

# HRL 12110W FR

## 12V 110W FR

HRL 12110W FR is specially designed for high efficient discharge and long life application. It's 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 five to eight years in standby service.

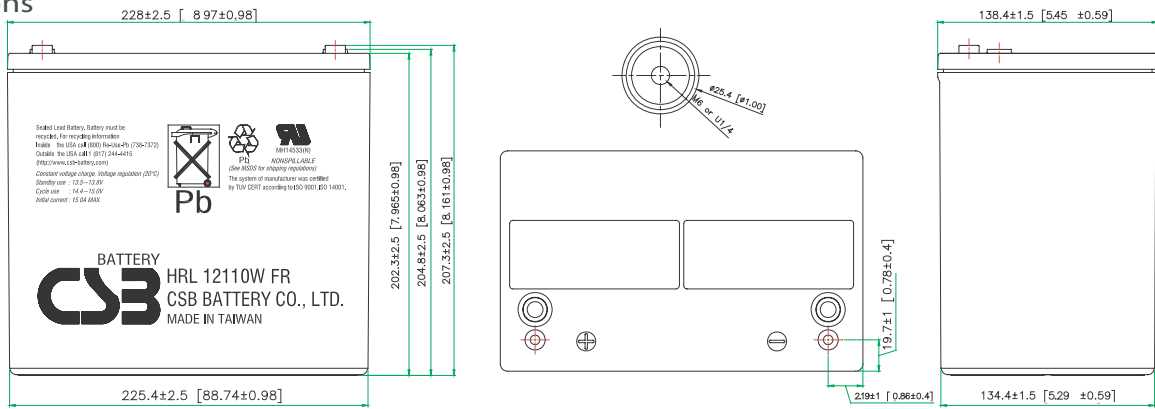
### Specification

|   |  |
|---|--|
| <b>Cells per unit</b>                             | 6  |
| <b>Voltage per unit</b>                           | 12   |
| <b>Capacity</b>                                   | 110W @15 minute-rate to 1.67V per cell @25°C (77°F)  |
| <b>Weight</b>                                     | Approx. 9.90kg (21.78lbs)  |
| <b>Maximum Discharge Current</b>                  | 400A (5sec)  |
| <b>Internal Resistance Approx.</b>                | Approx. 5.7 mΩ   |
| <b>Operating Temperature Range</b>                | Discharge: -15°C~50°C (5°F~122°F)<br>Charge: -15~40°C (5°F~104°F)<br>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> | 11A  |
| <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>                                   | Thread lead alloy recessed terminal to accept 1/4"×M6-20bolt   |
| <b>Container Material</b>                         | -Polypropylene (UL94-HB)*Flammability resistance of UL94-V0 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:Ampere(25°C,77°F)

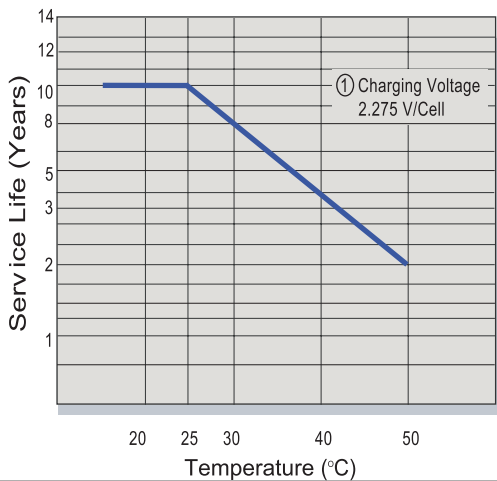
| F.V/Time | 2MIN   | 4MIN   | 6MIN   | 8MIN   | 10MIN | 15MIN | 20MIN | 30MIN | 60MIN | 90MIN | 10HR | 20HR |
|----------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|------|------|
| 9.6V     | 170.00 | 149.00 | 123.00 | 102.00 | 81.60 | 62.90 | 48.90 | 33.60 | 21.30 | 14.90 | 2.54 | 1.37 |
| 10.02V   | 162.00 | 140.00 | 115.00 | 95.20  | 79.10 | 62.10 | 48.00 | 33.20 | 20.80 | 14.70 | 2.50 | 1.36 |
| 10.2V    | 153.00 | 132.00 | 106.00 | 90.10  | 77.40 | 61.20 | 46.30 | 32.70 | 20.40 | 14.50 | 2.47 | 1.35 |
| 10.5V    | 140.00 | 111.00 | 93.50  | 84.20  | 74.80 | 59.50 | 43.80 | 32.30 | 20.00 | 14.40 | 2.45 | 1.35 |
| 10.8V    | 132.00 | 93.50  | 85.00  | 80.80  | 72.30 | 55.30 | 42.90 | 31.90 | 19.60 | 14.20 | 2.42 | 1.31 |
| 11.1V    | 89.30  | 76.50  | 72.30  | 68.00  | 62.10 | 51.00 | 39.50 | 28.90 | 18.30 | 14.00 | 2.29 | 1.28 |

