

WES

WIND ENERGY SOLUTIONS

WES HYBRID 80 & 250 kW

- Wind-diesel patent
- 25 Years proven technology
- Container transport
- One crane install
- Fast passive pitch
- Low-maintenance
- Internet access

TURNING WIND INTO PROFIT



COMPANY



Wind Energy Solutions is a Dutch manufacturer of small to medium-sized wind turbines with generator capacities up to 250 kW. Our products are the result of over 25 years of evolution in wind turbine technology. WES wind turbines are operating in many different locations world-wide. They are characterized as being robust, reliable and easy to install in remote places, which enables our mission:

To Bring Renewable Energy Everywhere.

WIND AND DIESEL ENERGY

A large share of the world's electricity is produced by diesel generators for those locations where a grid connection is not possible or not economically viable. For many years the industry has sought for the best combination of wind and diesel energy. WES came up with the solution, a unique patented off-grid Hybrid Wind/Diesel wind turbine system that guarantees a stable power generation.

100% Wind Penetration

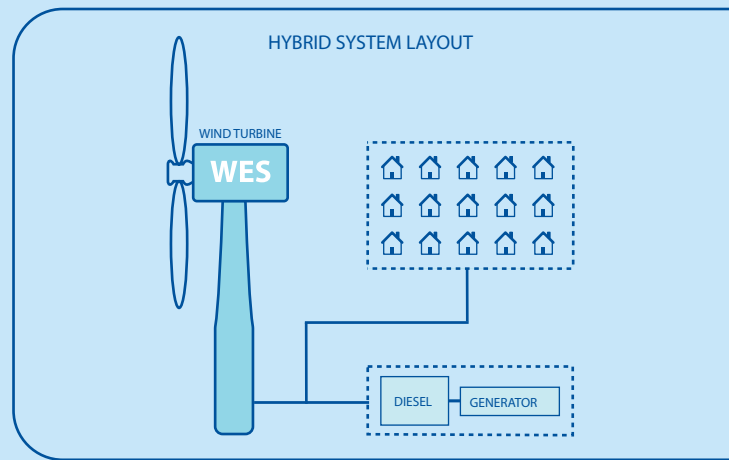
Wind Penetration is the amount of electricity supplied by the wind turbine in the total amount of electricity produced by the whole system. Due to the combination of the WES wind turbine rotor technology, the a-synchronous variable speed generator and the state-of-the-art control cabinet with a specially designed control, a Wind Penetration of 100% can be achieved. This is unique as a maximum wind penetration of 30% is the norm for other hybrid systems.



REDUCE DIESEL CONSUMPTION WITH GREEN ENERGY

With the WES Hybrid system you can harvest the wind and generate your own green energy, while reducing your diesel fuel consumption to a minimum.

The WES18 and WES30 Hybrid have a nominal output of 80 kW and 250 kW. A diesel generator with equal or larger capacity connected to the wind turbine will provide the “grid power” and will act as a back-up in case there is insufficient wind to produce the needed electricity. The make or model of the diesel generator is not important. The wind turbine powers the diesel generator when there is sufficient wind, thus maximizing your diesel fuel savings.



Efficient, Reliable & All-round

The technology and design of the Hybrid system are based on the WES18 mkI and WES30 mkI. The Hybrid system is commonly used as a solitary wind turbine and it has the reputation of being durable and reliable. The typical Dutch two-bladed rotor has a unique hinge system and a passive blade-angle adjustment. This unique mechanism needs very little maintenance. Its weight and size allow for easy installation in remote locations. Installation on a tubular or a lattice tower is possible, making the WES Hybrid an all-round wind turbine.

KEY POINTS

FEATURE	BENEFIT
100% wind penetration	is maximum diesel fuel saving
New IPC Control Cabinet	can be used with any electronically controlled diesel generator
Reactive Power	no other equipment needed
Frequency Assist Control	never produce more energy than needed
IPC user interface	fully automatic functions and user-friendly
Hinged blades	low stress loads on the drive train
Low weight and height	easy transport and installation
Mechanical design	low maintenance
Unique mechanical rotor	optimum reliability
Remote monitoring	output data available anywhere

GENERAL SPECIFICATIONS

80kW

250kW

Supplier / manufacturer
Life expectancy
Service maintenance
Nominal Power
Cut in wind speed
Cut out wind speed
Nominal wind speed
Survival wind speed
Yawing
Passive power regulation
Active power regulation
Tower height
Number of blades
Rotor diameter
Noise emission at 8 m/s
Operating temperatures

