

FORTIS WIND ENERGY

Great in small turbines



Product brochure

Fortis turbines:

- ✈ 30 years of experience
- ✈ Maintenance free
- ✈ Quietest Turbine in the Industry
- ✈ 20 years expected life time
- ✈ Easy installation
- ✈ Over 6,400 installed world wide
- ✈ 5 year warranty



Picture cover: Fortis Montana in Sebaldeburen (The Netherlands) next to a classical Dutch Wind mill.

Picture left: Installation of a Fortis Alize on a 43m (140ft) lattice tower in New York USA.

Picture right: A Fortis Montana at our factory in The Netherlands. This grid connected turbine is used for product development testing.



Fortis Wind Energy

European market leader in small wind turbines

Holland has a rich history of using the energy of the wind for improving the quality of life. From the milling of wheat and the sawing of wood to the draining of large parts of Holland, the work was done by windmills. While those days are in the past, current developments in wind energy technology are making a similar contribution. By providing clean energy and power independence from the grid, Fortis continues this tradition.

Over 6,400 Fortis turbines have been installed all over the world. From the deserts of Mauritania to the ice fields of the Arctic and the rugged terrain in Scotland, Fortis turbines keep performing. Many of the oldest models installed in 1981 are still functional. One of our Passaats, installed on a platform in the North Sea, has never stopped working since it was commissioned.

Our current models are based on the same principle as the original versions: an upwind rotor with a failsafe tail vane furling system. This principle guarantees high energy generation while protecting the turbine in gale force winds. The use of high tech materials in combination with a simple design results in state of the art wind turbines at a low price. Our commitment to quality has made us the European market leader according to Sun & Wind magazine 1-2007.

There are three models: the Passaat 1.4 kW, the Montana 5 kW, and the Alizé 10 kW wind turbine.



Applications of Fortis wind turbines

Home electrification

Reducing one's electricity bill with green technology is a major argument for a small wind turbine. The turbine can be connected to your home's main electric service where you consume the energy as it is produced. If there is more wind energy than is needed, the surplus can be sold back to the utility. If there is no wind, the grid will deliver the electricity needed for the household as usual.

Where there is no connection to the utility, an off-grid solution is possible. In this case a wind turbine can be used in combination with a battery bank to smooth demand and supply. This can also be done in a hybrid combination with solar panels or a diesel generator. In this way, you can be certain you will have the energy you need even if the wind isn't blowing.



The Passaat in the picture is located in Croatia on a roof mounted structure. It provides substantial energy savings for its owners.



Telecommunication power supply

There are many places in the world where diesel generators are used to meet a local electricity demand. Telecommunication stations are just one example.

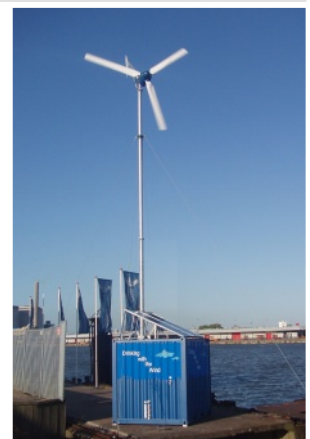
We have helped to save huge amounts of diesel fuel and expenses in these locations by installing a wind turbine. The diesel generator remains in place for backup but the turbine and battery bank keep costs very low. And best of all, diesel fuel consumption has been cut 80%.

A Montana turbine delivers electricity to this GSM antenna in Madagascar. The turbine is equipped with a 48V 1000 Ah battery bank which satisfies demand when wind speeds are low. With a 7 m/s average wind speed, the return on investment for this installation was less than one year.

Water pumping and purification

Access to water is even more important than having electricity. By using a modern wind turbine in combination with an electrical water pump, a highly efficient and reliable system can be built. The placement of both the turbine and the pump can be such that the performance of both are optimized.

This Montana electrifies a reverse osmosis desalination plant inside the container. Together with the solar panels on the container, this hybrid energy system produces 5000 liters of clean water per day.





Electricity for small and medium enterprises

Your electricity bill is determined not only by your own usage, but also on ever changing energy prices. You can use a wind turbine to limit this dependency. Turbines can also be used to express your concern about the environment and show that you take this responsibility seriously.

This Montana turbine is installed in the parking lot of a French road side restaurant to help reduce electricity costs. In addition, it has also attracted 25% more customers because people like to meet 'at the wind turbine'.

In the picture below you can see three roof-mounted Montanas. They are placed on a building next to the highway from Lille to Antwerp in Belgium. Because of the visibility of these turbines, the company itself has attracted serious interest from the local and national press.



