



Vestas Cold Climate Solutions

Ensuring safe and efficient energy production in cold climate conditions

Turbine compatibility

Vestas Cold Climate Solutions availability (for new turbines and aftersales) is dependent on turbine type. For more information contact your local Vestas Sales & Service office

Vestas Cold Climate Solutions build on years of experience ensuring safe and efficient energy production in cold climate conditions, and are made up of several individual solutions:

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.

Vestas De-Icing™

Vestas De-Icing™ system maximises the energy production of wind turbines in icy conditions. Activated by the Vestas SCADA system, the Vestas De-Icing™ system pauses turbine operations in order to carry out de-icing, 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. 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™.

Cold Climate Operation

Cold Climate Operation is a software-based technology that prevents wind turbines operating in cold climates from stalling when ice is detected by optimizing the pitching strategy proportional to estimated ice severity. CCO is suitable for areas with less severe icing, serving as an alternative to the Vestas Anti-Icing System™.

Integration with Vestas Ice Assessment™ and Vestas Ice Control

Vestas Cold Climate Solutions 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 Ice Assessment™ is a siting tool that predicts icing exposure for each individual turbine on a specific site. It can forecast specific icing conditions, ice formation on blades and expected losses due to ice to assess the total energy production of a cold climate site. Vestas Ice Control orchestrates the standard yawing and pausing functionalities of the turbine with different ice mitigation actions. Vestas Ice Control enhances safety by automatically pausing the turbine operation when ice build-up becomes critical, reducing operation time with high risk of ice throw.



Scan for more information on
Environmental Control features
and other Power Plant and
Energy Solutions products



©Vestas 2024

This document was created by Vestas Wind Systems A/S and contains copyrighted material, trademarks and other proprietary information. All rights reserved. No part of the document may be reproduced or copied in any form or by any means such as graphic, electronic or mechanical, including photocopying, taping or information storage and retrieval systems, without the prior written permission of Vestas Wind Systems A/S. All specifications are for information only and are subject to change without notice. Vestas does not make any representations or extend any warranties, expressed or implied, as to the adequacy or accuracy of this information.