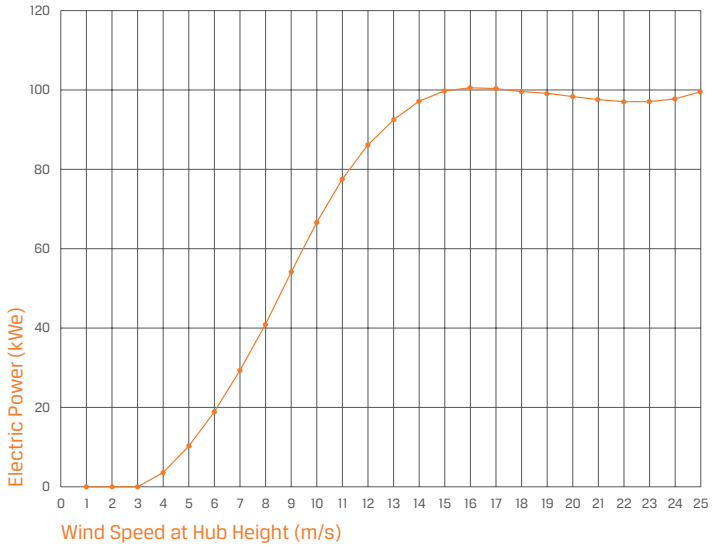
Specifications

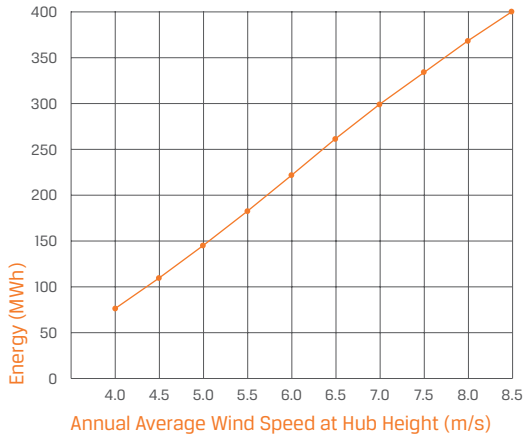
Northern Power® 100-21
IEC Class II

Power Curve: 21-Meter Rotor Standard Air Density (1.225 kg/m³)



Wind Speed (m/s)	Power (kWe)	Wind Speed (m/s)	Power (kWe)
1	0	14	97.8
2	0	15	100.0
3	0.5	16	99.9
4	4.1	17	99.2
5	10.5	18	99.4
6	19.0	19	97.5
7	29.4	20	96.8
8	41.0	21	96.4
9	54.3	22	96.3
10	66.8	23	96.8
11	77.7	24	98.0
12	86.4	25	99.2
13	92.8		

Annual Energy Production*: 21-Meter Rotor Standard Air Density, Rayleigh Wind Speed Distribution



Average Annual Wind Speed (mph)	Average Annual Wind Speed (m/s)	Annual Energy Output (MWh/yr)
8.9	4.0	77
10	4.5	110
11	5.0	145
12	5.5	183
13	6.0	222
15	6.5	260
16	7.0	298
17	7.5	334
18	8.0	368
19	8.5	400

*Annual energy production estimates assume standard conditions, 100% availability and no losses.

Northern POWER SYSTEMS

Specifications

GENERAL CONFIGURATION	DESCRIPTION
Model	Northern Power® 100-21
Design Class	IEC IIA (air density 1.225 kg/m^3, average annual wind below 8.5 m/s, 50-yr peak gust below 59.5 m/s)
Design Life	20 years
Hub Height Options	37 m (121 ft) / 30 m (98 ft) /23 m (75 ft)
Tower Type	Tubular steel monopole
Orientation	Upwind, 3 blade
Yaw System	Active yaw drive with wind direction/speed sensors and automatic cable unwind
Rotor Diameter	21 m (68 ft)
Power Regulation	Variable speed, stall control
Certifications	UL1741, UL1004-4, CSA C22.2 No.107.1-01, CSA C22.2 No. 100.04, CE compliant, CEI 0-21

PERFORMANCE	DESCRIPTION
Rated Wind Speed	14.5 m/s (32.4 mph)
Cut-In Wind Speed	3.0 m/s (7 mph)
Cut-Out Wind Speed	25 m/s (56 mph)
Extreme Wind Speed	59.5 m/s (133 mph)

WEIGHT	DESCRIPTION
Rotor (21-meter) & Nacelle (standard)	7,200 kg (16,100 lbs)
Tower (37-meter)	14,000 kg (30,800 lbs)

DRIVE TRAIN	DESCRIPTION
Gearbox Type	No gearbox (direct drive)
Generator Type	Permanent magnet

BRAKING SYSTEM	DESCRIPTION
Redundant Braking System (per IEC 61400-1)	Generator dynamic brake and multiple spring-applied calipers

CONTROL SYSTEM	DESCRIPTION
Controller Type	DSP-based multiprocessor embedded platform
Converter Type	Pulse-width modulated IGBT frequency converter
Monitoring System	SmartView remote monitoring system, ModBus TCP over ethernet

ELECTRICAL SYSTEM	DESCRIPTION
Rated Electrical Power	100 kW, 3 Phase, 400 VAC, 50 Hz (standard conditions: air density of 1.225 kg/m^3, equivalent to 15°C (59°F) at sea level)
Power Factor	Set point adjustable between 0.9 lagging and 0.9 leading
Reactive Power	+/- 45 kVAR
Grid Interconnect	Utility approved protective relay included

NOISE	DESCRIPTION
Apparent Noise Level	55 dBa at 40 meters (131 ft)

ENVIRONMENTAL SPECIFICATIONS	DESCRIPTION
Temperature Range: Operational	-20°C to 50°C (-4°F to 122°F)
Temperature Range: Storage	-40°C to 55°C (-40°F to 131°F)
Lightning Protection	Receptors in blades, nacelle lightning rod and electrical surge protection

All Specifications subject to change without notice.

Northern POWER SYSTEMS

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