



PRODUCT REFERENCE GUIDE

About AMP-Tech Deep Cycle Battery

AMP-Tech Deep Cycle Battery offers longer life, more power and performance with maximum durability and reliability.

Manufactured for use in caravans and RV's, our AMP-Tech Deep Cycle batteries have exceptional strength, durability and reserve capacity even in the toughest and most extreme conditions. The Amp-Tech Deep Cycle Battery provides power to electrical accessories, such as lights, trolling motors, fridges or winches. It is built to provide a low but steady level of power for a longer period of time.

AMP-Tech Deep Cycle Battery uses a higher density, thicker plate design to ensure more than sufficient energy on cycling, whilst preventing damage to plate active material due to vibration.

VRLA-AGM (Valve Regulated Lead Acid-Absorbed Glass Mat) battery technology

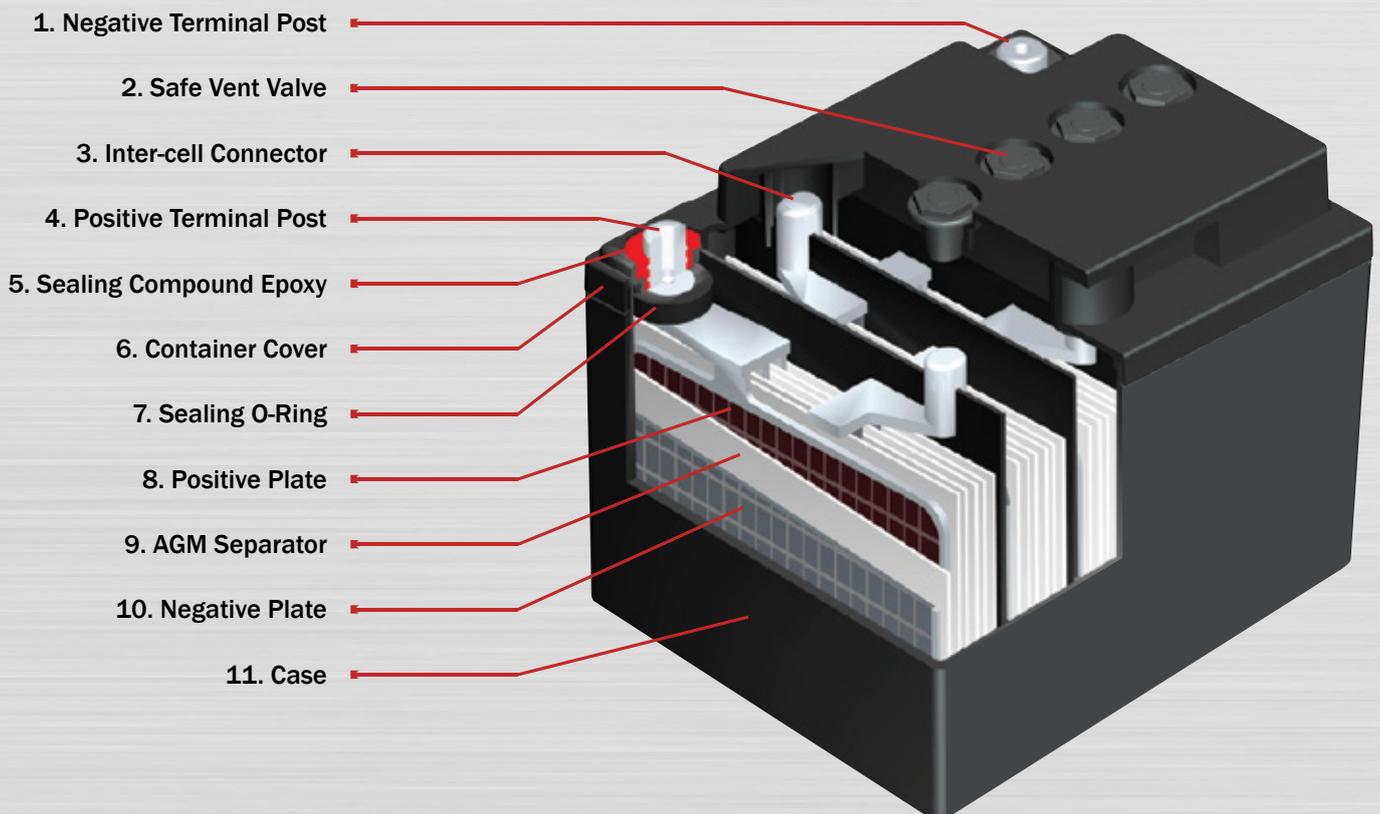
A VRLA-AGM battery is an electric storage lead-acid battery

