

USER GUIDE

Solar Battery

Solar Battery



DEEP CYCLE BATTERY

(GEL Deep Cycle) series is specially designed for frequent cyclic discharge. By using strong grids and specially designed active material, the DC series battery offers 30% more cyclic life than the standby series. It is suitable for solar energy systems, marine and RV etc.

Specification

| Model | G12V65AH | G12V70AH | G12V100AH | G12V150AH | G12V200AH | G12V200AH-S | G12V250AH |
|--|--|--|---|---|---|---|---|
| Cells Per Unit | 6 | | | | | | |
| Voltage Per Unit | 12 | | | | | | |
| Capacity | 65Ah@10hr-rate to 1.80V per cell @25°C | 70Ah@10hr-rate to 1.80V per cell @25°C | 100Ah@10hr-rate to 1.80V per cell @25°C | 150Ah@10hr-rate to 1.80V per cell @25°C | 200Ah@10hr-rate to 1.80V per cell @25°C | 200Ah@10hr-rate to 1.80V per cell @25°C | 250Ah@10hr-rate to 1.80V per cell @25°C |
| Weight | 16Kg | 20Kg | 31.5Kg | 42.5Kg | 60.0Kg | 60.0Kg | 70.1Kg |
| Max. Discharge Current | 650A(5 sec) | 700A(5 sec) | 1000A(5 sec) | 1500A(5 sec) | 2000A(5 sec) | 2000A(5 sec) | 2500A(5 sec) |
| Internal Resistance | Approx. 6.0 mΩ | Approx. 5.8 mΩ | Approx. 5.0 mΩ | Approx. 4.2 mΩ | Approx. 4.0 mΩ | Approx. 4.0 mΩ | Approx. 3.8 mΩ |
| Recommended Maximum Charging Current Limit | 22.5A | 23.5A | 30A | 45A | 60A | 60A | 75A |
| Operating Temperature Range | Discharge: -20°C ~ 60°C Charge: 0°C ~ 50°C Storage: -20°C ~ 60°C | | | | | | |
| Normal Operating Temperature Range | 25°C ± 5°C | | | | | | |
| Float charging Voltage | 13.6 to 13.8V DC/unit Average at 25°C | | | | | | |
| Equalization and Cycle Service | 14.4 to 14.6V DC/unit Average at 25°C | | | | | | |
| Self Discharge | GEL batteries can be stored for more than 6 months at 25°C. Self-discharge ratio less than 3% per month at 25°C. Please charge batteries before using. | | | | | | |
| SIZE | 350x166x175MM | 270x180x245MM | 330x171x218MM | 484x170x241MM | 522x220x240MM | 522x220x240MM | 522x260x220MM |

Constant Current Discharge Characteristics: A (25 °C)

| G12V100AH | | | | | | | | | | | | |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| F.V/Time | 5MIN | 10MIN | 15MIN | 30MIN | 1HR | 2HR | 3HR | 4HR | 5HR | 8HR | 10HR | 20HR |
| 9.60V | 320.7 | 226.9 | 181.4 | 112.7 | 65.00 | 38.89 | 26.88 | 22.03 | 18.03 | 12.42 | 10.50 | 5.78 |
| 10.0V | 311.4 | 215.8 | 177.7 | 110.8 | 64.70 | 38.60 | 26.78 | 21.93 | 17.93 | 12.32 | 10.40 | 5.67 |
| 10.2V | 302.2 | 208.2 | 174.9 | 109.8 | 64.10 | 38.31 | 26.57 | 21.83 | 17.82 | 12.22 | 10.30 | 5.57 |
| 10.5V | 271.3 | 192.1 | 166.5 | 107.1 | 63.50 | 38.02 | 26.47 | 21.62 | 17.61 | 12.12 | 10.20 | 5.46 |
| 10.8V | 244.9 | 175.2 | 153.5 | 102.4 | 62.00 | 37.33 | 25.75 | 21.11 | 17.29 | 11.92 | 10.10 | 5.36 |
| 11.1V | 209.1 | 156.6 | 137.7 | 95.91 | 58.90 | 35.68 | 24.62 | 20.09 | 16.55 | 11.41 | 9.80 | 5.04 |

