



NRG Power Systems
01202 735 544

IMPORTANT PLEASE READ

ENHANCED BATTERY PERFORMANCE & LIFE THROUGH CORRECT CHARGING

All our Sealed Lead Acid (SLA) Absorbed Glass Matt (AGM) batteries leave the factory in a fully charged state after being manufactured under stringent quality assurance regime. This includes a capacity check on every battery. To maintain their high quality performance, it is essential to charge at the correct voltage for the type of use. Briefly, usage can be regarded as either standby or cyclic.

STANDBY USE

Standby batteries are used as backup power for fire/security alarm systems, emergency PA/ lighting and UPS systems for computers etc where the battery is infrequently discharged, perhaps at most once every three months, and probably much less. VRLA batteries were developed for these applications in order to avoid the necessity of regular maintenance, topping up and separate battery rooms as required by conventional wet batteries. Therefor substantial savings can be made in man hours and battery accommodation. These benefits are due solely to the highly efficient gas recombination ability of the Yuasa VRLA batteries, which prevents the emission of hydrogen into the atmosphere. However, this efficient gas recombination is very much dependent upon the correct charge voltage being applied.

If the float voltage is too low, the battery will not only fall from full capacity, but softening and deterioration of the positive plate material occurs which shortens useful life. On the other hand, an excessive voltage forces a high overcharge current into the battery which will increase the breakdown of water in the electrolyte to a rate beyond the recombination capacity of the battery. This leads to the emission of gas through the safety valve incorporated into each cell and a reduction in electrolyte volume. Charging of Our VRLA batteries at the recommended voltage ensures that any gas is recombined within the cell and there is no significant loss of electrolyte. Overcharge can also cause expansion and deterioration of positive plate material. These 2 effects each directly reduce battery capacity, and a slight but persistent overcharge can eventually lead, within a few months, to a completely dried out battery with dry, brittle and enlarged positive plates. Overcharge also generates heat which increases the battery temperature possibly to a level at which thermal runaway may occur. This is characterised by a swollen battery.

To obviate the above effects, the float charging voltages must be set between the limits recommended (ie at 20°C, NP – 2.27 to 2.28VPC, UXL 2.23VPC, EN 2.25 to 2.27 VPC). At elevated temperatures these voltages must be decreased, whilst lower temperatures need a higher voltage. Temperature compensation is basically -3 millivolts per cell per °C above 20°C.

CYCLIC USE

Frequent charge and discharge of a battery is termed cyclic use. For example, this could be powering an electric Golf Trolley during a game and then re-charging immediately after. Other cyclic applications include mobility scooters, working lights, video cameras, portable communications, models, inflight tills, drinks dispensers, ticket machines and childrens toys among others.

Charging AGM batteries at a float voltage and using them in a cyclic application results in the gradual reduction of battery capacity. When used in the cyclic mode, batteries should be charged at a higher voltage. For a 12 volt NP battery the recommended cyclic charging voltage is 14.5 to 15 volts (Standard 1st phase of most modern 2/3/4 stage chargers) at 20°C

In addition, three rules must be observed when charging at the cyclic voltage.

- (i) Recharge after use no matter how little you use it. Failure to do so will cause sulphation which is irreparable and will affect your warranty.



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- (ii) Charging current must not exceed a maximum value equal to one quarter of battery capacity (expressed as 0.25CA eg. 6A for 24Ah). Exceeding this limit could damage the battery.
- (iii) The battery must not remain on this high voltage for too long after reaching full charge and should be switched down to a float charge voltage at this point. Unless this is carried out, the high voltage will cause overcharge with effects as previously described.

TWO EXAMPLES OF HOW YOUR CHARGER WORKS:

Standard 2 stage charging method

For 2 stage chargers we recommend the following values:

Initial maximum charging current = 0.25CA.

Charge voltage

1st stage = 2.45V/Cell (2.40 to 2.5 max)

2nd stage = 2.275V/Cell (2.27 to 2.28 max)

Switch from 1st stage to 2nd stage when charging current falls to 0.05C (0.04C to 0.08C)

If 0.25C current is available, a fully discharged battery will charge to switch over point in approx. 4-5 hours; if only 0.1C is available, this will take approx. 8-10 hours.

