

General

Type	Horizontal Axis, Upwind
Rated power	20kW
Model	P10-20
Design Class	IEC SWT Class II
Design Standard	IEC 61400-2
Cut-in Speed	2.7m/s (6.0 mph)
Rated Speed	11.0m/s (24.6 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	20kW, 3 Phase
Voltage	460VAC

Pitch System

Type	Fixed Pitch
Drive	Not Applicable

Yaw System

Type	Active
Drive	AC
Brake	Electric
Yaw Bearing	Ball Bearing

Power Inverter

Type	Variable Frequency Drive AC/DC
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Power Coverter

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	10m (32.8ft)
Material	Fiberglass/Resin
Operation RPM	100 RPM

Drive Train

Type	Direct Drive
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Braking Systems

Emergency Back Up Speed Reg	Regenerative Brake
GridLoss Power/DC Bus over voltage	Dynamic Resistive Brake
Emergency Shutdown/parking	Failsafe 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 1804 kg (4050 lbs)
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Temperature Conditions

Standard Operation	-10°C to 40°C (14°F to 104°F)
Extreme Range	-25°C to 50°C (-13°F to 122°F)

Noise Performance

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