

Case story | VACON® 100 FLOW

VACON® 100 FLOW improves water pumping in Kristinestad

KRS-Vesi is responsible for water supply in the Kristinestad area on the west coast of Finland. Controlling the pumps – the workhorse in the water supply – with VACON® 100 FLOW AC drives results in an even flow and reduces pressure spikes in the pipes. The VACON® 100 FLOW is the newest range in Vacon's third-generation VACON® 100 product family, and is dedicated to improving flow control in pump applications.

VACON® 100 FLOW combines the core design of VACON® 100 with

dedicated functions that benefit flow control processes. The new AC drive also improves the efficiency and redundancy of pump systems, offering advanced features such as Multimaster and Multifollower for controlling multiple pumps simultaneously.

When KRS-Vesi saw that modernization was necessary at their Friiveli booster station and Osvald waste water pumping station, their pump supplier Grundfos included seven VACON® 100 FLOW AC drives in the power range 5-15 kW in its offer. Three

of the VACON® 100 FLOW units are installed at the Friiveli booster station and four units are at the Osvald waste water pumping station.

Each pump is controlled by an AC drive – smoothly

Before modernization, a conventional pump solution was used at the Friiveli booster station: the main pump was controlled by an AC drive, and a separate contactor unit was required to switch on two auxiliary pumps. After modernization, each of the three pumps is controlled by its own



VACON® 100 FLOW drive, and a separate contactor unit is no longer needed. At the Osvald waste water pumping station, direct on-line starting was previously used to start the pumps. This caused a pressure spike in the pipes and mechanical stress on the equipment. After modernization, the VACON® 100 FLOW units accelerate the pump motors quickly but smoothly to their running speed, avoiding extra mechanical stress on the pumps.

The VACON® 100 FLOW drives provide multipump functions as standard, which improves reliability and efficiency. The drives in a system communicate with each other via a Modbus RTU communications protocol. They are able to judge how many pumps are needed at any particular time and at what speed the pumps should operate, and notice if there is a fault in one of the motors, pumps or AC drives. If the demand exceeds the maximum capacity of the leading pump and more capacity is needed, auxiliary pumps are connected as needed. The leading pump and the auxiliary pumps run in parallel, which saves energy and reduces wear on the pumps.

“The Multipump Multidrive system improves redundancy. Starting the pumps smoothly decreases the stress on the electrical network and mechanical parts and reduces pressure spikes in the pipeline,” says Kimmo Äijö, Service Technician at Grundfos Pumps.

Commissioning the VACON® 100 FLOW is easy and quick and does not require any special skills. “Multipump Multidrive is a modern solution whereas an AC drive-contactor-combination is yesterday’s technology. We have found the AC drive application to be very good and recommend it to our pump customers,” says Kimmo Äijö, who has been working together with Vacon for more than 10 years.

Even flow and pressure

Pump control with the help of AC drives also brings other benefits, such as improved process control and optimum pump control. According to Grundfos’ Kimmo Äijö, the most important benefits of the VACON® 100 FLOW units at KRS-Vesi are a steady flow and pressure. “Thanks to the process control enabled by the VACON® 100 FLOW AC drives, the flow rate from the Osvald wastewater pumping station to the wastewater treatment plant is steady. At the Friiveli booster station the VACON® 100 FLOW drives keep the pressure stable.”

Energy and space savings

Energy savings are one of the most important benefits that AC drives bring. Process control with the help of AC drives can reduce energy consumption by 20-50%. The greatest savings are seen in pump and fan applications, when the speed of the motor is constantly adjusted according to process requirements. The power required by the drive is proportional to the third power of the speed. This means that even a small drop in speed leads to huge energy savings. AC drives technology also reduces the need for space and cabling. All VACON® 100 FLOW drives delivered to KRS-Vesi were provided in splash-proof IP54 enclosures, which can be installed on the wall in the close vicinity of the process. This brings space savings in cramped electrical rooms and reduces the need for cabling.

The VACON® 100 FLOW drives have been controlling pumps at KRS-Vesi since May-June 2013. “We are very satisfied with the solution,” says Ari Hakala, Maintenance Manager at KRS-Vesi.

KRS-Vesi was familiar with VACON® AC drives technology even before the VACON® 100 FLOW units were installed. The VACON® CX and VACON® NXS range of drives have been used for years at their water treatment plant and other water intake plants.





VACON® 100 FLOW units at the Osvald waste water pumping station. The drives were installed on a backplate at SK-kojeisto, the Seinäjoki, Finland based company that has built the switchboards used at KRS-Vesi.

Cover photo: Vacon's latest product – VACON® 100 FLOW – controls pumps at the Friiveli booster station operated by KRS-Vesi in Kristinestad, Finland. IP54 enclosures mean that the drives can be installed in the process environment without any extra protection.

Multipump Multidrive is designed for systems that have a maximum of eight parallel variable speed motors (e.g. pumps, fans or compressors). By default, the Multipump Multidrive is configured for three parallel motors. Each motor is controlled by its own drive. The drives in the system communicate with each other via Modbus RTU communication.



OY GRUNDFOS PUMPUT AB is the Finnish sales and service company of Grundfos Group. Grundfos is one of the leading pump manufacturers in the world and employs about 80 pump professionals in Finland. The company offers energy-efficient pump solutions for facility, building and municipal needs, as well as for industrial use. The most important product segments are circulator, booster, submersible, drainage, dosage, disinfection and sewage pumps and pumping stations, as well as mixers, flowmakers, aeration equipment and monitoring/control units.

This case story was originally released before the merger of Vacon and Danfoss Power Electronics was fully completed on 15 May 2015. As a result, Vacon as a company brand no longer exists and contact persons mentioned in the story may have changed. Future case stories on VACON® products will be released on behalf of the new organization – Danfoss Drives – which is part of the Danfoss Group.



Danfoss Drives

Danfoss Drives is a world leader in variable speed control of electric motors. We aim to prove to you that a better tomorrow is driven by drives. It is as simple and as ambitious as that.

We offer you unparalleled competitive edge through quality, application-optimized products targeting your needs – and a comprehensive range of product lifecycle services.

You can rely on us to share your goals. Striving for the best possible performance in your applications is our focus. We achieve this by providing the innovative products and application know-how required to optimize efficiency, enhance usability, and reduce complexity.

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We draw on decades of experience within industries that include:

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- Marine and Offshore
- Material Handling
- Mining and Minerals
- Oil and Gas
- Packaging
- Pulp and Paper
- Refrigeration
- Water and Wastewater
- Wind

You will find it easy to do business with us. Online, and locally in more than 50 countries, our experts are never far away, reacting fast when you need them.

Since 1968, we have been pioneers in the drives business. In 2014, Vacon and Danfoss merged, forming one of the largest companies in the industry. Our AC drives can adapt to any motor technology and we supply products in a power range from 0.18 kW to 5.3 MW.