- Sealed with special compound epoxy and using pressure controlled vent valves.
- Starved electrolyte design - acid solution is absorbed in separators .
- Using a recombination reaction to prevent the escape of hydrogen and oxygen gases.
- Non-spillable - can be operated in any position. But, upside-down installation is not recommended.
- Maintenance free.

A VRLA-AGM battery uses recombinant technology. The oxygen produced from the positive plates of the battery is absorbed by the negative plates. This suppresses the generation of hydrogen at the negative plates. The recombination of oxygen and hydrogen leads to Water (H₂O), retaining the electrolyte amount within the battery. Water filling is never required. Battery should never be opened as this would damage the battery with additional oxygen from the air. The warranty will be void if the battery is opened.

Features	Benefits
Maintenance-free	Safe operation in any orientation
Sealed Valve-Regulated	Low gassing (unless overcharged)
Spill proof / Leak proof	Good cycling and stationary performance
Deep discharge protection	Good high rate discharges
Plate grids from lead-calcium alloy, free of antimony	Long shelf life
No corrosion	Rugged and vibration-resistant

VRLA batteries construction



General Purpose Batteries - Small size

General features

- Using oxygen recombination technology: maintenance-free
- PbCaSn alloy for plate grids: less gassing, less self-discharging
- High quality AGM separator: extend cycle life and prevent micro short circuit
- ABS material: increase the strength of battery container.
- High purity raw material: ensure low self discharge rate
- Silver-coated copper terminals (T1, T2 terminal), brass insert terminals and lead terminals improve the electric conductivity



Typical applications

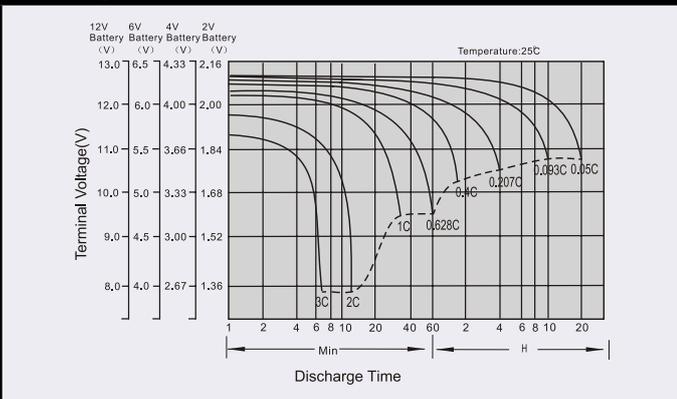
- All purpose
- Uninterruptable Power Supply (UPS)
- Electric Power System (EPS)
- Emergency backup power supply
- Emergency light
- Railway signal
- Aircraft signal
- Alarm and security system
- Electronic apparatus and equipment
- Communication power supply
- DC power supply
- Auto control system

