NPS 100C-21

Class II/A

NPS 100C-21

» The NPS 100C-21 features state-of-the-art hub and blade technology with superior aero-dynamics providing a larger swept area. This increases the annual energy production (AEP) of the NPS 100C-21 is up to 11% over the previous model.

» The turbine is a complete redesign of NPS' distributed wind platform that has been deployed around the world since 2008. The nacelle is now 30% smaller with a completely new tower configuration. This results in lower weight and load characteristics reducing foundation and installation costs.

» Over 25 million hours of cumulative run time makes the NPS 100 turbine series one of the most reliable and proven wind turbines in the world. The average availability of Northern Power's global fleet currently stands at 98%.

Key Benefits

» **Optimised for medium to high wind regimes**
The NPS 100C-21 starts making power at wind speeds as low as 3 metres per second and provides maximum generation at 12-15 m/s

» **Reliable**
Reinforced blades, gearless design, industry leading yaw configuration, and best-in-class brake system make Northern Power turbines the most reliable small wind turbines available today.

» **Generate profitable income**
With low ownership costs over the lifetime of the turbine, the NPS 100C-21 pays for itself quickly and will generate a healthy income streamover its 20+ year life.

2 Year Warranty

» Our Warranty options cover up to 2 years, with service options that extend up to 20 years. Various levels of service packages are available to meet varying customer needs. The Premium package includes an availability and power curve performance guarantee. Northern Power Systems will remain your service and maintenance provider for the entire duration of the program. With several multi-year options, Northern Power Systems guarantees operational costs, optimized for your specific needs.

Operation and Maintenance

» Our service network guarantees rapid response and swift repairs thanks to our dedicated teams and spare part warehouses distributed across Europe.

» 24/7 monitoring is provided by our L1 technicians in order to minimize turbine downtime.

» Upon request, customized reporting services and integration into third-party plant monitoring systems are available.

Specifications

General configuration

Model	Northern Power® 100C-21
Design Class	IEC WTGS II/A air density 1.225 Kg/m³, average annual wind below 8.5 m/s, 50-yr peak gust below 59.5 m/s
Design Lifetime	20 years
Rotor Diameter	20.7 m
Tower Types	Steel tubular tower
Hub Height	37 m, 29 m, 22 m
Orientation	Upwind, 3 blades
Yaw System	Active yaw drive, electromechanical controls guided by wind speed and direction sensors; automatic cable unwind.
Power Regulation	Variable speed, stall control
Certification	CE compliant, CEI 0-21

Performance

Rated Wind Speed	15 m/s
Cut-in Wind Speed	3 m/s
Cut-out Wind Speed	25 m/s
Extreme Wind Speed	59.5 m/s

Weight

Nacelle & Rotor (21 m)	6,500 kg
Tower (37 m)	12,000 kg

Drive train

Gearbox	No gearbox (direct drive)
Generator Type	Permanent magnet

Braking system

Redundant Braking System (IEC 61400-1ed3)	Dynamic generator brake and multiple hydraulic calipers

Control system

Controller Type	DSP-based multiprocessor embedded platform
Converter Type	IGBT frequency converter with PWM (pulse-width modulated) technology
Monitoring System	SmartView® remote monitoring system; ModBus TCP via ethernet

Electrical system

Rated electrical power	100 kW, 3 Phase, 400 VAC, 50 Hz
Power factor range	Set point adjustable between 0.9 lagging and 0.9 leading
Reactive power	+/- 45 kVAR
Grid connection	Utility approved protective relay included

Noise

Apparent Noise Level	50 dBa at 50 metres from nacelle

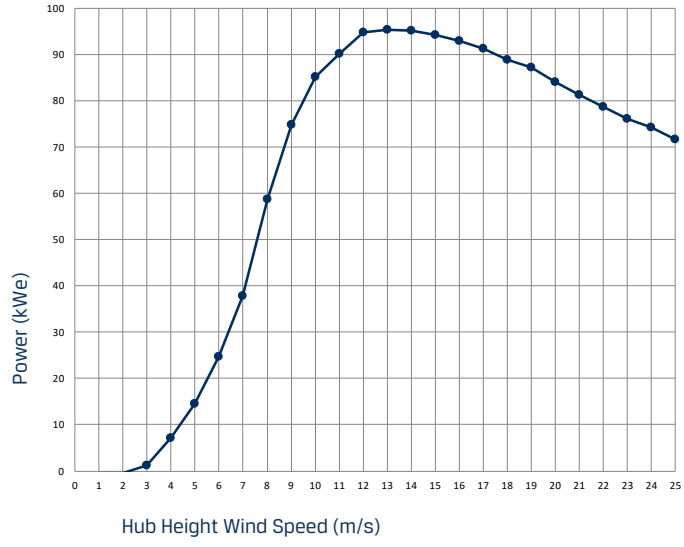
Environmental specifications

Operating Temperature Range	-20°C to 40°C
Temperature Range in Sstorage	-30°C to 50°C
Lightning Protection	Receptors in blades, nacelle lightning rod and electrical surge protection

Power Curves

NPS 100C-21 Class II/A Power Curve

21m Rotor, Standard Conditions*

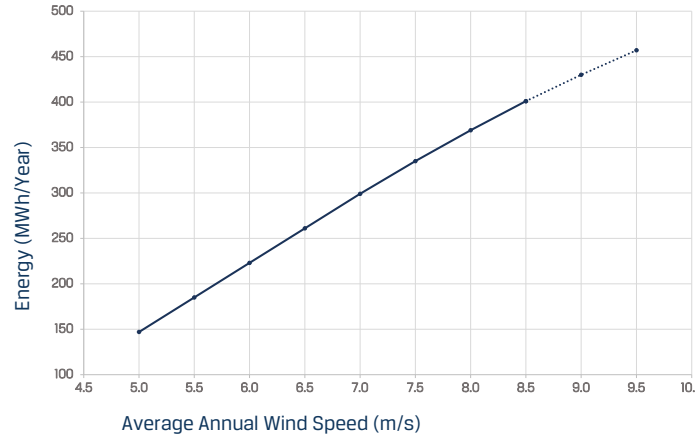


Wind Speed (m/s)	1	2	3	4	5	6	7	8	9	10
Power (kWe)	-0.6	-0.6	0.5	4.1	10.5	19.0	29.4	41.0	54.3	66.8

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
77.7	86.4	92.8	97.8	100	99.9	99.2	98.4	97.5	96.8	96.4	96.3	96.8	98.0	99.2

Annual Energy Production: 21m Rotor

Standard Conditions*, Rayleigh Wind Distribution



Average Annual Wind Speed (m/s)	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0**	9.5**
Energy (kWe)	147	185	223	261	299	335	369	401	430	457

* Standard conditions: air density 1.225 kg/m³, equivalent to 15°C at sea level.
** Above IEC 61400-1 class II

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