as ISO 9001 and ISO 14001 certified.

### Dimensions



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

F.V/Time	2MIN	4MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	60MIN	90MIN
1.60V	60.2	44.9	35.0	29.9	25.8	19.0	15.0	10.8	5.83	4.67
1.67V	56.1	42.0	32.7	28.3	24.4	18.2	14.1	10.4	5.61	4.48
1.70V	54.3	40.8	31.7	27.7	23.8	17.8	13.8	10.3	5.52	4.40
1.75V	51.5	38.6	30.6	26.6	22.6	17.2	13.5	10.1	5.50	4.35
1.80V	48.7	36.5	29.6	25.6	21.4	16.6	13.3	9.92	5.47	4.30
1.85V	45.8	34.4	28.5	24.5	20.3	16.0	13.1	9.76	5.45	4.25

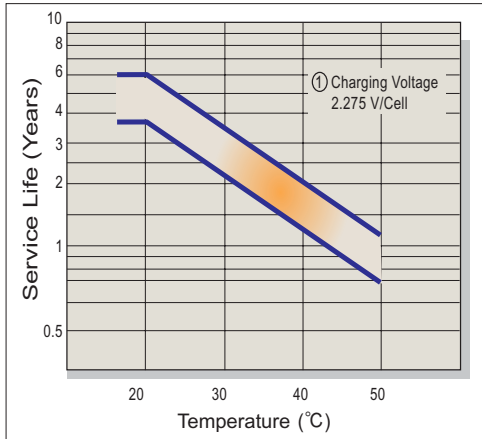
### Constant Power Discharge Characteristics Unit:W (25°C, 77°F)

F.V/Time	2MIN	4MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	60MIN	90MIN
1.60V	722	539	420	359	309	228	180	130	70.0	56.0
1.67V	673	504	392	340	292	218	170	125	67.3	53.8
1.70V	652	489	380	332	285	214	165	123	66.2	52.8
1.75V	618	464	368	320	271	207	163	121	65.9	52.2
1.80V	584	438	355	307	257	199	160	119	65.6	51.6
1.85V	550	413	343	295	243	192	158	117	65.3	51.0

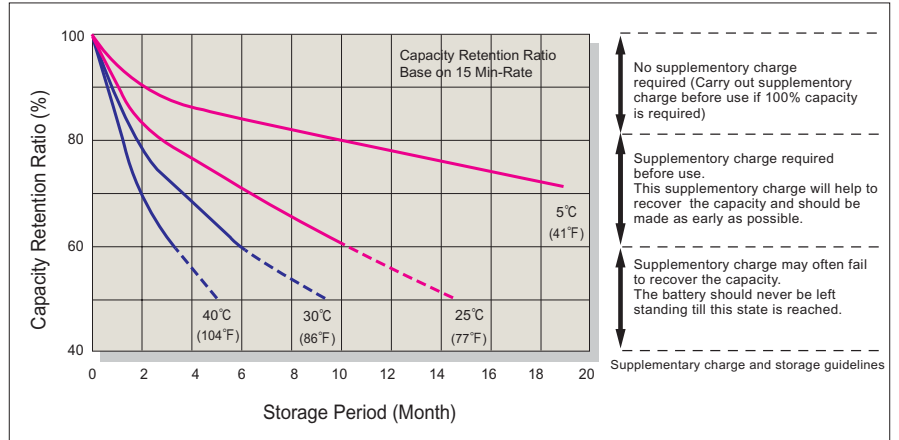
- All mentioned values are average values.
- Low rate discharge mode (over 90 mins.) is not recommended.



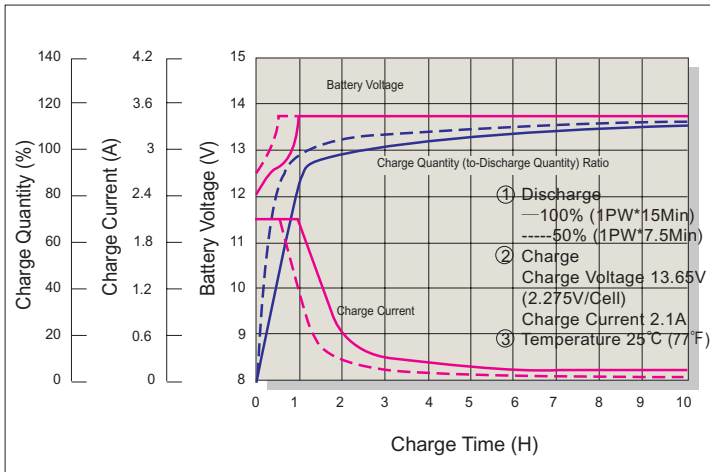
## Trickle (or Float) Service Life



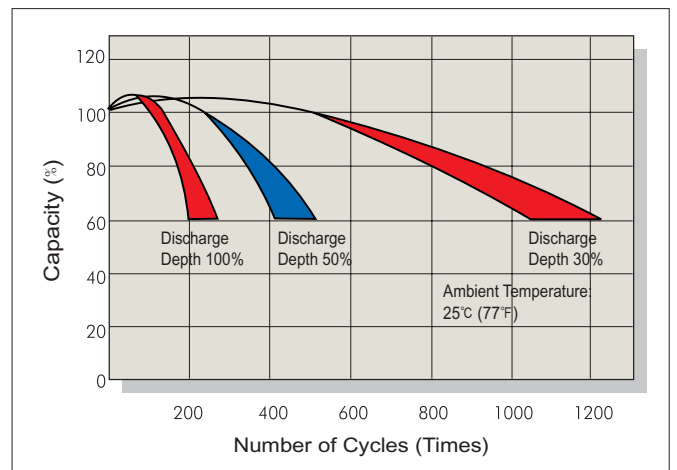
## Capacity Retention Characteristic



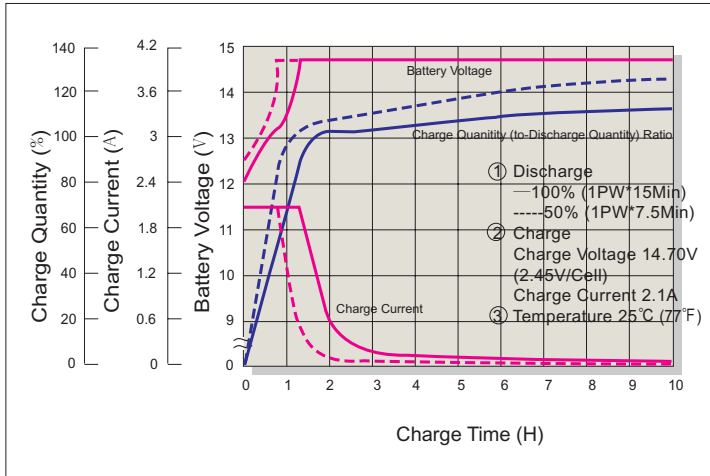
## Battery Voltage and Charge Time for Standby Use



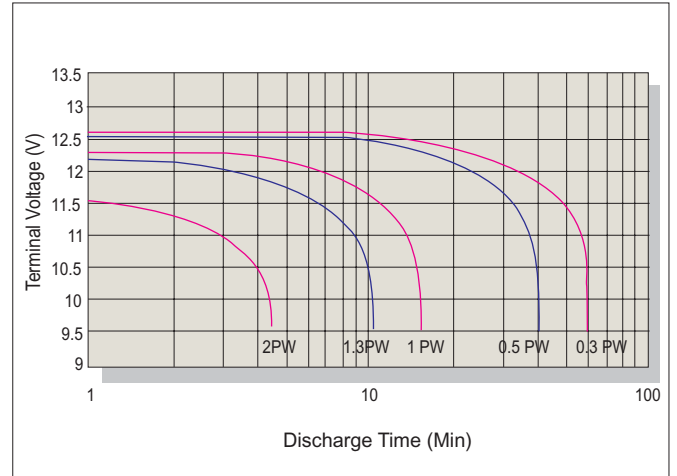
## Cycle Service Life



## Battery Voltage and Charge Time for Cycle Use



## 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	
Cycle Use	25°C (77°F)	2.45	2.40~2.50	0.3C
Standby	25°C (77°F)	2.275	2.25~2.30	

## Discharge Current VS. Discharge Voltage

Final Discharge Voltage V/Cell	1.75	1.70	1.55	1.30
Discharge Current (A)	0.2C>(A)	0.2C<(A)<0.5C	0.5C<(A)<1.0C	(A)>1.0C

# HR 1251W F2

## 12V 51W

HR 1251W F2 is specially designed for high efficient discharge application. Its characteristics are small volume, light weight and high discharge efficiency. It can be used for more than 260 cycles at 100% discharge in cycle service, or three to five years in standby service.



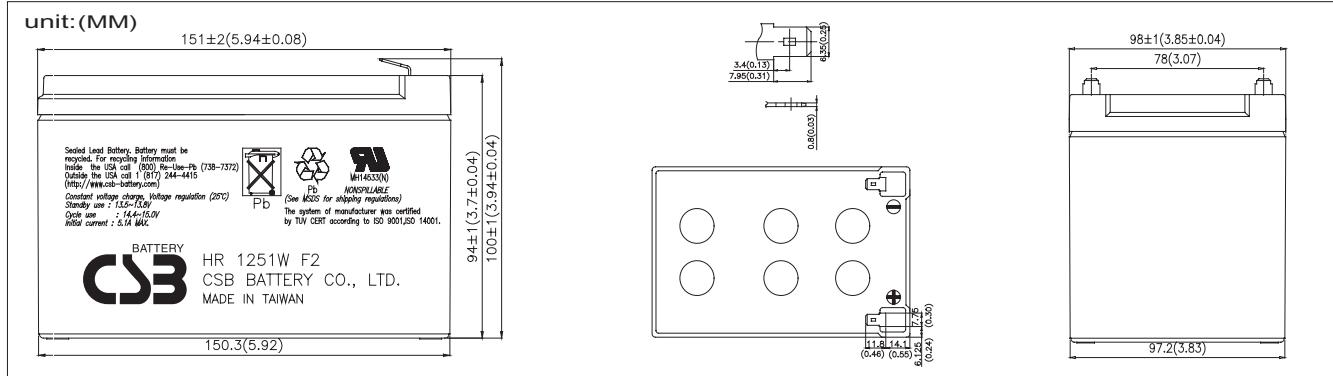
### Specification

<b>Cells Per Unit</b>	6
<b>Voltage Per Unit</b>	12
<b>Capacity</b>	51W @ 15minute-rate to 1.67V per cell @25 °C(77°F)
<b>Weight</b>	Approx. 4.20kg(9.26 lbs)
<b>Maximum Discharge Current</b>	180A(5sec)
<b>Internal Resistance</b>	Approx. 16mΩ
<b>Operating Temperature Range</b>	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)
<b>Nominal Operating Temperature Range</b>	25°C±3°C(77°F±5°F)
<b>Float Charging Voltage</b>	13.5 to 13.8 VDC/unit Average at 25°C(77°F)
<b>Recommended Maximum Charging Current Limit</b>	5.1A
<b>Equalization and Cycle Service</b>	14.4 to 15.0 VDC/unit Average at 25°C(77°F)
<b>Self Discharge</b>	CSB Batteries can be stored for more than 6 months at 25°C(77°F). Please charge batteries before using. For higher temperatures the time interval will be shorter.
<b>Terminal</b>	Faston Tab 187/250
<b>Container Material</b>	-ABS (UL94-HB)*Flammability resistance of UL94-V2 can be available upon request.