| G12V150AH | | | | | | | | | | | | |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| F.V/Time | 5MIN | 10MIN | 15MIN | 30MIN | 1HR | 2HR | 3HR | 4HR | 5HR | 8HR | 10HR | 20HR |
| 9.60V | 452.4 | 337.8 | 272.1 | 150.7 | 93.63 | 57.81 | 39.28 | 31.68 | 26.29 | 17.32 | 15.61 | 8.26 |
| 10.0V | 439.3 | 321.4 | 266.5 | 148.8 | 92.38 | 56.64 | 38.56 | 31.23 | 26.06 | 17.25 | 15.46 | 8.11 |
| 10.2V | 426.3 | 310.1 | 262.4 | 146.5 | 91.50 | 56.04 | 38.21 | 30.91 | 25.89 | 17.10 | 15.30 | 7.95 |
| 10.5V | 382.8 | 286.1 | 249.8 | 142.5 | 90.38 | 55.31 | 37.87 | 30.46 | 25.67 | 16.94 | 15.15 | 7.80 |
| 10.8V | 345.5 | 260.9 | 230.3 | 137.8 | 89.12 | 54.85 | 37.43 | 29.41 | 25.55 | 16.87 | 15.01 | 7.72 |
| 11.1V | 295.0 | 233.2 | 206.5 | 132.5 | 87.01 | 52.65 | 36.70 | 28.99 | 25.36 | 16.74 | 14.84 | 7.41 |

| G12V200AH | | | | | | | | | | | | |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| F.V/Time | 5MIN | 10MIN | 15MIN | 30MIN | 1HR | 2HR | 3HR | 4HR | 5HR | 8HR | 10HR | 20HR |
| 9.60V | 569.6 | 426.7 | 344.7 | 200.9 | 124.8 | 77.07 | 52.38 | 42.23 | 35.06 | 23.09 | 20.81 | 11.02 |
| 10.0V | 553.2 | 406.0 | 337.6 | 198.4 | 123.2 | 75.52 | 51.41 | 41.63 | 34.75 | 23.00 | 20.61 | 10.81 |
| 10.2V | 536.8 | 391.7 | 332.3 | 195.3 | 122.0 | 74.72 | 50.95 | 41.22 | 34.52 | 22.79 | 20.40 | 10.61 |
| 10.5V | 482.0 | 361.4 | 316.4 | 190.0 | 120.5 | 73.74 | 50.50 | 40.61 | 34.23 | 22.59 | 20.20 | 10.40 |
| 10.8V | 435.1 | 329.6 | 291.7 | 183.7 | 118.8 | 73.14 | 49.91 | 39.22 | 34.06 | 22.50 | 20.02 | 10.30 |
| 11.1V | 371.5 | 294.6 | 261.6 | 176.7 | 116.0 | 70.20 | 48.93 | 38.65 | 33.81 | 22.32 | 19.78 | 9.88 |

Constant Power Discharge Characteristics: W (25°C)

| G12V100AH | | | | | | | | | | | | |
|-----------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| F.V/Time | 5MIN | 10MIN | 15MIN | 30MIN | 1HR | 2HR | 3HR | 4HR | 5HR | 8HR | 10HR | 20HR |
| 9.60V | 3317 | 2416 | 1996 | 1284 | 751.1 | 458.4 | 319.9 | 262.6 | 215.1 | 148.3 | 125.5 | 69.26 |
| 10.0V | 3251 | 2342 | 1964 | 1269 | 749.3 | 456.0 | 320.0 | 262.3 | 214.6 | 147.6 | 124.7 | 68.06 |
| 10.2V | 3214 | 2280 | 1941 | 1260 | 743.5 | 453.3 | 318.6 | 261.7 | 213.9 | 146.6 | 123.6 | 66.80 |
| 10.5V | 2926 | 2123 | 1852 | 1230 | 736.8 | 450.0 | 317.4 | 259.3 | 211.3 | 145.4 | 122.4 | 65.54 |
| 10.8V | 2665 | 1957 | 1712 | 1179 | 723.2 | 444.2 | 308.7 | 253.4 | 207.5 | 143.0 | 121.2 | 64.28 |
| 11.1V | 2341 | 1770 | 1541 | 1108 | 692.3 | 427.7 | 295.4 | 241.1 | 198.6 | 136.9 | 117.6 | 60.50 |

