

## General features for MPE Series (Deep-cycle) battery

- \* Absorbent Glass Mat (AGM) technology for efficient gas recombination of up to 99% and freedom from electrolyte maintenance or water adding.
- \* Computer designed lead, calcium tin alloy grid for high power density.
- \* UL-recognized component.
- \* Long service life, float or cyclic applications.
- \* Maintenance-free operation.
- \* Low self discharge.
- \* Case and cover are available in both standard and flame retardant ABS (Standard : UL94V0).



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**MPE12-28 (12V28Ah)**

## Specifications

|                               |              |                      |                      |
|-------------------------------|--------------|----------------------|----------------------|
| Nominal Voltage               |              | 12V                  |                      |
| Rated capacity (20 hour rate) |              | 28Ah                 |                      |
| Dimensions (±2mm)             | Total Height | T13                  | 125 mm (4.92 inches) |
|                               |              | T4                   | 125 mm (4.92 inches) |
|                               | Height       | 125 mm (4.92 inches) |                      |
|                               | Length       | 175 mm (6.89inches)  |                      |
|                               | Width        | 166 mm (6.54 inches) |                      |
| Weight Approx (±3%)           |              | 9.0Kg (19.81 lbs)    |                      |

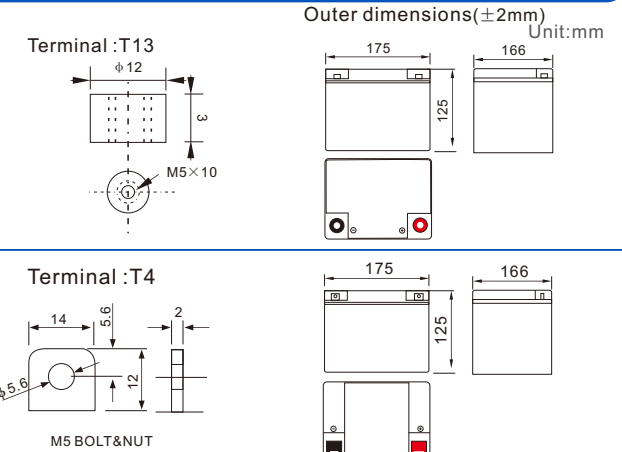
## Battery picture and construction



### Battery Construction

|              |                      |                |              |          |
|--------------|----------------------|----------------|--------------|----------|
| Component    | Positive plate       | Negative plate | Container    | Cover    |
| Raw material | Lead dioxide         | Lead           | ABS          | ABS      |
| Component    | Electrolyte          | Separator      | Safety valve | Terminal |
| Raw material | Dilute sulfuric acid | Fiberglass     | Rubber       | Copper   |

## Outer dimension and terminal



## Characteristics

|   |  |  |
|---|--|--|
| Capacity<br>25°C(77°F)                          | 20 hour rate(1.4 A, 10.5V)                             | 28.0Ah   |
|   | 10 hour rate(2.58A, 10.5V)                             | 25.8Ah   |
|   | 5 hour rate(4.76A, 10.5V)<br>1 hour rate(16.8 A, 9.6V) | 23.8Ah<br>16.8 Ah  |
| Internal Resistance                             | Full charged battery at 25°C(77°F)                     | Approx 9.6mΩ   |
| Capacity affected by Temperature (20hour rate)  | 40°C (104°F)   | 102%   |
|   | 25°C (77°F)  | 100%   |
|   | 0°C (32°F)   | 85%  |
|   | -15°C (5°F)  | 65%  |
| Remaining capacity Self-Discharge At 25°C(77°F) | Capacity after 3 month storage                         | 91%  |
|   | Capacity after 6 month storage                         | 82%  |
|   | Capacity after 12 month storage                        | 64%  |
| Terminal type                                   | T13 (Option T4)  |  |
| Max. Discharge current 25°C/(77°F)              | 420A (5Seconds)  |  |
| Nominal operating temperature                   | 25°C ±5°C(77°F ±9°F)                                   |  |
| Operating Temperature Range                     | Discharge  | -15°C ~50°C (5°F ~122°F)   |
|   | Charge   | -10°C ~50°C (14°F ~122°F)  |
|   | Storage  | -20°C ~50°C (-4°F ~122°F)  |
| Charge methods (constant Voltage) At 25°C(77°F) | Cycle use  | Initial Charging Current less than 11.4 A<br>Voltage 14.5-14.9V<br>Temperature compensation:-30mV/°C |
|   | Standby use  | Voltage 13.5-13.8V<br>Temperature compensation:-18mV/°C  |