CSB-manufactured batteries are UL-recognized components under UL924 as well as ISO 9001 and ISO 14001 certified.

### Dimensions



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

F.V/Time	2MIN	4MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	60MIN	90MIN
1.60V	85.8	64.0	49.9	42.6	36.8	27.1	21.4	15.4	8.33	6.65
1.67V	82.8	62.0	48.2	41.8	36.0	26.8	20.8	15.4	8.30	6.62
1.70V	81.5	61.1	47.5	41.5	35.7	26.8	20.6	15.3	8.28	6.60
1.75V	77.2	57.9	45.9	39.9	33.9	25.8	20.3	15.1	8.24	6.52
1.80V	72.9	54.8	44.3	38.3	32.2	24.8	19.9	14.9	8.20	6.44
1.85V	68.6	51.6	42.7	36.7	30.4	23.9	19.6	14.7	8.16	6.36

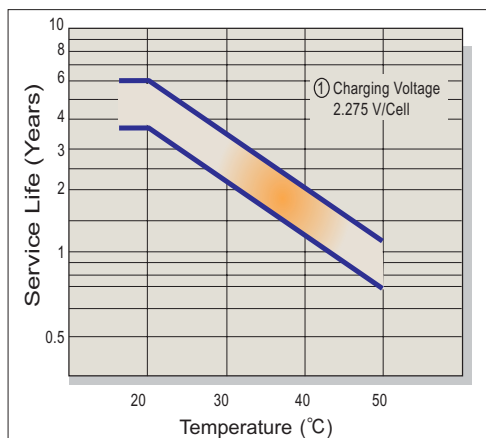
### Constant Power Discharge Characteristics Unit:W (25°C, 77°F)

F.V/Time	2MIN	4MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	60MIN	90MIN
1.60V	1030	768	599	511	441	325	257	185	100	79.8
1.67V	994	744	579	502	432	322	250	184	99.6	79.4
1.70V	978	733	570	498	428	321	247	184	99.4	79.2
1.75V	927	695	551	479	407	310	243	182	98.9	78.3
1.80V	875	657	532	460	386	298	239	179	98.4	77.3
1.85V	824	619	513	441	365	287	235	177	97.9	76.4

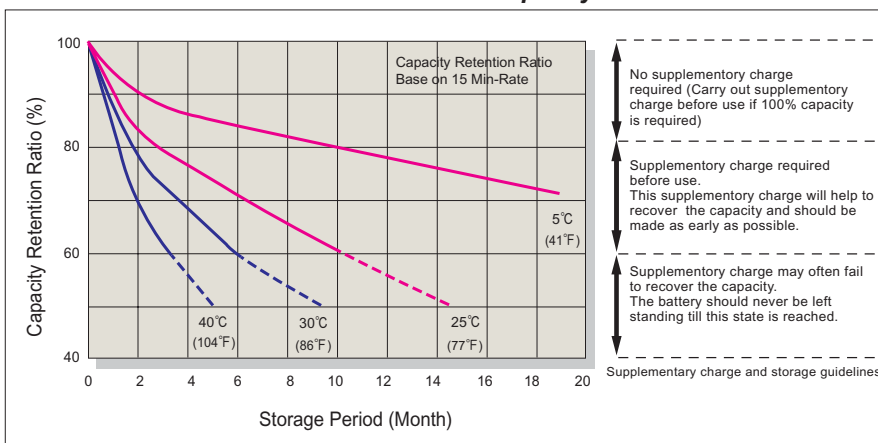
- All mentioned values are average values.
- Low rate discharge mode (over 90 mins.) is not recommended.



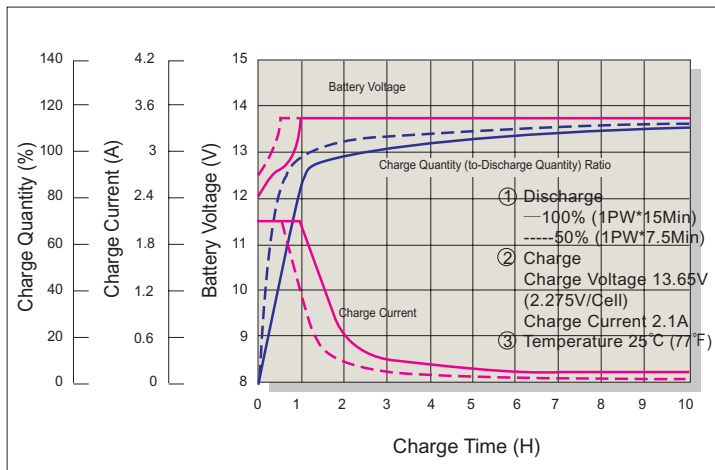
## Trickle (or Float) Service Life



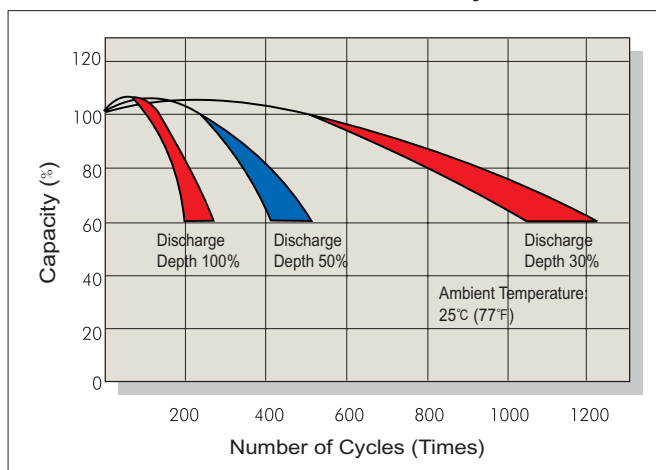
## Capacity Retention Characteristic



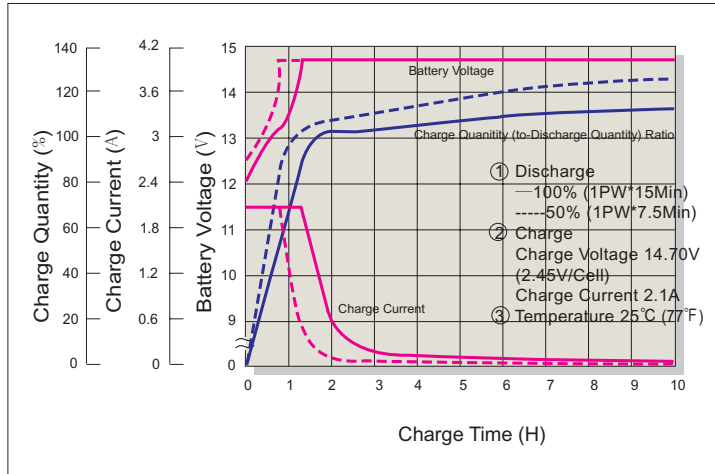
## Battery Voltage and Charge Time for Standby Use



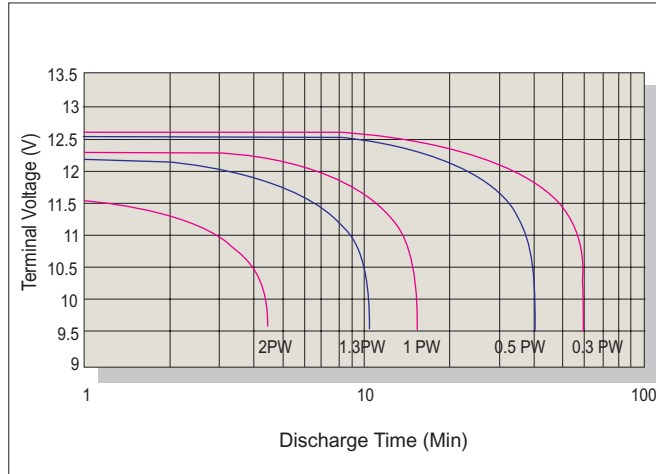
## Cycle Service Life



## Battery Voltage and Charge Time for Cycle Use



## 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	
Cycle Use	25°C (77°F)	2.45	2.40~2.50	0.3C
Standby	25°C (77°F)	2.275	2.25~2.30	

## Discharge Current VS. Discharge Voltage

Final Discharge Voltage V/Cell	1.75	1.70	1.55	1.30
Discharge Current (A)	0.2C>(A)	0.2C<(A)<0.5C	0.5C<(A)<1.0C	(A)>1.0C

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# HR 1290W ▶ 12V 90W

HR 1290W is specially designed for high efficient discharge application. Its characteristics are high energy density, small footprint and high discharge efficiency. It can be used for more than 260 cycles at 100% discharge in cycle service, up to 5 years in standby service.



