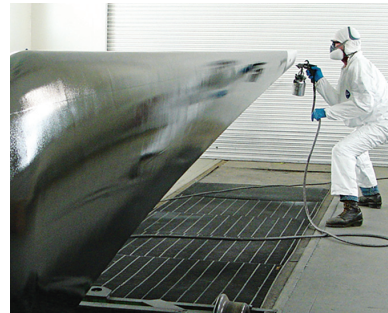


Northern Power® 100 ARCTIC

Community Scale Wind Turbine for Cold Climates



Not all turbines operate well in extreme environments.

The **Northern Power** 100 Arctic is designed for them.



Superior by design—Proven through experience

Northern Power Systems knows extreme environments. Our early HR3 turbine model has survived 198 mph winds and -60° C temperatures in Antarctica and still continues to operate. We have shipped more than 20 turbines into Alaska and have produced over 3.8 million kilowatt hours to date. Based on over 30 years of proven wind experience, the Northern Power team has created an arctic turbine model that is truly best in class for cold and icy environments.

The Northern Power 100 (NPS 100) Arctic turbine shares a number of the advanced design elements that make Northern Power's standard NPS 100 the ideal turbine choice in mainstream markets. Additional features and design enhancements in this specialized model ensure optimum performance for your wind project no matter the frigid conditions—so that you can achieve your renewable energy goals whether you are located in the tundra or the Alps.

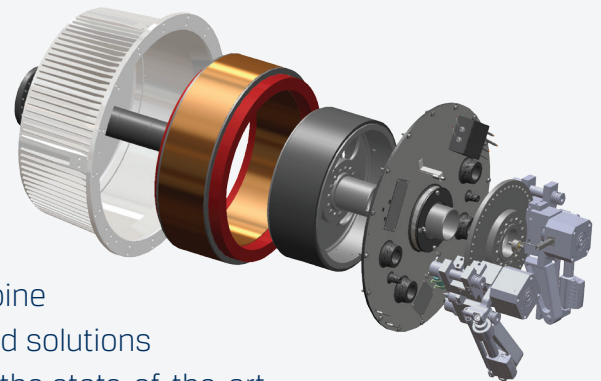
Military Bases • Universities • Corporations • Hotels & Resorts • Libraries



Direct.

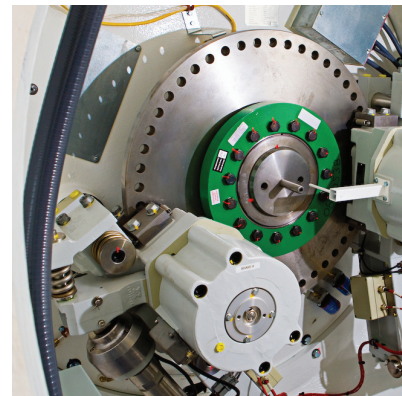
To Cold Climates Everywhere.

Wind power has been in use around the world for decades. Even so, the mainstream technology used in most wind turbines today is not always the best fit for specialized environments. Arctic conditions where temperatures reach below -20°C (-4°F) and ice buildup is common, can negatively impact wind turbine operations. Demanding environments require specialized solutions and that is why Northern Power Systems has designed the state-of-the-art Northern Power 100 Arctic turbine.



Public Schools • Small Businesses • Greenhouses • Municipal Buildings

Our Design



The right technology: Permanent Magnet Direct Drive (PMDD)

Northern Power's PMDD technology is designed for superior performance in all environments, but it also forms the basis of our superior performance in Arctic conditions.

» **Low maintenance:** Our PMDD technology and simple design architecture are why the NPS 100 Arctic requires only minimal preventative maintenance—once per year. In this way you can set your maintenance schedule to avoid particularly harsh seasons. Additionally, the gearless technology bypasses much of the long-term maintenance issues that are associated with the more conventionally designed gearbox turbines.

» **Better energy capture:** All turbines can make more power in cold environments, but Northern Power has developed an advanced design and control system that takes advantage of the high air densities associated with very cold temperatures.

The Right Options

Aside from the obvious benefits of choosing a turbine that has been optimized to operate specifically for your cold weather region, we also offer remote monitoring and wind diesel options.