Note:

At switch over point (usually indicated by a green LED) the battery will be at 80-90% state of charge, the battery will need a further 16 hours at float voltage to reach 100% state of charge

Proportional timing charging method

Multi stage programmable logic chips are frequently used in modern chargers which monitor the decreasing charging current and switch to a timer mode that holds the boost charge on for an extra period of time, proportional to the time taken from switch on to the low current switching point. When the end of the timing stage is reached the charger will switch from boost voltage to float voltage. When these chips are properly set in a cyclic application, the battery receives the correct amount of charge at the proper voltage regardless of the level of discharge. When the charger switches down to float charge (usually indicated by green LED) the battery is almost fully charged typically 90-95% and can be safely left on float charge until it is required for use. A further 8 hours on float charge is recommended to achieve 100% state of charge.

The above charging methods cannot be used in applications where the load and battery are connected in parallel unless the current monitoring is effected in the cabling to the battery alone. This is because the total current drawn from the charger includes the load current as well as charge current.



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DETERIORATION OF BATTERY AND CHARGERS

Possibly the most common reason for premature cyclic battery failure is a failing or ageing charger.

There is a view that because a battery charger has no moving parts it cannot possibly wear out. Sadly this is not the case. Just as other devices fail, for example a Television gradually loses quality of sound and vision, so a battery charger's control circuits lose their quality of control. This will lead to incorrect charging and battery failure. In effect you may be undercharging your battery without knowing, causing sulphated lead plates – An irreversible condition. The rate at which a charger ages, is affected by the conditions and the amount in which it has to work. If it is a hot, damp or dusty location then it will deteriorate quicker than if it were operating in a cool, dry, dust free position. These poorer conditions affect the electrical components in different ways:

1. Heat causes the silicone in ICs (Integrated Circuits) and other components to gradually break down. This leads to the control circuits losing control of the voltage and damaging the battery.
2. Moisture causes short circuits across the ICs as well as corrosion of various components and connections, causing them to be inaccurate failing completely.
3. Dust causes components to overheat and deteriorate quickly. Some types of dust are electronically conductive and cause short circuits with inevitable inaccuracy of the charger or burning of the circuit board leading to the failure of the charger.
4. The more a charger is used, the faster it ages. The frequency of use that the charger will also affect the life of the charger. Batteries may be charged once or twice a week, or possibly five to six times a week. This is often not taken into consideration when people say 'but it is only 3 years old' A charger that is used every day for two years will show signs of ageing. It is advisable to have it checked thoroughly by a professional for charge voltage and cycle control. Even though you may be getting a green light on your charger it may not mean that it is working effectively. As there is a cost for testing it is often more efficient to replace the charger.

The challenge for us as a battery and battery charger vendor is convincing customers that we are not just out to sell a new charger, but that the benefits of better charging will help to avoid damaging a battery and therefore a worthy investment.

So, in the case of battery chargers, education and understanding ensures longer battery life and allows us to provide a better quality service and increased levels of customer satisfaction.

Don't damage your battery by charging with an old worn out charger.

If you would like to discuss this with us further please do not hesitate to contact us directly: 01202 73 55 44

HOW TO ENSURE YOU GET THE MOST FROM YOUR BATTERY

Battery Use:

Always:

- Ensure you have purchased the correct size of battery for your application
- Ensure all leads and connectors are fitted correctly and securely
- Re-charge as soon as you can after each use no matter how little you have used it - Failure to do so will cause sulphation which is irreparable and will affect your warranty. Our batteries do not suffer from 'Memory Effect' and so short charges between use are advisable
- Store and Charge in a cool dry place
- Ensure you are using the correct type of charger to re-charge your battery. At NRG Power Systems we advise you to consider replacing your charger if it is over 3 years old as electronic parts wear out
- Ensure your battery powered equipment is serviced regularly and that your battery is not being over worked.

Avoid

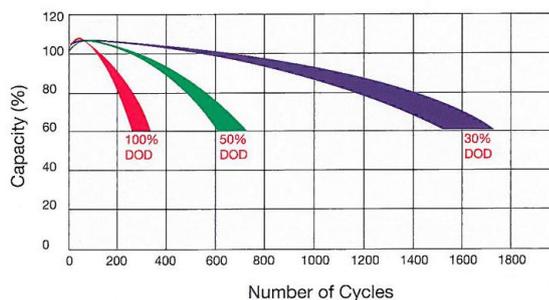
- Using your battery until it is totally discharged, this will shorten its life
- Using and Storing your battery in a warm environment, this will shorten its life
- Leaving your battery on charge for extended periods. Your battery, when fully charged will dissipate at less than 1% per month. Therefore if you are not using it for a couple of weeks or months, store your battery as recommended and recharge every 8 weeks.