## ► Specification

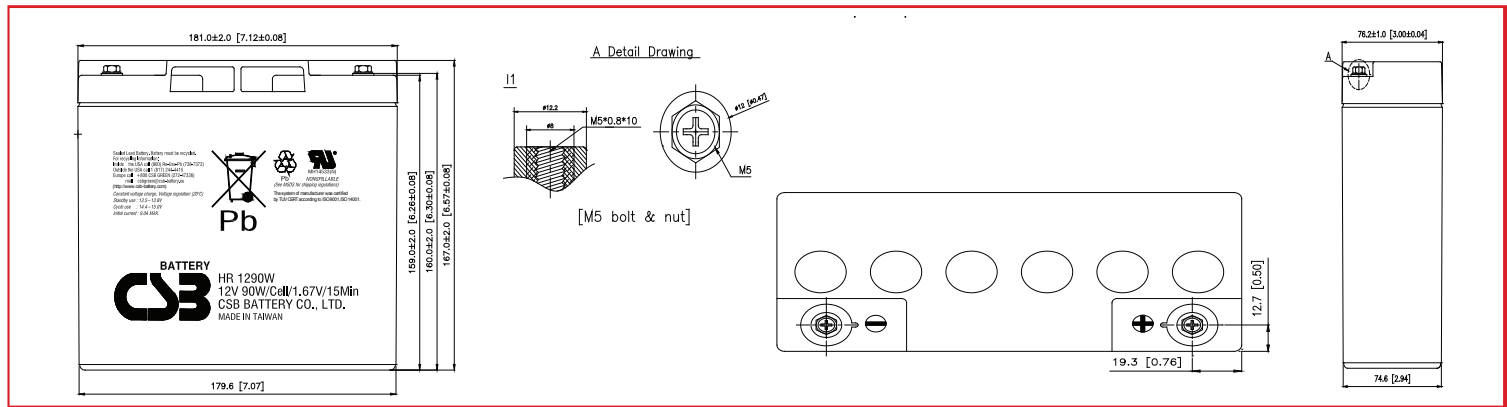
Cells Per Unit	6
Voltage Per Unit	12
Capacity	90W @ 15min-rate to 1.67V per cell @25 °C(77°F)
Weight	Approx. 6.80 kg(14.99 lbs)
Maximum Discharge Current	300A(5sec)
Internal Resistance	Approx. 9.5mΩ
Operating Temperature Range	Discharge: -15°C~50°C ( 5°F~122°F) Charge: -15 °C~40°C ( 5°F~104°F) Storage: -15°C~40°C ( 5°F~104°F)
Nominal Operating Temperature Range	25°C±3°C(77°F±5°F)
Float Charging Voltage	13.5 to 13.8 VDC/unit Average at 25°C(77°F)
Recommended Maximum Charging Current Limit	9A
Equalization and Cycle Service	14.4 to 15.0 VDC/unit Average at 25°C(77°F)
Self Discharge	CSB Batteries can be stored for more than 6 months at 25°C(77°F). Please charge batteries before using. For higher temperatures the time interval will be shorter.
Terminal	I1-Thread lead alloy recessed terminal to accept M5 bolt
Container Material	ABS(UL 94-HB) & Flammability resistance of (UL 94-V0) can be available upon request.



CSB-manufactured **VRLA** (Absorbent Glass Mat type) batteries are UL-recognized components under UL1989.

CSB is also certified by ISO 9001 and ISO 14001.

Dimensions :	Overall Height (H)	Container height (h)	Length (L)	Width (W)
Unit: mm (inch)	167.0±2.0 (6.57±0.08)	167.0±2.0 (6.57±0.08)	181.0±2.0 (7.12±0.08)	76.2±1.0 (3.00±0.04)



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

F.V/Time	2MIN	4MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	60MIN	90MIN
1.60V	177	124	95.8	79.4	68	48.7	38.4	27.3	15.8	11.5
1.67V	156	114	90.2	77.6	65.2	48.4	38.1	27	15.7	11.4
1.70V	147	109	87.8	76.4	63.9	47.6	37.7	26.9	15.6	11.3
1.75V	131	102	82.9	72.8	61.1	46.2	37	26.3	15.5	11.2
1.80V	115	92.5	77.2	67.7	58	44	35.5	25.5	15.2	11.1
1.85V	98.6	82.9	70.8	60.8	53.3	40.7	32.6	23.8	14.5	10.6

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

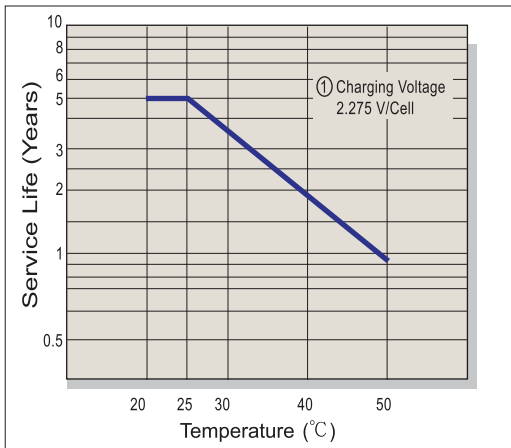
F.V/Time	2MIN	4MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	60MIN	90MIN
1.60V	1701	1282	1041	868	753	544	429	309	183	133
1.67V	1570	1193	989	850	734	540	428	307	182	132
1.70V	1509	1155	962	838	726	534	426	305	181	131
1.75V	1398	1087	913	802	704	520	416	300	179	130
1.80V	1282	1011	862	756	665	501	402	295	177	129
1.85V	1166	926	797	687	608	461	375	277	168	124

Ratings presented herein are subject to revision without notice. Please refer to [www.csb-battery.com](http://www.csb-battery.com) to confirm the latest version.

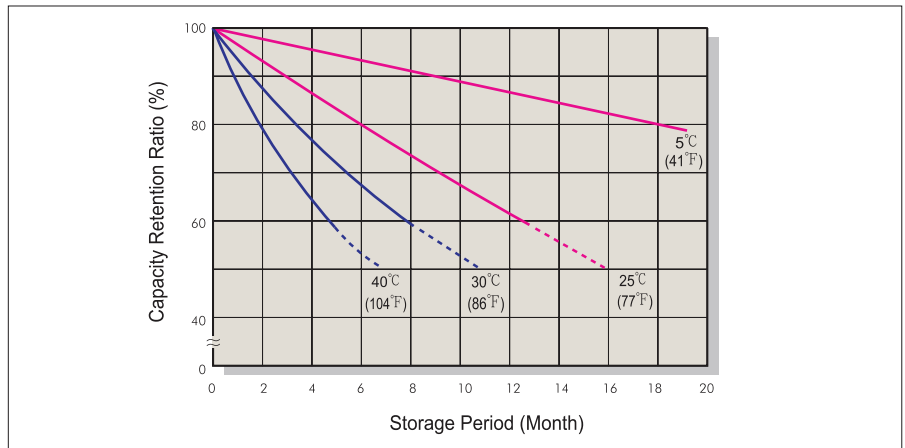




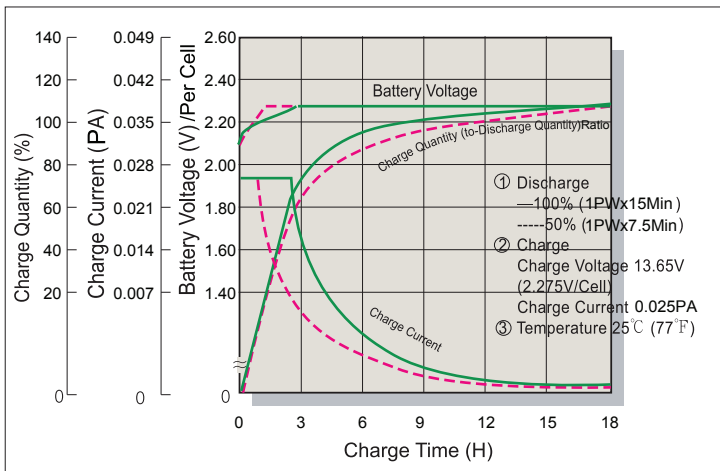
### Trickle (or Float) Service Life



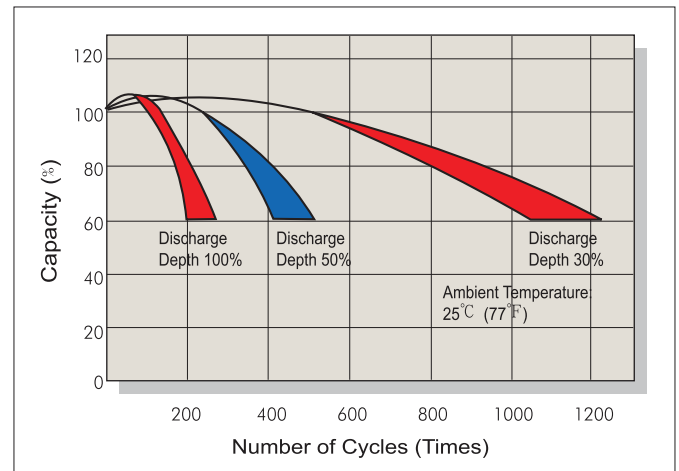
### Capacity Retention Characteristic



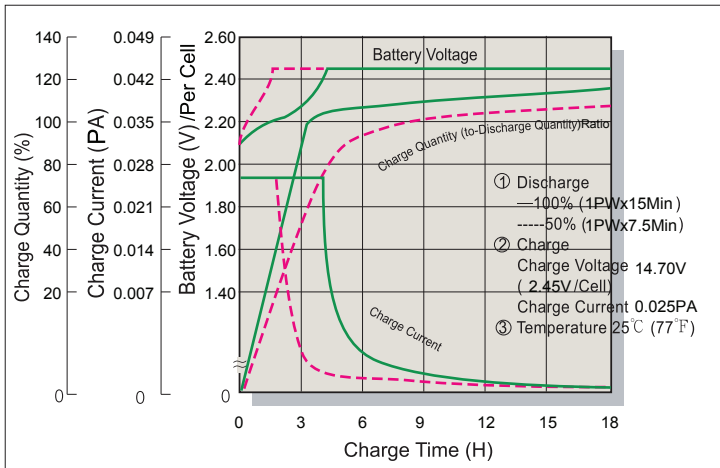
### Battery Voltage and Charge Time for Standby Use



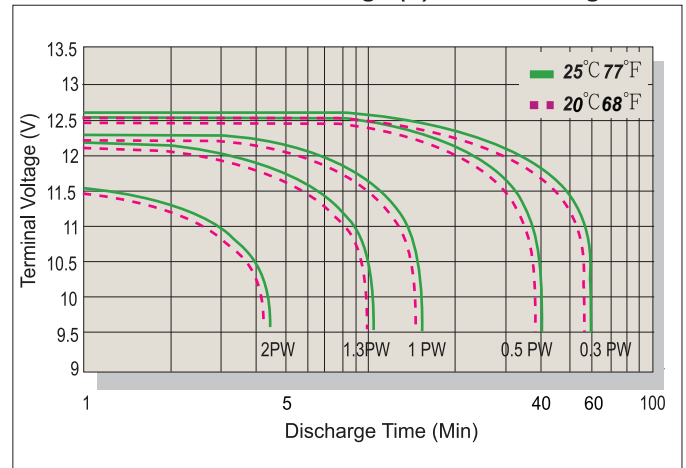
### Cycle Service Life



### Battery Voltage and Charge Time for Cycle Use



### Terminal Voltage (V) and Discharge Time



### Charging Procedures

Application	Charge Voltage(V/Cell)			Max.Charge Current
	Temperature	Set Point	Allowable Range	
Cycle Use	25°C(77°F)	2.45	2.40~2.50	0.3C
Standby	25°C(77°F)	2.275	2.25~2.30	

### Discharge Current VS. Discharge Voltage

Final Discharge Voltage V/Cell	1.75	1.70	1.60	1.30
Discharge Current(A)	0.2C>(A)	0.2C<(A)<0.5C	0.5C<(A)<1.0C	(A)>1.0C

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# HR 12120W ▶ 12V 120W

HR 12120W is specially designed for high efficient discharge application. Its characteristics are high energy density, small footprint and high discharge efficiency. It can be used for more than 260 cycles at 100% discharge in cycle service, up to 5 years in standby service.



