



ENGINEERING
TOMORROW



Case story | VLT® HVAC FC 102

Carlsberg brewery drives down energy consumption

Situation

POLAND: Okocim Brewery in Brzesko is the largest of the three plants owned by Carlsberg Poland, which in turn is part of the Danish Carlsberg Group. The company sold more than 140 million hectoliters of beer and beverages worldwide in 2021.

Carlsberg Group is taking steps towards sustainable development, to reduce carbon dioxide emissions and decrease water and energy consumption. Therefore, Okocim Brewery implemented an upgrade project to achieve these aims, with the help of Control-Service, a Danfoss Drives partner company based in Krakow.

The scope of the project was to improve efficiency of the hydrophore and ventilation systems at the Brzesko plant, and with the help of AC drives they succeeded! Today, the water supply, air conditioning, and ventilation systems consume approximately 50% less electricity than comparable standard solutions. With these exceptional results, other Carlsberg divisions have been inspired to deploy similar solutions using

VLT® AQUA Drive FC 202 and VLT® HVAC Drive FC 102.

Challenge

For the hydrophore system, the main challenge was to distribute water reliably throughout the brewery. The plant requires stable pressure which can adapt to the current conditions, and prevention of hydraulic surges. Before the upgrade, the brewery experienced erratic pump shutdowns and startups, and pressures often exceeded demand.

In the ventilation system upgrade, Okocim Brewery needed to ensure adequate number of air exchanges in the premises. Carbon dioxide removal and dew point control were also important requirements. They also wanted to collect historical data to generate advanced reports. Analysis of these data could help to develop optimal conditions for production and storage of beer.

Carlsberg was also keen to improve on other aspects of operations such as regular maintenance and efficient support services, to ensure reliable brewery production operations.

Solution

To optimize water distribution, the partner company Control-Service proposed a solution using Danfoss drives. They used 2 x 55 kW VLT® AQUA Drive FC 202 devices, 3 x 55 kW pumps and a 55 kW soft starter. The installation does not require the drive to switch between pumps, and the entire system is protected on several levels. If the first drive fails, another drive automatically takes over. A pressure switch also helps to maintain the preset pressure, when required.

For the ventilation efficiency optimization, Control-Service installed VLT® HVAC Drive FC 102 devices, offering dedicated features developed for HVAC installations. These features include smart air handling unit control with different modes of operation. A Smart Logic Controller integrated into the drive takes over PLC tasks to control the operation of valves, fans, and dampers.

In addition, as part of the cooperation, the Cracow-based company conducts proactive maintenance activities – including preventive maintenance of drives and soft starters.

Result

Not only did the new water distribution system meet the requirements, but the investment was also repaid within only 7 months. The dual-pump solution is approximately 17% more energy-efficient than a comparable system using only a single pump running at 100% capacity.

VLT® HVAC Drive FC 102 drives used in the HVAC system are primarily responsible for the control of fans operation. Air recirculation adapts to the operation cycle of the brewery.

Control-Service aligns maintenance inspection dates with the plant production schedules, making it easier to maintain production uptime.

For more than a decade, Danfoss drives have helped to control the hydrophore and ventilation systems at Okocim Brewery in Brzesko. In both systems they reduce energy consumption. These systems also save water and reduce carbon dioxide emissions.

“Reliability is a key feature of the system, along with water and electricity savings. Production security and certainty of achieving planned throughput are important aspects of maintaining uptime. This is where knowledge of the condition of the drives and a preventive approach to equipment maintenance are key. System performance has been efficient and trouble-free since 2012”.

Krzysztof Grodny, Head of Electric Controls at Okocim Brewery

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10 years
trouble-free and
energy efficient
operation