Roof-mounted turbines

It is not really a different application, but many people ask if they can mount a turbine on their roof. In principle that can be done, but not every roof is suitable. First of all, a turbine needs smooth air flow to work properly, so neighboring obstructions can reduce efficiency. Second, the roof needs to be flat and strong enough to cope with the weight. And last but not least, the structure needs to be insulated from the natural vibration that turbines produce.



Rural electrification

Many places in the world are not connected to an electricity grid. People use batteries, candles, or petroleum to light their homes. Expanding the grid is often much more expensive than the green alternative of having a local (hybrid) energy system. Fortis assists in the design and installation of these systems in order to improve the standard of living for these people.

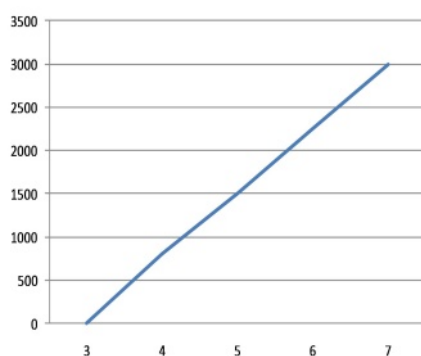
This Fortis Passaat is installed on a locally built lattice tower. In this project in Mauritania the turbines are used for battery charging and to energize water pumps. To improve the reliability of the system, local people have been trained to do maintenance. Before this system was installed, people would travel to the city to charge batteries - this time and cost has now been saved.

Fortis Passaat

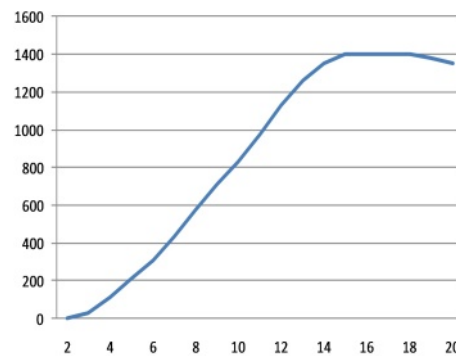
The Passaat is the oldest Fortis model and is used all over the world. It is commonly used at private homes to reduce dependence on other energy sources which are often unreliable and expensive. The Passaat is also used for pumping water.



Passaat on a guyed pole, this turbine is used as a demo on exhibitions.



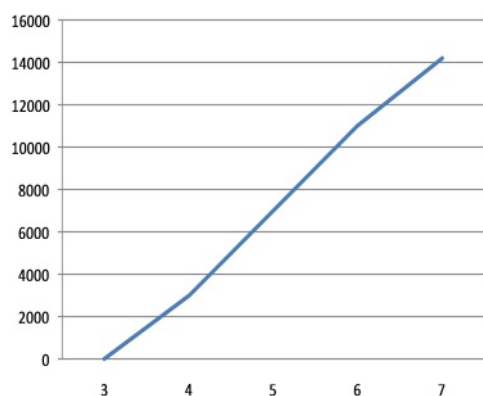
Annual kWh at mean wind speed [m/s]



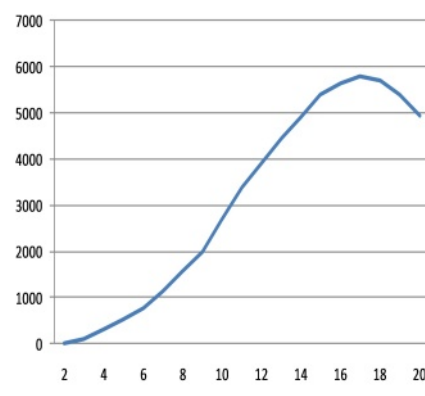
Power [W] output at wind speed [m/s]

Fortis Montana

In northwestern Europe and North America, the Montana is most often used for home electrification. In rural areas, this turbine is used for water purification and telecom power supply and is often coupled with a hybrid energy system.



Annual kWh at mean wind speed [m/s]



Power [W] output at wind speed [m/s]



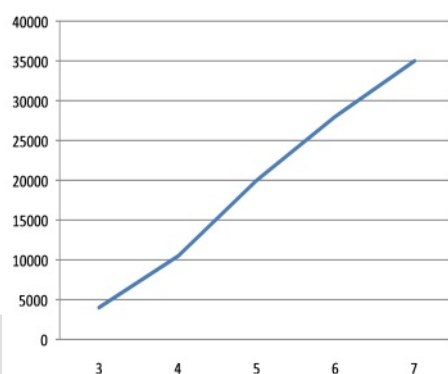
Montana on a guyed pole. This turbine is used for home electrification in The Netherlands.

