Wind Power

Do you have a good wind site?

Wind powered battery charging systems can be cost-effective if the average wind-speed is **TWELVE** miles per hour or more at the site where the wind generator will be located. (19 kilometers per hour or more). If you are using a wind generator in combination with photovoltaic power, it may be cost effective if you have enough wind only during part of the year. The power available from wind is proportional to the cube of the wind speed. When the wind speed doubles the power delivered is eight times as great. Most wind generators are designed to deliver maximum power at a wind speed of 30 mph (48 kph). At 15 mph (24 kph), they will deliver about 1/8 their rated power. A wind generator should be mounted at least **30 feet higher** than any obstruction, regardless of direction, within **300 feet** to avoid turbulence, which will cause the turbine to oscillate from side-to-side and dramatically reduce power output.

Measuring The Wind

When considering buying a wind generator, many people think they have a site with good wind potential. This, more often than not, proves to be wishful thinking rather than an actual fact. It is best to do a wind site survey, conducted over a minimum of one years` time, to determine if a wind generator is actually feasible at your site. Measuring wind velocities and their duration is a slow but important process. This may save you much expense and effort if your site proves to be less than required to justify buying and installing a wind generator.

You can use one of the measuring devices listed on these pages to determine wind speed at your location. The Wind Data Logger acts like an odometer in a car, giving you the total wind passage over time. It provides you with the most complete information on the power producing potential of your designated site. The Kestrel wind speed indicator is like a speedometer, displaying wind speed at the time you are looking at it, but it does not record any information for further reference. It can be mounted on a tower to give you an idea of wind speed where the generator will be located.

If you measure wind speed at ground level, you can expect about 1.5 times the wind speed 30 feet up, which equates to about three times the power. At 120 feet above the ground, wind speed may be twice what is measured at ground level and power output will be more than twice the output at 30 feet.

Wiring

It is important to avoid excessive loss of power from voltage drop in a wire from the wind generator to the batteries. It is not necessary to use a wire size that minimizes voltage drop for maximum generator output. It will be more economical to choose a wire size that gives a 2% voltage drop at the average generator output for your site. But remember, **even large size wire is comparatively cheap** when considering that for a few dollars more you can probably eliminate the 2% loss altogether.

Chck out the wire loss chart on page 80 of this catalog to decide on wire size. Use a wire designed to carry 1/2 the rated current of the generator you are using, but remember, three conductors (wires) are required.

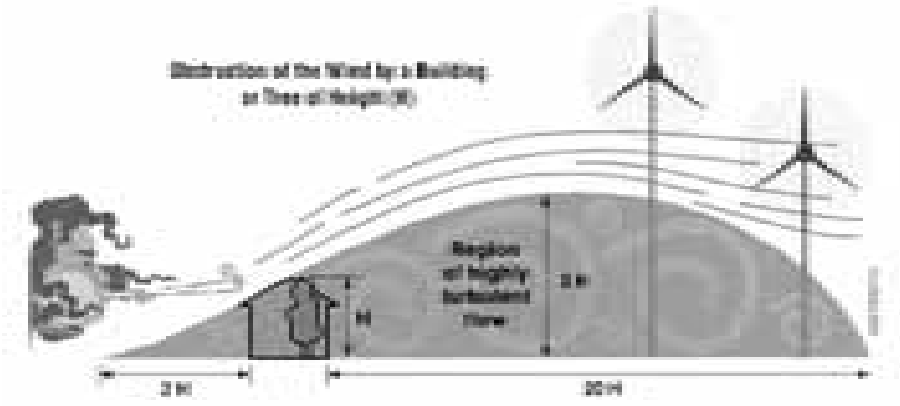
Towers

Mounting wind generators on a building should include vibration isolators, like the kits listed on page 19. We do not recommend doing this with turbines larger than 500 watts as noise and vibration will be a problem. Larger wind generators can cause severe damage to a building. Free standing towers, guyed towers or guyed poles or pipes are the best choices for installing any wind turbine—regardless of size.

