

# stored energy solutions for a demanding world

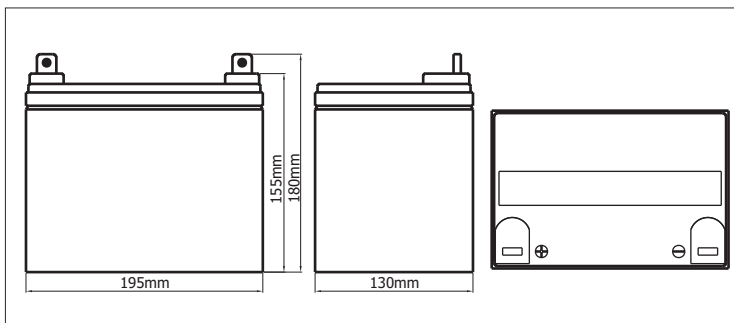


## Model: 12HRL140

## HRL Series

The HRL range of VRLA batteries with 12+ years design life is perfectly suited to any application which requires a high rate current over a short period. In particular they are ideal for IDC and UPS systems thanks to their optimized performance and a patented post seal design. Meanwhile with excellent uniform battery performance, long design life wide usage temperature range, HRL series are suit for high ambient temperature.

### Dimensions--mm[inch]



### Specifications

| Battery Model                              | 12HRL140                                                                          |  |
|--------------------------------------------|-----------------------------------------------------------------------------------|--|
| Nominal Voltage                            | 12V                                                                               |  |
| Rated Capacity                             | 140 W/cell(15 minute rate, 1.67 V/cell) and 34Ah(20 hr to 1.80V/cell) @25°C(77°F) |  |
| Typical Weight                             | 10.7kg                                                                            |  |
| Internal Resistance                        | Approx 10.0mΩ                                                                     |  |
| Temperature Ranges                         | Operation (maximum) : -40°C to 55°C(-40°F to 131°F)                               |  |
|                                            | Operation (recommended) : 15°C to 25°C(59°F to 77°F)                              |  |
|                                            | Storage: -20 °C to 40 °C(-4°F to 104 °F)                                          |  |
| Float Voltage                              | 2.27V/cell@25°C(77°F)                                                             |  |
| Recommended Maximum Charging Current Limit | 10A                                                                               |  |
| Equalize and Cycle Service                 | 2.35V~2.40V@25°C(77°F)                                                            |  |
| Self Discharge                             | The residual capacity is above 87% after 90 days storage(25°C/77°F)               |  |
| Terminal                                   | M5 Terminal                                                                       |  |
| Terminal Hardware Torque                   | 6 ± 1.0Nm                                                                         |  |
| Container Material                         | ABS (V0 optional)                                                                 |  |

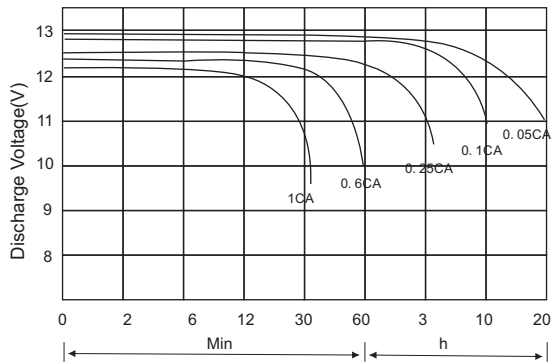
### Constant Current Discharge Characteristics Units: Amperes (25°C, 77°F)

| End voltage per cell | 5min | 10min | 15min | 20min | 30min | 40min | 50min | 1h   | 2h   | 3h   | 4h   | 5h   | 6h   | 8h   | 10h  |
|----------------------|------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|------|------|------|
| 1.60V                | 120  | 94.7  | 82.7  | 64.6  | 46.4  | 37.3  | 30.5  | 23.0 | 13.4 | 9.01 | 7.31 | 6.13 | 5.27 | 4.21 | 3.67 |
| 1.67V                | 112  | 89.2  | 79.5  | 60.9  | 44.7  | 36.5  | 29.5  | 22.8 | 13.2 | 8.91 | 7.24 | 6.10 | 5.23 | 4.14 | 3.63 |
| 1.70V                | 109  | 86.3  | 77.2  | 59.2  | 43.9  | 35.8  | 29.0  | 22.6 | 13.1 | 8.84 | 7.21 | 6.03 | 5.20 | 4.10 | 3.55 |
| 1.75V                | 105  | 82.3  | 74.5  | 56.4  | 42.3  | 35.1  | 28.3  | 22.4 | 13.0 | 8.73 | 7.14 | 5.96 | 5.09 | 4.03 | 3.45 |
| 1.80V                | 100  | 77.3  | 72.2  | 54.6  | 40.6  | 34.3  | 28.1  | 21.5 | 12.8 | 8.59 | 6.90 | 5.75 | 5.02 | 3.99 | 3.30 |
| 1.85V                | 93.8 | 72.7  | 68.3  | 52.6  | 39.2  | 33.8  | 27.5  | 21.0 | 12.1 | 8.42 | 6.72 | 5.47 | 4.75 | 3.81 | 3.20 |
| 1.90V                | 71.2 | 54.7  | 49.3  | 44.7  | 34.6  | 28.0  | 23.9  | 19.0 | 11.5 | 7.76 | 6.03 | 5.06 | 4.30 | 3.56 | 3.07 |