Fortis Alize

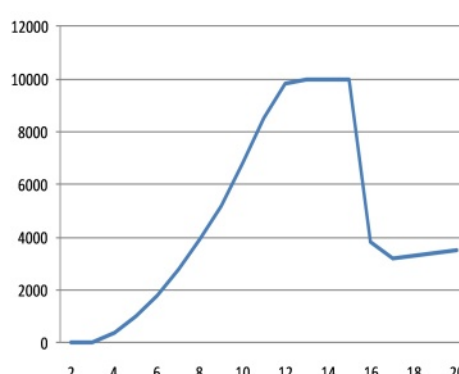
Main markets for the Alizé are home electrification for people with a high energy cost or demand, but also farmers and small industry. In more remote locations, the Alizé is used to provide power to telecom repeater stations and various other applications.



Alize on a free standing pole with additional steps. This turbine electrifies a consultancy office.



Annual kWh at mean wind speed [m/s]



Power [W] output at wind speed [m/s]



Technical specifications

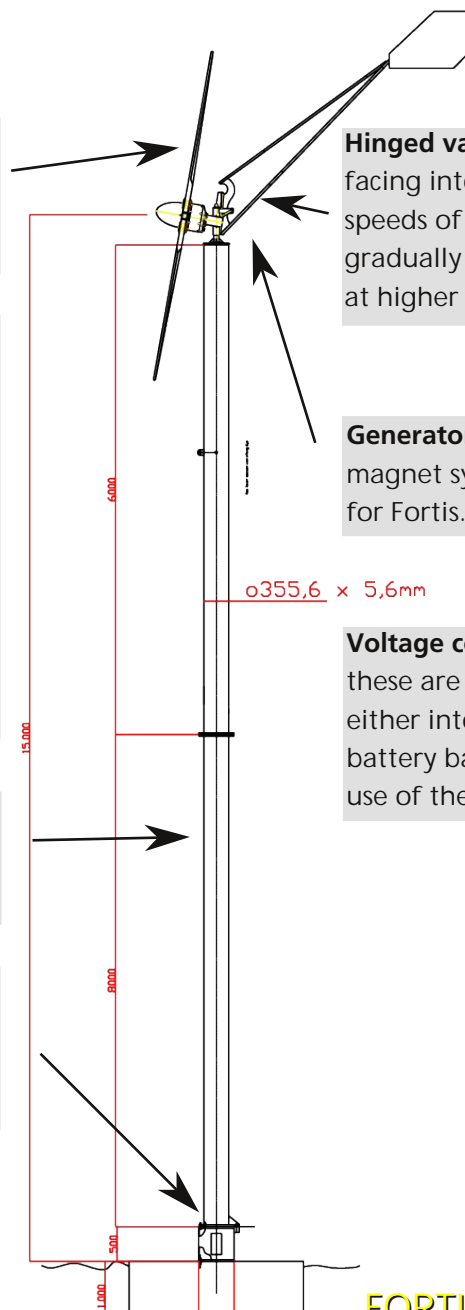
| | | Passaat | Montana | Alize |
|------------------|----------------|------------|--------------|----------|
| Max power | kW | 1.4 | 5.8 | 10 |
| Power @ 11 m/s | kW | 0.9 | 3.4 | 8.5 |
| Radius | m | 3.12 | 5.00 | 7.00 |
| Surface | m ² | 7.65 | 19.65 | 38.50 |
| Cut in wind | m/s | 3 | 2.5 | 3 |
| Max power wind | m/s | 16 | 17 | 13 |
| Cut out wind | m/s | n/a | n/a | n/a |
| Survival wind | m/s | 55 | 55 | 55 |
| Weight | kg | 75 | 200 | 420 |
| Frequency | rpm | 180 - 775 | 120 - 450 | 25 - 300 |
| Battery charging | V | 12, 24, 48 | 48, 120, 240 | 120, 240 |
| Grid connection | V | 230 | 230, 380 | 230, 380 |

Rotor, 3-blades made of fiberglass and epoxy with a special coating on the leading edge to prevent wear by wind borne debris.

Overspeed control, Mechanical: The rotor axis is offset to one side of the yaw axis so that in high winds it rotates the blades out of the wind and thereby reduces their profile. This is balanced with the angled and damped tail system which keeps blades facing into the wind. Electrical: Switched short circuit of generator and/or shunting of output current to a heating diversion load.

Pole, available in lattice tower, guyed tower, and free standing pole (as shown).

Hinge and foundation, the hinge is used for erecting and lowering the turbine; the foundation is constructed of reinforced concrete.



Hinged vane, will keep the rotor facing into the wind at wind speeds of up to 8 m/s (18 mph) and gradually move it out of the wind at higher velocities.

Generator, direct drive permanent magnet system specially developed for Fortis.

Voltage controller and inverter; these are used to feed electricity either into the grid or into a battery bank depending on the use of the turbine.



Your dealer:

FORTISWINDENERGY.COM