

Martini Packaging

Dedicated to pasta: A flowpack reduces waste



Pastry revolution

The new flowpack Martini for packaging long format pastas takes advantage of a unified control for packaging and dosing operations through PLC-based Omron architecture, Trajexia motion controllers and brushless motors

In recent years, the pasta packaging market has been updated by leaps and bounds, especially through investments in electromechanical components. In this context, long pasta packaging stands out because it requires an elaborate engineering process, due primarily to the complexity of dosing different pasta formats. Martini Packaging (which since 1973 has made machinery for weighing and packaging) wished to face this challenge with the support of Omron, a key partner in the creation of a new flowpack system (M08LV), which represents the top of the sector in terms of operational speed and dosing precision.



A single control for packaging and dosing

One of the advantages of the Martini flowpack lies in its capacity for aggregate management of both packaging and dosing. The control system consists in multiple modules attached to DIN guide and coupled by the PLC bus. The key components are Omron's PLC CJ1, which governs I/Os; the CJ1WMCH72 motion controller for managing the packaging machine's brushless axes (based on servo drives); the CJ1W-NCF71 for managing the doser's brushless axes (based on rotary servo motors); the CJ1W-TC temperature controller boards and the CJ1W-SCU31 communication boards for interfacing with the weighing system via RS485. The PLC CJ1 is connected via serial to an NS8 operator panel.

Francesco Gusson, Chief Engineer of Martini's Motion Control Division, explains: «The architecture proposed by Omron enabled us to arrive at single control system for distinct management of the logic, the motion developed for packaging (managed with interpolating brushless axes) and a second kinematic chain made up of small brushless motors for the dosing phase. In addition, the control of the weighing system, managed via serial network, and that of the sealing pincer temperature control system». This last aspect, the manager highlights, is essential to the quality of pasta packaging: «The greater the thermal stability of the pincers (which operate between 130 and 70 °C, depending on the type of film used) the better the seal quality, especially and above all at high speeds».



Reliable coupling thanks to trajexia

The use of Trajexia technology on a Mechatrolink network proved decisive in bestowing the continuous packaging process with the level of reliability required during the planning phase. The performance of the MCH72 board, which is actually a Trajexia motion controller integrated to the PLC bus, together with the use of servo drives, has enabled creating a

high performing and reliable system. «It is clear that this system represents a leap forward - emphasizes Gusson – especially in terms of hardware. The axis control boards, the drives and the brushless motors have proven very reliable in the field, and this is for us an indispensable condition, since we have to deal with many environmentally critical sites, both in terms of temperature (up to 50°C) and of energy distribution quality». In addition to activating an integrated packaging/dosing management system, and thus greater speed, the Omron architecture has also enabled a reduction in size of the doser itself. Also in this case, the contrast with the past is stark: compared to the pneumatic dosage system managed by special electronics, the current system – which can be controlled in all aspects by the PLC – proves more than 50% smaller. Moreover, as stated above, the possibility of configuring all parameters on a single machine control panel carries an immediate benefit in terms of practicality and ease of use.

Management made simpler, even by remote

As far as installation monitoring goes, Martini selected a management system which focuses on limiting the number of tasks left to the operator, especially for changeover. The objective is that of providing the end customer with a solution capable of working with a wide spectrum of pasta formats and weights (from 200 g to 1.5 kg), minimizing the need to reconfigure the machine's parameters. Then the possibilities for intervention were developed on three access levels in order to guarantee the installation's absolute safety: a base level reserved for the operator (from which it is possible to command formulas selection, startup and machine stops), an intermediate level, with data that can be managed by the installation supervisor (for example formulas setup) and an engineer level with critical parameters not accessible to the customer. Having to deal with a rather broad geographic distribution (80% of the machines are sold abroad, particularly in emerging markets), Martini decided to also integrate with the machine a series of remote control functions in order to further safeguard its offer. In this sense, going online enables the Veneto native company's technicians to connect with the machines to provide remote assistance, but also to carry out control and maintenance operations: sending software updates, managing machine errors, replicating the operator panel from a distance and downloading production statistics to the central server. The rest is entrusted to Omron distribution, whose global network enables any end user to easily acquire individual replacement parts.

Packaging spaghetti?

Yes, but with precision and repeatability M08LV is the flowpack solution by Martini Packaging capable of automatically carrying out the entire packaging cycle for pasta. The machine receives the pasta from the production line and turns out the packaged units ready to be placed in boxes. The machine was developed to support pasta factories and production sites that have to process a wide spectrum of long format pastas at high speeds (up to 130 bpm). In order to manage this, Martini engineers focused their attention largely on the dosing system,

a key element to guaranteeing a repeatable process with little waste. Michela Martini, the company's Chief Sales Technical Officer, speaks from experience: «Precision dosing is that which guarantees the efficiency of a production site; in facilities that work at speeds of 4 t of product/h circa per production line, each wasted quantity deeply affects total costs. That's why the challenge for a manufacturer such as Martini lies mainly in creating precise and repeatable dosing systems, a task which becomes more daunting the higher the number of pastaformats to be managed». In this spirit, the Veneto-based concern decided to create a new flowpack with integrated control also for dosing. In the new machine, all pneumatic motions of the old doser have been revisited so as to be controlled by small brushless motors.

What results is a new doser that optimizes the flow of pasta and, by guaranteeing a homogenous pasta density, enables excellent precision in dosing by volume. Specifically, the dosing process is done in 2 consecutive phases: first, the dose is roughed out by volume by weighing on a load cell; then a final correction (also by volume) is done, with a margin of error of a few grams. The last correction is the heart of the application, because it is performed by sectioning a volume of product laid out on a very narrow channel; in this way, it is possible to guarantee the ratio between the weight and volume of the product sectioned and shorten the time of the finishing operation, which does not require a second weighing by load cell. What results is a standard 500 gram spaghetti package with no more than one gram error.