## Specification

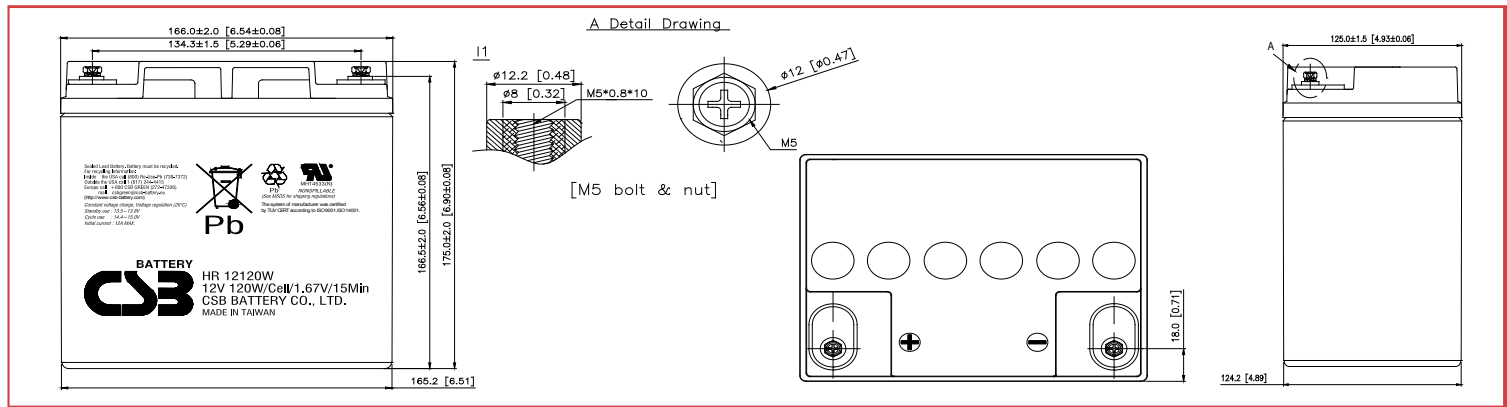
Cells Per Unit	6
Voltage Per Unit	12
Capacity	120 W @ 15min-rate to 1.67V per cell @25 °C (77°F)
Weight	Approx. 10.2 kg(22.49 lbs)
Maximum Discharge Current	225A(5sec)
Internal Resistance	Approx. 9 m Ω
Operating Temperature Range	Discharge: -15°C~50°C ( 5°F~122°F) Charge: -15 °C~40°C ( 5°F~104°F) Storage: -15°C~40°C ( 5°F~104°F)
Nominal Operating Temperature Range	25°C±3°C(77°F±5°F)
Float Charging Voltage	13.5 to 13.8 VDC/unit Average at 25°C(77°F)
Recommended Maximum Charging Current Limit	12A
Equalization and Cycle Service	14.4 to 15.0 VDC/unit Average at 25°C(77°F)
Self Discharge	CSB Batteries can be stored for more than 6 months at 25°C(77°F). Please charge batteries before using. For higher temperatures the time interval will be shorter.
Terminal	I1-Thread lead alloy recessed terminal to accept M5 bolt
Container Material	ABS(UL 94-HB/File E50263)*Flammability resistance of (UL 94-V0/File E88637) can be available upon request.



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

CSB is also certified by ISO 9001 and ISO 14001.

Dimensions :	Overall Height (H)	Container height (h)	Length (L)	Width (W)
Unit: mm (inch)	175.0±2.0 (6.90±0.08)	--	166.0±2.0 (6.54±0.08)	125.0±1.5 (4.93±0.06)



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

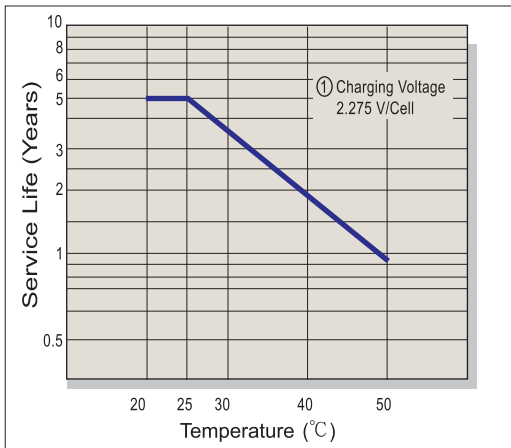
F.V/Time	2MIN	4MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	60MIN	90MIN
1.60V	169	148	125	107	94.2	70.5	56.1	41.2	24.5	16.8
1.67V	153	135	115	100	88.9	67.0	53.6	39.7	24.0	16.6
1.70V	146	128	109	95.5	85.6	65.3	52.5	39.2	23.7	16.4
1.75V	132	117	101	88.9	80.2	62.0	50.4	37.8	23.1	16.2
1.80V	117	105	91.2	81.3	73.3	58.3	48.0	36.0	22.2	15.8
1.85V	100	92.5	82.4	74.3	67.3	54.3	45.7	34.6	21.2	15.2

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

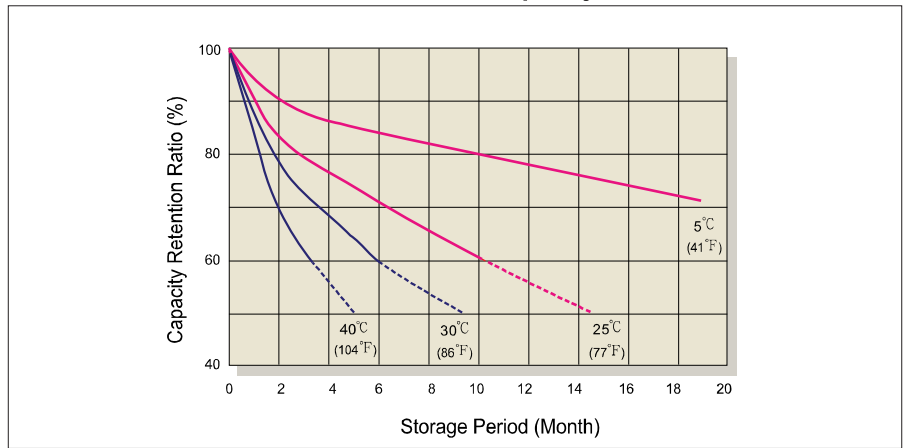
F.V/Time	2MIN	4MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	60MIN	90MIN
1.60V	1,745	1,622	1,419	1,199	1,030	771	621	462	284	197
1.67V	1,608	1,495	1,315	1,119	975	738	600	453	279	194
1.70V	1,539	1,427	1,260	1,084	947	724	590	447	276	193
1.75V	1,412	1,306	1,161	1,012	895	701	578	435	270	190
1.80V	1,273	1,181	1,060	944	853	676	561	418	263	186
1.85V	1,100	1,045	966	877	805	648	536	402	253	181



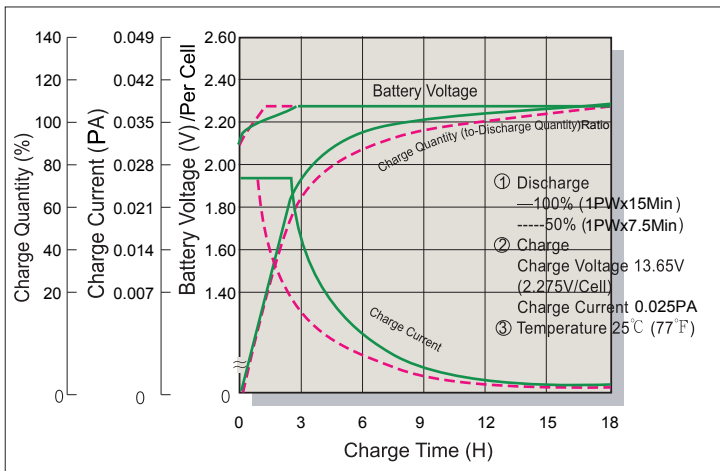
### Trickle (or Float) Service Life



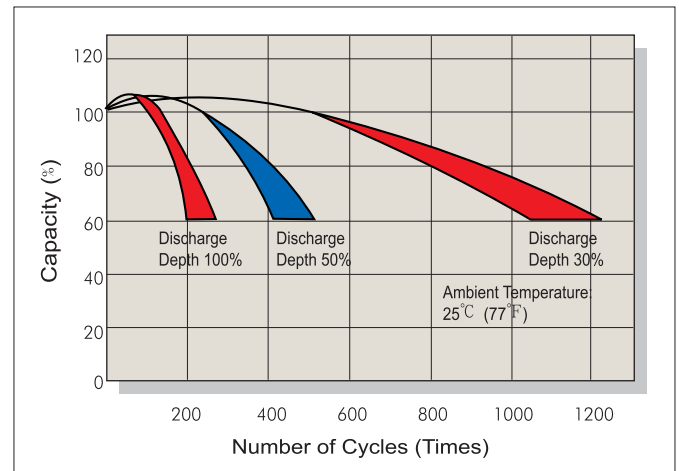
### Capacity Retention Characteristic



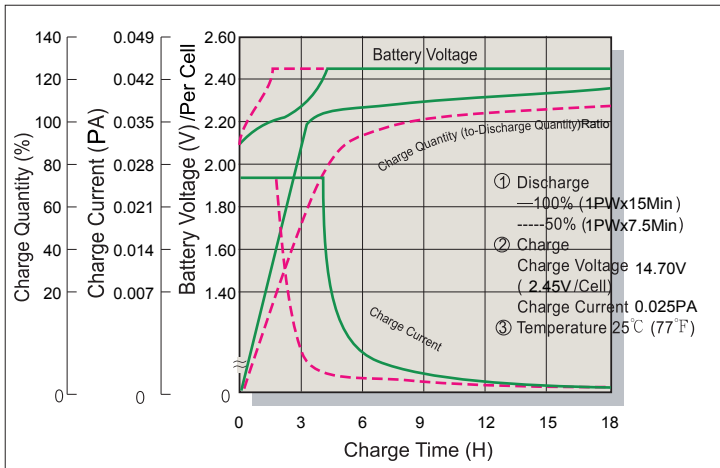
### Battery Voltage and Charge Time for Standby Use



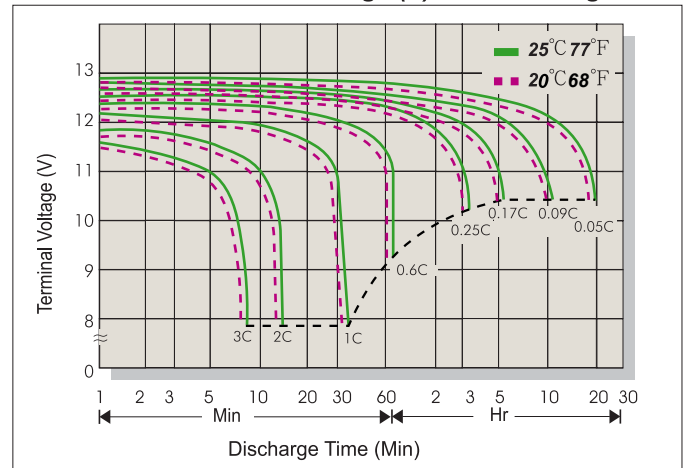
### Cycle Service Life



### Battery Voltage and Charge Time for Cycle Use



### Terminal Voltage (V) and Discharge Time



### Charging Procedures

Application	Charge Voltage(V/Cell)			Max.Charge Current
	Temperature	Set Point	Allowable Range	
Cycle Use	25°C(77°F)	2.45	2.40~2.50	0.3C
Standby	25°C(77°F)	2.275	2.25~2.30	

### Discharge Current VS. Discharge Voltage

Final Discharge Voltage V/Cell	1.75	1.70	1.60	1.30
Discharge Current(A)	0.2C>(A)	0.2C<(A)<0.5C	0.5C<(A)<1.0C	(A)>1.0C

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# HRL 12200W ▶ 12V 200W

HRL 12200W is specially designed for high efficient discharge application. Its characteristics are high energy density, small footprint and high discharge efficiency. It can be used for more than 260 cycles at 100% discharge in cycle service, up to 10 years in standby service.



