

Drive & Control profile

Vertical Case Packer Picks Up the Pace with Innovative Mechatronic Drive Solution



Stand-up bags are ideal for packaging solid, liquid, or powdered products and are suitable for a wide range of applications. Bosch Packaging has developed a case-packer using innovative Rexroth machine automation technology to pack the individual stand-up bags into cases.

Instead of expensive robotics, Bosch Packaging specified a machine automation solution from Rexroth for its compact, high capacity case packer. Driven by standard pneumatic, electronic and linear components working in tandem, the machine now packs 120 bags per minute, and its highly adaptable design is poised for future system expansions.

Supply the bags, separate them, gather them, let them drop—and they continue on their way in the carton. It all appears so easy for the new CCV 6400BA case packer; however, in reality it is a blend of

ingenious ideas and sophisticated modern technology based on standard components. With the CCV 6400BA, Bosch Packaging offers an automated process for packaging block bottom bags,

Challenge:

Create an innovative drive solution from standard components for high-precision vertical case packer

Bosch Rexroth Solution:

- Pneumatic compact cylinders
- Linear modules
- IndraMotion for Packaging control platform.

Benefits:

- The case packer achieves a rate of 120 bags packed per minute
- High precision yet flexible handling of various packages within a very small area
- Case packer is poised for quick adaptation and simple integration in its environment thanks to specially installed pneumatic components with standardized connecting dimensions



The bags are first separated, then collected and inserted in the cassette. Linear modules operate the insertion and support plates, which bring the bags exactly into position.

boxes and similar packages into cartons. The so-called Case Packer Compact Vertical (CCV) is suitable for various product dimensions ranging from 70 x 50 x 100 (2.75" x 2" x 4") up to 400 x 180 x 450 millimeters (15.75" x 7" x 17.5") and weights of up to 25 kilograms (55 lb.). With an output of up to 15 cartons per minute, the case packer appeals to all companies where secondary packaging is still done manually.

“We can pack everything with it that can be dropped and remain vertical,” explains Eugène Vissers, chief design engineer at Robert Bosch Verpakkingsmachines B.V., located in Weert in the Netherlands. The patented method of operation is impressive with its high precision yet flexible handling of various packages within a very small area. The main attraction: instead of the expensive robots usually used for automated

positioning in secondary packaging, the CCV simply uses gravity. The floor is literally pulled out from under the prepackaged bags so that they drop precisely into a carton.

First, the individual packages are transported by a conveyor belt into the machine and separated. “The user determines how many bags should be placed in one carton and the bags obviously have to



The CCV 6400BA case packer from Bosch Packaging.

be counted for this,” says Vissers. The clamp required for holding the bags is activated by a Rexroth compact cylinder. According to the carton size and the number of rows in the carton, the corresponding number of bags is inserted into a cassette and additionally supported by a plate.

A [KPZ series](#) pneumatic compact cylinder is one of the system details. Design engineers appreciate its advantages, such as standardized external and connecting dimensions, as well as its small installation requirements. Slightly larger products can be lightly compressed by adjusting the cassette side walls with this compact cylinder. The device underneath the bottom flap is actuated by four additional pneumatic cylinders, thus opening the carton flaps.

Exact positioning required

“Feeding and handling of the bags within the packaging machine must function with absolute precision,” emphasizes Vissers. “Only exact positioning and correct support of the bags on the bottom flap can guarantee that the packages drop exactly into the carton below when the bottom flap is removed.” Therefore, two [MKR series linear modules](#) from Rexroth take over this function. The compact dimensions of the precise, ready-to-install guide systems are well suited for the small installation space in the CCV. The modules consist of an aluminum profile with an integrated ball rail guide and are driven by toothed belts.

Bosch Packaging combines mechanical MKR modules with [IndraMotion for Packaging](#), a complete automated solution for packaging machines from Rexroth. Intelligent, highly dynamic IndraDrive servo drives can achieve accelerations of up to 45 m/s². The IndraControl L platform's controller ensures high flexibility: The controller's storage capacity permits up to 100 programs for various packages. According to Vissers, "Users expect highly flexible machines. We designed the CCV case packer with this customer preference in mind."

Valve terminal system fulfills additional customer demands

The second integral part of the machine is the carton supply beneath the cassette. Cartons are individually delivered on a conveyor belt, then separated, and exactly positioned for filling. "We also use Rexroth's compact cylinders for this, because they require so little space. At the same time, they offer a sufficient pressure of 5 bar (73 psi) for positioning and clamping the cartons," explains Vissers.

A valve terminal system equipped with [HF03-LG series valves](#) provides the necessary pressure in the pneumatic system. The "light generation" version allows for a high-capacity flow rate of 700 liters (185 gallons) per minute despite its low weight and dimensions. A Rexroth [AS2 maintenance unit](#), which combines the individual processes of compressed air preparation, dehydration, filtration and regulation with one safety

valve, guarantees that the installed valves are supplied with clean compressed air.

According to Vissers, "The CCV will later be surrounded by other

machines, by at least a bag packer and carton feeder. In order to enable quick and simple integration of the case packer in its environment, we specially installed four additional pneumatic valves



Linear modules from Rexroth's MKR series move the insertion and support plates for filling the cassette. The compact modules are combined with MSK servo drives in the CCV, making it possible for both plates to accelerate by up to 45 m/s².



IndraDrive C compact drives enable high positioning accuracy and control.



At the end of the system with innovative feed and drop technology, the filled cartons leave the case packer.



Pneumatic functions are controlled by an HF03-LG series valve unit, while the AS2 maintenance unit ensures clean compressed air.

for further options. That is not a problem with these small valves. This means that the user can directly connect other functions, such as lifting the cartons, for example, or expand the system with additional options.” The machine’s entire focus is adaptability: users can freely select the supply side for the bags as well as for the cartons.

Along with flexibility, reliability and speed are the case packer’s primary characteristics. “Tried

and true, high-quality components support this claim and are therefore important,” affirms Vissers. He adds that Bosch Packaging can thus achieve two goals at the same time: the implementation of this simple work principle and the CCV’s high capacity, which can feed, collect and pack up to 120 packages per minute into cartons.

Rexroth
Bosch Group