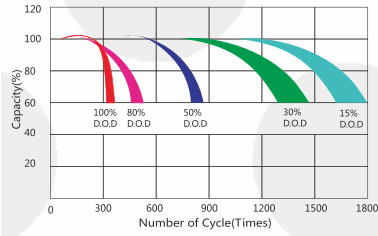
| G12V150AH | | | | | | | | | | | | |
|-----------|------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|
| F.V/Time | 5MIN | 10MIN | 15MIN | 30MIN | 1HR | 2HR | 3HR | 4HR | 5HR | 8HR | 10HR | 20HR |
| 9.60V | 4679 | 3598 | 2993 | 1725 | 1085 | 677.4 | 462.5 | 379.1 | 315.0 | 207.4 | 187.2 | 99.54 |
| 10.0V | 4587 | 3487 | 2945 | 1707 | 1075 | 669.1 | 455.6 | 373.8 | 312.2 | 206.6 | 185.7 | 97.81 |
| 10.2V | 4534 | 3395 | 2912 | 1692 | 1069 | 664.4 | 453.6 | 370.3 | 310.3 | 205.0 | 184.1 | 96.00 |
| 10.5V | 4128 | 3162 | 2778 | 1658 | 1062 | 656.0 | 449.9 | 365.3 | 307.8 | 203.3 | 182.2 | 94.19 |
| 10.8V | 3760 | 2914 | 2567 | 1619 | 1048 | 651.1 | 444.9 | 353.0 | 306.4 | 202.4 | 180.4 | 93.28 |
| 11.1V | 3302 | 2635 | 2311 | 1574 | 1033 | 626.7 | 437.4 | 347.9 | 305.3 | 201.0 | 178.5 | 89.94 |

| G12V200AH | | | | | | | | | | | | |
|-----------|------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|
| F.V/Time | 5MIN | 10MIN | 15MIN | 30MIN | 1HR | 2HR | 3HR | 4HR | 5HR | 8HR | 10HR | 20HR |
| 9.60V | 5892 | 4544 | 3792 | 2300 | 1447 | 903.2 | 616.7 | 505.5 | 420.0 | 276.5 | 249.6 | 132.7 |
| 10.0V | 5776 | 4405 | 3731 | 2276 | 1433 | 892.2 | 607.5 | 498.4 | 416.2 | 275.5 | 247.6 | 130.4 |
| 10.2V | 5710 | 4289 | 3689 | 2257 | 1425 | 885.8 | 604.8 | 493.7 | 413.7 | 273.4 | 245.4 | 128.0 |
| 10.5V | 5198 | 3994 | 3518 | 2211 | 1416 | 874.6 | 599.9 | 487.1 | 410.4 | 271.1 | 243.0 | 125.6 |
| 10.8V | 4734 | 3681 | 3252 | 2158 | 1398 | 868.1 | 593.2 | 470.6 | 408.5 | 269.9 | 240.6 | 124.4 |
| 11.1V | 4159 | 3328 | 2927 | 2099 | 1377 | 835.6 | 583.2 | 463.9 | 407.0 | 268.0 | 238.0 | 119.9 |