Specification chart for AMP-Tech General Purpose range

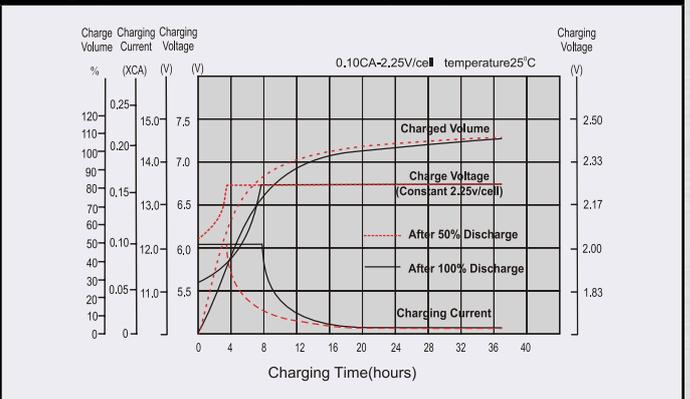
BATTERY TYPE	VOLT	AH				DIMENSION (MM)				WET WEIGHT (KG)	ASSEMBLY	POST TYPE	VENT	WARRANTY (MONTHS)
		20HR	10HR	5HR	1HR	LENGTH	WIDTH	HEIGHT	TOTAL HEIGHT					
AMP-TECH GENERAL PURPOSE														
AT645	6	4.50	4.19	3.78	2.73	70	47	100	106	0.75	B	T1	VRLA	12
AT670	6	7.00	6.51	5.59	4.40	150	34	94	100	1.12	D	T1	VRLA	12
AT6120	6	12.00	11.20	10.20	7.54	151	51	94	100	1.80	D	T1	VRLA	12
AT1212	12	1.2	1.1	1.0	0.7	97	43	52	58	0.57	F	T1	VRLA	12
AT1229	12	2.9	2.7	2.4	1.8	79	56	99	105	1.10	C	T1	VRLA	12
AT1245	12	4.5	4.2	3.8	2.7	90	70	101	107	1.48	D	T1	VRLA	12
AT1270	12	7.0	6.1	5.6	4.1	151	65	94	99	2.06	E	T1	VRLA	12

General Purpose Battery - Performance characteristic

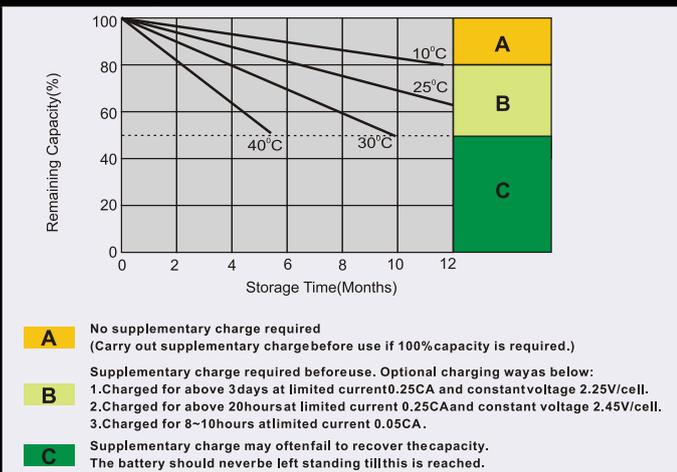
Discharge characteristics



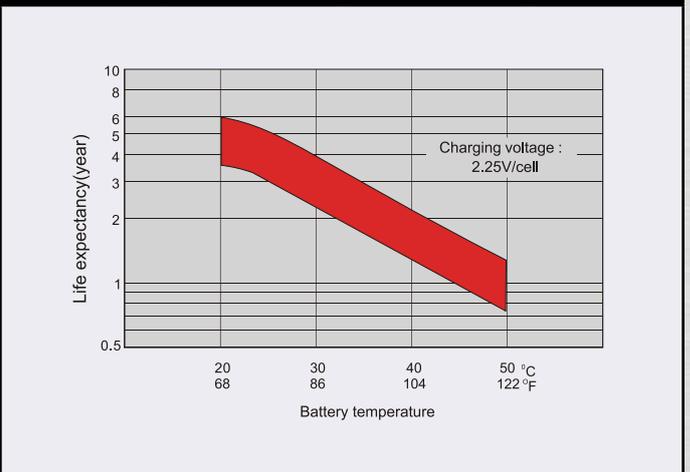
Charging characteristics (Standby use)



