



HR Series-High Rate

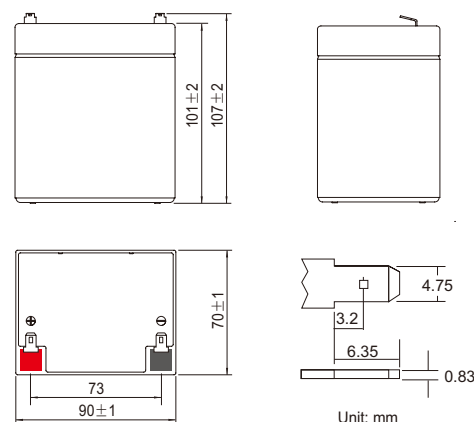
HR1224W(12V24W)

Specifications

| | | | |
|--|----------------------|----------------------------|--------------|
| Rated Voltage | 12V | | |
| Nominal Rate (W ₁₅ , 1.67V/cell) | 24W | | |
| Nominal Capacity(C ₁₀ , 1.80V/cell) | 5.3Ah | | |
| Dimension | Length | 90±1mm (3.54 inches) | |
| | Width | 70±1mm (2.78 inches) | |
| | Container Height | 101±2mm (3.98 inches) | |
| | Total Height | 107±2mm (4.21 inches) | |
| Approx. Weight | 1.88 Kg (4.15 lbs) | | |
| Terminal | T2 | | |
| Container Material | ABS: UL 94 HB or V-0 | | |
| Rated Capacity (25°C) | 5.30 Ah | (10hr, 0.530A, 1.80V/cell) | |
| | 5.20 Ah | (8hr, 0.650A, 1.80V/cell) | |
| | 4.90 Ah | (5hr, 0.980A, 1.75V/cell) | |
| | 4.50 Ah | (3hr, 1.50A, 1.75V/cell) | |
| | 4.78 Ah | (1hr, 4.78A, 1.67V/cell) | |
| Max. Discharge Current | 90A | | |
| Internal Resistance (25°C) | Approx. 31 mΩ | | |
| Operating Temp. Range | Discharge | -20 ~ 55°C (-4 ~ 131°F) | |
| | Charge | -20~ 40°C (-4 ~ 104°F) | |
| | Storage | -15 ~ 50°C (5 ~ 122°F) | |
| Nominal Operating Temp. Range | 25±3°C (77±5°F) | | |
| Max. Charging Current(25°C) | 1.43A | | |
| Charge voltage(25°C) | Charge voltage | Temp. Coefficient | |
| | Float | 2.25 ~2.30V/cell | -3mV/cell/°C |
| Effect of temp. to Capacity | Equalization | 2.30~2.40V/cell | -4mV/cell/°C |
| | 40°C (104°F) | 106% | |
| | 25°C (77°F) | 100% | |
| | 0°C (32°F) | 86% | |
| Self Discharge | ≤3%/month @ 25°C | | |



Layout



Constant Current Discharge (Amperes) at 25 °C (77°F)

| F.V/Time | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 8h | 10h |
|------------|------|-------|-------|-------|-------|-------|------|------|------|------|------|-------|-------|-------|
| 1.85V/cell | 17.7 | 11.8 | 9.69 | 7.73 | 5.43 | 3.87 | 3.01 | 2.25 | 1.80 | 1.35 | 1.07 | 0.890 | 0.607 | 0.497 |
| 1.80V/cell | 20.7 | 13.9 | 11.3 | 8.90 | 6.14 | 4.33 | 3.33 | 2.46 | 1.96 | 1.46 | 1.15 | 0.959 | 0.650 | 0.530 |
| 1.75V/cell | 22.6 | 14.9 | 11.9 | 9.34 | 6.42 | 4.51 | 3.46 | 2.55 | 2.02 | 1.50 | 1.18 | 0.980 | 0.662 | 0.538 |
| 1.70V/cell | 24.4 | 15.9 | 12.6 | 9.83 | 6.70 | 4.68 | 3.58 | 2.63 | 2.09 | 1.54 | 1.21 | 1.00 | 0.673 | 0.547 |
| 1.67V/cell | 25.5 | 16.5 | 13.0 | 10.1 | 6.87 | 4.78 | 3.66 | 2.68 | 2.12 | 1.57 | 1.23 | 1.02 | 0.680 | 0.552 |
| 1.60V/cell | 28.1 | 17.9 | 13.9 | 10.7 | 7.25 | 5.03 | 3.84 | 2.80 | 2.21 | 1.62 | 1.27 | 1.05 | 0.696 | 0.563 |