## Specification

Cells per unit	6
Voltage per unit	12
Capacity	200W @ 15min-rate to 1.67V per cell @25 °C(77°F)
Weight	Approx. 17.6 kg(38.8 lbs)
Maximum Discharge Current	300A(5sec)
Internal Resistance	Approx. 5.9 mΩ
Operating Temperature Range	Discharge: -15°C~50°C ( 5°F~122°F) Charge: -15 °C~40°C( 5°F~104°F) Storage: -15°C~40°C( 5°F~104°F)
Nominal Operating Temperature Range	25°C±3°C (77°F±5°F)
Float Charging Voltage	13.5 to 13.8 VDC/unit Average at 25°C (77°F)
Recommended Maximum Charging Current Limit	20A
Equalization and Cycle Service	14.4 to 15.0 VDC/unit Average at 25°C (77°F)
Self Discharge	CSB Batteries can be stored for more than 6 months at 25°C (77°F). Please charge batteries before using. For higher temperatures the time interval will be shorter.
Terminal	I2-Thread lead alloy recessed terminal to accept M6 bolt
Container Material	Polypropylene(UL 94-V0/File E50955)*Flammability resistance of (UL 94-HB/File E216959) can be available upon request.



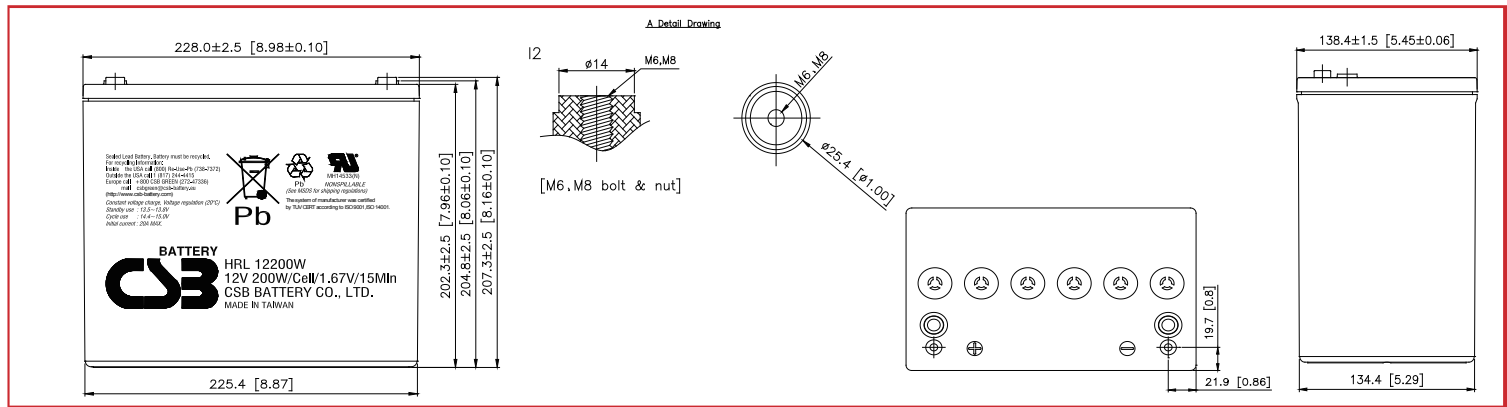
MH14533(N)



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

CSB is also certified by ISO 9001 and ISO 14001.

Dimensions :	Overall Height (H)	Container height (h)	Length (L)	Width (W)
Unit: mm (inch)	207.3±2.5 (8.16±0.10)	202.3±2.5 (7.96±0.10)	228.0±2.5 (8.98±0.10)	138.4±1.5 (5.45±0.06)



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

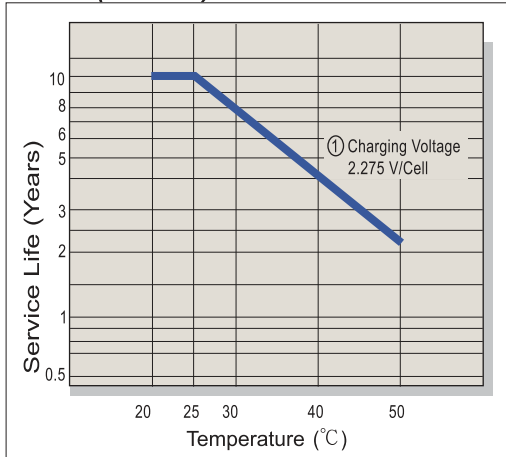
F.V/Time	5MIN	7.5MIN	10MIN	15MIN	20MIN	30MIN	40MIN	50MIN	60MIN	90MIN
1.60V	225	184	155	116	92.7	67.2	53.4	44.6	38.5	27.7
1.67V	205	169	144	110	89.4	64.7	52.0	44.3	38.1	27.4
1.70V	195	163	138	108	87.6	63.6	51.1	43.9	37.8	27.3
1.75V	177	150	128	103	83.6	61.2	49.5	42.8	37.0	26.7
1.80V	159	138	119	95.7	79.0	58.7	47.4	41.0	35.7	26.0
1.85V	142	125	110	89.3	73.4	55.6	44.8	38.1	33.3	24.8

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

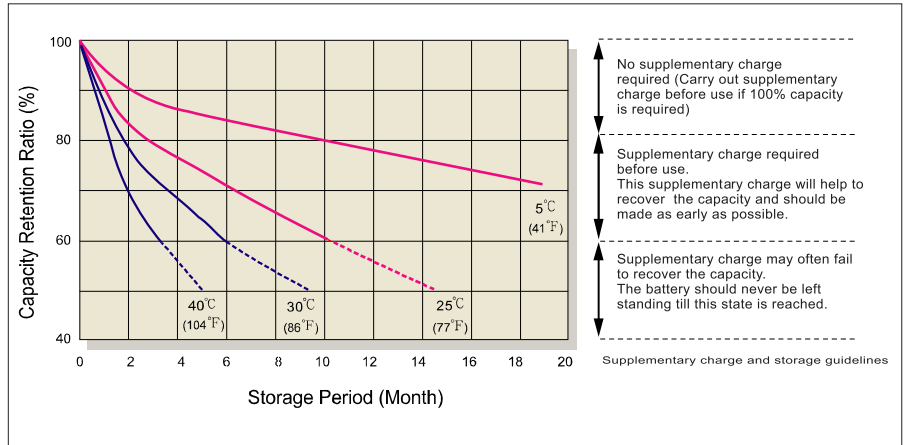
F.V/Time	5MIN	7.5MIN	10MIN	15MIN	20MIN	30MIN	40MIN	50MIN	60MIN	90MIN
1.60V	2,392	1,972	1,684	1,290	1,050	770	618	516	447	325
1.67V	2,176	1,842	1,589	1,235	1,010	748	612	514	445	323
1.70V	2,081	1,774	1,540	1,208	988	737	607	510	443	322
1.75V	1,914	1,648	1,449	1,160	945	710	594	499	434	315
1.80V	1,747	1,526	1,359	1,093	900	683	568	481	419	308
1.85V	1,584	1,410	1,258	1,031	852	649	528	450	395	295



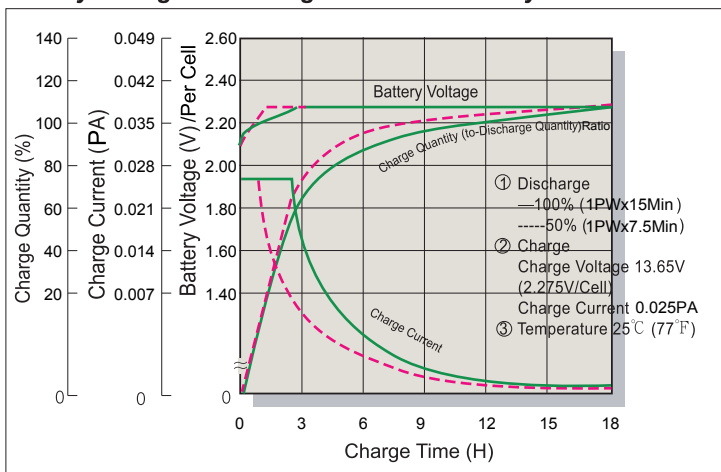
### Trickle (or Float) Service Life



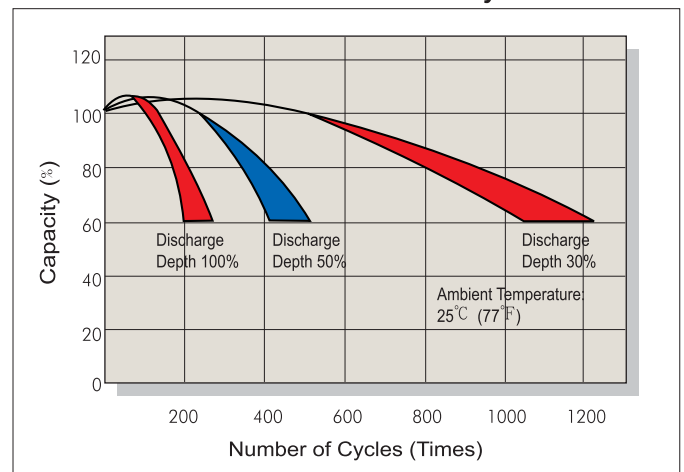
### Capacity Retention Characteristic



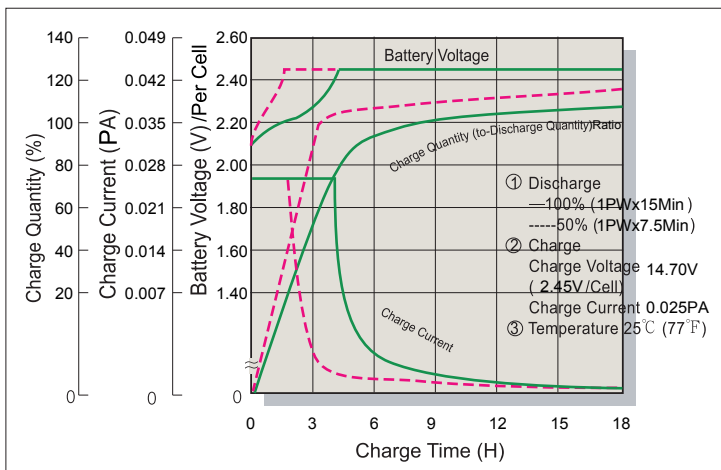
### Battery Voltage and Charge Time for Standby Use



