



Renewable Energy Terms

Ian Woofenden

©1999 Ian Woofenden

Ampere, or Amp for short—rate of electron flow.

Derivation: Named after Andre Marie Ampere (1775–1836), the French physicist who developed the first electromagnet and first used the word “current.”

What’s an amp? We talk about them all the time in renewable energy circles, but there is still plenty of confusion about just what the term means. An amp is a measure of electron flow. But is it a quantity, a certain amount of electricity? No, an amp is a quantity flowing over a specific time—a *rate* of electron flow.

I think it’s unfortunate that the term doesn’t *sound* like it’s a rate. When we say “miles per hour,” we know we are talking about a rate of speed. But “30 amps” doesn’t sound like a rate of electron flow. So we need to remind ourselves that an amp is in fact a coulomb per second—6.28 billion billion (6.28×10^{18}) electrons passing a point in one second. We can compare 15 amps and 50 amps when talking about electrical energy to 15 miles per hour and 50 miles per hour when talking about travel.

When we say a light “draws 2 amps,” we mean electrons flow through it at a certain rate. A motor that draws 16 amps has current that is flowing eight times faster. If both the motor and the light are left on for an hour, eight times fewer electrons will pass through the light than through the motor. The amp rating of each load tells us the rate at which electrons will flow through it when it is on.

And it doesn’t matter *how* they are flowing. In direct current (DC) circuits, the flow is all in one direction. In alternating current (AC) circuits, the direction of flow is constantly changing. An ammeter (a meter that measures amperes) measures the current in a circuit. DC ammeters measure current in one direction, while AC ammeters measure alternating current, ignoring the direction of flow.

Remembering that an amp is in fact a rate of electron flow makes electrical talk a lot easier to understand. Perhaps you can see why we shouldn’t say, “amps per hour.” Next column I’ll talk about that, and how to get from amps to *amp-hours*.

Access

Author: Ian Woofenden, PO Box 1001, Anacortes, WA 98221 • ian.woofenden@homepower.com



Tom Lane, M.Ed., Licensed Solar Contractor
SOLAR CONTRACTING SINCE 1977
4,000 REFERENCES AVAILABLE

• AUTHORIZED DEALER •
TRACE ENGINEERING Siemens Solar
PowerPro™

Energy Conservation Services

TROPICAL SOLAR CONSULTANTS

6120 S.W. 13th Street • Gainesville, Florida 32608 • U.S.A.
 PHONE: (352) 377-8866 • FAX: (352) 338-0056 • www.ecs-solar.com

WIND ELECTRIC POWER

The **WINDSTREAM** Basic Model

for REMOTE RESIDENTIAL, MARINE, RV, TELECOM WIND-SOLAR APPLICATIONS

BUILT TO LAST!

WIND TURBINES

ON or OFF GRID

for **BATTERY CHARGING**

WATER PUMPING

AERATION

ALSO:

- Plans, Kits, Parts
- Microhydro
- Hand & Pedal-crank generators
- Permanent magnet generators & alternators
- Solar Panels
- Power Control

WINDSTREAM POWER SYSTEMS
 PO BOX 1604-HP
 BURLINGTON, VT 05402-1604
 Tel: 802 658 0075 / FAX 802 658 1098
 e-mail: windstrm@ix.netcom.com