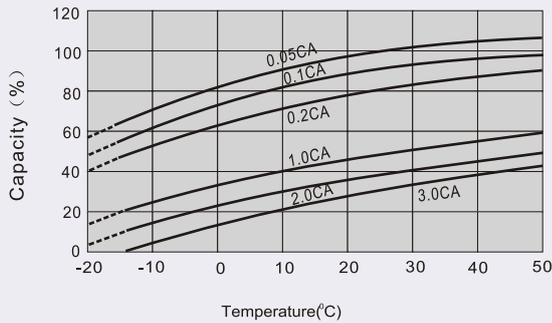
Self-Discharge characteristics



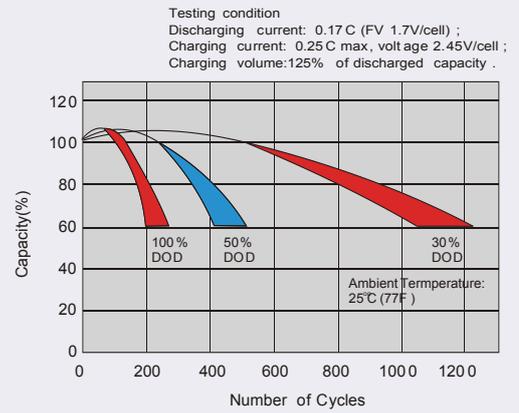
Effect of temperature on long term float designed life



Temperature effects in relation to battery capacity



Cycle service life in relation to the depth of discharge



Deep Cycle Batteries

General features

- Using oxygen recombination technology: maintenance-free
- Special grid alloy: less gassing, less self-discharging
- For longer cycle life: special paste formula, thicker plates, additives for deep discharge
- Special anti-vibration design
- High quality AGM separator: extend cycle life and prevent micro short circuit
- ABS material: increase the strength of battery container.

Typical applications

- Electric tools
- Vehicle in place of walking
- Lawn mowers
- Golf trolleys and golf cart
- Portable apparatus, lights and instruments
- Electric toys
- Illumination light



- Fire alarms
- Portable power
- Wheelchairs
- Medical equipments

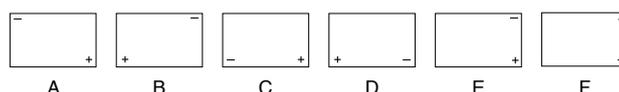
Specification chart for AMP-Tech Deep Cycle range

BATTERY TYPE	VOLT	AH				DIMENSION (MM)				WET WEIGHT (KG)	ASSEMBLY	POST TYPE	VENT	WARRANTY (MONTHS)
		20HR	10HR	5HR	1HR	LENGTH	WIDTH	HEIGHT	TOTAL HEIGHT					
AMP-TECH DEEP CYCLE														
AT62250	6	224.0	194.0	179.0	-	260	180	247	253	30.50	A	T11	VRLA	12
AT1290D	12	9.0	7.9	7.2	5.3	151	65	93.5	99	2.45	E	T2	VRLA	12
AT12120D	12	12.0	11.2	10.2	7.5	151	98	95	101	3.50	E	T2	VRLA	12
AT12180D	12	18.0	16.8	15.8	11.6	181.5	77	167.5	167.5	6.00	C	T12	VRLA	12
AT12200D	12	20.0	18.0	17.0	12.0	181.5	77	168	168	6.90	C	T12	VRLA	12
AT12260D	12	26.0	24.0	21.1	15.5	166	175	125	125	8.57	C	T12	VRLA	12
AT12350D	12	35.0	32.6	29.8	22.0	195	130	163	168	11.20	D	T6	VRLA	12
AT12450D	12	45.0	42.0	38.7	27.5	197	165	170	170	13.20	C	T6	VRLA	12
AT12550D	12	55.0	52.9	48.2	35.5	229	138	210	216	17.70	D	T6	VRLA	12
AT12750D	12	75.0	72.2	65.8	48.5	260	168	208	214	22.30	D	T6	VRLA	12
AT12900DS	12	105.0	95.2	83.0	57.9	306	168	208	214	30.60	D	T6-A	VRLA	12
AT121000DS	12	120.0	110.0	94.6	67.1	330	173	212	220	31.20	D	T11	VRLA	12
AT121200D	12	120.0	110.0	94.6	68.1	408	177	225	225	34.00	D	T11	VRLA	12
AT121500D	12	150.0	140.0	129.0	91.5	483	170	238.5	238.5	43.20	D	T11	VRLA	12
AT122000D	12	200.0	187.0	175.4	129.2	522	240	218	224	62.20	F	T11	VRLA	12