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

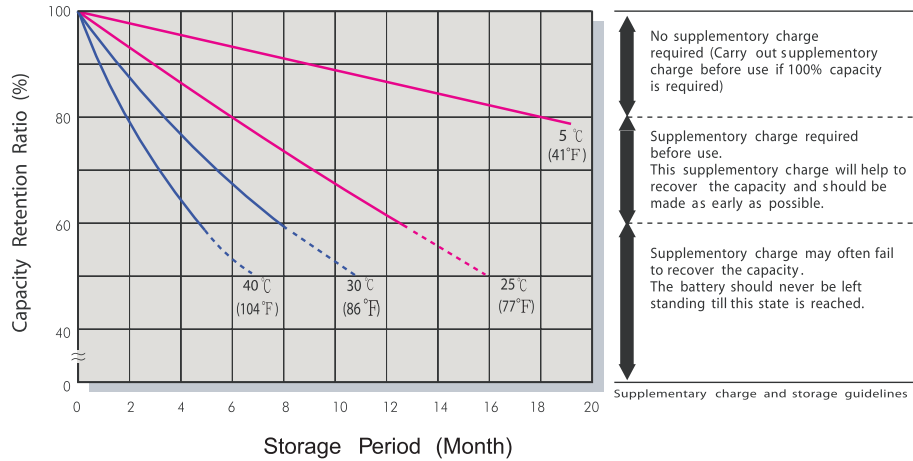
| F.V/Time | 2MIN    | 4MIN    | 6MIN    | 8MIN    | 10MIN  | 15MIN  | 20MIN  | 30MIN  | 60MIN  | 90MIN  | 10HR  | 20HR  |
|----------|---------|---------|---------|---------|--------|--------|--------|--------|--------|--------|-------|-------|
| 9.6V     | 1806.00 | 1580.00 | 1314.00 | 1091.00 | 888.00 | 702.00 | 554.00 | 385.00 | 247.00 | 174.00 | 30.50 | 16.40 |
| 10.02V   | 1739.00 | 1511.00 | 1240.00 | 1032.00 | 865.00 | 693.00 | 547.00 | 382.00 | 243.00 | 173.00 | 30.00 | 16.30 |
| 10.2V    | 1658.00 | 1427.00 | 1155.00 | 982.00  | 852.00 | 690.00 | 530.00 | 376.00 | 239.00 | 171.00 | 29.60 | 16.20 |
| 10.5V    | 1542.00 | 1215.00 | 1030.00 | 930.00  | 830.00 | 676.00 | 502.00 | 373.00 | 234.00 | 170.00 | 29.40 | 16.20 |
| 10.8V    | 1458.00 | 1035.00 | 944.00  | 900.00  | 811.00 | 632.00 | 496.00 | 369.00 | 229.00 | 168.00 | 29.00 | 15.70 |
| 11.1V    | 995.00  | 853.00  | 809.00  | 764.00  | 707.00 | 589.00 | 459.00 | 337.00 | 217.00 | 167.00 | 27.50 | 15.40 |

• All mentioned values are average values.

