



How did this smart factory reach carbon-neutral?

Thursday, November 23, 2023



POLAND: Innovative approaches to industrial production are essential given the growing challenges of climate change and the need to reduce greenhouse gas emissions. Therefore, manufacturers increasingly strive to use clean and sustainable energy sources to minimize their environmental impact.

Danfoss' factory in Grodzisk Mazowiecki is among the company's most advanced production facilities and is the first to be fully powered by renewable energy sources. An important aspect during the construction of the plant was to optimize efficiency, using technologies for data collection and processing. In the factory, [VLT® HVAC Drive FC 102](#) supports efficient ventilation, featuring condition-based monitoring and connected to a [DrivePro® Remote Monitoring service](#). These drives control the ventilation and air-conditioning system and also collect information about the parameters, or emergency states of the system.



"Eliminating unplanned downtime has a tangible impact on operating expenses", explains Jaroslaw Strzelczyk, Senior Operations Director at Danfoss Poland

The challenge: More comfort for less CO2 emission

During the design process of the facility, it was important to ensure the safety of workers and production. The systems had to meet the requirements of maintaining set parameters in buildings to ensure a comfortable working environment.

Eliminating downtime risk was also a priority. According to estimates, a production stoppage costs the factory 22,000 EUR per incident. This figure is based such factors as the cost of delays in meeting order deadlines, the purchase of spare parts, and the cost of employees leaving their workstations.

Danfoss also aims to achieve carbon neutrality by 2030. To meet this goal and customer demands for sustainable, eco-friendly products, Danfoss focused on using renewable energy sources and maximizing energy efficiency in the new factory. By reducing energy usage and optimizing its carbon footprint in this way, Danfoss aimed to lower costs while upholding its commitment to ethical, environmentally-conscious operations.



The solution: Intelligent drives with remote monitoring

The ventilation and air conditioning system at the factory is controlled by Danfoss VLT® HVAC Drive FC 102 units with built-in condition-based monitoring (CBM) and DrivePro® Remote Monitoring service.

The monitoring service applies to 10 drives in the power range up to 18.5 kW. These drives operate in conjunction with cloud computing based on an industrial Ethernet standard. CBM improves real-time control of motor insulation status and load profile. Historical and real-time data are accessible from a web browser, which means the maintenance staff can analyze them from anywhere in the world.

The factory maintenance department receives notifications regarding any deviations from the baseline values. This enables staff to identify and react early when situations arise which can pose a risk of imminent failure, such as dirty filters or increased overload. The notifications also streamline the process of fault localization.

The outcome: 50% less energy consumption

The main benefit to the factory of Danfoss Drives technology, particularly CBM and remote monitoring, is a reduction in failures and increased uptime. The DrivePro® Remote Monitoring service has improved the efficiency of the entire maintenance department, facilitating the service process. By monitoring the operating condition of machinery, the personnel can prepare a detailed repair and maintenance plan. Spare parts are ordered well in advance so that there is no need to stock redundant components. Reducing the load on machinery has extended the life of the entire plant. Thus, the time spent on all service activities has been reduced and production continuity is maintained. Servicing and maintenance costs have decreased as well.

Full electrification, the use of energy-saving solutions (such as Danfoss drives) and the use of energy from renewable sources have made the newly built production hall in Grodzisk Mazowiecki carbon-neutral. In this way, Danfoss reduces emissions and operating costs while taking care of employees' well-being and getting a step closer to meeting climate targets.

Learn more about condition-based monitoring

Drives have the potential to be so much more than simple power processors, designed to act as sensors and sensor hubs to process, store and analyze data – in addition to their built-in connectivity capabilities. Condition-based monitoring can help modernize and optimize your automation systems. [Learn more about CBM here.](#)

Visit the factory

The factory in Grodzisk is the first carbon-neutral Danfoss factory in the world. It serves as a model example of a decarbonization path for other factories. To learn more about how Danfoss has achieved carbon neutrality, you can register to visit the factory on this page.

Danfoss products installed in this project

VLT® HVAC Drive FC 102

Get even higher reliability and lower total cost of ownership (TCO) in your heating, ventilation and air-conditioning (HVAC) installations, with this unique VSD optimized for building automation systems.

DrivePro® Remote Monitoring

Monitor your AC drives with our powerful tool to ensure your AC drives are operational. With real-time monitoring available online, you are alerted of any potential issues allowing you to take immediate action.