Abbreviations

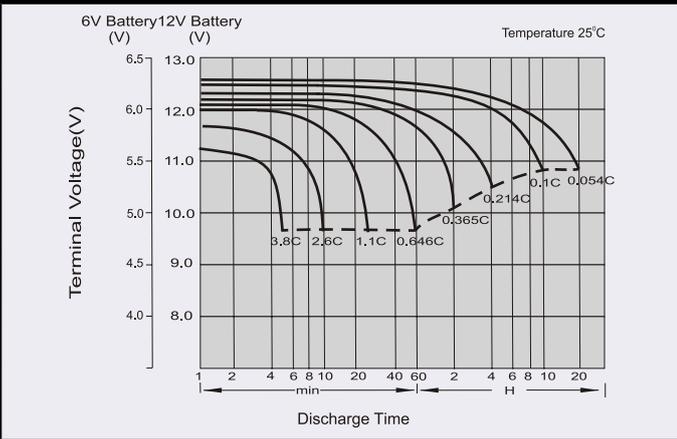
VRLA - Valve Regulated Lead Acid

Battery Assembly

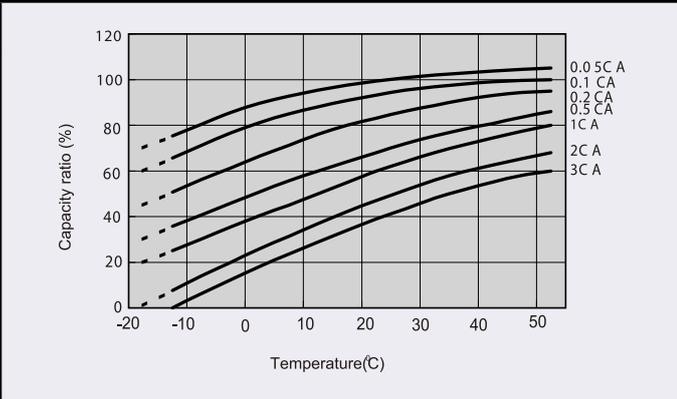


Deep Cycle Batteries - Performance characteristic

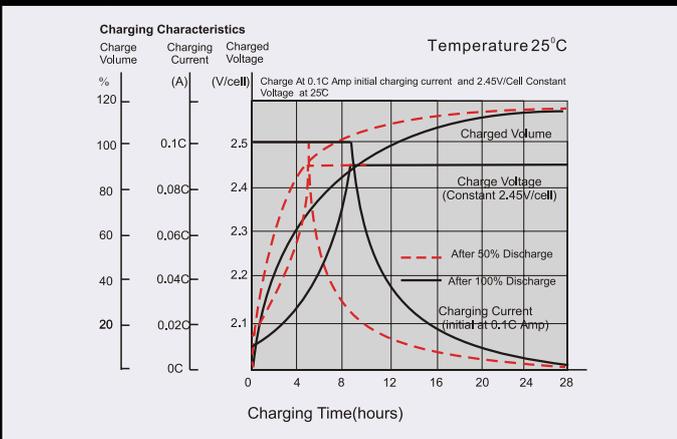
Discharge characteristics



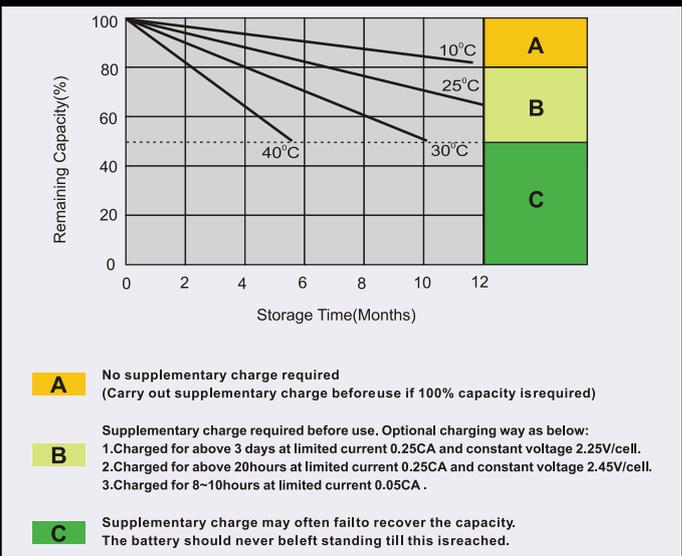
Temperature effects in relation to battery capacity



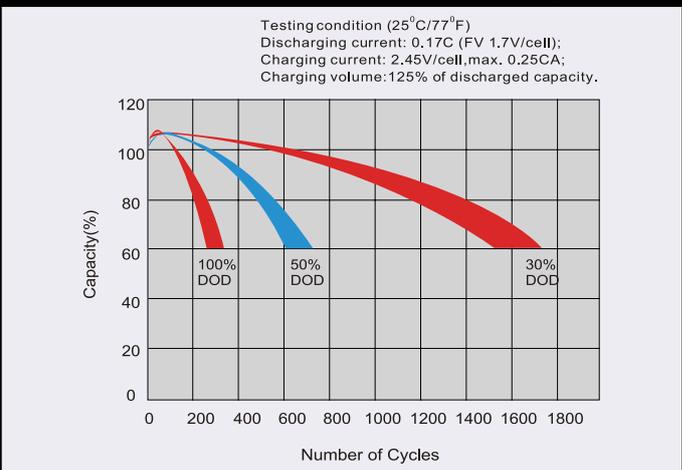
Charging characteristics



Self-discharge characteristics



Cycle service life in relation to depth of discharge



VRLA Battery terminal options

T1 Terminal
FASTON TYPE (Copper) quick disconnect tabs; silver coating for better conductivity

T2 Terminal
FASTON TYPE (Copper) quick disconnect tabs; silver coating for better conductivity

T6 Terminal
Brass Coated with tin; Threaded insert 6mm STUD
Torque: 3.9 ~ 5.4 N*m (34.39 ~ 47.75 in*lbs)

T6-A Terminal
Brass Coated with tin; Threaded insert 6mm STUD
Torque: 3.9 ~ 5.4 N*m (34.39 ~ 47.75 in*lbs)

T11 Terminal
Brass Coated with tin; Threaded insert 8mm STUD
Torque: 11 ~ 14.7 N*m (97.28 ~ 130.0 in*lbs)

T12 Terminal
Brass Coated with tin; Threaded insert 5mm STUD
Torque: 2.0 ~ 3.0 N*m (17.69 ~ 26.53 in*lbs)

Note: The figures below just show the appearance and dimension
* Unit in mm [Inch]