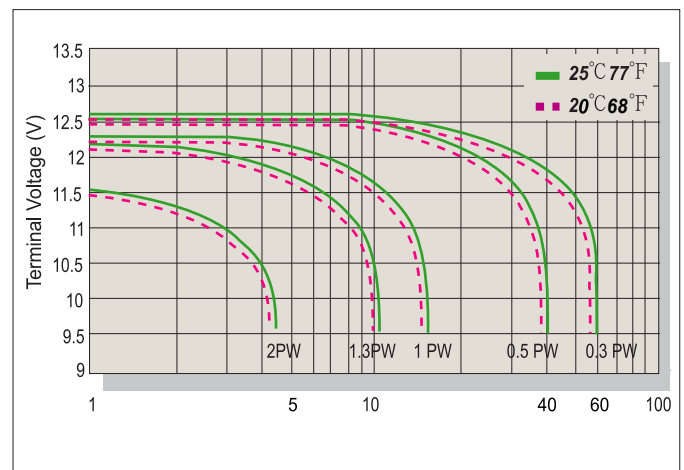
### Cycle Service Life



### Battery Voltage and Charge Time for Cycle Use



### Terminal Voltage (V) and Discharge Time



### Charging Procedures

Application	Charge Voltage(V/Cell)			Max.Charge Current
	Temperature	Set Point	Allowable Range	
Cycle Use	25°C(77°F)	2.45	2.40~2.50	0.1PA
Standby	25°C(77°F)	2.275	2.25~2.30	

### Discharge Current VS. Discharge Voltage

Final Discharge Voltage V/Cell	1.75	1.70	1.60	1.30
Discharge Power(W)	0.1P>(W)	0.1P≤(W)<0.25P	0.25P≤(W)<1.0P	(W)≥1.0P

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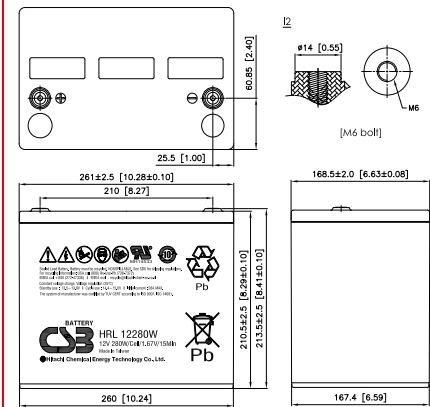
**Valve Regulated Lead Acid Battery**

Maintenance-Free Sealed Lead Acid Battery.  
Absorbent Glass Mat (AGM) technology for efficient gas recombination of up to 99%.

**Design for Standby Power Applications**

<p><b>【Design Life】</b> Up to 10 Years in Standby Service at 25°C Eurobat (20°C) : 10-12 years, Long Life</p> <p><b>【Operating Temperature Range】</b> Nominal Operating Temperature : 25°C (77°F) Discharge : -15°C ~ 50°C (5°F~122°F) Charge: -15°C ~ 40°C (5°F~104°F) Storage: -15°C ~ 40°C (5°F~104°F)</p>	<p><b>【Float Charging Voltage】</b> 13.5 ~ 13.8 VDC/Unit at 25°C (77°F)</p> <p><b>【Equalization Charging Voltage】</b> 14.4 ~ 15.0 VDC/Unit at 25°C (77°F)</p> <p><b>【Self Discharge】</b> Less than 10% after 90 days, can be stored up to 6 months at 25°C (77°F); Fully recharging is required before usage, and charged sooner if stored at higher temperature than 25°C (77°F).</p>
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Specification		Design according with IEC 60896-21/22:2004	
Nominal Voltage	12V (6 cells per unit)		
Nominal Capacity	280W @15min-rate to 1.67V per cell @25°C (77°F)		
Weight	Approx. 25.80 Kg (56.86 lbs)		
Maximum Discharge Current	800A (5sec)		
Internal Resistance	Approx. 3.50 mΩ		
Short Circuit Current	2576A		
Maximum Charge Current	28.0A		
Terminal types	I2 thread lead alloy terminal to accept M6 bolt		
Terminal hardware Torque	138.6 Kgf-cm / 120.3 lbf-in / 13.58 N-m		
Container Material	PP (UL 94-HB) & Flame Retardant (94-V0) available upon request		
Dimensions	Length (L)	261.0±2.5 mm	10.28±0.10 inch
	Width (W)	168.5±2.0 mm	6.63±0.08 inch
	Container Height (h)	210.5±2.5 mm	8.29±0.10 inch
	Overall Height (H)	213.5±2.5 mm	8.41±0.10 inch
	Terminal Height	210.5±2.5 mm	8.29±0.10 inch



Constant Current Discharge Characteristics Unit: A (25°C, 77°F)												
F.V/Time	2MIN	4MIN	5MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	45MIN	60MIN	90MIN
1.60V	--	--	318	287	237	216	167	137	103	76.0	59.9	44.6
1.67V	--	--	283	258	217	200	155	128	98.3	72.9	57.7	42.1
1.70V	--	--	266	244	207	192	149	124	96.3	71.2	55.6	40.6
1.75V	--	--	236	218	188	175	141	117	91.3	68.5	53.8	38.5
1.80V	--	--	207	194	171	161	131	111	85.4	63.7	50.1	36.3
1.85V	--	--	178	169	152	145	122	105	81.3	59.7	47.3	34.7

Constant Power Discharge Characteristics Unit: W (25°C, 77°F)												
F.V/Time	2MIN	4MIN	5MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	45MIN	60MIN	90MIN
1.60V	--	--	3354	3039	2519	2304	1788	1476	1110	822	648	485
1.67V	--	--	3036	2778	2347	2166	1700	1417	1079	804	636	466
1.70V	--	--	2880	2650	2263	2100	1643	1384	1060	792	618	454
1.75V	--	--	2615	2422	2095	1955	1575	1326	1023	780	600	436
1.80V	--	--	2329	2176	1913	1800	1493	1274	980	738	581	422
1.85V	--	--	2016	1914	1735	1656	1408	1212	938	694	550	404

Please refer to the official site for the latest rating confirmation. URL: [www.csb-battery.com](http://www.csb-battery.com)

Issued: 170201

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Recognized under UL 1989,  
and certified by ISO 9001, 14001.



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# HRL 12500W ▶ 12V 500W

HRL 12500W is specially designed for high efficient discharge application. Its characteristics are high energy density, small footprint and high discharge efficiency. It can be used for more than 260 cycles at 100% discharge in cycle service, up to 10 years in standby service.



## Specification

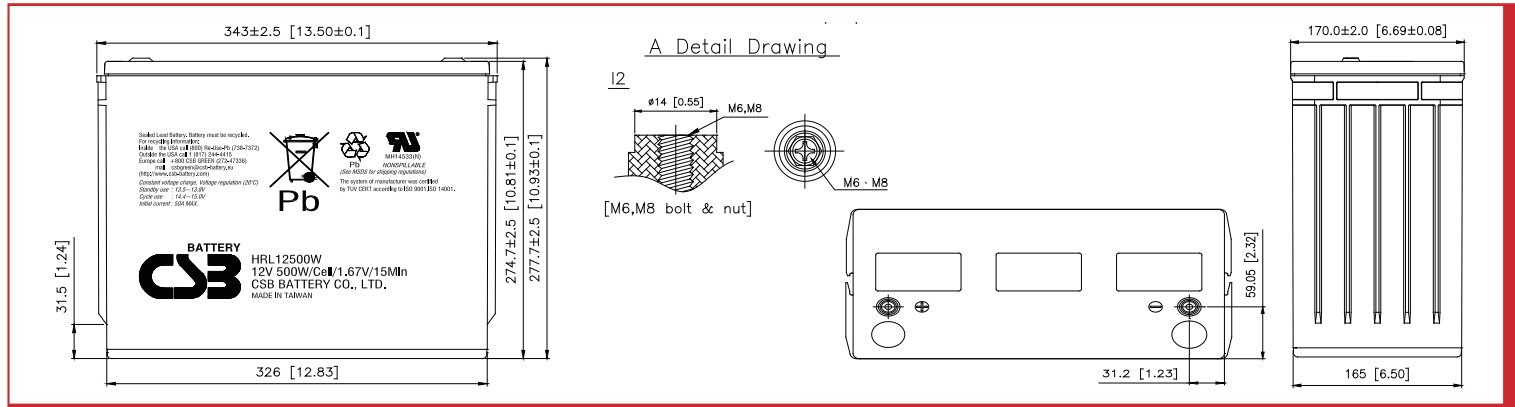
Cells per unit	6
Voltage per unit	12
Capacity	500W @ 15min-rate to 1.67V per cell @25 °C(77°F)
Weight	Approx.45.7 kg(100.75 lbs)
Maximum Discharge Current	800A(5sec)
Internal Resistance	Approx.3.7 mΩ
Operating Temperature Range	Discharge: -15°C~50°C ( 5°F~122°F) Charge: -15 °C~40°C( 5°F~104°F) Storage: -15°C~40°C( 5°F~104°F)
Nominal Operating Temperature Range	25°C±3°C (77°F±5°F)
Float Charging Voltage	13.5 to 13.8 VDC/unit Average at 25°C (77°F)
Recommended Maximum Charging Current Limit	50A
Equalization and Cycle Service	14.4 to 15.0 VDC/unit Average at 25°C (77°F)
Self Discharge	CSB Batteries can be stored for more than 6 months at 25°C (77°F). Please charge batteries before using. For higher temperatures the time interval will be shorter.
Terminal	I2-Thread lead alloy recessed terminal to accept M6/M8 bolt
Container Material	PPE(UL94-V0)*Flammability resistance can be available upon request.