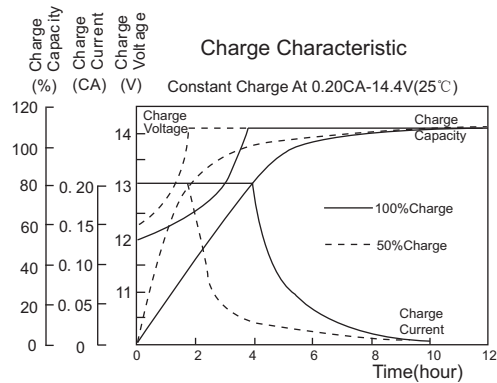
### Discharge Data with Constant Power Units: Watts per cell (25°C, 77°F)

| End voltage per cell | 5min | 10min | 15min | 20min | 30min | 40min | 50min | 1h   | 2h   | 3h   | 4h   | 5h   | 6h   | 8h   | 10h  |
|----------------------|------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|------|------|------|
| 1.60V                | 202  | 163   | 145   | 119   | 86.3  | 65.7  | 53.8  | 41.1 | 24.3 | 16.5 | 13.6 | 11.4 | 9.88 | 7.91 | 6.94 |
| 1.67V                | 191  | 156   | 140   | 113   | 83.9  | 64.9  | 53.1  | 40.6 | 24.2 | 16.4 | 13.4 | 11.4 | 9.82 | 7.80 | 6.91 |
| 1.70V                | 186  | 152   | 138   | 111   | 82.7  | 64.2  | 52.3  | 40.3 | 24.0 | 16.3 | 13.4 | 11.3 | 9.77 | 7.76 | 6.87 |
| 1.75V                | 182  | 146   | 134   | 107   | 80.7  | 63.4  | 51.6  | 39.7 | 24.3 | 16.5 | 13.2 | 11.3 | 9.68 | 7.70 | 6.83 |
| 1.80V                | 176  | 139   | 131   | 104   | 78.0  | 63.0  | 51.9  | 39.1 | 23.9 | 16.1 | 12.9 | 10.9 | 9.55 | 7.63 | 6.61 |
| 1.85V                | 169  | 133   | 126   | 101   | 75.7  | 62.7  | 51.2  | 37.8 | 22.7 | 15.9 | 12.8 | 10.5 | 9.05 | 7.31 | 6.35 |
| 1.90V                | 125  | 101   | 96.8  | 83.1  | 64.6  | 52.3  | 44.9  | 36.1 | 21.7 | 14.8 | 11.5 | 9.68 | 8.21 | 6.86 | 5.99 |

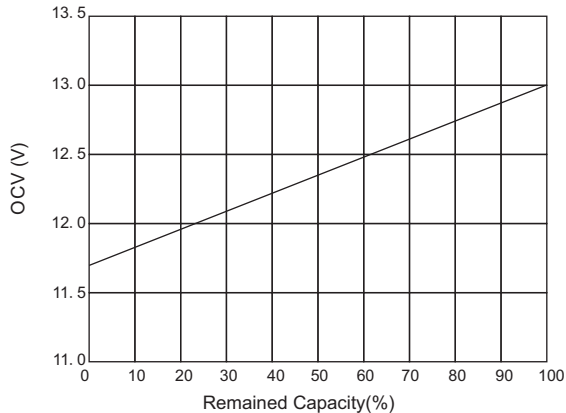
Terminal Voltage(V) Vs. Discharge Time (25°C, 77°F)



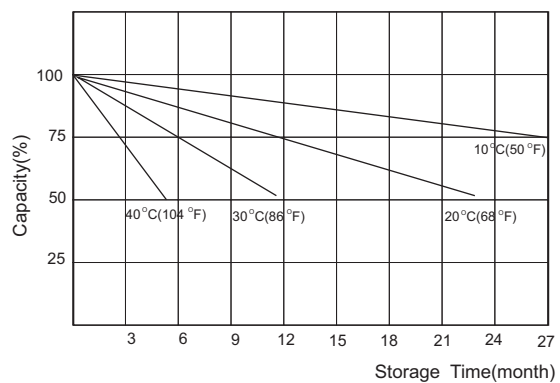
Battery Voltage Vs. Charge Time



Relationship of OCV Vs. State of Charge



Capacity Retention Characteristic



Charging Procedures

| Application | Charge Voltage (V/Cell) |           |                 | Max. Charge Current |
|-------------|-------------------------|-----------|-----------------|---------------------|
|             | Temperature             | Set Point | Allowable Range |                     |
| Cycle       | 25 °C                   | 2.40      | 2.35~2.45       | 10A                 |
| Standby     | 25 °C                   | 2.27      | 2.23~2.27       |                     |

Discharge Current VS. Discharge Voltage

| Final Discharge Voltage V/Cell | 1.80    | 1.70          | 1.55          | 1.30    |
|--------------------------------|---------|---------------|---------------|---------|
| Discharge Current (A)          | 10A ≥ I | 10A < I < 25A | 25A < I < 50A | I > 50A |

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