

# HR 1221W F2

## 12V 21W

HR 1221W 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

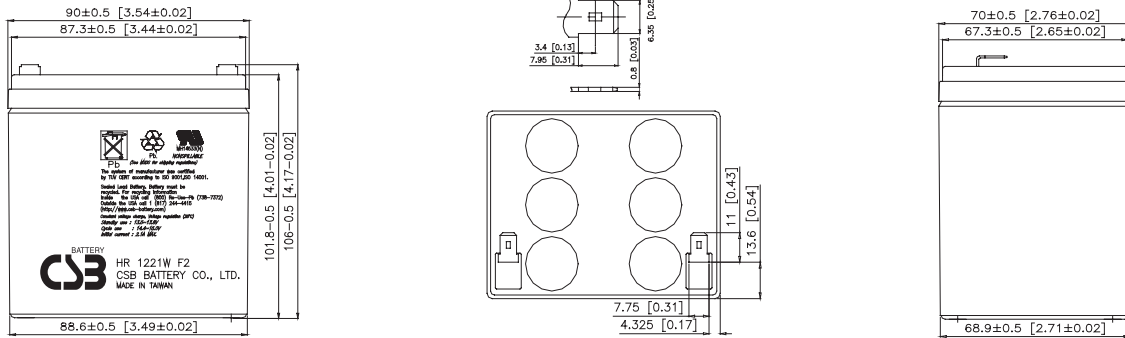
<b>Cells Per Unit</b>	6
<b>Voltage Per Unit</b>	12
<b>Capacity</b>	21W @ 15minute-rate to 1.67V per cell @25 °C (77°F)
<b>Weight</b>	Approx. 2.00kg(4.40 lbs)
<b>Maximum Discharge Current</b>	90A(5sec)
<b>Internal Resistance</b>	Approx. 21mΩ
<b>Operating Temperature Range</b>	Discharge: -20°C~50°C (-4°F~122°F) 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>	2.1A
<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 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

unit:(MM)



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

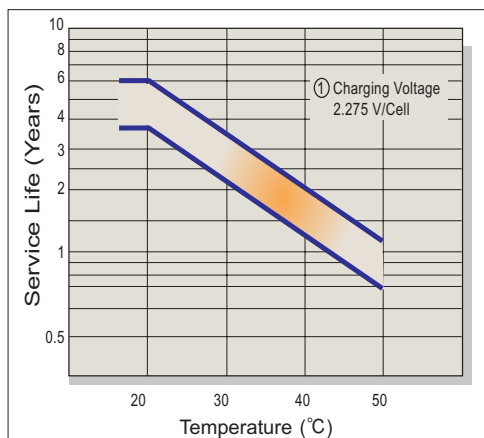
F.V/Time	2MIN	4MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	60MIN	90MIN
1.60V	46.4	31.2	24.4	20.3	16.4	12.3	10.7	7.18	4.02	2.83
1.67V	43.4	30.1	23.8	20.0	16.3	12.3	10.6	7.15	4.00	2.71
1.70V	42.1	29.7	23.5	19.8	16.3	12.3	10.6	7.13	3.99	2.66
1.75V	37.6	27.4	22.2	19.0	15.8	12.0	10.4	7.13	3.99	2.56
1.80V	33.1	25.2	20.8	18.2	15.3	11.8	10.3	7.12	3.98	2.46
1.85V	28.6	22.9	19.5	17.3	14.8	11.5	10.1	7.12	3.98	2.36

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

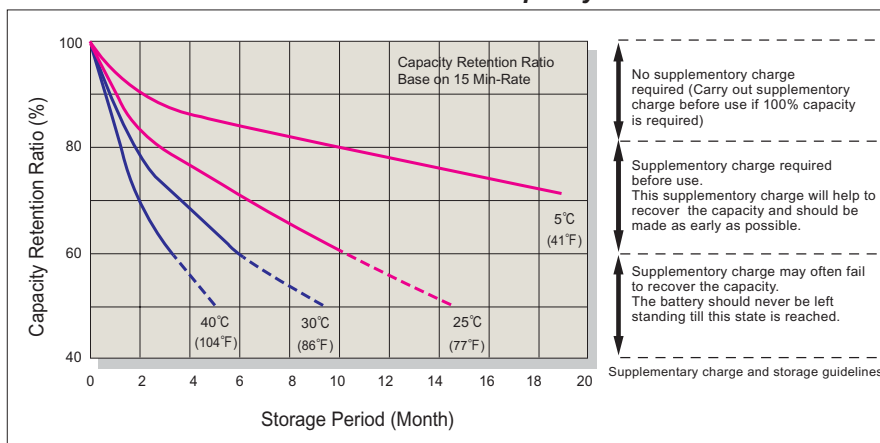
F.V/Time	2MIN	4MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	60MIN	90MIN
1.60V	557	374	293	244	197	148	128	86.1	48.2	33.9
1.67V	521	361	285	240	196	147	127	85.8	48.0	32.5
1.70V	505	356	282	238	195	147	127	85.6	47.9	31.9
1.75V	451	329	266	228	189	144	125	85.5	47.9	30.7
1.80V	397	302	250	218	183	141	123	85.4	47.8	29.5
1.85V	343	275	234	208	177	138	121	85.3	47.8	28.3