CSB-manufactured **VRLA** (Absorbent Glass Mat type) batteries are UL-recognized components under UL1989.

CSB is also certified by ISO 9001 and ISO 14001.

Dimensions :	Overall Height (H)	Container height (h)	Length (L)	Width (W)
Unit: mm (inch)	277.7±2.5(10.93±0.10)	274.7±2.5 (10.81±0.10)	343.0±2.5 (13.50±0.10)	170.0±2.0 (6.69±0.08)



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

F.V/Time	5MIN	7.5MIN	10MIN	15MIN	20MIN	30MIN	40MIN	50MIN	60MIN	90MIN
1.60V	491	444	388	294	235	172	136	112	95.7	67.2
1.67V	449	405	356	278	223	164	134	110	94.3	66.1
1.70V	425	386	340	270	217	161	133	109	93.5	65.4
1.75V	388	348	310	253	206	155	130	107	91.1	64.5
1.80V	348	309	278	233	194	147	123	102	87.3	62.0
1.85V	304	270	247	211	179	140	115	95.3	81.1	57.3

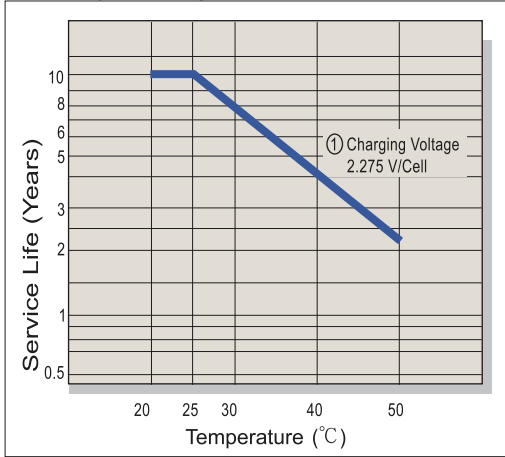
## Constant Power Discharge Characteristics Unit:W (25°C ,77°F)

F.V/Time	5MIN	7.5MIN	10MIN	15MIN	20MIN	30MIN	40MIN	50MIN	60MIN	90MIN
1.60V	5,275	4,691	4,167	3,181	2,594	1,951	1,558	1,292	1,112	783
1.67V	4,880	4,300	3,790	3,018	2,490	1,871	1,520	1,276	1,091	769
1.70V	4,640	4,110	3,610	2,932	2,422	1,829	1,507	1,258	1,083	763
1.75V	4,250	3,750	3,290	2,748	2,309	1,740	1,466	1,237	1,066	754
1.80V	3,830	3,340	2,950	2,497	2,138	1,657	1,390	1,186	1,025	731
1.85V	3,366	2,882	2,600	2,203	1,964	1,564	1,321	1,130	977	695

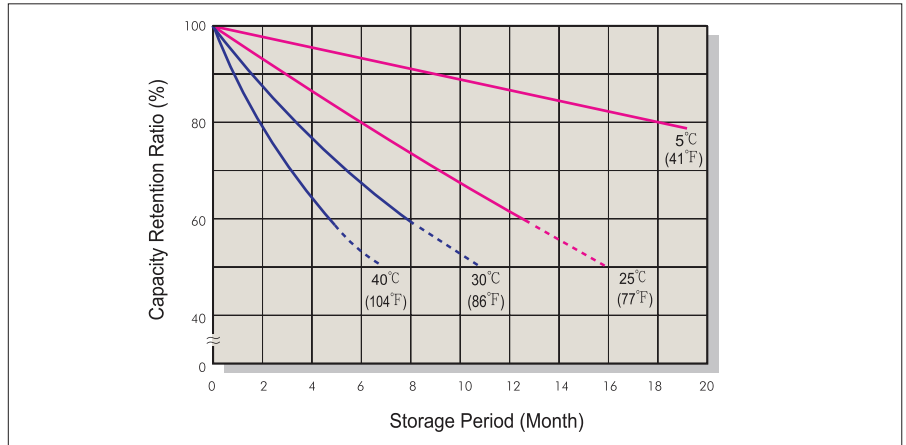
Ratings presented herein are subject to revision without notice. Please refer to [www.csb-battery.com](http://www.csb-battery.com) to confirm the latest version.



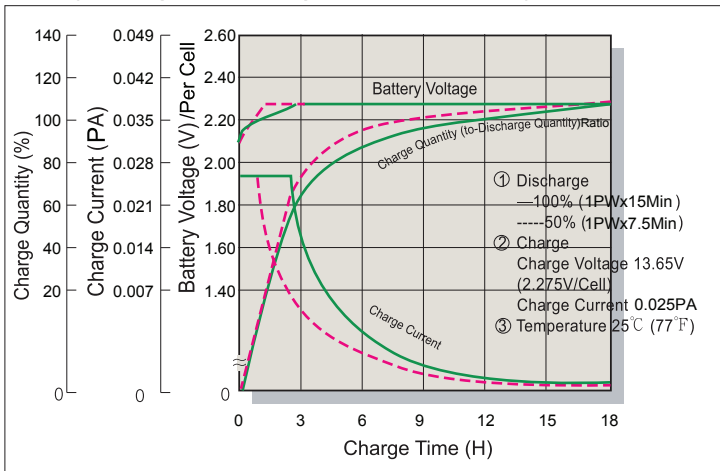
### Trickle (or Float) Service Life



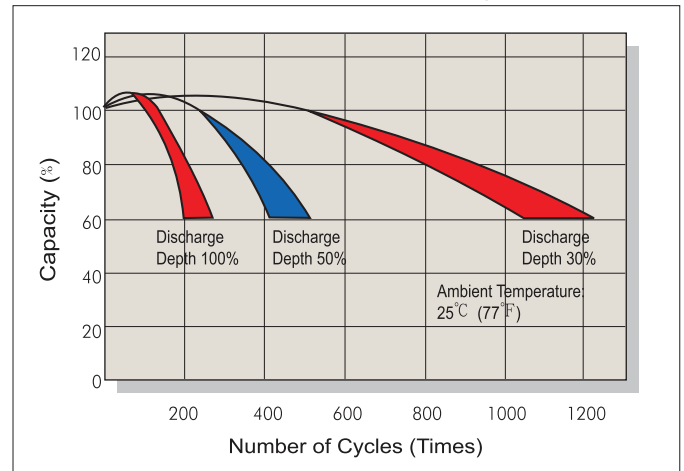
### Capacity Retention Characteristic



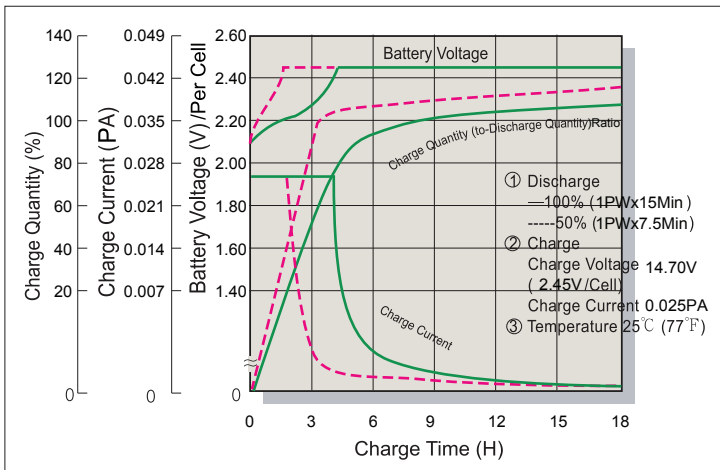
### Battery Voltage and Charge Time for Standby Use



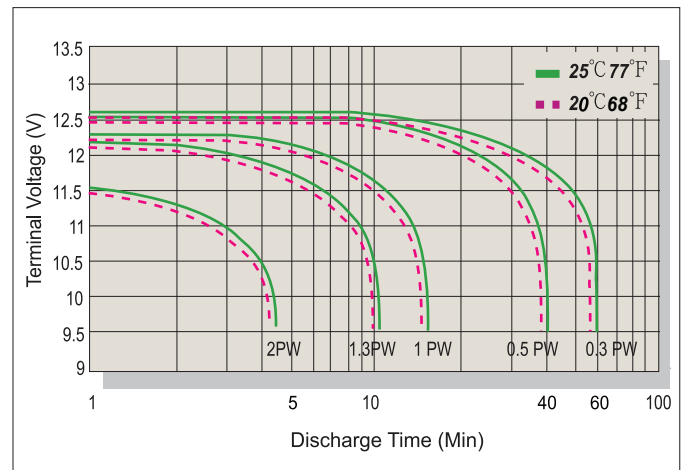
### Cycle Service Life



### Battery Voltage and Charge Time for Cycle Use



### Terminal Voltage (V) and Discharge Time



### Charging Procedures

Application	Charge Voltage(V/Cell)			Max.Charge Current
	Temperature	Set Point	Allowable Range	
Cycle Use	25°C(77°F)	2.45	2.40~2.50	0.1PA
Standby	25°C(77°F)	2.275	2.25~2.30	

### Discharge Current VS. Discharge Voltage

Final Discharge Voltage V/Cell	1.75	1.70	1.60	1.30
Discharge Power(W)	0.1P>(W)	0.1P≤(W)<0.25P	0.25P≤(W)<1.0P	(W)≥1.0P

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# HRL 12540W ▶ 12V 540W

HRL 12540W is specially designed for high efficient discharge application. Its characteristics are high energy density, small footprint and high discharge efficiency. It can be used for more than 260 cycles at 100% discharge in cycle service, up to 10 years in standby service.



## Specification

Cells per unit	6
Voltage per unit	12
Capacity	540W @ 15min-rate to 1.67V per cell @25 °C(77°F)
Weight	Approx.43.9 kg(96.7 lbs)
Maximum Discharge Current	800A(5sec)
Internal Resistance	Approx. 4 mΩ
Operating Temperature Range	Discharge: -15°C~50°C ( 5°F~122°F) Charge: -15 °C~40°C( 5°F~104°F) Storage: -15°C~40°C( 5°F~104°F)
Nominal Operating Temperature Range	25°C±3°C (77°F±5°F)
Float Charging Voltage	13.5 to 13.8 VDC/unit Average at 25°C (77°F)
Recommended Maximum Charging Current Limit	54A
Equalization and Cycle Service	14.4 to 15.0 VDC/unit Average at 25°C (77°F)
Self Discharge	CSB Batteries can be stored for more than 6 months at 25°C (77°F). Please charge batteries before using. For higher temperatures the time interval will be shorter.
Terminal	I2-Thread lead alloy recessed terminal to accept M6 bolt (M8 bolt also available upon request)
Container Material	Polypropylene(UL94-V0)*Flammability resistance can be available upon request.

