



High-energy, rechargeable batteries

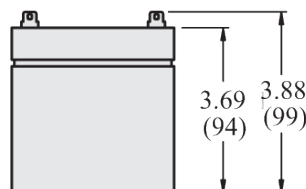
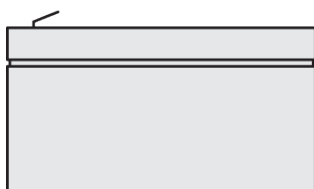
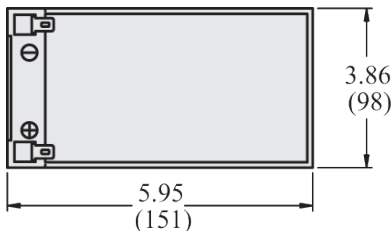
Carefree[®] Lead Acid Battery

Features and Benefits

- Maintenance-free service
- Long-service life
- Extended battery cycle life

Applications

- Wheelchairs and scooters
- Telecommunications
- Electric fencing



Specifications

Part Number	HE-12V12.7FR
Weight	9.70 lbs (4.4 kg)
Dimensions	Length: 5.95 in. (151 mm)
	Width: 3.86 in. (98 mm)
	Height (excluding terminals): 3.69 in. (94 mm)
	Height (including terminals): 3.88 in. (99 mm)
Nominal Voltage at 25°C (77°F), voltage reading per cell	20 hour rate (0.635 A to 1.75 V): 12.70 Ah
	10 hour rate (1.45 A to 1.75 V): 11.60 Ah
	5 hour rate (2.3 A to 1.75 V): 11.50 Ah
	1 hour rate (8.2 A to 1.75 V): 8.20 Ah
	0.5 hour rate (13A to 1.75 V): 6.50 Ah
Energy Density	20 hour rate: 1.76 Wh/in ³
	20 hour rate: 15.71 Wh/lb
Operating Temperature	Discharge: -60 to 140°F (-51 to 60°C)
	Charge: 0 to 120°F (-18 to 49°C)
Recharging Method	Float charging: constant potential source of 13.6 to 13.8 V continuously
	Routine charging: constant potential source of 14.6 to 15.0 V with charging current of 4.0 A maximum
Terminal	Tin plated brass, positive and negative terminals are 0.03 stock by 0.25 wide, mates with Amp Faston series or equal
Case Material	Flame retardant ABS
Above data are average values which can be obtained within 3 charge/discharge cycles. These are not minimum values.	

Charging versus Temperature

The charging of Carefree® batteries is best accomplished in a temperature range of 60 to 90°F (15°C). Charging within this temperature range requires no temperature compensation. For applications over a wider temperature range, charging voltage must be changed as a function of temperature. (see chart)

Capacity versus Temperature

The efficiency of the lead-acid system decreases as temperature decreases and increases as temperature increases or decreased from room temperature 77°F (25°C). These four curves (see chart) are based on discharges at the 20 hour, 5 hour, 1.5 hour and 1 hour rates.

Self-Discharge Characteristics

High temperature increases the rate of self-discharge of all battery systems but even in this respect, the lead-calcium battery is perhaps least affected. In general, the rate of self-discharge can be expected to double for each 20°F (11°C) rise in temperature above 70°F (21°C).

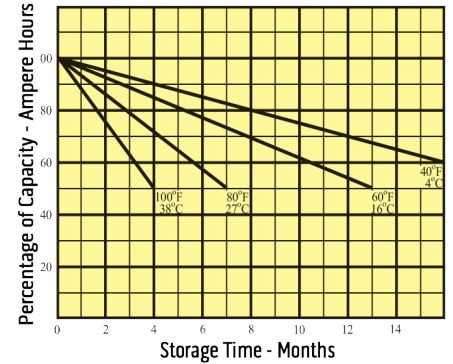
Battery Operating Conditions and Cautions

This battery contains toxic material (lead) and corrosive fluid (sulfuric acid). Charging the battery can produce explosive gases. Do not charge the battery in gas tight enclosures, charge in a well-ventilated area away from sparks, flames or smoking. Use approved voltage controlled charger. Do not short-circuit battery terminals, as this can cause an explosion or fire. Keep batteries and chargers away from children. Charge battery as soon as possible after use, do not store battery in discharged state. Do not puncture, disassemble, mutilate or incinerate the battery. This battery MUST BE RECYCLED OR DISPOSED OF PROPERLY

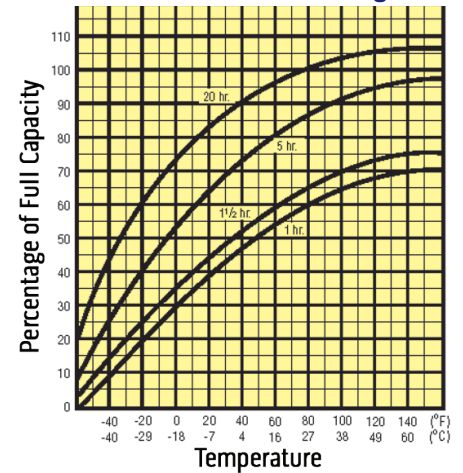
Installation Care

All Carefree batteries are carefully assembled and with proper charging will provide excellent service. When placing the battery into service it must be inspected to make sure that the battery has not been damaged by rough handling. If the unit has been damaged, there is a possibility of loss of a small amount of sulfuric acid electrolyte and possible corrosion of adjacent components. Any sulfuric acid can cause severe burns to the skin and eyes. If contact is made with a damaged battery, immediately wash the contacted area with water for at least 5 minutes. When installing the battery in equipment, ventilation must be provided. Toward the end of charge and under overcharge conditions, hydrogen and oxygen gas can be generated. If this gas is allowed to accumulate in the enclosure and a spark is introduced, an explosion could result.

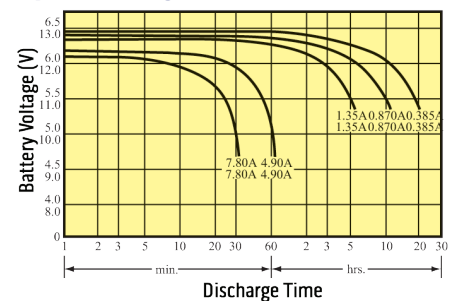
Charge Voltage per Cell versus Temperature



Capacity ad Affected by Temperature at Various Rates of Discharge



Discharge Curve Typical Voltage Characteristics (77°F)



Typical Self-Discharge Characteristics