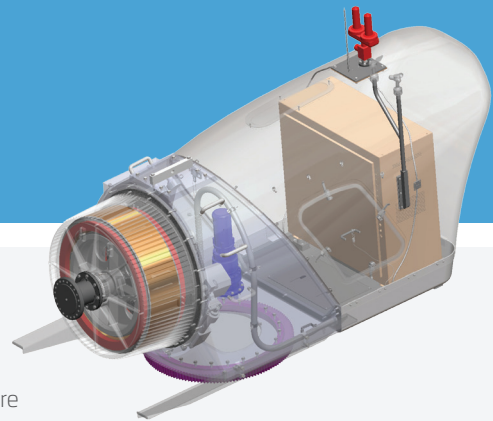
» **SmartView Products:** Our web based monitoring and reporting platform supports a range of options—from reporting, supervisory controls, and turbine monitoring from your PC to remote diagnostics services from Northern Power Systems—to ensure optimum turbine performance and avoiding unnecessary service calls.

» **Wind Diesel:** Our state-of-the-art turbine combined with our advanced control systems and years of expertise allow for the seamless integration into your diesel grid, enabling utilities to save fuel, cut emissions, and reduce diesel maintenance.

Island Communities • Ski Resorts • Auto Dealerships • Rural Utilities • Farms



Your Solution



Customized blades for icy conditions

Like most other turbines, the Northern Power 100 Arctic has a safety feature that automatically shuts the turbine off when too much ice has built up on the blades. But each moment that turbines are not operating translates to lost power and money. To maximize uptime in cold and icy environments, our blades come with a specially formulated **hydro phobic polymer coating** ensuring a **smooth surface** so ice cannot easily build up on the blades. If ice does form, our **black blades** absorb the sun's heat and allow for ice to be shed easily.

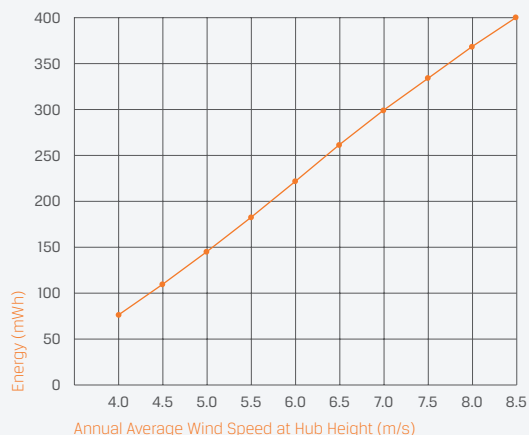
Advanced turbine design for arctic conditions: Ensuring reliability and accessibility

- >> **Blades:** Fiberglass reinforced and unique aerodynamic design
- >> **Materials:** Low temperature castings ensure safe operation of the turbine to -40° C
- >> **Heating:** Power converter and controls cabinet are heated to maximize operation, expanding possible operating temperatures
- >> **Controls:** Air density compensation enables maximum energy capture in cold environments
- >> **Tubular Tower & Enclosed Heated Nacelle:** Maintenance and service personnel are protected from uncomfortable and often dangerous conditions

Manufacturing Facilities • Remote Villages • Hospitals • Sports Facilities

Annual Energy Production: 21-Meter Rotor

Standard Air Density, Rayleigh Wind Speed Distribution



Specifications

Model	Northern Power 100 ARCTIC
Design Class	Class S (air density 1.34 kg/m ³ , average annual wind below 8.3 m/s, 50-yr peak gust below 56 m/s)
Design Life	20 years
Hub Height	37 m (121 ft)
Rotor Diameter	21 m (69 ft)
Rated Electrical Power	100 kW, 3 Phase, 480 VAC, 60 Hz
Cut-In Wind Speed	3.5 m/s (7.8 mph)
Gearbox Type	No gearbox (direct drive)
Generator Type	Permanent magnet, passively cooled
Apparent Noise Level	55 dBA at 30 meters (98 ft)

For more information, see the Northern Power 100 ARCTIC Specifications Sheet.
All specifications subject to change without notice.



Northern Power Systems has over 30 years of experience in developing advanced, innovative wind turbines. The company's next generation wind turbine technology is based on a vastly simplified architecture that utilizes a unique combination of permanent magnet generators and direct-drive design. This revolutionary new approach delivers higher energy capture, eliminates drive-train noise, and significantly reduces maintenance and downtime costs. Northern Power Systems is a fully integrated company that designs, manufactures, and sells wind turbines into the global marketplace.

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