



eoltec

Scirocco E5.6-6

**Best Wind Technology
for
Highest performances**

- ▶ **optimized 5.6 m rotor diameter**
- ▶ **high efficiency / low noise**
- ▶ **6.6 kW direct drive PM generator**
- ▶ **variable speed MPPT operation**
- ▶ **overspeed centrifugal stall control**
- ▶ **fully sealed design**
- ▶ **DC standalone, AC grid or direct pumping applications**

Eoltec SAS

455, promenade des Anglais, Porte de l'Arenas, Hall C
06299 Nice Cedex03 – France
info@eoltec.com www.eoltec.com

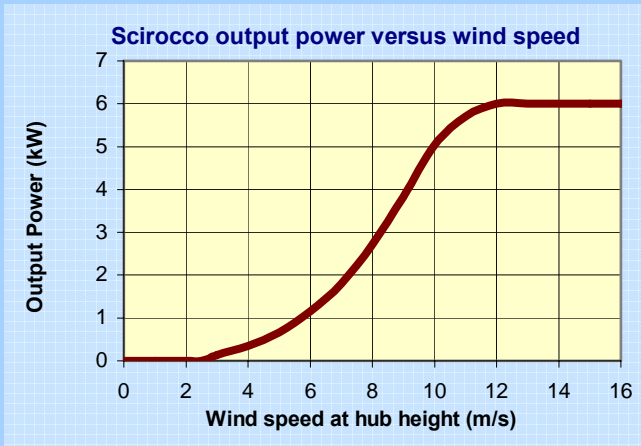
V02c – updated 10-2004

Eoltec's technology integrates all necessary features to achieve the best possible energy yield out of wind, this especially in the prevalent low and medium wind speed conditions. The variable speed concept applies maximal power point tracking controls resulting in an increased production of up to 50% compared to conventional equipment.

The direct drive generator reduces the amount of critical mechanical components, ensuring high reliability and low maintenance. The variable speed and centrifugal overspeed control drastically reduces material stress for increased lifetime and quiet operation.

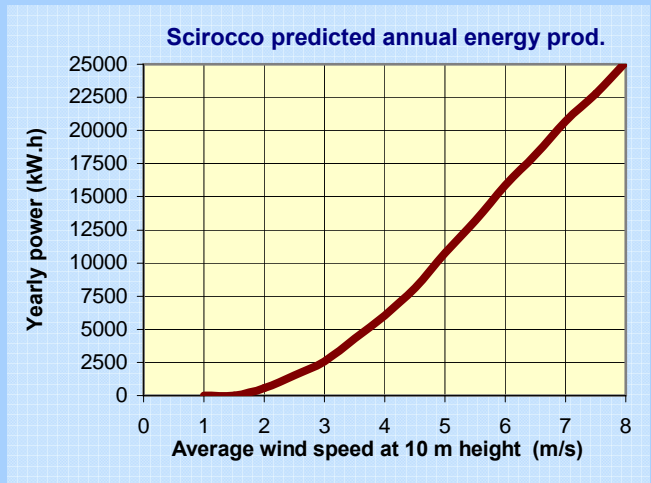
The wind turbine is connected to the AC grid through a specific AC/DC/AC inverter delivering best quality power in case of grid connection or to an AC/DC converter with micro-controlled PWM technology.

Last but not least, Eoltec's Scirocco WT is designed and realized without compromise, using state of the art components and according to IEC 61400-2 design rules (IEC 61400-1 for class II maximum wind speed)

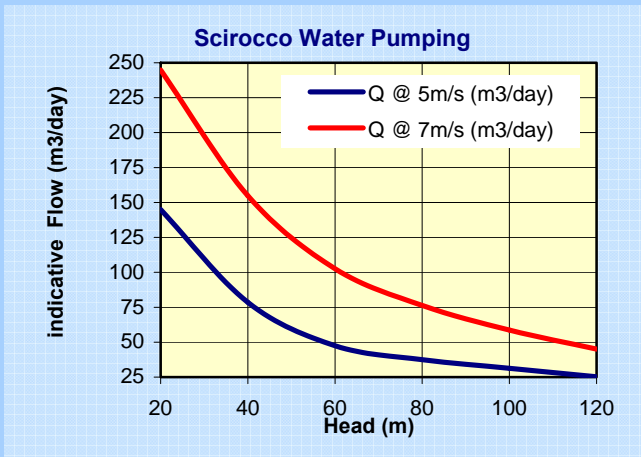


Scirocco wind turbine is characterized by a very high efficiency in the lower to medium wind speed range which is prevailing most of the time (>80%). This is achieved by the conjunction of an optimized 2 blades rotor, efficient direct drive PM generator combined with the maximal power point tracking control following the constantly varying wind speed. At high wind speeds, the WT continue to operate at its nominal output, the overspeed being controlled by the centrifugal full span stall control device. These unique features makes the Scirocco unit the most powerful WT of its class.

The high availability of Scirocco WT power production makes it a reliable source of cost effective renewable energy throughout the years and weather conditions. Its superior low/medium wind performances opens new possibilities for the application of medium size wind power in distributed power production with minimal environmental impact. The various available configurations of the Scirocco WT respond to a very wide range of applications as battery charging, stand-alone AC distribution, island AC grid, public grid intertie, water pumping. Its figures as a real alternative or complement to photovoltaic or diesel generation.



