

Carter 25 kw Wind Turbines



To: 'usasolar@comcast.net'

Subject: Hi Bruce

Well, I have a power curve attached above. It is tough to read but if you can't make it out, call me and I will read the numbers to you. Furthermore, I have the specs of these wind turbines attached. I have an informational brochure on them that I may be able to send you tomorrow. I thought it was on this computer, but couldn't find it. I believe it is on my computer at home. I had a small pic of the Carter unit running at Windland. This picture was taken of the Carter units on the Windland windfarm in Tehachapi California.

I have in front of me the following:

C25W Blueprints from Carter Wind Systems, Inc.

- 1) Wind Farm Installtions blueprint
- 2) Electrical Wiring
- 3) Tower base blueprints .. C-01-0046
- 4) Carter 30KW ... (they are rated as 25kw but can put out 30 kw in higher wind speeds per paperwork) 240 VAC with capacitors (looks like wiring diagram) for SINGLE PHASE 12-30yf (480vac in parallel)
- 5) SCR wiring schmatic 3 PHASE B-01-0043
- 6) 1 PHASE 240V Control box Electrical Schematic B-01-0037
- 7) 3 PHASE 240V Control Box electrical Schematics ... 2 blueprints B-01-0035 and B-01-0036
- 8) SCR Wiring schematic that just says PHASE ... looks different from the 3 Phase schematic so this may be the single phase B-01-0043
- 9) Yaw Motor Wiring B-01-0142
- 10) 25kw Generator Wiring B-01-0135

I have
~~My brother has~~ the maintenance manual for these units.

The blueprints are too large to scan so after the sale is approved, I can mail them.

Thanks, Linda

11/16/06

Bruce,

*My errand has technical problems.
I am sending these through another
source. Any Questions, please call.*

Linda

11/16/2006

CARTER 25KW INFORMATION

(as provided from manufacturer)

The Carter 25 is a 25-kilowatt wind turbine generator (WTG). It uses a two bladed downwind rotor. The rotor drives an induction generator through a mechanical gearbox. The turbine is mounted on a guyed steel tower. Several unique features are incorporated into the design of the turbine including: 1) fiberglass blades with taper and twist; 2) use of blade stall, and a synchronous induction generator to maintain constant rpm operations; 3) use of blade stall and a mechanical disc brake for overspeed and vibration protection; and 4) a heavy duty induction generator.

A self adjusting mechanical disc brake is used for stopping the rotor at any wind speed. The brake can be manually actuated from the base of the tower by pulling down on a lever attached to a cable. The brake may also be locked on by setting the lever into a slot on the tower. To raise and lower the tower to inspect or service the WTG, a single gin pole is used. One person, equipped with a winch or pickup truck, is required to lower or raise the tower; all service may be performed on the ground. All of the tower mounted components are housed in an attractive aerodynamic fiberglass housing with a labyrinth seal which keeps out water and sand.

Wind Speed

The turbine will automatically cut-in at 8.5 mph to produce electricity. We suggest they operate in an area with at least 11 mph **annual average** wind speed. Keep in mind that wind speeds monitored at 20 to 30 feet above ground, may be 2 to 4 mph higher at 80 ft. elevations. Normally the wind speed increases as we move away from the surface of the earth.

Installation

This turbine can be raised and lowered using a pick up truck. The foundation consists of a small central pad and 4 small anchor pads to connect the guide cables to. The foundation or pads can be dug with a backhoe and approx. 9 yards of concrete required. The blueprints give specific information as do the electrical schematics provided.

Exhibit B-1

CARTER 25 kw WIND TURBINE

ROTOR

# of blades	two
Axis of Rotor	horizontal
Diameter	32.5 ft
Rotor C/L Ht	80 ft.
Speed (rated pwr)	120 rpm
Orientation	downwind
Tilt Angle	-2 1/3 degrees
Power reg	aerodynamic stall
Swept Area	829 sq ft
Tip Speed	204 ft/sec
Weight (blades & hub)	296 lbs
Torque rated output	1472 ft - lbs

HUB

Type	teetering underslung
Material	steel
Blade conn	bolted (fiberglass wrap)
Diameter	2.83 ft.
Weight	74 lbs

BLADE

Length (root to tip)	14.58 ft.
Ground clearance	64 ft
Material	fiberglass composite
Weight (includes 21 lbs of lead)	110 lbs each
Airfoil sect (var.)	NACA 23013-23021
Pitch	fixed
Twist	non linear
Chord root	3.458 ft
Chord tip	1.042 ft
Chord taper	non linear
Manufacturer	Carter Wind Systems

TOWER

Type	tapered 8-sided
Height	80 ft
Weight (w/ gin pole)	2551 lbs
Diameter at the base	0.73 ft
Diameter at midpoint	1.05 ft
Diameter at hub	1.38 ft
Material (galvanized)	42 ksi min
Guys	four
Guys height	64 ft
1st bending frequency	1.33 hz
Access	tilt down
Foundation	concrete w/ rebar reinforcement
Erection tech	gin pole (tilt down)
Tower mfg	American Pole Structures & Valmont Ind.

TRANSMISSION

Type (double red)	round helical
Ratio	15.3
Input speed	120 rpm
Output speed	1836 rpm
Eff rated output	96%
Manufacturer	Carter Wind Systems - Winsmith & Fairfield Mfg.

