
Availability of Vestas Low Temperature

V90-2.0 MW™
V100-2.0 MW®
V110-2.0 MW®
V120-2.2 MW™
V105-3.45 MW™
V112-3.45 MW®
V117-3.45 MW®
V117-4.2 MW™
V126-3.45 MW®
V136-3.45 MW®
V136-4.2 MW™
V136-4.5 MW™
V150-6.0 MW™
V162-6.2 MW™
V162-6.8 MW™

Availability of Vestas Ice Detection™

V105-3.45 MW™
V112-3.45 MW®
V117-3.45 MW®
V117-4.2 MW™
V126-3.45 MW®
V136-3.45 MW®
V136-4.2 MW™
V136-4.5 MW™
V150-4.2 MW™
V150-4.5 MW™
V155-3.6 MW™
V150-6.0 MW™
V162-6.2 MW™
V162-6.8 MW™

Vestas Cold Climate Solutions

Ensuring safe and efficient energy production in cold climate conditions

The Vestas Cold Climate Solutions build on years of experience ensuring safe and efficient energy production in cold climate conditions. The Vestas Cold Climate Solutions include Vestas Low Temperature Option™, Vestas Ice Detection™, Vestas De-Icing™ and Vestas Anti-Icing System™, which can be combined with additional options and solutions such as Vestas Ice Assessment™ and Vestas Ice Control to enhance the performance of the power plant.

Vestas Low Temperature

The Vestas Low Temperature Option enables wind turbine operation in ambient temperatures as low as -30°C and safe withstanding of an ambient temperature as low as -40°C in pause. By using heating elements, it ensures continued and safe operation of temperature-sensitive components. Installed on more than 5,000 turbines worldwide, Vestas Low Temperature Option is a proven high performer in cold climate conditions.

Vestas Ice Detection™

The Vestas Ice Detection™ system assesses the ice conditions on the rotor, enabling operational strategies to increase safety. Through sensors installed on each blade, it monitors changes in the natural frequency flow oscillation produced by the turbine operation, enabling to evaluate the risk of ice throw. Vestas' solutions for ice detection also include nacelle-based ice detection, which monitors ice conditions on the nacelle, and power curve-based ice detection, which detects ice build-up through the degradation of the power curve performance.

Availability of Vestas De-Icing™

V112-3.45 MW®
V117-3.45 MW®
V117-4.2 MW™
V126-3.45 MW®

Availability of Vestas Anti-Icing System™

V150-4.2 MW™
V150-4.5 MW™
V150-6.0 MW™
V162-6.2 MW™
V162-6.8 MW™

Vestas Cold Climate Solutions availability for after-sales dependent on turbine type. For more information contact your local [Vestas Sales & Service office](#).

Vestas De-Icing™

The Vestas De-Icing™ system maximises the energy production of wind turbines in icy conditions by de-icing the blades. Activated by the Vestas SCADA system, the Vestas De-Icing™ system pauses the turbine operation in order to realise the de-icing action, heating and circulating air within the blades. The energy use of the system is optimised by concentrating the de-icing action on the outer third of a turbine blade full chord and the remaining outer two-thirds of the leading edge towards the tip.

Vestas Anti-Icing System™

The Vestas Anti-Icing System™ continuously monitors the effects of ice formation and intelligently engages to remove ice on blades while in operation to maximise performance. The combination of several independent heating elements and levels result in targeted and effective anti-icing action tailored to the specific icing event. A large operational envelope secures high energy production in extreme cold climate conditions, making it the optimal cold climate solution for sites ranging from low to high ice severity. During the most common icing events, Vestas Anti-Icing System™ ensures a minimum of 90% production retention*. Vestas has received more than 1 GW of wind turbine orders with Vestas Anti-Icing System™.

Siting in cold climate conditions with Vestas Ice Assessment™

Vestas' wide suite of siting tools, including the Vestas Ice Assessment™, allow us to use highly advanced meteorological models and algorithms to assess icing challenges. Vestas Ice Assessment™ predicts icing exposure for each individual turbine on a specific site. It can forecast the specific icing conditions, ice formation on blades and expected losses due to ice to assess the total energy production of a cold climate site.

Full system integration with Vestas Ice Control

The Vestas Ice Control is an optional feature of the Vestas SCADA system that orchestrates the standard yawing and pausing functionalities of the turbine with different ice mitigation actions. Based on the input of an ice detection system**, the Vestas Ice Control enhances safety by automatically pausing the turbine operation when ice build-up becomes critical, reducing the time of operation with high risk of ice throw. The Vestas Ice Control also activates the automatic resume of the turbine operation when the ice detection system indicates low risk of ice throw. In addition, combining Vestas Ice Control with Vestas De-Icing™ or Vestas Anti-Icing System™ ice is actively removed from the blades while the turbine is in safety mode, therefore potentially reducing the time the turbine is in pause.

* Depending on siting and climatic conditions. The system retains 90% in climatic and operating conditions within the maximum performance operating envelope.

**Vestas Ice Control receives and processes inputs from one or more ice detection systems such as the Vestas Ice Detection™ system, Vestas' nacelle-based ice detection and Vestas' power curve-based ice detection.

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Vestas Wind Systems A/S
Hedeager 42 . 8200 Aarhus N . Danmark
Tlf: +45 9730 0000 . Fax: +45 9730 0001
vestas@vestas.com . vestas.com