

# Flow wrapper

## Machine Case Study



### VERTICAL FORM, FILL & SEAL, INTERMITTENT OPERATION

- Dedicated interrupt feeding control
- Standard PLC-Based solution
- Easy axis positioning control

# Vertical flow wrapper

## Machine description

Bags are supplied from a roll in the form of a continuous web, are formed into a tube by a mandrel, sealed longitudinally and transversely, then cut in precise registration with a printed graphic. The feeding operation is intermittent and the feed length corresponds to the bag length.

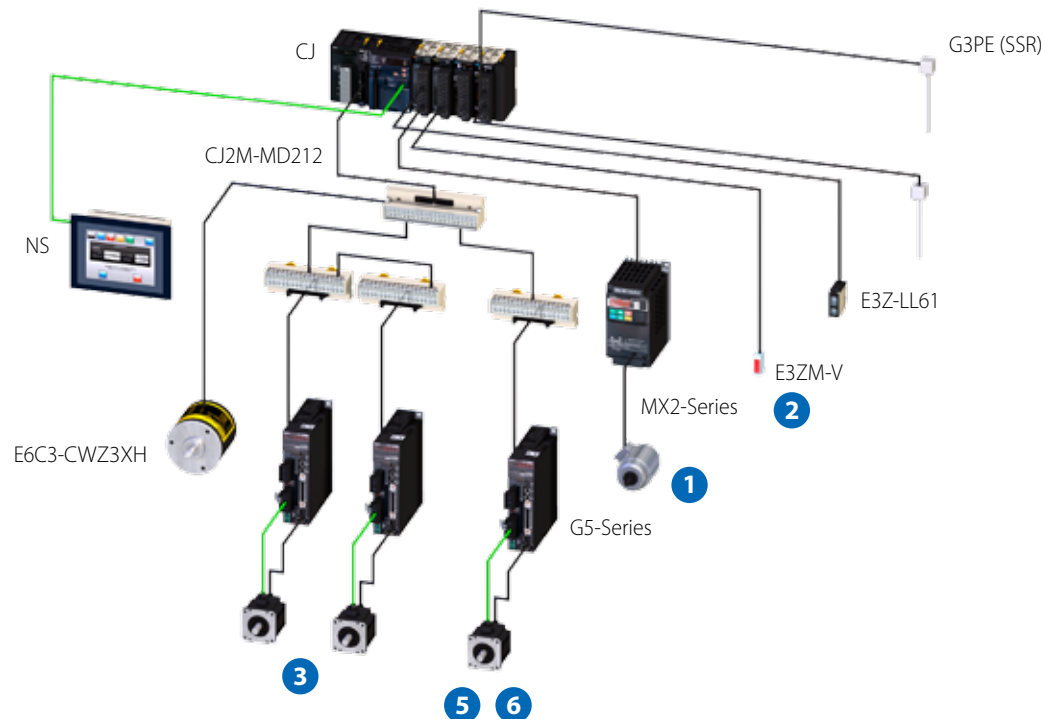
## Machine Function

- 1 Feeder**  
A bag foil is fed via a loop control to the filling station. The foil tension control is achieved with a dancing arm system and an inverter.
- 2 Register**  
Because the foil feed is subject to slippage, the exact position of the foil is constantly updated using a register mark encoder.
- 3 Driver**  
Two vacuum side-belts which are controlled by 2 servo-motors pull the film through the forming area.
- 4 Former & Side-Sealer**  
A forming collar is used to shape the film into a bag, and the length is sealed by the longitudinal sealing unit
- 5 Bottom-Sealer & Filler**  
While the bag is sealed at the bottom, feeding station start to drop fill material into the bag.
- 6 Top-Sealer**  
Once the bag has moved downward by one length, traverse sealing unit close the bag and a cutter separates the packaged product from the bag foil



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### Simple PLC-Based motion control

This solution is the perfect fit for vertical flow wrappers with intermittent servo-driven sealing jaw. Since axis synchronisation is not required, the machine sequences [Unwind, Mark Register, Form, Fill & Seal] can be programmed into the CJ2-Series PLC thanks to the advanced function blocks of the CX-One library (PLC/HMI/Drive programming environment).

### Easy positioning control with Pulse Train Output (PTO)

This configuration uses only one CJ2-Series Pulse Output unit (CJ2M-MD212) with two pulse train outputs to command three servo-drives. The first output is used to command the unique servo-drive of the sealing system. The second output is used to command, through junction blocks, two G5-Series servo-drives which control the foil vacuum pull-belt.

### Cost-effective daisy chain wiring method with PTO signal inversion

The use of junction blocks allows to reverse the PTO signal from one servo-drive compare to the other. This wiring method makes turn one servo-motor clock-wise while the other turn counter clock wise in a perfect synchronisation. This configuration enables the two servo-drives to run in synchronisation without the need for advanced motion controller.

### Dedicated interrupt feeding control

The foil/bag positioning before sealing is achieved with a simple interrupt feeding function block which processes the registration mark detection (E3ZM-V or E3U-GL) via an interrupt input which is used as a trigger during speed control to switch to position control and then move a specified amount, equivalent to one bag length, before decelerating to a stop. This architecture keeps the solution cost-effective, pneumatic-system free and really reliable in regard of the required performance.

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OMRON EUROPE B.V.

 +31 (0) 23 568 13 00

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Tel: +43 (0) 2236 377 800  
[industrial.omron.at](http://industrial.omron.at)

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Tel: +32 (0) 2 466 24 80  
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Tel: +420 234 602 602  
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Tel: +33 (0) 1 56 63 70 00  
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Tel: +49 (0) 2173 680 00  
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Tel: +39 02 326 81  
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#### **Netherlands**

Tel: +31 (0) 23 568 11 00  
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Tel: +47 (0) 22 65 75 00  
[industrial.omron.no](http://industrial.omron.no)

#### **Poland**

Tel: +48 22 458 66 66  
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Tel: +351 21 942 94 00  
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Tel: +27 (0)11 579 2600  
[industrial.omron.co.za](http://industrial.omron.co.za)

#### **Spain**

Tel: +34 902 100 221  
[industrial.omron.es](http://industrial.omron.es)

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Tel: +46 (0) 8 632 35 00  
[industrial.omron.se](http://industrial.omron.se)

#### **Switzerland**

Tel: +41 (0) 41 748 13 13  
[industrial.omron.ch](http://industrial.omron.ch)

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Tel: +90 212 467 30 00  
[industrial.omron.com.tr](http://industrial.omron.com.tr)

#### **United Kingdom**

Tel: +44 (0) 1908 258 258  
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