Constant Power Discharge (Watts/cell) at 25 °C (77°F)

| F.V/Time | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 8h | 10h |
|------------|------|-------|-------|-------|-------|-------|------|------|------|------|------|------|------|-------|
| 1.85V/cell | 33.8 | 22.6 | 18.6 | 14.9 | 10.5 | 7.51 | 5.86 | 4.39 | 3.52 | 2.65 | 2.10 | 1.75 | 1.20 | 0.983 |
| 1.80V/cell | 38.9 | 26.3 | 21.4 | 17.0 | 11.8 | 8.33 | 6.44 | 4.78 | 3.81 | 2.85 | 2.25 | 1.88 | 1.28 | 1.05 |
| 1.75V/cell | 41.9 | 27.9 | 22.4 | 17.7 | 12.2 | 8.61 | 6.63 | 4.91 | 3.91 | 2.91 | 2.30 | 1.92 | 1.30 | 1.06 |
| 1.70V/cell | 44.8 | 29.4 | 23.5 | 18.4 | 12.6 | 8.86 | 6.82 | 5.04 | 4.01 | 2.99 | 2.35 | 1.96 | 1.32 | 1.08 |
| 1.67V/cell | 46.4 | 30.3 | 24.0 | 18.8 | 12.9 | 9.02 | 6.93 | 5.12 | 4.07 | 3.02 | 2.38 | 1.98 | 1.33 | 1.09 |
| 1.60V/cell | 50.5 | 32.4 | 25.4 | 19.7 | 13.4 | 9.38 | 7.20 | 5.30 | 4.20 | 3.12 | 2.45 | 2.03 | 1.36 | 1.11 |



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Applications

- UPS
- Hospitals & Testing Laboratories
- Emergency Power Supply
- Industrial Process Control Facilities
- Banks & Financial Markets
- Data & Network Operation Centers

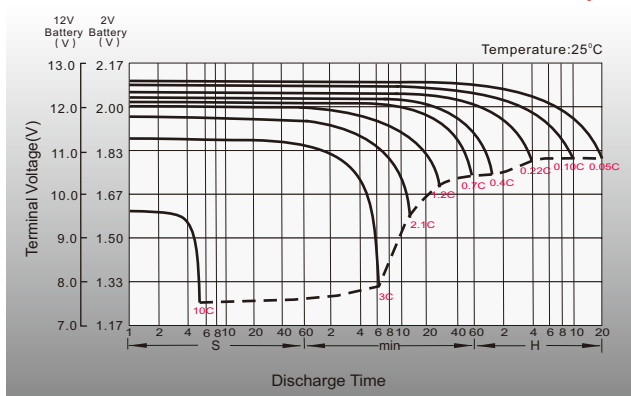
General Features

- High quality AGM separator: extend cycle life and prevent micro short circuit
- PbCaSn alloy for plate grids: less gassing, less self-discharging
- Unique vent valve design: reduce water losing and prevent air/spark going inside

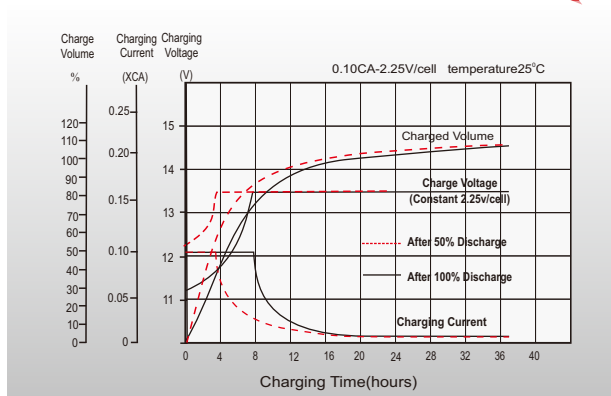
Standards

- Compliance with IEC 60896 standards
- Classified as "General Purpose" according to Eurobat

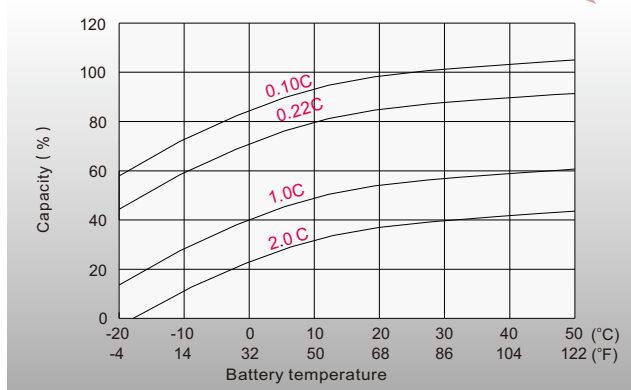
Discharge Characteristics



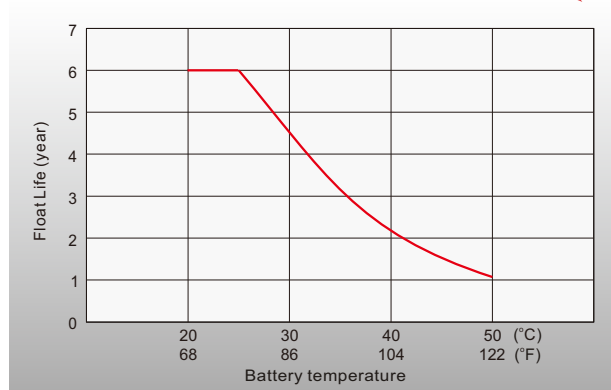
Float Charging Characteristics



Temperature Effects in Relation to Battery Capacity



Effect of Temperature on Long Term Float Life



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