## Constant current discharge (25°C , 77 °F)

## Constant power discharge (25°C , 77 °F)

Unit:A

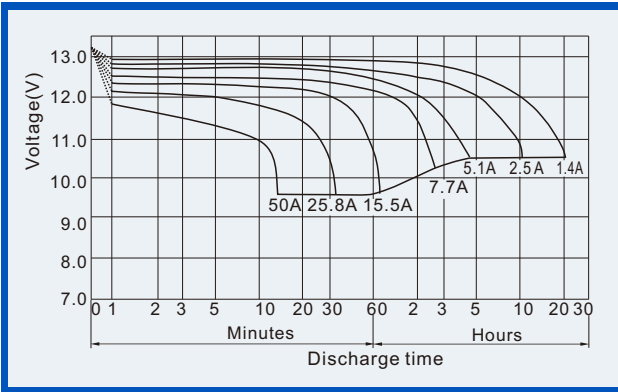
Unit:watts

| Time   | 5min | 10min  | 15min | 30min | 1h    | 2h    | 3h    | 4h   | 5h   | 8h   | 10h  | 20h  |      |
|--------|------|--------|-------|-------|-------|-------|-------|------|------|------|------|------|------|
| 9.60V  | A    | 100.80 | 66.08 | 49.00 | 32.20 | 16.80 | 9.80  | 7.21 | 5.79 | 4.91 | 3.24 | 2.65 | 1.45 |
|        | W    | 1188.8 | 746.7 | 564.7 | 341.8 | 193.7 | 113.4 | 83.4 | 67.0 | 56.8 | 37.5 | 30.7 | 16.8 |
| 10.20V | A    | 92.40  | 63.23 | 45.03 | 30.57 | 15.77 | 9.40  | 7.00 | 5.60 | 4.82 | 3.19 | 2.60 | 1.41 |
|        | W    | 1118.8 | 707.0 | 530.8 | 339.5 | 182.0 | 108.9 | 81.1 | 64.9 | 55.8 | 36.9 | 30.1 | 16.3 |
| 10.50V | A    | 84.12  | 59.08 | 42.00 | 29.63 | 15.26 | 9.22  | 6.88 | 5.32 | 4.80 | 3.15 | 2.58 | 1.40 |
|        | W    | 1080.3 | 686.0 | 507.5 | 336.0 | 176.6 | 106.8 | 79.7 | 61.6 | 55.4 | 36.5 | 29.9 | 16.2 |
| 10.80V | A    | 80.84  | 56.47 | 39.20 | 28.82 | 14.75 | 8.98  | 6.77 | 5.23 | 4.55 | 3.07 | 2.51 | 1.37 |
|        | W    | 947.3  | 665.0 | 488.8 | 334.8 | 171.5 | 104.5 | 78.8 | 60.8 | 53.0 | 35.0 | 29.2 | 15.9 |
| 11.10V | A    | 74.76  | 53.20 | 36.40 | 28.00 | 14.23 | 8.75  | 6.42 | 5.13 | 4.35 | 2.99 | 2.45 | 1.33 |
|        | W    | 915.8  | 642.8 | 465.5 | 332.5 | 169.2 | 103.8 | 76.4 | 60.7 | 51.8 | 33.8 | 28.6 | 15.8 |

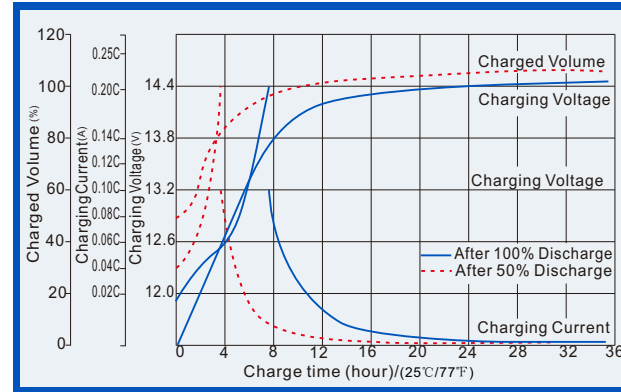
(Above characteristics data are average values obtained within three charge/discharge cycles, not the minimum values.)

