

Energy efficiency module reduces compressed air consumption

Maximum pleasure, minimum consumption

Energy-saving measures are a cornerstone of the corporate philosophy of global firm Unilever. The company is now significantly reducing its compressed air consumption on a machine producing Magnum ice creams by using the new energy efficiency module MSE6-E2M.

Ice cream is refreshing and with its proteins and carbohydrates is considered a source of energy. However, it also takes a lot of energy to mix ingredients like milk, dairy chocolate, sugar and vanilla beans into the finished product. Electricity and compressed air play an important role in the thermal and kinetic processes for everything from mixing and extruding the ingredients, deep-freezing to -25°C, dipping into various chocolate coatings through to final packaging. Energy efficiency is therefore right at the top of Unilever's list of priorities. As part of the Unilever Sustainable Living Plan, this global corporation has succeeded in saving more than 150 million euros in energy costs from efficiency improvements in production alone since 2008.

In the area of pneumatics too, the use of innovative developments offers the potential to save energy and thereby lower costs. In the Unilever plant in Heppenheim, Germany the energy efficiency module MSE6-E2M has just recently been deployed to reduce the compressed air consumption of a plant manufacturing Magnum ice creams. Unilever and Festo worked together closely to get this prototype of the energy efficiency module ready for series production. This process also showed that it is not just in the field of energy consumption that less is more.

Sustainability along the entire line

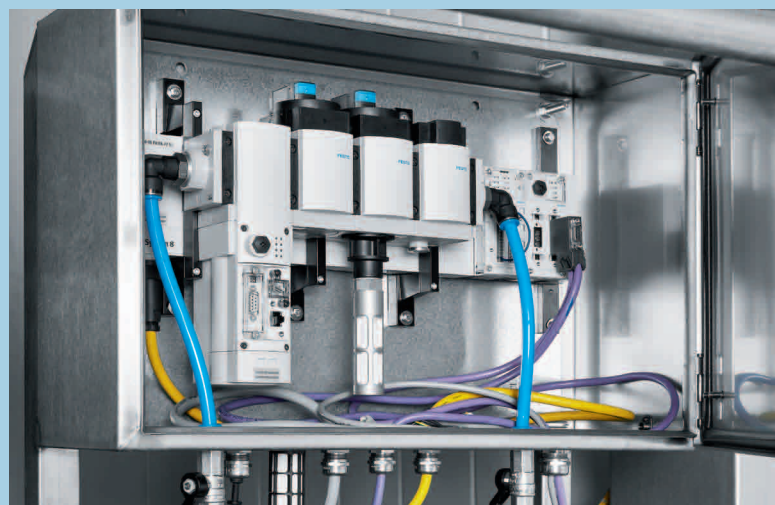
The Heppenheim factory is one of the main Unilever production locations for ice cream. These include products of the well-known Wall's line including Magnum, Feast, Viennetta and Carte d'Or. High production quantities form the basis for supplying other parts of the European market. Just one of the five Magnum production lines in Heppenheim produces more than 20,000 ice creams on a stick per hour. This requires a lot of energy. In order to reduce the compressed air consumption of the pneumatic components, the ability to visualise and measure the compressed air consumption was of huge importance to Unilever. Previously, the

consumption on the individual production lines had not been determined. "Until then we were just unaware," says Alexander Hemmerich, Automation Engineer at the Unilever Plant, Heppenheim. "Air is not visible, so it is not immediately obvious if consumption is too high." As part of the

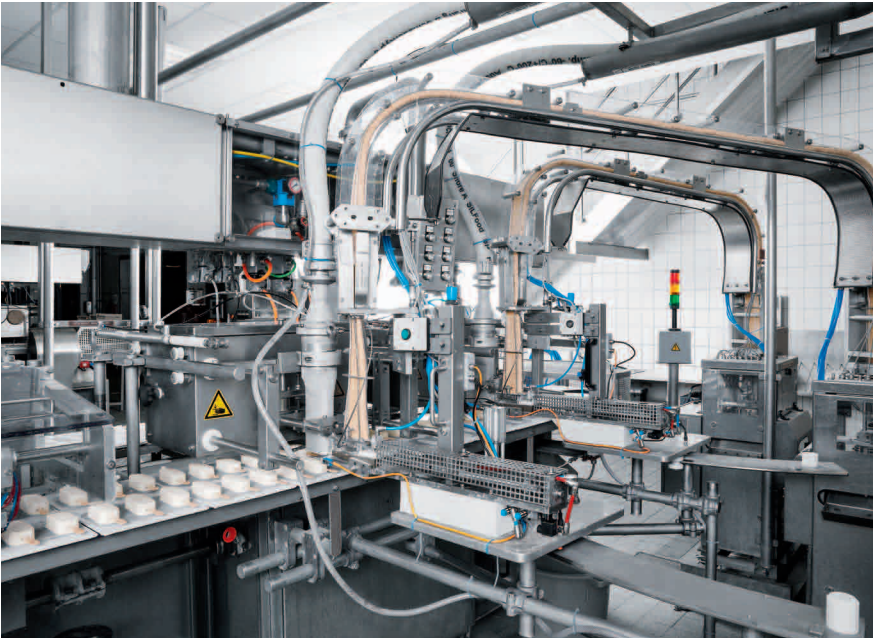
Unilever Sustainable Living Plan there had already been successes in other areas of the plant. Energy-intensive geared motors were replaced with more efficient ones, achieving energy savings of up to 60 per cent. Numerous 18 kW ventilators in the cooling tunnels, which previously ran →