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

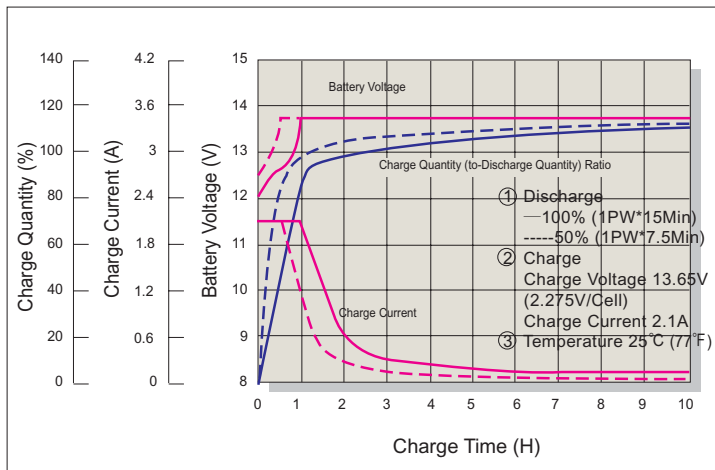
## Trickle (or Float) Service Life



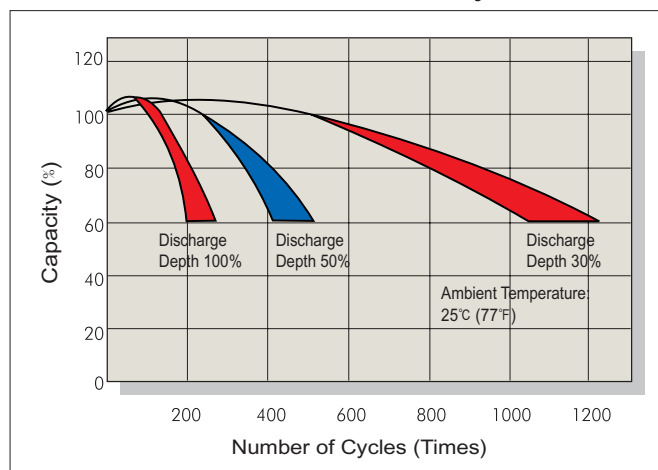
## Capacity Retention Characteristic



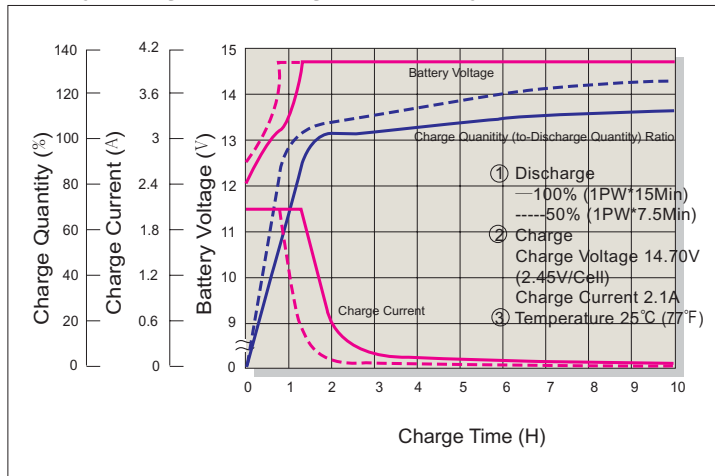
## Battery Voltage and Charge Time for Standby Use



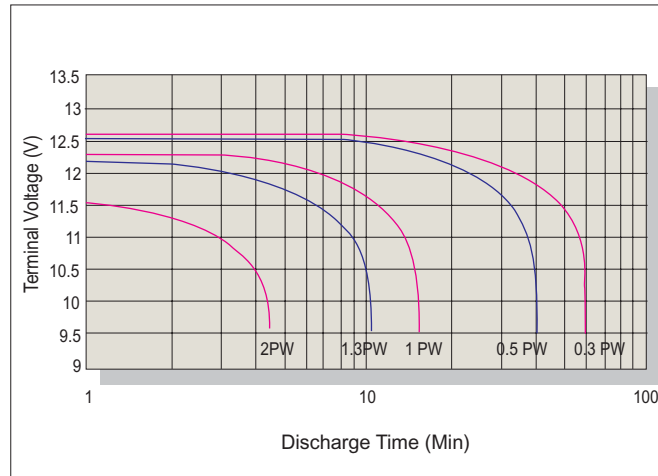
## Cycle Service Life



## 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