Never

- Charge your battery with an incorrect charger e.g. Automotive type charger
- Leave your battery after use without charging it back up for at least 8 - 14 hours
- Attempt to use your battery if it has been left un-charged
- Drop your battery
- Charge your battery in temperatures below 5°C or above 30°C

Your batteries carries a full warranty for failure or workmanship, it does not cover your battery if it has been used incorrectly or if failure due to wear & tear from excessive use.

Cycle Life in relation to Discharge:



Industry Standard Battery Definitions:

18 Hole Battery: 20-22Ah, Suited to light use (once a week), flat/short course, light bag, Dry conditions

27 Hole Battery: 24-26Ah, Suited to light use (twice a week), undulating/short-medium course, light/medium bag, Dry Damp conditions

36 Hole Battery: 28-34Ah, Suited to regular use, full bag, all conditions.



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WHAT TO DO IF YOU BELIEVE YOUR BATTERY TO BE FAULTY UNDER WARRANTY

Your battery comes with a 12 month replacement warranty. Please take the time to read our guidelines to ensure it is the battery that is at fault. Do not hesitate to give us a call if you are in any doubt on our free helpline: 0800 0854 703. Please make sure you have your original order details or receipt to hand and we will gladly advise on the next steps to take.

GOLFERS: NOT SURE IF IT IS THE BATTERY? HERE ARE SOME SIMPLE TESTS:

- Try your battery on someone else's trolley – If there is an improvement it may be time to service your trolley.
- Try their battery on your trolley –Does their battery give you the same returns as on their trolley?
- Try your battery on a new charger (This is not a magic wand, only small improvement will be seen) Lights 'on' on your charger do not always indicate it is working properly.
- Has it been left flat for any time? See Sulphation p4.
- Is your battery swollen? This is a result of 'over charging' and often occurs when a charger does not 'switch over' this may not be a warranty fault with your battery.

If you see any negative results from the above please **fully charge** your battery **on your charger**. **Completed the warranty returns form** (below) and return the product to us for testing as detailed:

TO SEND YOUR BATTERY BACK TO US PLEASE:

- Go to: www.myhermes.co.uk Select: [Send a parcel](#) Our Post Code: BH12 3LY
- Standard Weights: 18Hole battery: 7kg 27Hole Battery: 9kg 36Hole: 11kg
- chose to drop off at a parcel shop or have the parcel collected
- Signature and Compensation: **Standard FREE**
- Parcel Details: **Delivery Reference: WARRANTY RETURN**
- Parcel Contents: For Golf batteries list as: **Golf Cart Dry Cell**
- Complete your details and payment
- Ship the items to:

Title: Mr
First Name: N
Surname: Thomson
House name/number: Unit1
Address: N R G POWER SYSTEMS - Returns
470 Ringwood Rd
Poole
Dorset

Our Contact Details are:

Tel: 01202 735 544

Email: Sales@NRGPowerSystems.com

Special Instructions: Can Be Left Safe

- Ensure the battery is packaged thoroughly and is well protected – Any damage is not covered by the warranty.
- Then print the label and stick it – Bar-Code clearly and fully visible.
- Once NRG Power Systems have received your battery and carried out the necessary tests they will contact you with the results.
- There will be no charge for batteries identified as eligible for warranty replacement.
- Please be aware that because of the length of the testing process and the cost of the equipment used there is a charge for 'batteries providing a positive *PASS* return or identified as a non-manufactured fault' of £15 and the return of the battery charged at £10 or prepared for collection if you would like to arrange your own transportation. Any batteries not eligible for warranty replacement will be held for 4 weeks and then recycled according to environmental standards



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WARRANTY RETURNS

Return Number:
 Official Use only

NAME OF CUSTOMER:		Address:	
Email:		Tel:	
ORDER ID			
ITEM			
DATE PURCHASED		DATE RETURNED	
PROBLEM			
USAGE DETAILS		Please complete the following in full	
Charger:	Trolley:	Rounds Per Week:	
Manufacture:	Age:		
Model:	Last Service Date:	General Course Type:	
Age:	Bag Weight:		

Official Use only

TESTING			
Damage Inspection			
Test1_Cust. Charge		Test 2_ 4ah Charge	
Test 2_ 12ah Charge		Test 4_ 4ah Charge	



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