

Batteries

Batteries are a convenient and safe source of electrical energy. They come in a variety of sizes and have different voltage levels. It is important to select the most suitable for your project. Connecting cells in series, positive to negative, will increase the voltage available. For example, one AA battery has a voltage of 1.5v, putting 4 in series will provide 6v. The table below show some of the most common battery types. You must match voltage and capacity to the requirements of your circuit. The information given is based on the Rapid catalogue at March 2000.

Battery	Type	V	Capacity (mAh)	Order code	Cost	Typical use	Properties
Zinc chloride	AAA	1.5	340	18-1025	22p	Calculators, portable cassette players	Inexpensive when compared to alkaline. Voltage levels not as constant as alkaline.
	AA	1.5	480	18-1030	22p		
	C	1.5	1800	18-1035	38p		
	D	1.5	3800	18-1040	48p		
	PP3	9.0	350	18-1020	50p		
Alkaline	AAA	1.5	1175	18-3340	62p	Motors in equipment, CD players. Devices that would use a high current.	Voltage remains fairly constant throughout life. Unlikely to leak and cause damage. Greater capacity than zinc.
	AA	1.5	2700	18-3350	62p		
	C	1.5	7750	18-3355	£1.09		
	D	1.5	18000	18-3360	£1.19		
	PP3	9.0	550	18-3370	£2.10		
	23A	12	50	18-1362	69P		
Lithium manganese coin cells	CR2016	3.0	75	18-0481	66p	Memory backup power in organisers, calculators, clocks	These batteries supply almost constant voltage until discharged.
	CR2025	3.0	150	18-0485	69p		
	CR2032	3.0	200	18-0490	65p		
	CR2430	3.0	280	18-0375	75p		
Alkaline button cells	L621	1.5	8	18-1395	10p	Calculators, cameras and clocks	Ideal for small scale products.
	L736	1.5	20	18-0410	12p		
	V13GA	1.5	125	18-1360	80p		
Lithium	AA	1.5	2900	18-0214	£2.95	Medical equipment	Very good constant voltage and capacity.
	PP3	9.0	1200	18-0202	£5.90		
Nickel metal hydride NiMH (rechargeable)	AAA	1.2	800	18-4030	£2.40	Portable power tools. Safety torches.	Provide constant voltage levels. Lower capacity than other batteries.
	AA	1.2	2000	18-4035	£3.55		
	C	1.2	3500	18-4040	£5.60		
	D	1.2	7000	18-4045	£9.90		
	PP3	8.4	170	18-4025	£4.50		

There are also Lead Acid batteries used in cars. These have a voltage of 6v, 12v, or 24v with capacities from 45Ah to 150Ah. Prices range from £20 to £150 roughly.

More information on batteries is at

http://library.solarbotics.net/pieces/parts_elect_pass_batcomp.html

Solar Cells

Solar cells can vary in size from the tiny ones on watches or calculators to the huge ones seen on the roofs of houses. The voltage produced by a single cell is usually 0.5v, but they are often put in series to provide higher output voltages – up to 12v for battery charging. Current available is from 6mA right up to 200mA. In fact, solar cells are now being sold which produce 45watts output at a price of around £100.

Clearly the output of a solar cell is dependant on the brightness of the sunlight falling on it, and the hours of sunlight per day. More power will be produced if the cell is positioned at right angles to the incident light, or even if it is moved to follow the sun. Most modern solar cells can produce a healthy output even from a cloudy sky. For more details see http://encyclobeamia.solarbotics.net/articles/solar_cell.html