Freestanding towers designed for antennas can be used. They require a large, engineered concrete base for support, but since they do not require guy wires, they can be installed in the smallest space. Guyed steel truss towers, also designed for antenna mounting are less costly, but require a large area for guy wire placement.

A tilt-up pole tower is the most economical and the easiest to install. Wiring and mounting of the wind generator are done before the tower is erected. No climbing is necessary. Four or five inch steel tubing can be bought locally to save freight charges.

Some areas with zoning bylaws may not allow installing a tower over a certain height. If your location is within the glide path of an airport or public landing strip, this may also be the case. Check with your local zoning commission or airport authority before buying and erecting a wind generator tower of any kind. Hazard warning beacons may also be required atop a tower and at intervals along its length.



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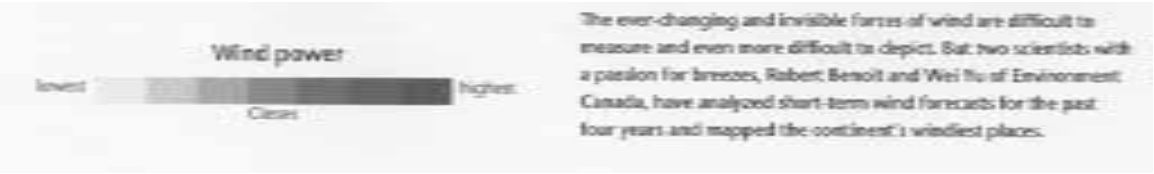

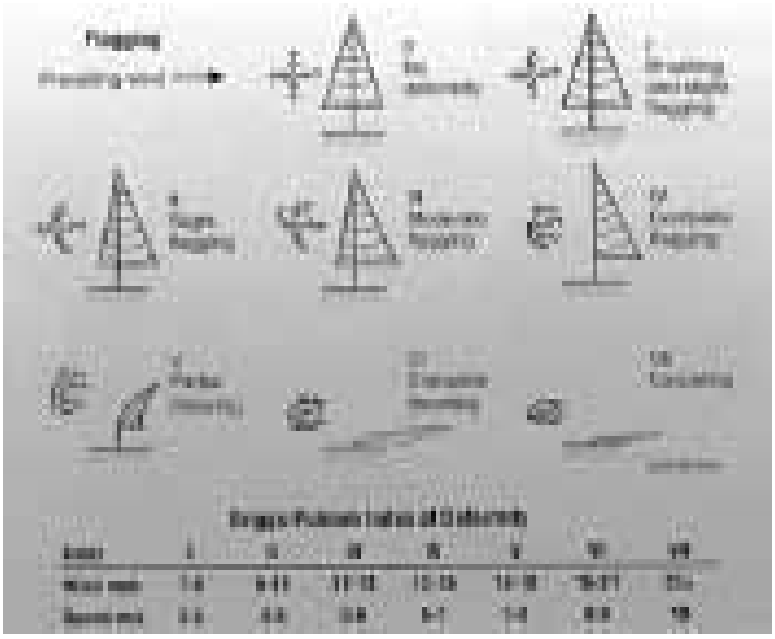

Griggs-Putmum Wind Energy Index

Wind Power

Kestral 1000 Pocket wind Meter

The Kestral 1000 pocket wind meter is accurate , tough and affordable. It requires no setup—just hold it up to measure the wind speed whenever needed. It can track maximum and average wind speeds along with current readings and allows you to choose the measurement units which suit your application. The Kestral 1000 measures wind speed with a precision ultra light impeller which turns on jewel bearings, providing excellent accuracy (+/- **3%**) and the ability to measure the slightest breeze (0.3 M/S). The impeller and protective housing pop out for easy and inexpensive replacement, ensuring that the Kestral's high accuracy can be maintained even if the impeller mechanism becomes damaged or worn. The Kestral 1000 is built to withstand daily use in tough outdoor conditions. The slip-on hard case buttons and protects the impeller and LCD display from damage in your pocket or toolbox. The user replaceable battery provides 400 hours of use. The Kestral 1000 is also protected by a full one-year warranty.