# Deep Cycle Battery (VRLA Battery, AGM technology) Maintenance-free Sealed Lead Acid Rechargeable Battery

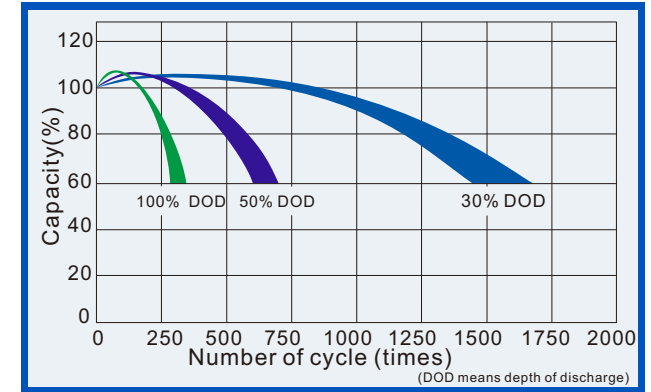
**Discharge characteristics (25°C, 77°F)**



**Charge characteristics (25°C, 77°F)**



**Life characteristics of Cyclic Use (25°C, 77°F)**



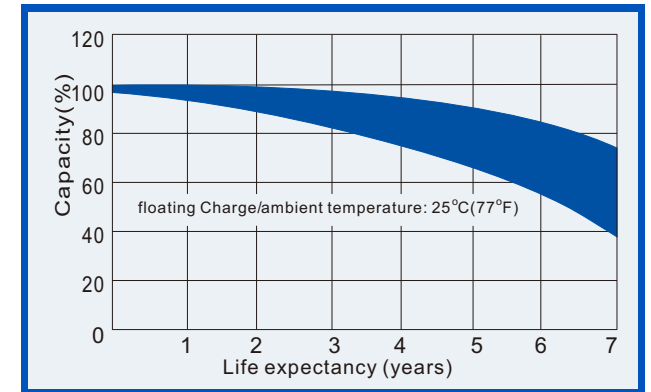
**Effect of Temperature on capacity**



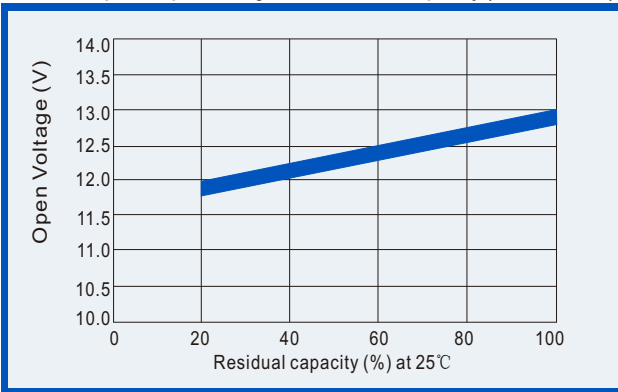
**Self-discharge characteristics**



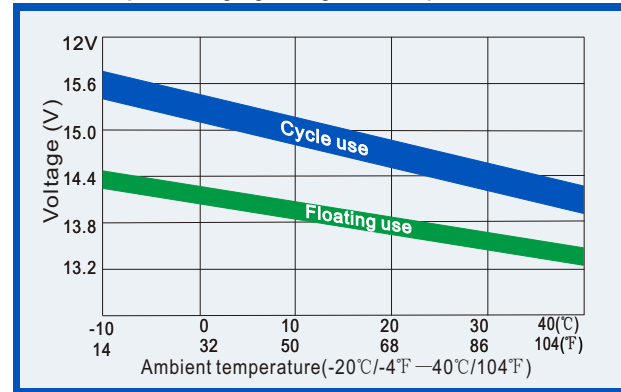
**Life Characteristics of standby use (25°C, 77°F)**



**Relationships for open voltage and remained capacity (for reference)**



**Relationship for charging voltage and temperature**



**Temperature effects on floating life**

