

ENGINEERING
TOMORROW

Danfoss

Case story | VLT® HVAC Drive FC 102

Digitalization drives energy savings at Centro Carni Company

Digitalization in the refrigeration sector can help companies reduce their electricity consumption, improve system management and streamline maintenance. Digitalization can also contribute to reducing general site management costs, and optimizing systems to eliminate production inefficiencies. In other words, it helps to make companies like Centro Carni Company more competitive in today's market, which is under constant evolution and transformation.

2 MW

cooling capacity



VLT®

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Renowned beef processor Centro Carni Company di Tombolo (PD) installed a new cooling system, designed and installed by industrial refrigeration system contractor Freddo & Co. The process handles 75 tons of raw material throughput every day.

The system requirements were clear:

- high yield
- no machine downtime
- guaranteed operator safety
- low maintenance costs
- automation and innovation
- sustainability



Glycolate water pumping system

Maximum productivity with lower energy costs

The impressive plant developed and installed by Freddo & Co delivers 2 MW of cooling capacity and comprises:

- Two chiller units operating with HFO, each equipped with two compressors to manage the 0°C temperature circuit.
- A direct expansion plant, consisting of four compressors serving the low (-20°C) and very low (-40°C) temperature circuits, operating with synthetic refrigerants and drives, with a spare active compressor.
- PLC control logic that analyzes and monitors conditions for maximum performance and floats the working point of the compressors to prevent stress points.
- The machine room is equipped with environmental and level sensors, in order to warn of any dispersion of refrigerant into the environment, thus protecting staff.
- The production areas and operating rooms include fully and easily sanitized air treatment units made of monocoque fiberglass and are equipped with a “free-cooling” system with an automated washing phase unit.
- Storage rooms are equipped with new-generation evaporators that use the “SmartDefrostSystem.” Electronics and automation meet the customer’s requirements for specific settings for each environment and each type of product to be stored.

Fast return on investment

Technology and innovation are the focus of this cutting-edge project implemented by the Vicenza-based company.

As well as ensuring maximum productivity and quality, the chosen technical solutions also ensure lower plant management costs, including energy and maintenance. This results in a faster return on investment, with major benefits for the company’s bottom line.

Freddo & Co chose Danfoss, a world-leading supplier of refrigeration products and solutions, as its technological partner. Specifically, Danfoss supplied VLT® HVAC Drive FC 102 drives for compressor, pump and fan control and all refrigeration control components.

Compact & robust control of shock-freezing tunnels

The refrigeration system has a capacity of 2 MW and comprises a low-temperature direct-expansion plant for shock-freezing tunnels, equipped with four Bitzer screw compressors, each regulated by a 160 kW VLT® HVAC Drive FC 102 IP54 drive from Danfoss. The system is extremely compact and can be installed directly on-site or anywhere in the machine room. The drives require no additional protection, so the machine room electrical panels are more compact.

Freddo & Co has also installed drives on chiller systems for water: two 200 kW VLT® HVAC Drive FC 102 units, suitable for managing Bitzer screw compressors.

Other smaller drives have been used for controlling the speed of evaporative condenser fans, pumping units, and air-handling units in processing rooms.



160 KW VLT® HVAC Drive FC 102 IP54 drive



Freddo & Co.
Passione per il Tuo lavoro

*Direct expansion plant
with ventilated oil cooling*

Ensuring non-stop operation

Freddo & Co's plan for emergency operation is particularly interesting. If there is a fault on one compressor, the drive increases the frequency on the other compressor to 60 Hz, as opposed to the standard 50 Hz. This change increases cooling efficiency by 20%, for the compressor which is still running. In practice, with one compressor stopped, the system will still be able to supply 90% of the total cooling power, thus ensuring continuity of on-site service and production, with a considerable positive impact on running costs.

Adapting to external temperature

Freddo & Co has included an additional proprietary energy-saving function in this system, the NewCold®System, which exploits condenser fan control via the drive, to vary the condensation pressure set-points by adapting them to the external temperature. For example, during the lower-temperature seasons, this control method allows the compressors to run with lower condensing pressures, and thus with lower electrical absorption and higher cooling efficiency.

Remote monitoring

Freddo & Co has developed the Guardian system, which enables service operators to manage, monitor and program the different phases of system operation remotely. Danfoss drives can communicate in an advanced way with this system and use advanced algorithms to exchange essential data related to electric motors, alarms and parametrics. Moreover, if faults occur, Freddo & Co technicians can troubleshoot quickly or even resolve the problem remotely.

Based on state-of-the-art technology in industrial refrigeration digitalization, the system completely fulfils all Industry 4.0 requirements.

Danfoss Drives

The frequency converter, commonly referred to as a drive, is an electronic device used to modulate the speed of electric motors and is a fundamental component for engine-room compressor control and other uses. Danfoss drives are recognized as the most efficient in the market and contribute significantly to the reduction of power consumption, compared to traditional systems. They fully meet the customer's initial requirement that the system make use of the best available technologies.

Using variable speed control can reduce power consumption by 30-40% for compressors and by 50-70% for pumps and fans.

Danfoss drives are also equipped with innovative management and continuous motor-monitoring functions, which further reduce the management costs of the system.

Danfoss VLT® HVAC Drive FC 102 units can operate continuously with no derating, even at temperatures of up to 50 °C, which makes them particularly suitable for direct use in the engine room.

VLT® | VAGON®

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