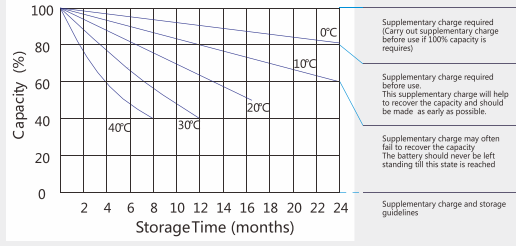
G12V200AH-S

| F.V/Time | 5MIN | 10MIN | 15MIN | 30MIN | 1HR | 2HR | 3HR | 4HR | 5HR | 8HR | 10HR | 20HR |
|----------|------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|
| 9.60V | 5892 | 4544 | 3792 | 2300 | 1447 | 903.2 | 616.7 | 505.5 | 420.0 | 276.5 | 249.6 | 132.7 |
| 10.0V | 5776 | 4405 | 3731 | 2276 | 1433 | 892.2 | 607.5 | 498.4 | 416.2 | 275.5 | 247.6 | 130.4 |
| 10.2V | 5710 | 4289 | 3689 | 2257 | 1425 | 885.8 | 604.8 | 493.7 | 413.7 | 273.4 | 245.4 | 128.0 |
| 10.5V | 5198 | 3994 | 3518 | 2211 | 1416 | 874.6 | 599.9 | 487.1 | 410.4 | 271.1 | 243.0 | 125.6 |
| 10.8V | 4734 | 3681 | 3252 | 2158 | 1398 | 868.1 | 593.2 | 470.6 | 408.5 | 269.9 | 240.6 | 124.4 |
| 11.1V | 4159 | 3328 | 2927 | 2099 | 1377 | 835.6 | 583.2 | 463.9 | 407.0 | 268.0 | 238.0 | 119.9 |

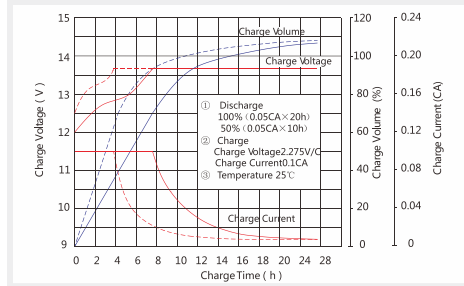
Life characteristics of cyclic use



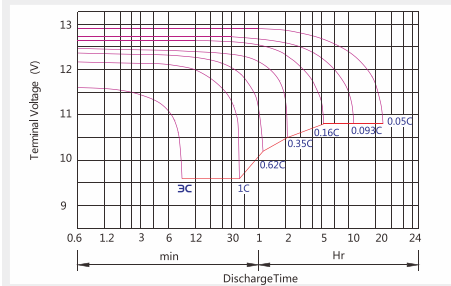
Storage characteristic



Charge characteristic Curve for standby use



Discharge characteristic Curve



Capacity Factors With Different Temperature

| Temperature | -20°C | -10°C | 0°C | 5°C | 10°C | 20°C | 25°C | 30°C | 40°C | 45°C |
|-----------------|-------|-------|-----|-----|------|------|------|------|------|------|
| Capacity Factor | 46% | 66% | 76% | 83% | 90% | 98% | 100% | 103% | 107% | 109% |

Discharge Current VS. Discharge Voltage

| | | | |
|----------------------------------|-------------------------------|-----------------------------------|-------------------------------|
| Final D ischarge Voltage V /cell | 1.75V | 1.70V | 1.60V |
| Discharge Current (A) | $\langle A \rangle \leq 0.2C$ | $0.2C < \langle A \rangle < 1.0C$ | $\langle A \rangle \geq 1.0C$ |

Charge the batteries at least once every five months, if they are stored at 25°C.

Charging Method:

| | |
|------------------|---|
| Constant Voltage | $-0.2C \times 2h + 14.4 - 14.7V \times 24h$, Max. Current 0.3C |
| Constant Current | $-0.2C \times 2h + 0.1C \times 7h + 0.05C \times 4h$ |
| Fast | $-0.2C \times 2h + 0.3C \times 3h$ |

Maintenance & Cautions

Cycle service

- ✘ Avoid battery over discharge, especially battery series connection use.
- ✘ Charged with recommend voltage, ensure battery can be full recharged.
 - In general, recharge capacity should be 1.1-1.15 times discharge capacity.
- ✘ Effect of temperature on cycle charge voltage: $-4mV/^\circ C/Cell$.
- ✘ There are a number of factors that will affect the length of cyclic service.
 - The most significant are depth of discharge, ambient temperature, discharge rate, and the manner in which the battery is recharged.
 - Generally speaking, the most important factors is depth of discharge.

Special notes:

The products should be recharged if still not being used after 4 months since the manufacturing date. Or the battery will be deteriorated or spoiled.