16-511	**Kestral 1000 Pocket Wind Meter**	**$129**
16-512	**Replacement Impeller**	**$ 28**

Solar Powered Wind Data Logger

The Wind Data Logger is designed to provide an affordable and easy-to-use solution for wind site evaluation and wind generator performance. It records wind speed, as well as the time and date directly to a Secure Digital (SDTM) card to provide convenient data downloads. An inexpensive 128 megabyte SDTM card will store weeks of data at 30 second intervals and months of data at longer logging intervals. Microsoft Excel, OpenOffice.org, or practically any spreadsheet program can be used to view, graph, and analyze your wind data. Web-based software that makes your analysis even easier is provided. Simply upload your data and our software will automatically plot the data as well as provide basic statistics.

The Wind Data Logger comes in a waterproof enclosure with a 10-watt module and 7 amp-hour battery. Order side-of-pole mount for solar module separately if needed.

16-525	**Wind Data Logger**	**$1,569**

Wind Turbines

Southwest Windpower

AIR 30, AIR 40 and AIR Breeze small Wind Generators

Southwest Wind Power's newest AIR 30 and AIR 40 wind generator is the best renewable energy choice for applications on land. It is specifically designed for small battery-charging applications such as small cabins, RVs, camping, garden lighting, education, hobbies and more. The AIR 30 is an ideal wind turbine for hybrid systems using solar power. It is not designed for marine applications.

Extensive third party testing and certification shows that the AIR 30 generates a more consistent output than competing brands. AIR 30 is built and backed by the worldwide leader in the small wind generator market. Southwest Wind Power's AIR 30 wind generator is part of the latest generation of AIR products—the world's best-selling wind turbines—with more than 135,000 units sold worldwide.

The AIR 30 12VDC has a 5-year warranty.

Features:

- unprecedented LIVETIME WARRANTY
- Durable composite blades
- Delivers 30kWh/mo @ 12 mph avg wind speed (Air-30)
  40kWh/mo @ 12 mph avg wind speed (Air-40)
- start up wind speed: 6 mph (Air-Breeze)
  7 mph (Air-40)
  8 mph (Air-30)
- survival wind speed: 110 mph
- all units available in 12, 24 and 48V models

16-131	**AIR Breeze Marine, w/built in regulator**	**$2.158**
16-132	**Air-30**	**$1,739**
16-133	**Air-40**	**$1,739**
53-650	**Stop Switch**	**$ 150**
16-166	**EZ-WireTower 29' (including pole)**	**$1,679**
16-167	**Roof Mount Kit with Seal**	**$ 485**
16-168	**27' AIR Guyed Tower Kit (does not include poles & anchors)**	**$ 514**
16-169	**45' AIR Guyed Tower Kit (does not include poles & anchors)**	**$**

Whisper Wind Generators

Whisper wind turbines feature a patented side furling angle governor to protect the turbine in high winds by turning the alternator and blades out of the wind. Other features include field adjustable voltage, a four bearing spindle for efficiency, upgraded yaw shaft and a new bushing for smoother operation. Voltage is factory set at 24 Vdc and is adjustable to 12/36/48 Vdc. High voltage versions of the Whisper 200 and 500 produce 220 Vac transmitting to a step down transformer that changes it to nominal system voltage (transformer sold separately). High voltage versions are used in applications where there is a long distance from the turbine to the batteries.

Every Whisper 100 and 200 comes with the Whisper Charge Controller except for HV and pump models. The SCR-based shunt type controller, housed in a single unit, is dedicated to wind only. LED lights indicate regulation operation and Power ON. Other features include individually rectified phases, battery/turbine shunt isolation, quiet diversion-powered fan, a large heat sink and easy access block connectors for turbine and battery wires.

The marine versions, designed for coastal and offshore applications, feature powder coating for corrosion protection, stainless steel hardware, marine-grade wire and watertight housings. 5-year

16-206	**WHI-200, 1kW turbine w/Controller**	**$ 5,858**
16-207	**Optional Controller Display (for WHI-100/WHI-200)**	**$ 175**
16-208	**WHI 500, 3kW turbine (24V or 48V incl. Controller)**	**$12,825**
16-209	**WH4500, 4.5kW turbine**	**$17,950**