Battery Care And Maintenance

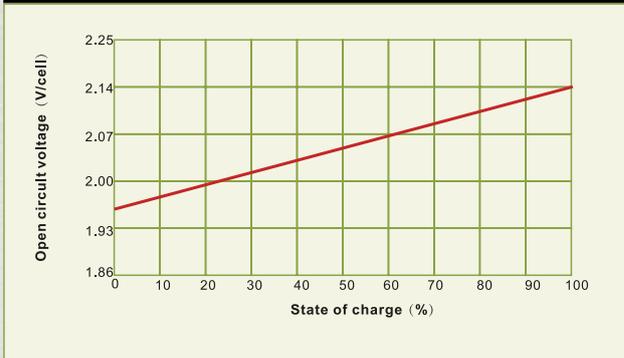
Top-charge and precautions

Any battery will be damaged by continual undercharging or overcharging. Overcharging is extremely harmful to any VRLA battery because of the sealed design. Overcharging dries out the electrolyte by driving the oxygen and hydrogen out of the battery through the pressure relief valves which will lead to less capacity and shorter life. If a battery is continually undercharged, a barrier layer of sulfate will build up on the positive plate which will impact recharging acceptability. Premature plate shedding can also happen, affecting performance.

The charger must be temperature-compensated to prevent under or overcharging due to ambient temperature changes (Please refer to the table titled as "Charge Voltage and Temperature Ranges" BELOW. The warranty is void if improperly charged. Use a good constant potential, temperature-compensated, voltage-regulated charger. Constant current charges should never be used on VRLA batteries.

Charge voltages and temperature					
Temp (°F)	Boost Charge(V/cell)		Float Charge(V/cell)		Temp (°C)
	Optimum	Maximum	Optimum	Maximum	
≥120	2.23	2.28	2.15	2.18	≥49
110-120	2.27	2.32	2.17	2.22	43-49
100-111	2.28	2.33	2.18	2.23	38-43
90-100	2.30	2.35	2.20	2.25	32-38
80-90	2.32	2.37	2.22	2.27	27-32
70-80	2.35	2.40	2.25	2.30	21-27
60-70	2.38	2.43	2.28	2.33	16-21
50-60	2.40	2.45	2.30	2.35	10-16
40-50	2.43	2.48	2.33	2.38	4-10
30-40	2.46	2.51	2.34	2.39	(-1)-4
20-30	2.49	2.54	2.36	2.41	(-6)-(-1)
10-20	2.53	2.58	2.38	2.43	(-12)-(-6)
≤10	2.58	2.63	2.39	2.44	≤-12

State of charge vs. Open circuit voltage



Battery storage

High temperature and poor ventilation during storage and delivery can increase self discharge. Store battery with good ventilation and keep away from fire, flame and heat supply. Recharge battery before use, when the battery has been kept for a long time.

Cautions

1. Keep battery out of reach of children.
2. Do not immerse battery in water or near heat sources.
3. Avoid direct contact with sulfuric acid.
4. Do not open or disassemble.
5. Do not short terminals
6. Avoid exposure to high operating temperature.

Influence of temperature

Battery performance is optimum at operating temperature between 20°C to 30°C. Use of the VRLA batteries at elevated temperatures reduces service life.

Getting the right AMP-Tech Battery

To determine the correct AMP-TECH battery size for your application:

1. Identify the Ampere Hours (AH) required for each electrical equipment. Divide the loading (watts) by the system voltage (i.e. 12 volts) then multiply by the intended time of usage.
2. Add the AH required and increase this by 30% for a safety cushion. In the example below, you need a battery that can deliver 98.5AH (safety cushion added to 75.8 total ampere hour requirement).

Equipments	Loading (in watts)	System Voltage	Usage Hours	Ampere Hours Required
Lights	40 /	12	x4 =	13.3
Refrigerator	60 /	12	x5 =	25.0
Pump	70 /	12	x3 =	17.5
Radio	80 /	12	x3 =	20.0
Total Ampere Hours Required				75.8
Plus Safety Cushion of 30%				98.5 Ampere Hours

3. Select the AMP-TECH battery which will deliver the AH for the required time and voltage. In the sample above you'd need an AT12900DS battery which has a 20AH rating above 98.5AH. (105AH)
4. The cycle life of the AMP-TECH will depend on operating conditions such as extent of use, temperature and charging conditions.