

General

Type	Horizontal Axis, Upwind
Rated power	60kW
Model	P21-60
Design Class	IEC WT CLASS II
Design Standard	IEC 61400-1
Cut-in Speed	2.7m/s (6.0 mph)
Rated Speed	10m/s (22.4 mph)
Cut-out Speed	25m/s (55.9 mph)

Design Class

IEC Class II Standard	Air density 1.225kg/m ³ , Avg annual wind below 8.5m/s 50 yr peak gust below 59.5 m/s
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Generator

Type	Permanent Magnet
Rated Power	62kW, 3 Phase
Voltage	460VAC

Pitch System

Type	Variable Pitch
Drive	Centralized Pitch Mechanism

Yaw System

Type	Active
Drive	Hydraulic
Yaw Bearing	Ball Bearing

Power Inverter

Type	Variable Frequency Drive AC/DC
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Power Converter

Type	DC/AC Pulse-width modulated IGBT frequency converter
Voltage	230VAC - (1) or 460VAC - (3)
Frequency/Phase	60Hz or 50Hz/ (1) or (3)

Environmental Limits

Survival Wind Speed	59 m/s (132 mph)
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Rotor

Diameter	21.2m (69.6ft)
Material	Fiberglass/Resin
Operation RPM	58 RPM

Drive Train

Type	Direct Drive
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Braking Systems

Emergency Back Up Speed Regulation	Spring Applied Hydraulic Caliper Disc Brake
GridLoss Power/DC Bus over voltage	Dynamic Resistive Brake
Emergency Shutdown	Spring Applied Hydraulic Caliper Disc Brake

Controller

Processor	PLC
User Interface	HMI
Communications	Ethernet
Monitoring System	Web Based

Speed Regulation

Generator	Torque Control from Drive
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Tower

Type	Tubular
Hub Height	21.3m (70ft) 30.5m (100ft) 36.6m (120ft)

Lightning Protection

Standard	Surge Suppression on Generator
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Weight

Nacelle	Around 7500 kg (16550 lbs)
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Temperature Conditions

Standard Operation	-10°C to 40°C (14°F to 104°F)
Extreme Range	-20°C to 50°C (-4°F to 122°F)

Noise Performance

Apparent Noise Level	50-55 db at 30m (100ft)
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