WES BV
minimum 20 years
twice a year
80 kW
< 3 m/s (6.7 mph)
25 m/s (56 mph)
13 m/s (29 mph)
60 m/s (134 mph)
active yawing
blade angle adjustment
fully variable back-to-back system
18 - 24 - 30 - 39 m
2
18 m
45 dB(a) at 100 m
from -20°C up to +40°C

WES BV
minimum 20 years
twice a year
250 kW
< 3 m/s (6.7 mph)
25 m/s (56 mph)
13 m/s (29 mph)
60 m/s (134 mph)
active yawing
blade angle adjustment
fully variable back-to-back system
30 - 39 - 48 m
2
30 m
45 dB(a) at 300 m
from -20°C up to +40°C

ELECTRICAL SPECIFICATIONS

Power
Voltage

80 kW
400V/50Hz 3 phase + neutral or
400V/60Hz 3 phase + neutral
diesel generator / grid connected
back-to-back inverter (IGBT)

250 kW
400V/50Hz 3 phase + neutral or
400V/60Hz 3 phase + neutral
diesel generator / grid connected
back-to-back inverter (IGBT)

Connection
Converter

APPLIED STANDARDS

Degree of Protection
Complies with standards

IP55
NEN1010 (electrical), EN50308 (safety),
EN6096 (wind turbines), ULI1741 (anti
islanding), IIEC61346-2000 (cabinet)
yes
passive blade pitch
yawing out of the wind

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NEN1010 (electrical), EN50308 (safety),
EN6096 (wind turbines), ULI1741 (anti
islanding), IIEC61346-2000 (cabinet)
yes
passive blade pitch
yawing out of the wind



CE mark
First safety
Second safety

GENERATOR

Type
Number of poles

a-synchronous
4

a-synchronous
6

WEIGHTS

Blade
Rotor
Nacelle incl. rotor and blades

100 kg
900 kg
3.300 kg

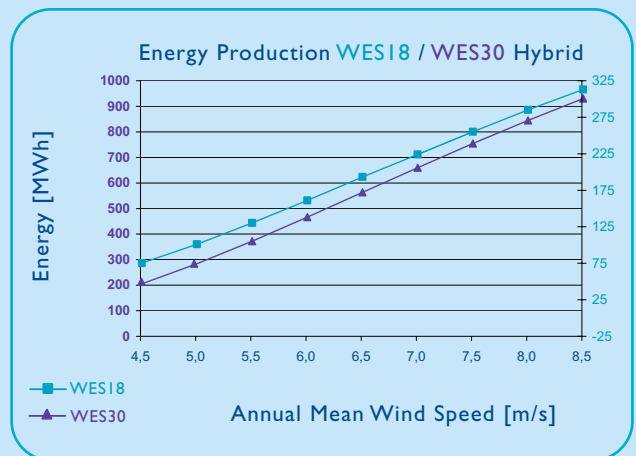
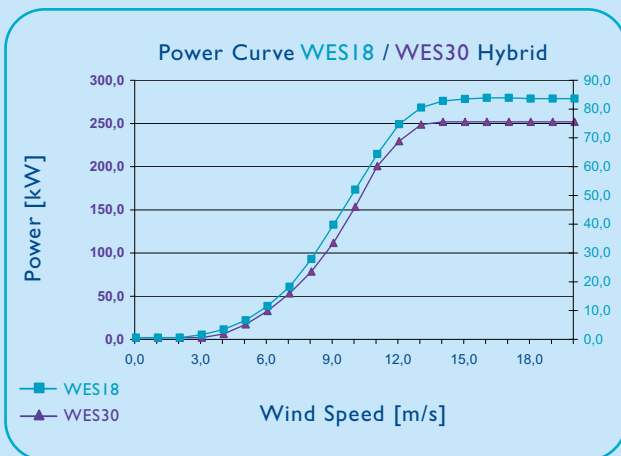
315 kg
2.970 kg
10.700 kg

MATERIAL SPECIFICATIONS

Blades
Nacelle
Cover
Tower
Foundation

carbon and glass fibre reinforced epoxy
steel
polyester
steel (hot dip galvanized)
concrete block with anchor

carbon and glass fibre reinforced epoxy
steel
polyester
steel (painted)
concrete block with anchor



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