



Wind speed (m/s)	Wind speed (mph)	Rated power (DC kW) ◆	Output power (DC kW) ▼	Inverter efficiency (%)	Delivered power (AC kW) ▲
1	2.2	0.00	0.00	0%	0.00
2	4.5	0.00	0.00	0%	0.00
3	6.7	0.10	0.08	55%	0.04
4	8.9	0.20	0.16	75%	0.12
5	11.2	0.40	0.32	88%	0.28
6	13.4	0.70	0.56	92%	0.52
7	15.7	1.10	0.88	93%	0.82
8	17.9	1.50	1.20	94%	1.13
9	20.1	2.00	1.60	94%	1.50
10	22.4	2.60	2.08	94%	1.96
11	24.6	3.30	2.64	93%	2.46
12	26.8	3.90	3.12	93%	2.90
13	29.1	4.40	3.52	92%	3.24
14	31.3	4.90	3.92	92%	3.61
15	33.6	5.40	4.32	92%	3.97
16	35.8	5.60	4.48	92%	4.12
17	38.0	5.80	4.64	92%	4.27
18	40.3	5.60	4.48	92%	4.12
19	42.5	5.40	4.32	92%	3.97
20	44.7	4.90	3.92	92%	3.61
21	47.0	4.50	3.60	92%	3.31
22	49.2	4.00	3.20	93%	2.98
23	51.4	3.70	2.96	93%	2.75
24	53.7	3.60	2.88	93%	2.68
25	55.9	3.70	2.96	93%	2.75

Technical Specifications	
Rotor diameter	16.4 ft (5.0 m)
Peak rated power	5.8 kW @ 38 mph (17 m/s)
Number of blades	3
Length of blades	7.7 ft (2.35 m)
Swept area	211 ft ² (19.63 m ²)
Blade profile	NACA 4415
Blade manufacturer	Fortis Wind Energy B.V.
Blade material	Fiberglass-reinforced epoxy
Rated speed	450 rpm (max)
Blade rotation	Clockwise (viewed upwind of turbine, from hub toward tail vane)
Rotor axis angle	10°
Cone angle	0°
Pitch control & hub design	Fixed pitch, Rigid hub
Generator	Permanent magnet alternator
Battery-charging option	48 VDC (nominal)
Grid connection option	1Ø 240VAC or 3Ø 208VAC line-to-line or 3Ø 277VAC line-to-neutral
Braking system	Mechanical furling: inclined-hinge tail vane + Electrical braking: alternator output
Yaw control	Passive alignment by tail vane
Towers	Guyed-lattice, free-standing lattice or monopole
Total weight	440 lb (200 kg)
Generator weight	242 lb (110 kg)
Blade weight	66 lb (30 kg)
Tail + frame weight	79 lb (36 kg)
Load controller	SMA Protection Box with matched resistive diversion load
Inverter(s)	SMA WindyBoy

Assumptions and Comments:

- (1) Turbulence Factor (TF) = 20%. TF assumes a roughness length of 0.4, which is typical for rural terrain in central New York. This is a relatively high value compared to many other locations in the U.S. An excellent description of roughness length values for various types of terrain can be found on the website of the Danish Wind Energy Association. TF is a function of both roughness length and wind shear (and therefore varies with tower height).
- (2) Rated Power (DC kW) is taken from the turbine power curve published by Fortis Wind Energy B.V. in The Netherlands. Fortis Wind Energy U.S. is conducting independent data collection from turbines sited in central New York and will publish these data as they become available.
- (3) Output Power (DC kW) is reduced from Rated Power (DC kW) by the value of TF.
- (4) Delivered Power (AC kW) is the product of Output Power (DC kW) and Inverter Efficiency.
- (5) Inverters configured as (2) grid-connected SMA WindyBoy 2.5kW units operating in parallel. Other configurations are possible which may be more (or less) efficient.
- (6) Performance calculation spreadsheets which estimate energy production from Fortis wind turbines under a wide range of conditions are available from Fortis Wind Energy U.S.