



# Danfoss PAHT pumps help regulate temperature and humidity in massive Russian greenhouse

Russia has increased domestic production of vegetables in recent years to decrease reliance on imports from the EU. So to help keep residents of the St. Petersburg region supplied with plenty of fresh cucumbers and tomatoes, Russian entrepreneurs commissioned a 70,000 m<sup>2</sup> greenhouse southeast of the city in 2011. Dutch installers chose Danfoss PAHT pumps to drive the misting system that regulates temperature and humidity throughout the facility.

**The challenge: Turn demineralized water into enough mist to regulate temperature and humidity for an ambitious greenhouse venture. And be so sure of high-pressure pump reliability that you can count on them even if they are installed more than 2,500 km away.**

Building a dependable misting unit capable of regulating heat and humidity across seven hectares under glass no easy task. Average temperatures in the St. Petersburg area vary from -10°C in winter to 23°C in summer. Furthermore, the mister had to have separate controls for six large sections of up to a hectare each as well as two smaller nursery sections.

According to Paul van den Bos, the project engineer for Van der Ende Pompen, the main criteria for selecting components for the system were reliability and predictably low maintenance procedures and costs. Van der Ende Pompen supplied the high-pressure pumps, calculated the duty point for pump and motor sets, and built the pump support system for the installation. "Together with the installer we tested the entire pump system in the Netherlands before installing it in Russia. Since high-

pressure pumps are the heart of the misting system, they had to be the most reliable available in order to prevent a lot of service visits to a location so far from home."

**The solution: Five Danfoss axial piston PAHT pumps running in parallel**

After a search of the high-pressure pump market and in consultation with the installer, Van der Ende Pompen's engineers opted for five Danfoss PAHT 90 pumps to provide the pressure for the misting system.

Each pump is capable of delivering up to 120 l per minute at a maximum pressure of 129 barg, and all are connected to the header that feeds mist to the entire greenhouse. The entire misting system has a maximum capacity of 581 l per minute.

Paul van den Bos  
Project engineer for Van der Ende Pompen



"High reliability

is very important

to prevent a lot of service visits to a location so far from home."

Application story  
Misting unit regulating heat and humidification  
in massive Russian greenhouses



*Danfoss is one of the largest industrial companies in Denmark, with more than 23,000 employees worldwide, production on four continents and sales in almost every country on the planet. Danfoss is among the 3 largest manufactures world-wide within all key divisions. This is also the case for axial piston pumps.*

*The Danfoss High Pressure Pump Division brings decades of hydraulic experience to the design and manufacture of energy-saving pumps. The division designs and markets a broad range of high-performance pumps, including the groundbreaking APP pumps for the reverse osmosis market and specially developed CLP pumps for the oil and gas industry. As something new, Danfoss also designs and markets a range of energy recovery devices for the Reverse Osmosis market.*

In order to provide constant pressure and also allow differentiated misting for the eight greenhouse sections, the PAHT pumps are pressure controlled in cascade by Danfoss frequency converters. Danfoss pressure valves are connected directly to the header, and Danfoss directional valves were also installed in each section.

### **The results: Simple installation and constant uptime**

Construction of the massive greenhouse and installation of the custom-made misting unit was completed during Q3 2013, and the first crops of tomatoes and cucumbers are already on their way.

While still too early to test the limits of Danfoss's 8,000-hour warranty, Van den Bos is happy with the process thus far. "Since we know Danfoss PAHT pumps from many other projects in the Netherlands – and we had tested the entire misting unit here prior to shipment and installation in Russia – we are confident that the Danfoss pumps will perform according to our expectations. Commissioning of the system went off without a hitch, and the pumps have performed perfectly thus far."



*Five Danfoss PAHT 90 pumps help to provide pressure for the misting system.*



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#### *About Van der Ende Pompen:*

*Van der Ende Pompen is part of the Van der Ende Group, a Dutch company that provides a comprehensive array of products and services related to pumps, associated electrical engineering and metalworking for the horticultural, industrial, governmental and non-residential sectors.*