### Trickle (or Float) Service Life

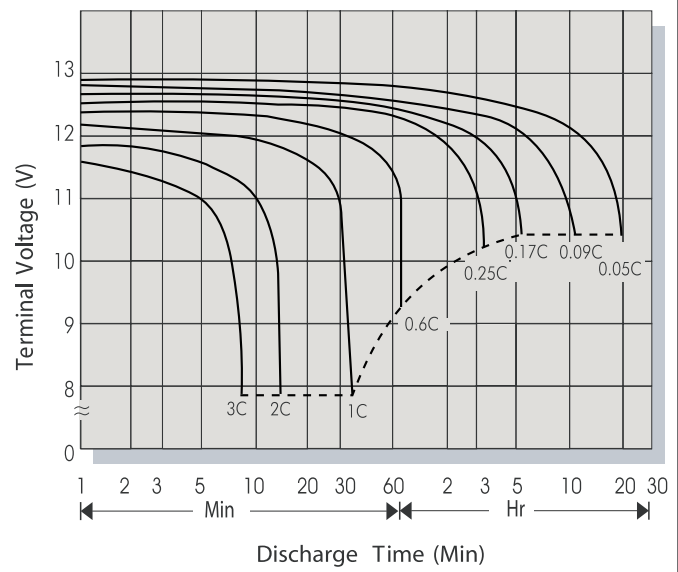
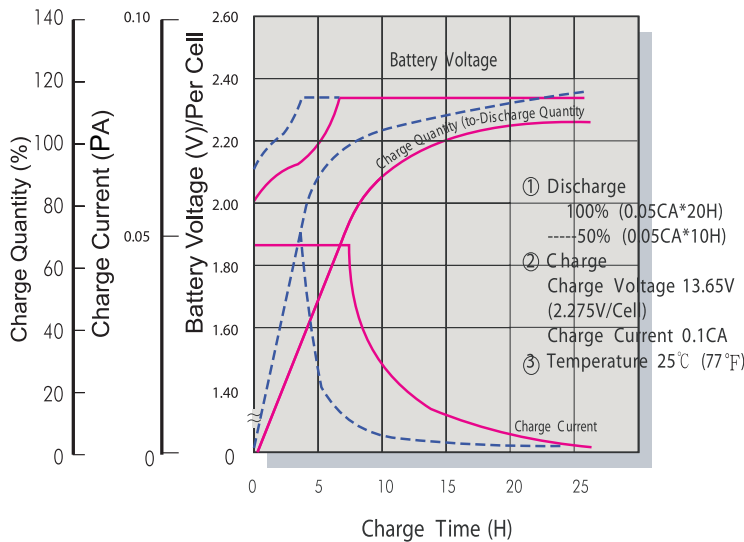


### Capacity Retention Characteristic



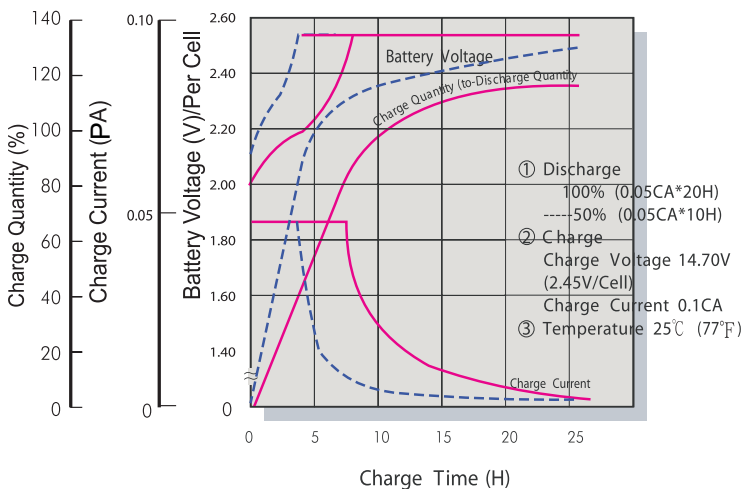
### Battery Voltage and Charge Time for Standby Use

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



### Battery Voltage and Charge Time for Cycle Use

### 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 |

### 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       |                     |

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