

It's in the Can!

Drives with Safety Function Prove Themselves in Production of Canned Products

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Production stoppages can have serious consequences in the processing of fresh vegetables. The canned food processor Mamminger has therefore invested in new modern plant automation. For quick changing of the product lines to the fresh products to be processed, the company chose innovative SINAMICS G120 frequency converters which ensure the greatest possible protection at the same time as high productivity with integrated safety technology.



Approximately 300,000 jars of vegetables and 20,000 10 liter cans of sauerkraut leave the production halls of Mamminger Konserven GmbH & Co. KG near Deggendorf every day. High flexibility, a high throughput rate and maximum availability are demanded. Mamminger therefore invested in completely new processing and packing lines in 2008. CEO Franz Ammer relies on robust and proven technology "Made in Germany". The motors in the new conveyor systems on the filling and packing lines 1 to 5 are controlled by direct or soft starters as well as SINAMICS G120 frequency controllers. Since the workers in the halls often move up close to the transport equipment, almost all the converters were integrated into the safety concept.

Flexibility by fail safety

All but 15 of the 372 converters used in Mamminger are connected directly to the emergency stop devices in the halls. The emergency stop buttons are connected directly to the SINAMICS G120 converter via failsafe inputs so that additional safety relays are not needed. When an emergency stop button is pressed, the parameterized safety function in the converter is activated immediately. In most cases, the plant must be shut down quickly and safely monitored with the "Safe Stop" function. The safely limited speed (SLS) ensures that the plant does not shut down when restricted areas have to be entered for inspection purposes. By using the safety-oriented SINAMICS G120 the problem could be easily solved because the devices have a second failsafe input with which another safety function can be activated. For the said case, the frequency converters were set so that the drives are only moved with 10 Hz and the conveyors therefore move much slower when the door is opened.

Thanks to the interfaces for Profibus and Profinet the link to the controller is very simple. In this way, either a Profisafe-based safety concept can be implemented or, as in this case, by distributed installation of the safety technology with conventional parallel wiring and linking of the standard communication via Profibus. In addition to the convenient parameterization of the devices by bus technology, the system integrators also welcome the local parameterization by laptop and copying of the data on the device. With the "Starter" software, an experienced operator is able to parameterize a frequency converter in just two minutes. In the basic installation, only the motor data have to be entered. Then the entire unit comprising the motor and motor supply lines can be measured by the frequency converter itself and thus optimized to the special application. This proved to be extremely practical because, due to lack of time, the entire parameterization had to be carried out during local installation and could not be done in the plant construction.

Integrated energy feedback instead of braking resistor

Unlike conventional frequency converters, the new SINAMICS G120s have many innovative functions integrated into the device. The possibility of energy feedback was utilized in the new lifting stations in the filling and packing stations for example. Thanks to the modular structure, a unit can be assembled individually from a Power Module (PM) and a Control Unit (CU).

Whilst the Power Module PM 240 sufficed for the normal transport units, the PM 250 with integrated energy feedback was used in the lifting units. This eliminated the need for the otherwise necessary braking resistor which the braking energy would dissipate into the room as heat loss, meaning a considerable energy saving for the plant owner during the entire lifecycle.

Reliable converter technology ensures trouble-free production

The newly installed filling and packing plant at Mamminger very clearly demonstrates the advantages of modern technology. The production must run efficiently 20 hours a day to process fresh vegetables such as sauerkraut, red cabbage, runner beans, celery, gherkins, beetroot etc. as quickly as possible. "For this reason, we demanded the installation of an innovative, robust and future-safe filling automation from our machine supplier," the plant owner confirms.

This succeeded with the SINAMICS G120 frequency converter from Siemens. Despite the numerous integrated control possibilities and versatile safety functions, the plant control stays clear and simple because all 372 frequency-controlled drives could be equipped with a single device type.

Safety functions of the SINAMICS G120

- **Safe Torque Off (STO)**Ensures that no more torque can be emitted at the motor shaft.
- **Safe Stop (SS1)**Brakes a drive actively before the STO function is activated. Drives with high kinetic energy can shut down as quickly as possible in case of danger with this function.
- **Safe Stop 2 (SS2)**Actively brakes a drive like SS1. However, the SOS function is activated instead of STO at standstill. As in SS1, drives with high kinetic energy are brought to a standstill as fast as possible.
- **Safely Limited Speed (SLS)**Monitors the drive for exceeding of one or more specified maximum speeds.
- **Safe Brake Control (SBC)**Controls a stop brake safely after activation of STO so that the drive can no longer move (by gravity for example).

Energy-efficient automation solutions for packing lines

The demands made both by machine manufacturers and machine users from the packing industry on an innovative automation system are sustainability, shorter time-to-market, reduction in the engineering effort and continuous traceability of products in the packing process. At this year's Hanover Fair, Siemens will not only be presenting concepts and innovative solutions for automation systems but also demonstrating how the line integration of packing machines can be simplified.

By remote access to a demo plant, the visitors can find out about the homogeneous drive and automation concept of Optimized Packaging Line (OPL). The emphasis here is on energy-efficient packing machine architectures which transparently visualize the operating data such as energy requirement, production counters and fault times in a line overview. OPL supports the consistent automation of packing machines and lines. Various configuration support for safety, energy or usability can be enlisted. This reduces the time-to-market and at the same time reduces the costs for engineering and commissioning. Siemens will

also be showing how the energy data can be recorded, transmitted and visualized in modern production and packing machines. These data are then available for energy management as well as for optimization of the production and thus reduction of the CO2 consumption.

The solutions comply with the specifications of the OMAC (Open Modular Architecture Controls Users' Group) and the Weihenstephan standard and therefore simplify the line integration and the data exchange between the machines. The homogeneous communication and the link to MES solutions in connection with Simatic IT offer the possibility of reducing the costs for the machine lifecycle and increasing the cost effectiveness especially for the user of a packing machine. The link to MES solutions also meets the demands for product tracing and product management from the pharmaceuticals industry for example.



Mamminger used innovative components with high reliability in its new, modern filling and conveyor systems for vegetable preserves