Intelligent module optimises compressed air consumption

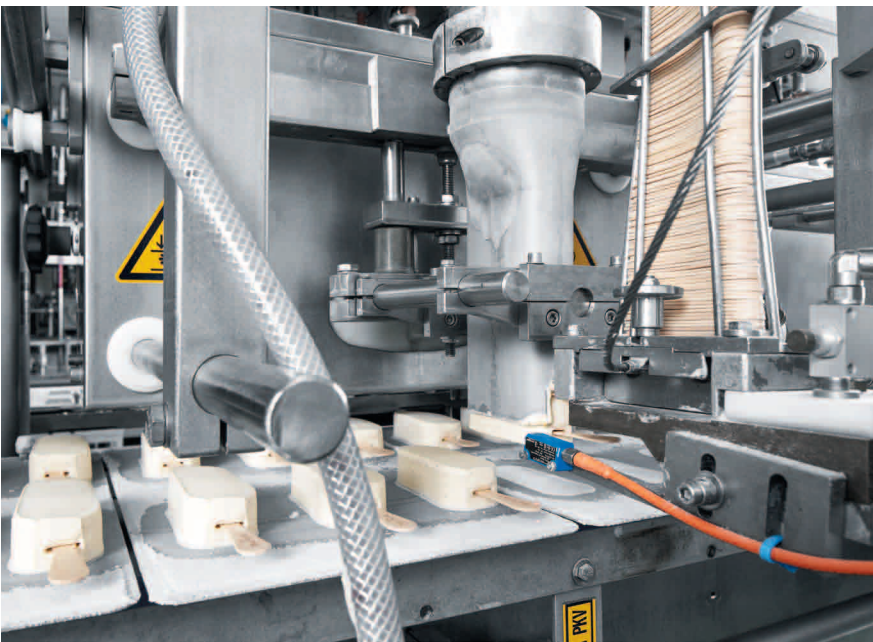
The energy efficiency module MSE6-E2M monitors and regulates the compressed air supply in new and existing systems – fully automatically. Similar to the start-stop system in a car, the intelligent MSE6-E2M detects a standby mode and automatically shuts off the supply of compressed air. Compressed air consumption is thus reduced to zero during system downtimes and breaks. In addition, the MSE6-E2M makes it possible to measure leaks as it reports back if the pressure drops too quickly during downtimes. Moreover, it continuously delivers process-relevant data such as flow, pressure and consumption, which it sends to the machine controller via Profibus.



Result of successful cooperation: the first generation of the energy efficiency module MSE6-E2M is currently in continuous operation at Unilever. The market-ready module is around 50 per cent more compact.



High-tech for maximum pleasure: the Heppenheim factory is one of the main Unilever production locations for ice cream.



Perfectly portioned: the extruder outputs one Magnum core per second. The stick is inserted in the ice cream during extrusion.

for 24 hours in continuous operation, were also converted to frequency converters with variable torque loads. This lowered the energy consumption of the ventilators by around 40 per cent.

Energy consumption made visible

Hemmerich and his team took the decisive step towards lowering compressed air consumption with the introduction of the energy efficiency module MSE6-E2M from Festo. “The energy efficiency module gave us the opportunity to see the amount of compressed air we were using during operation of a line,” explains Hemmerich. “In addition, we were able to determine how the compressed air requirement developed when we switched off individual consumers. We were thus able to locate leaks and eliminate unnecessary consumption.” One of the core functions of the MSE6-E2M is the automatic shut-off of the compressed air in stand-by mode, which made it possible to establish how quickly the system empties. The energy efficiency module MSE6-E2M immediately reports an unusually quick drop in pressure to the system controller.

At the same time, the automatic pressure shut-off function prevents further compressed air consumption while the system is not in operation. Thanks to its onboard intelligence and the specific model for operating the compressed air systems, the MSE6-E2M independently identifies when a system is in production and when it is at standstill. At Unilever, however, they decided to use the alternative option to operate the MSE6-E2M via the system controller so that all information is merged centrally.

Significantly reduced energy consumption

Thanks to the new condition monitoring for the pneumatic components of his Magnum machine, Alexander Hemmerich now has continuous process-relevant data. The MSE6-E2M regularly exchanges important measurement parameters, such as



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Alexander Hemmerich, Automation Engineer, Unilever plant, Heppenheim, Germany

flow, pressure and consumption, with the machine controls via Profibus. It is easy to operate via the control panel. “We’ve been able to reduce compressed air consumption on the Magnum production system step by step with the energy efficiency module from Festo. And the Profibus connection had the advantage that we did not have to add any more cables when converting our existing systems.” On the Magnum line, the costs for compressed air consumption were reduced by more than 500 euros per year.

Concentrating on the essentials

The Magnum line at Unilever provided an ideal environment to field test the MSE6-E2M prototype. The pilot use in the Heppenheim plant and the close cooperation with Festo developers showed what daily operation would be like. While the first version of the energy efficiency module still had I/O slots, the final MSE6-E2M uses a Profibus interface. The exhaust valve of the first product generation was also dropped. It was more important to keep the energy efficiency module compact, especially given the limited installation space of existing systems. Thus the MSE6-E2M was designed on the basis of a combination of pressure and flow sensor, shut-off valve and fieldbus node.

As a complete series product it is now only about half the size of the prototype and thus optimally tailored to the requirements of machine operators and builders.

It makes energy monitoring simple and effective, and supports companies such as Unilever on their path to effectively increase their sustainability. ■

www.festo.com/catalog/mse6

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Area of business:
Production of Wall’s ice cream



On the belt: one of the five Magnum lines produces more than 20,000 units per hour.