



## ComSpin C Series

Powering remote telecommunications sites

Maximum savings and unlimited communications

# 13,000 Watt Wind Generator ComSpin C 13000

## Wind Power System for telecommunications

The TechnoSpin ComSpin C 13000 wind turbine provides a renewable energy source to a wide range of applications for telecommunications in remote and urban locations.

Based on a revolutionary blade design, the TechnoSpin wind turbine generates substantial energy in areas with low and medium winds.

### Applications

- Remote telecommunications sites
- Cellular sites
- Microwave
- Telephone Exchanges
- Wireless Internet sites
- Remote TV and radio stations
- Satellite
- Monitoring stations
- Mobile radios
- Radar installations

### Product advantages

#### Performance

- Start-up and high energy output in low winds
- Superior efficiency (up to 30% higher than competition)
- Vibration free
- Silent operation in all wind regimes

#### Reliability

- Robust design
- Simple to install
- No maintenance required
- Up to 5 year warranty (optional extension up to 20 years)

#### Easy fit for any telecom site

**Cost effective - shorter ROI period compared to alternatives**



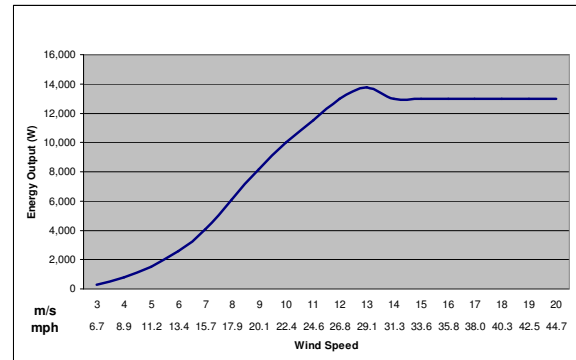
## System configurations

- Can be added to new or existing telecom sites
- Installation on telecom tower or on separate tower
- Hybrid solution with diesel generator and/or PV cells or wind turbine as stand alone energy source

## Technical Specifications

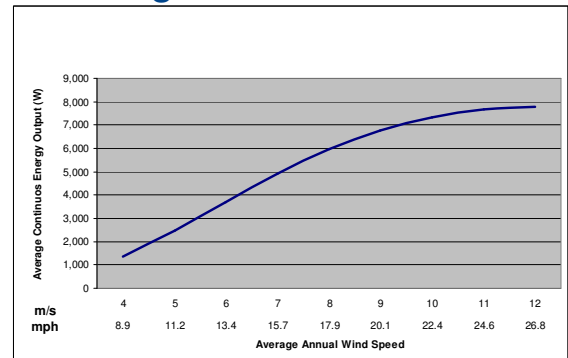
<b>Rotor Diameter</b>	8 m (26.3 ft)
<b>Rated Power</b>	13 kW
<b>Rotor Efficiency</b>	up to 45%
<b>Swept Area</b>	50.3 m <sup>2</sup> (541 ft <sup>2</sup> )
<b>Type</b>	Upwind, Yaw Control
<b>Yearly Energy Output</b>	32,000 kWh at average wind speed of 6 m/s (13.4 mph)
<b>Average Continuous Power</b>	3,700 W at average yearly wind speed of 6 m/s (13.4 mph)
<b>Rated Wind Speed</b>	12 m/s (26.8 mph)
<b>Start-up Wind</b>	2.5 m/s (5.6 mph)
<b>Survival Wind</b>	55 m/s (123 mph)
<b>Generator</b>	Permanent Magnet Generator
<b>Voltage for Battery Charging</b>	12-48 V DC
<b>Voltage for Grid Connection</b>	Adjusted to requirements of inverter
<b>Overspeed Protection</b>	Mechanical and Electrical System
<b>Temperature Range</b>	-40 to + 70 C (-40 to 158 F)
<b>Maximum Axial Load</b>	700 Kg force (1,540 lb)
<b>Installation</b>	Telecom or separate tower
<b>Separate Tower Height</b>	Minimum 12 m (40 ft)
<b>Product Design Life</b>	30 years
<b>Warranty</b>	5 years (optional extension up to 20 years)

## Power Curve



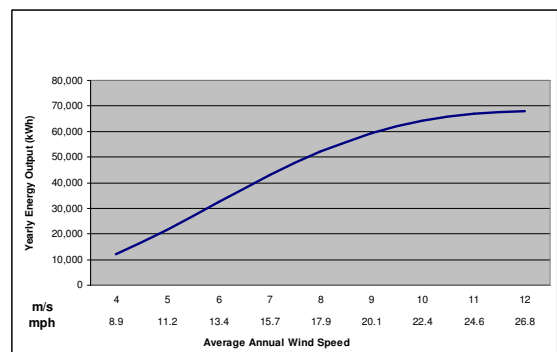
\* Power curve data measured with appropriate load

## Average Continuous Power



\* Average continuous power based on average annual energy output divided by 365 days and 24 hours.

## Average Total Annual Energy



\* This distribution is based on the Power Curve data and the average annual wind speed (weibull distribution)



## The standard kit includes:

- Blades
- Hub
- PMG Generator
- Wind head
- Tail
- Stub
- Charge controller (for battery charging)

## Noise

The turbine is extremely silent; its noise level is lower than 40 dB. Noise measurements are conducted based on the international standard 61400-11 and chapter 3 of the BWEA standard.

## Regulation

The turbine is manufactured according to relevant international standards:

- IEC 61400-2 (International Electrotechnical Commission)
- BWEA British Wind Energy Association Small Wind Turbine Performance and Safety Standard

## Mechanical Data

### Aerodynamic tail

The aerodynamic tail allows utilization of wind resources irrespective of wind direction, and serves as part of mechanical protection set-up.

### Furling

Pitch Control

### Generator

The PMG generator is optimized for maximum efficiency. Due to the direct drive, there are no transmission losses. Bearings are lubricated for life, the generator is closed and maintenance free.

### The tower

The turbines are light and vibration-free; therefore they can be installed on top of telecom tower, thus ensuring access to substantially higher wind resources. Alternatively, they can be installed on separate galvanized towers, both guyed and free-standing monopole towers. The turbines can be easily installed by a small professional team, using basic equipment.

## Electronics Data

The charge controller is used for rectifying unstable wind energy power output, voltage control and battery charging. This device makes a DC voltage out of the 3-phase AC voltage of the turbine, acts as a safety device, making sure that the voltage will never exceed the maximum.