Assumptions for predicted energy calculation: Inland site, altitude 300m, Rayleigh distribution (k=2), 18m tower Shear ratio 0.143 , turbulence factor 10%

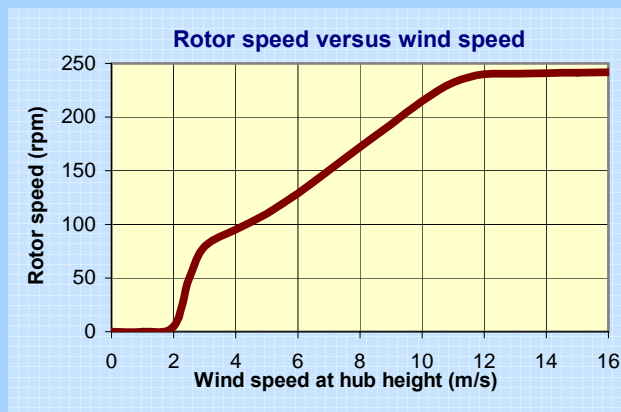


In run-of-the-wind water pumping applications, the Scirocco WT sets new standards by its direct electrical pumping concept coupled to Maximal Power Point Tracking controlled pump motor drive. Wind electric pumping permits to exploit well heads over 120m depth for drinking or irrigation water purposes. On typical remote water pumping sites with average wind speed as low as 5m/s, the Scirocco WT will saves up to 5'000 l/year of fuel, thus enabling excellent payback.

Unlike most of its competitors, Scirocco's WT rotation speed is always under control of both electronics and overspeed centrifugal device.

Due to that uncompromising design, maximum rotation speed is limited to 245rpm, involving a maximum tip speed of 70m/s. That's one of the key to get a quiet running on the entire wind range, low noise, low blade wearing, low mechanical stress.

For comparison, current competitor's 7m diam. furling WT exhibits about 400rpm nominal speed, involving a huge 145m/s tip speed.



- Scirocco E5.6-6 performances and specifications-

Performances

Rated output power : 6.0kW @ 12 m/s

Cut in wind speed : 2.7 m/s

Cut out wind speed : None

Survival wind speed : 60 m/s (design according to IEC 61400-1, class II wind site)

Wind speed at hub height (m/s)	3	4	5	6	7	8	9	10	11
Output Power (kW)	0.140	0.343	0.665	1.16	1.81	2.71	3.82	5.05	5.70
Average wind speed (m/s @ 10m)	3	4	5	6	7	8	9		
Average power (kW)	0.30	0.69	1.23	1.81	2.38	2.87	3.29		
Daily energy production (kW.h)	7.1	16.6	29.4	43.5	57.0	69.0	78.9		
Monthly energy production (kW.h)	215	504	895	1323	1734	2098	2398		
Yearly energy production (MW.h)	2.58	6.05	10.74	15.88	20.81	25.17	28.78		

Estimated for inland site, altitude 300m, Rayleigh distribution (k=2), 18m tower, shear ratio 0.143 , turbulence factor 10%

Rotor

Diameter/swept area : 5.6 m / 24.7m²

Blades : 2 fiberglass blades, AU4G aluminum root insert

Blades bearing : 2 sealed slewing rings

Rotational speed : 80 to 245 rpm, variable speed

Power regulation : Full span stall control (sealed centrifugal system)

Overspeed control : Aerodynamic full blades stalling (sealed centrifugal system)

Generator

Type : Synchronous multiple poles permanent magnets, direct drive

Rated output power : 6.5 kW at 240 rpm

Protection : Totally enclosed, fully sealed

Cooling : Passive air flow

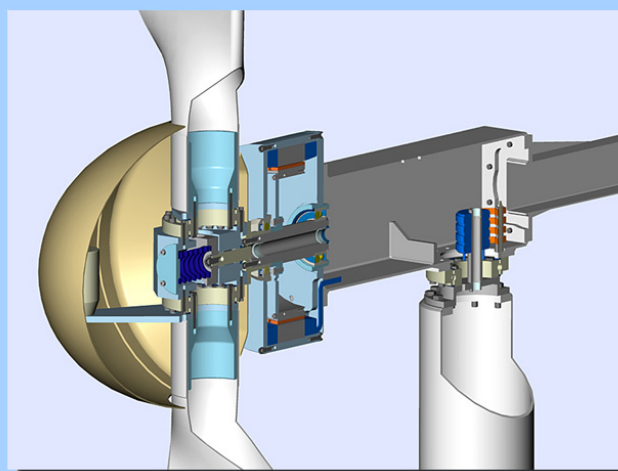
Miscellaneous

Yawing system : Passive, upwind tail (sealed slewing ring), electric rotating collector

Power regulation : Centrifugal stall control, electronic optimal power point tracking

Overspeed control : Aerodynamic full blades stalling (centrifugal system, slewing rings on blade root)

Brake : Optional remote control at tower base (forced stalling, mechanical patented system), operational on full wind speed range (0 to 60 m/s)



Weight : 202 kg (complete nacelle with rotor and generator)

Towers : 18 – 24 –30 m standard guyed tilt-up towers (galvanized steel)

Battery charger : 48 battery bank, 6kW nominal output, PWM with μ C management technology floating mode for optimal battery charging and lifetime, optimal power point tracking

Grid inverter : 5.2kW nominal output grid inverter with optimal power point tracking. (230V-50 or 60hz, comply with VDE grid feeding regulations)

Maintenance : Annual inspection