GENERATOR

Type	Induction AC
Rating	25kw @ 1836 rpm
Maximum output pwr & speed	30kw @ 1843 rpm
Power factor w/o capacitor	.77 @ 25kw
Voltage	220 or 440
Phase	single or three phase
Slip	2%
Eff. (rated pwr)	92%
Frequency	60 hz
Manufacturer	US Electrical & Century Electric

ORIENTATION (YAW DEVICE)

Type	free w/tail cone
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BRAKING SYSTEM

Type	self adjusting spring loaded disk brake
Release	manual pushbutton/auto on power outage
Activation/release	auto on excessive overspeed, power outage or component failure
Torque	300 ft/lbs on generator shaft
Parking brake	disk
Parking brake activation/release	manual/manual

NACELLE

Material	fiberglass composite
Dimensions (LxWxD)	5.25 x 2.53 x 3 ft
Manufacturer	Carter Wind Systems

WEIGHT

Rotor (blades & hub)	295 lbs
Nacelle total	620 lbs
Tower (incl gin pole)	2551 lbs
TOTAL SYSTEM (including cables and turnbuckles)	3891 lbs

RATED POWER	25kw @ 28mph
MAXIMUM POWER	30kw @ 40 mph
CUT IN WIND SPEED	8.5 mph
CUT OUT WIND SPEED	none
SHUT DOWN WIND SPEED	none
SURVIVAL WIND SPEED	125 mph
Maximum design wind speed	125 mph

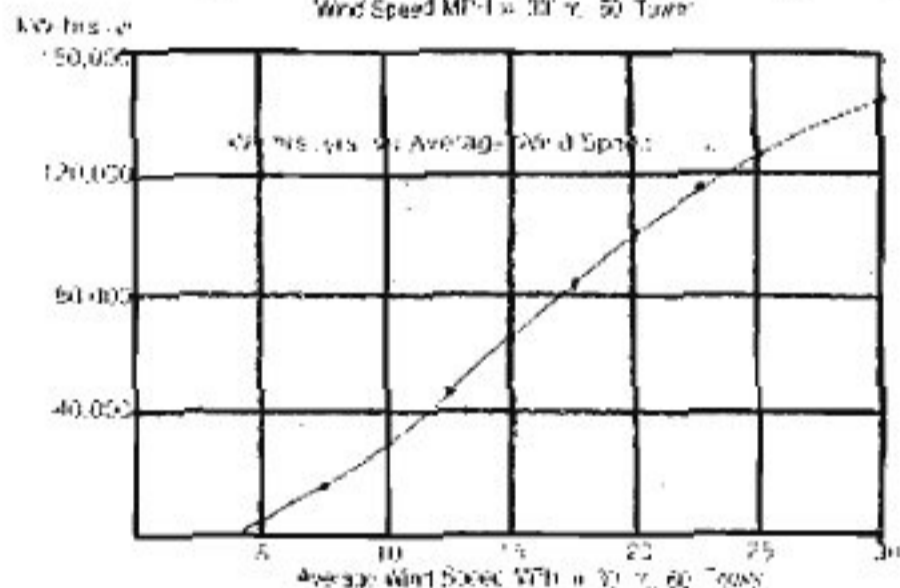
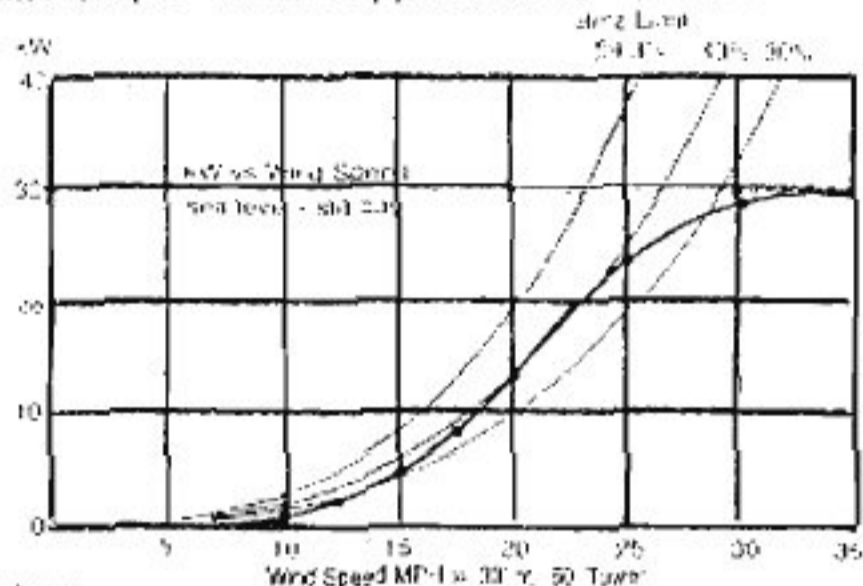
MODEL 25 SPECIFICATIONS

Output - Pertains to three phase only. Output of single phase units will be approximately 80% of three phase output.

Minimum output - 7 1/2 mph wind

Rated output - 25 kW in 26 mph wind

Max output - 30 kW approx. 30-40 mph wind



Voltage and current type

220 or 440 volt 60 cycle single or 3-phase AC current

Storage system

None except tie in with utility line

Power generation

Electric induction generator with control system so that excess power can be sold back to utility company

Rotor Diameter

32 feet

Blade chord

13 inches at tip, 42 inches at root

Weight

Nacelle - 630#

Complete rotor and hub - 270#

Blades - 98# each

60' Tower and Gin Pole - 1960#

80' Tower and Gin Pole - 2440#

Tower

60' or 80' high galvanized pole supported with four guy wires, capable of being erected and serviced without a crane.

MAINTENANCE MANUAL MODEL 25

CARTER WIND SYSTEMS, INC.

(817) 569-2238

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