

NPS 100C-24

Class III/A



The Next Generation High Output Wind Turbine for Low Wind Regimes

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» Introducing the NPS 100C, the next generation of our industry leading permanent magnet/direct drive distributed wind turbines.

» A new 24 metre rotor features state-of-the-art hub and blade technology with superior aerodynamics providing a larger swept area. This increases the annual energy production (AEP) of the NPS 100C-24 by 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.

» Further improvements include a new best in class brake system, a new industry leading yaw configuration, an enhanced electrical layout, more efficient generator cooling, and an ultrasonic wind vane and anemometer.

» Over 5 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 99.5%.

» This is made possible through an engineering advancement in simplicity and precision. Our permanent magnet direct drive (PMDD) technology maximises energy capture, outperforms conventional gearbox designs, and reduces maintenance costs.

Specifications

General Configuration

Model	Northern Power® 100C-24
Design Class	IEC WTGS III/A air density 1.225 Kg/m ³ , average annual wind below 7.5 m/s, 50-yr peak gust below 52.5 m/s
Design Life	20 years
Rotor Diameter	24.4 m
Tower Types	Tubular steel monopole
Hub Height	37 m, 29 m, 22 m
Oriention	Upwind, 3 blade
Yaw System	Active yaw drive with wind direction/speed sensors and automatic cable unwind
Power Regulation	Variable speed, stall control
Certification	CE compliant, CEI 0-21

Performance

Rated Wind Speed	12 m/s
Cut-in Wind Speed	3 m/s
Cut-out Wind speed	25 m/s
Extreme Wind Speed	52.5 m/s

Weight

Rotor (24 m) & Nacelle	7,010 kg
Tower (23 & 29 m)	TBD
Tower (37 m)	12,000 kg

Drive Train

Gearbox Type	No gearbox (direct drive)
Generator Type	Permanent magnet

Braking System

Redundant Braking System (per IEC 61400-1ed3)	Generator dynamic brake and multiple hydraulic calipers
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Control System

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

Rated Electrical Power	95 kW, 3 Phase, 400 VAC, 50 Hz
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

Apparent Noise Level	50 dBa at 50 metres from nacelle
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Environmental Specifications

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

Key Benefits

» Optimised for lower wind regimes

The NPS 100C-24 starts making power at wind speeds as low as 3 metres per second and provides maximum generation at 12-14 mps

» 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

» Easier planning

With a low height profile the NPS 100C-24 comes with a 37-metre tubular tower to help you achieve a high annual energy production (AEP) while minimising visual and acoustic impact to help meet planning requirements

» Generate profitable income

- Maximise the UK's Feed-in-Tariff (FiT) using the largest allowed turbine (100 kW) within the tariff band
- With low ownership costs over the lifetime of the turbine, the NPS 100C-24 pays for itself quickly and will generate a healthy income stream over its 20+ year life

» Plug and play

Installation is straightforward as the standard configuration for the NPS 100C-24 is grid ready. Supplied with an approved 400-volt transformer, an RTU data logger and a utility grid protective relay interface (G59/2) all built into the tower of the wind turbine. Our state of the art power converter design provides smooth, clean power to local grids, which simplifies grid connection.

5 Year Warranty

The NPS 100C-24 is covered by up to a 5-year manufacturer warranty, depending on country. This covers parts, labour and freight in the unlikely event something were to go wrong. Other services in the Northern Power warranty include:

- **24x7 monitoring and reporting:** Operation teams in the UK, Italy and the United States oversee the performance and operation of your wind turbine to ensure maximum availability
- **Global Spares Management Programme:** New parts for the NPS 100C-24 dispatched for same-day or next-day delivery

Extended O&M Contract

Extended operations and maintenance is available direct from Northern Power Systems once the warranty ends. Dependent on the terms agreed our engineers will continue to provide:

- Monitor and reporting
- RTU maintenance
- Remote support
- Preventative maintenance

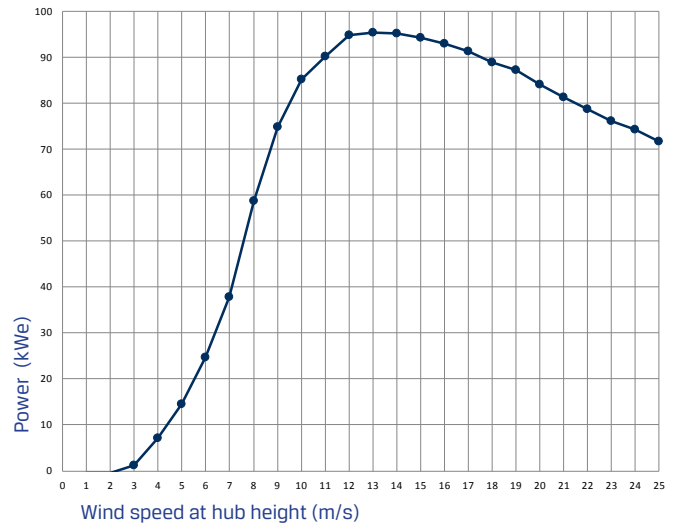


Power Curves

NPS 100C-24 Class III/A Power Curve

24m Rotor, Standard Density

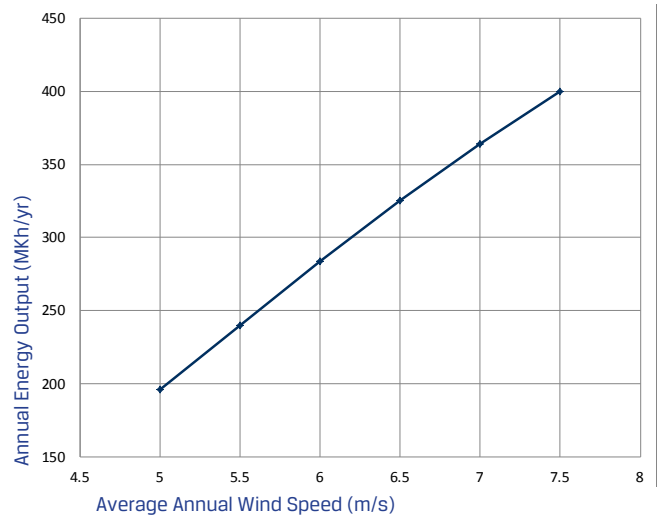
wind speed (m/s)	1	2	3	4	5	6	7	8	9	10					
electric power (kWe)	-0.5	-0.5	1.2	7.2	14.5	24.7	37.9	58.7	74.8	85.1					
	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	90.2	94.7	95.3	95.1	94.2	92.9	91.2	88.9	87.1	84.1	81.3	78.6	76.1	74.3	71.7



Annual Energy Production: 24-Metre Rotor

Standard Air Density, Rayleigh Wind Distribution

	(mph)	11	12	13	14.5	16	17
Average annual wind speed	(m/s)	5.0	5.5	6.0	6.5	7	7.5
Annual energy output	(MWh/yr)	196	240	284	325	364	400



* Standard conditions: air density of 1.225 kg/m³, equivalent to 15°C (59°F) at sea level

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Northern Power Systems

29 Pitman Road
Barre, Vermont, 05641 USA
UK Tel: 0808 234 6788

northernpower.com

