

Drive & Control profile

Milk at its finest



AMC uses the CL03 valve terminal system in all its packing lines and thus eliminates large control cabinets and long actuator cables.

New packing lines stack milk cartons twenty percent faster.

Milk straight from the cow and into the glass? That might be possible, but only on the farm. Consumers in towns nonetheless want their milk just that fresh. This requires quick filling and packing. The Norwegian automation specialists at Advanced Machine Company AS (AMC) have developed packing lines that can stack almost thirty different versions of filled milk cartons in containers. This small company, located in Vestfossen, has earned a reputation as a major systems

supplier to the Norwegian dairy cooperative. Amassed expertise, innovative technology and a keen sense for the tasks, potentials and problems of dairy operations have made this success possible.

“The rising capacities of modern filling machines require faster handling of the cartons once they’ve been filled. This is particularly true for milk—a completely natural product,” is how Harald Hals, CEO at AMC explains the prevailing needs. “This

Challenge:

Develop quick filling and packing lines to keep up with the demand for the freshest milk in dairy plants

Bosch Rexroth Solution:

- CL03 Clean Line IP69K pneumatic valve terminal systems with integrated DeviceNet bus protocol
- GPC series rugged twin-action guide cylinders
- ISO Clean Line series corrosion-resistant pneumatic cylinders
- MSK servo motors, IndraDrive C servo amplifiers with integrated controller
- Ball screws and Ball Rails®

Benefits:

- Increase line speeds by 20 percent with capacity of 7,000 cartons per hour
- Saved seven hours per day in production time with the same output
- Clean Line valves withstand stringent cleaning with boiling hot water
- Decentralized valve terminal system eliminates long feed lines, pressure losses, expensive control cabinets
- Remote system monitoring for better maintenance

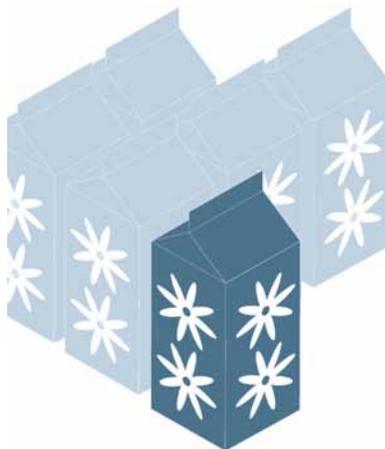
means we have to be very flexible and reliable in our work. We expect exactly the same from our suppliers as we search for solutions and the shortest possible delivery times for high-quality components.”

That is one of the main reasons why AMC turned to Rexroth. What’s more, that one supplier can deliver pneumatic, servo and linear drive technologies from a single source. Another ingredient in the AMC success formula is developing partnerships in the region. Frame construction and welding work are done by nearby companies. That lets AMC concentrate on its core functions: design, engineering, building electrical controls and assembling automated handling and packing equipment for cartons and trays.

Seven hours less work

The most recent success story at AMC stars new packing lines for a dairy plant. It places milk cartons into the individual rates situated in roll-in containers. Those cartons are then ready for dispatch to shops, companies and schools. Compared with previous systems, which could fill and pack no more than six thousand cartons per hour, the new lines have capacities for seven thousand cartons with fifteen hundred more in reserve.

This rise results in part from an increase in the speed of the lines by more than twenty percent, as Hals emphasized. “These new filling and packing lines let this dairy plant achieve enormous savings in production time—about seven hours daily with just the same



New packing lines increase line speed by 20 percent and save seven hours a day in production.

output. That’s a factor worth its weight in gold when producing five days a week.” The potential is enormous if you consider just the quantity of milk processed by the Norwegian dairy cooperative each year: 1.8 billion liters of cow’s milk and 20 million liters of goat’s milk.

A view from afar

Built into these packing lines is a whole series of components that Rexroth developed especially for use in the food processing industry. These include pneumatic valve terminal systems with integrated DeviceNet bus protocols, rugged twin-action guide cylinders from the GPC series, corrosion-resistant pneumatic cylinders from the ISO Clean Line series, and maintenance units to prepare compressed air for use.

The configuration selected to drive the AMC lines includes an intelligent combination of ball-screw drives and ball-mounted rail guides with MSK servo motors

featuring quick acceleration characteristics. These are augmented with IndraDrive C servo amplifiers. The modular concept offers a further advantage. The servo amplifier with its integrated controller can be linked directly to the dairy plant’s DeviceNet—and in this way can also be accessed from a remote point.

Clean and lightweight: the Clean Line concept

A further Rexroth development intended for use in sensitive settings like the food industry was particularly appealing for Harald Hals: the Clean Line concept. “Although our machinery makes no direct contact with milk, it does have to comply with stringent requirements. That means withstanding countless cleaning cycles.” That is why consistent use of stainless steel and components meeting hygienic requirements is important. Even cleaning with a jet of steam at 100 degrees Celsius will not phase the equipment.

The Clean Line concept joins uncomplicated care, simple cleaning and ease of maintenance with mature technology. Thus, for instance, the compact, modular CL03 valve terminal system, with an IP69K protection rating, cuts costs.

“A decentralized valve operating system eliminates long feed lines with their typical pressure losses; neither do we have to install any expensive control cabinets,” is how Hals describes the advantages. “All that, of course, speeds assembly of the packing lines on site and makes maintenance faster, easier and thus



Pneumatic, servo and linear drive technologies from a single source. Tore Enes, sales engineer at Rexroth in Norway, and AMC chief executive officer are glad of the excellent collaboration.

more economical.” AMC uses two such valve terminal systems for each packing line, populates them with sixteen valves each and connects their integrated bus with the DeviceNet protocol directly to the dairy plant’s bus system.

The solenoid valves in the valve terminal system are used to control the built-in GPC and ICL cylinders. The rugged PPC stainless steel guide unit is distinguished in particular by its precision and its resistance to transverse and torsional forces. Cleaning and

maintaining the cylinders are made simple, too, thanks to a practical sensor attachment concept and the Clean Line design, aligned specifically with hygiene needs. Even when the situation gets “weighty,” these same advantages simplify dealing with the milk. The lift that raises the milk cartons and trays—and they weigh about two hundred kilograms—is made almost exclusively from Rexroth components. That is why Hals refers to it as the “Rexroth lift.”

Every day Harald Hals comes to appreciate anew the ease with which operators can use his systems. In his office on the shores of Lake Eiker he is already planning future projects. As though just in passing he calls up, via the Internet, a user’s control panel in his own display. In just an instant he can determine whether recently installed packing lines—five hundred kilometers away—are working properly.

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