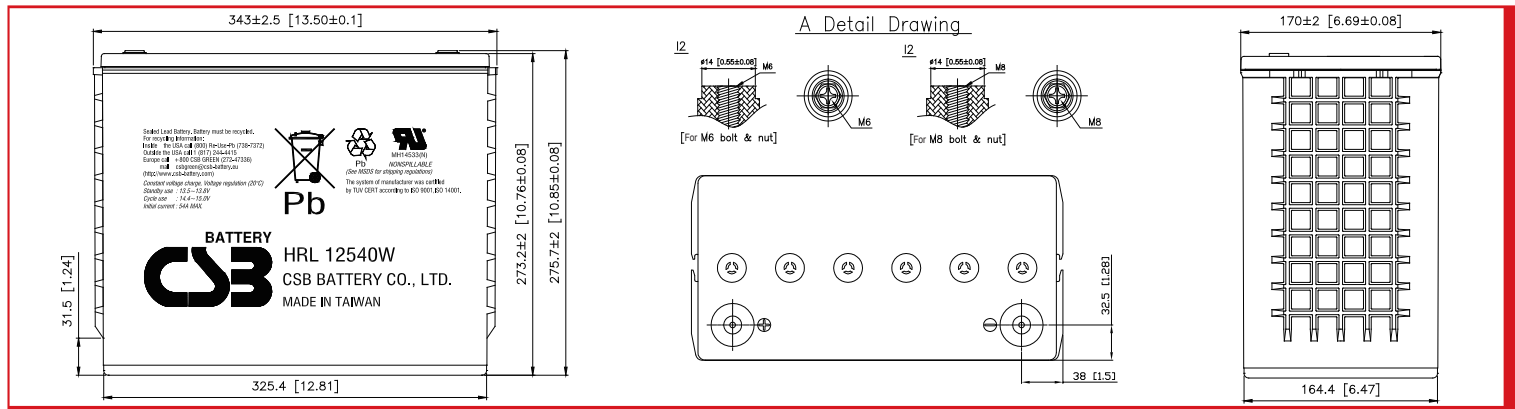


CSB-manufactured **VRLA** (Absorbent Glass Mat type) batteries are UL-recognized components under UL1989.

CSB is also certified by ISO 9001 and ISO 14001.

## Dimensions :

Overall Height (H)	Container height (h)	Length (L)	Width (W)
275.7±2.5(10.85±0.1)	273.2±2.5 (10.76±0.1)	343±2.5 (13.5±0.1)	170±2 (6.69±0.08)



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

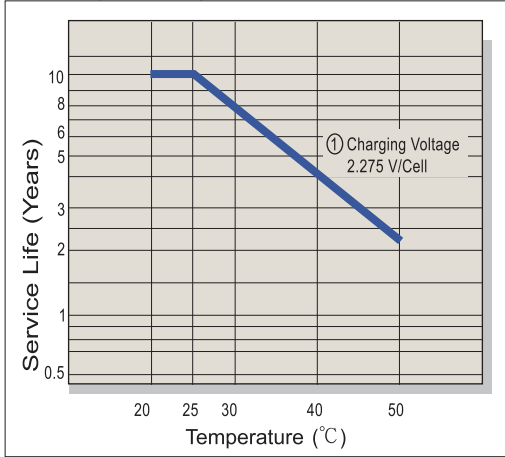
F.V/Time	2MIN	4MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	60MIN	90MIN
1.60V	720	572	498	436	394	308	256	187	106	75.5
1.67V	608	517	452	406	370	294	245	181	105	74.3
1.70V	564	493	430	392	354	286	240	178	103	73.8
1.75V	501	440	398	365	327	270	228	172	101	72.0
1.80V	430	391	362	323	296	252	209	161	97.9	70.3
1.85V	379	340	304	282	265	222	187	147	90.3	66.2

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

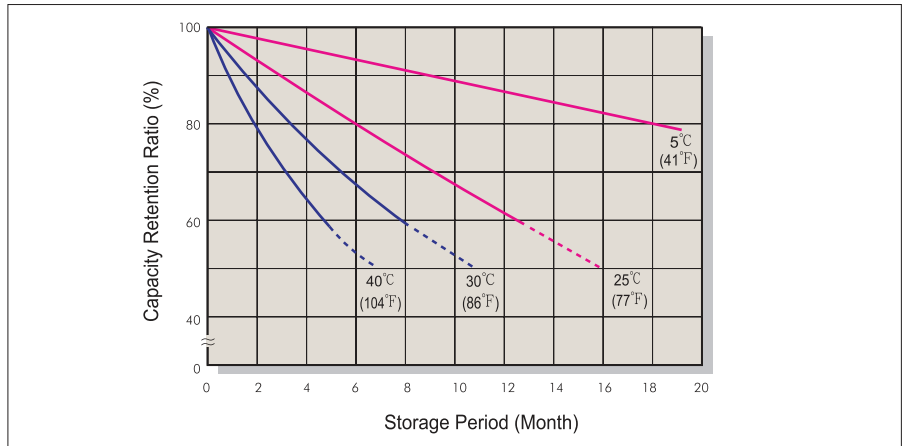
F.V/Time	2MIN	4MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	60MIN	90MIN
1.60V	6874	5883	5176	4688	4186	3421	2716	2057	1224	885
1.67V	6207	5325	4794	4282	3885	3250	2630	2006	1210	865
1.70V	5768	4937	4544	4016	3661	3097	2564	1988	1201	863
1.75V	5225	4639	4196	3766	3472	2951	2454	1925	1174	849
1.80V	4561	4310	3818	3442	3233	2723	2306	1846	1129	824
1.85V	4227	3643	3356	3146	3010	2443	2104	1715	1061	771

Ratings presented herein are subject to revision without notice. Please refer to [www.csb-battery.com](http://www.csb-battery.com) to confirm the latest version.

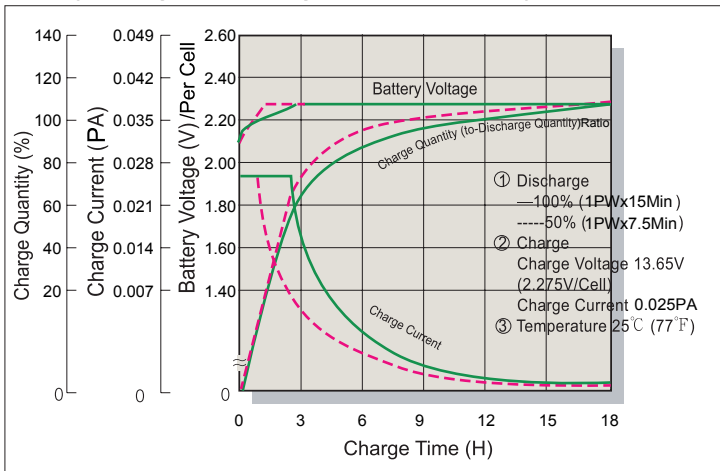
### Trickle (or Float) Service Life



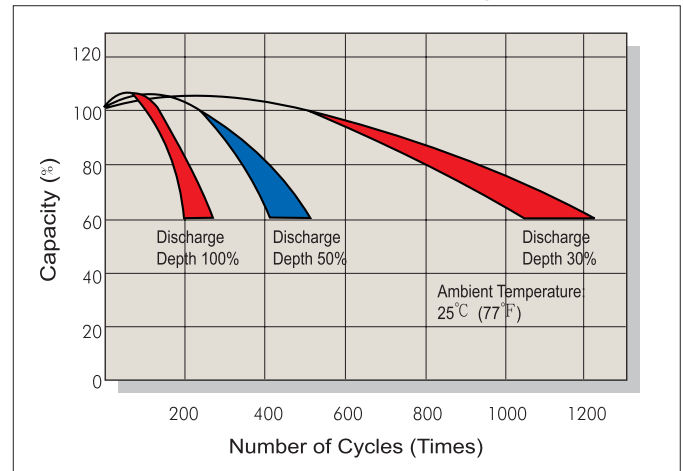
### Capacity Retention Characteristic



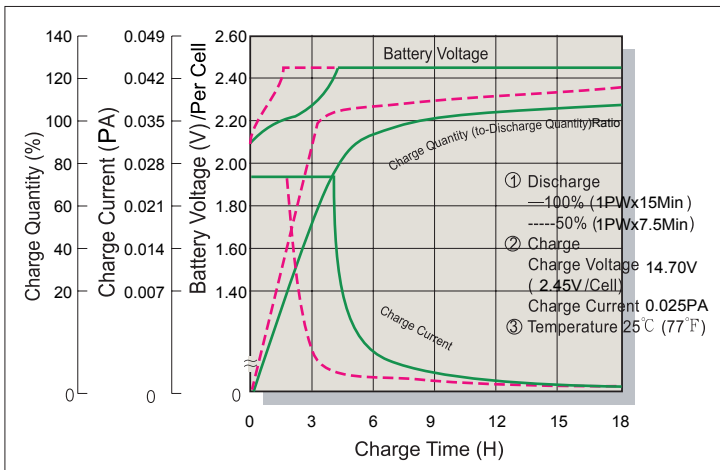
### Battery Voltage and Charge Time for Standby Use



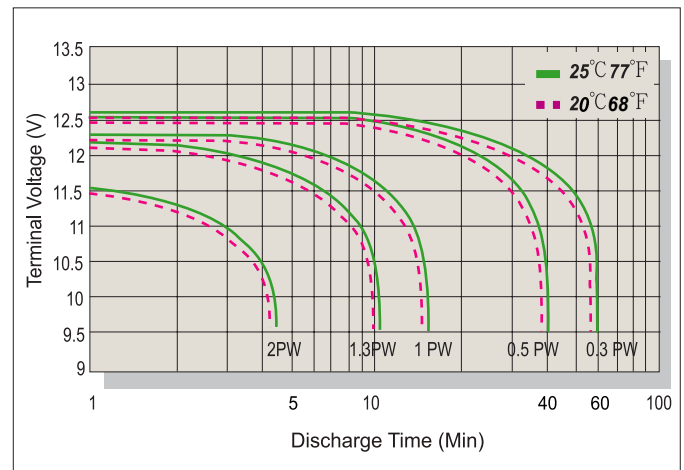
### Cycle Service Life



### Battery Voltage and Charge Time for Cycle Use



### Terminal Voltage (V) and Discharge Time



### Charging Procedures

Application	Charge Voltage(V/Cell)			Max.Charge Current
	Temperature	Set Point	Allowable Range	
Cycle Use	25°C(77°F)	2.45	2.40~2.50	0.1PA
Standby	25°C(77°F)	2.275	2.25~2.30	

### Discharge Current VS. Discharge Voltage

Final Discharge Voltage V/Cell	1.75	1.70	1.60	1.30
Discharge Power(W)	0.1P>(W)	0.1P≤(W)<0.25P	0.25P≤(W)<1.0P	(W)≥1.0P

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