



Focused Automation/Core Technology Solutions

Jam Detection in Packaging Machines

ZX



Industry:

Food and Beverage



Applications:

Detecting improper seals from product obstruction in Form, Fill & Seal machines



Problem:

Product mis-feeds in vertical or horizontal form, fill and seal machines often result in the product being pinched between the sealing jaws at the seams of the package or pouch. If not detected quickly, this condition, known as a "jam", usually results in significant loss of product and packaging because the condition that caused it continues to create jams until it is corrected. To prevent product loss, machine downtime and lost profits, jams must be detected immediately and operators and maintenance crews notified.



Omron "FACTS" Advantage

ZX-EDA11 sensor amplifier

ZX-EM07MT inductive sensor head

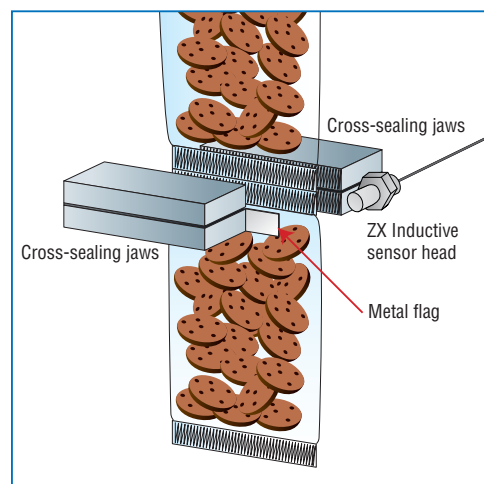
With its 1-micron accuracy, high-speed response, easy setup and built-in control outputs, the ZX sensor is ideally suited for jam detection. The sensor's high-speed response rate allows it to perform up to 5,000 inspections per minute – keeps pace with even the fastest packaging applications without slowing production. Reacts quickly when a jam is detected to stop machines or alert operators before products and profits are lost.

Built-in control outputs for High/Low/Pass and unique "self-triggering" function allow the sensor to work independently, without the "trigger" sensor to simplify wiring and control system complexity.

Optional set up and monitoring software simplifies set up and allows real-time monitoring of sensor operation.



Application Diagrams



Measuring distance between sealer jaws to detect sealing errors.

FACTS **Focused Automation/Core Technology Solutions**

Jam Detection in Packaging Machines Application Details

Issue

The ultra-competitive nature of the food industry has driven producers to scrutinize virtually every aspect of the production and packaging process. Improving process quality will eliminate waste, defects and production bottlenecks that lead to improved profits and customer loyalty. Producers who use form, fill & seal (FFS) machines have identified product jams as a particular point of pain because if these events are not detected early and dealt with quickly, a lot of wasted product and packaging will accumulate quickly. To prevent jam-related defects, producers must implement monitoring systems that quickly and accurately detect jams without generating false alarms or slow down production.

Cause

Form, fill & seal packaging jams are typically caused from overfilling from upstream measuring or product flow problems. Some products may also create a piston effect (in vertical FFS machines) when dropped down inside a bag-forming tube, by pushing air down into the sealed end of the packaging material, and preventing the product from freely dropping into the correct position before the jaws close.

Omron's Unique Solution

Omron's ZX sensors are capable of detecting the precise position of the sealing jaws during a normal sealing operation with micron-level accuracy. If the jaws are prevented from coming to the correct position due to an obstruction – such as a piece of product, extra packaging material or any other foreign materials – the sensor can detect it immediately.

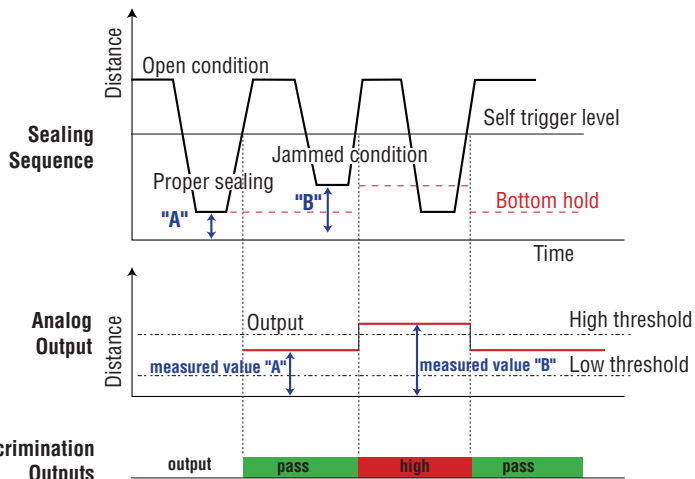
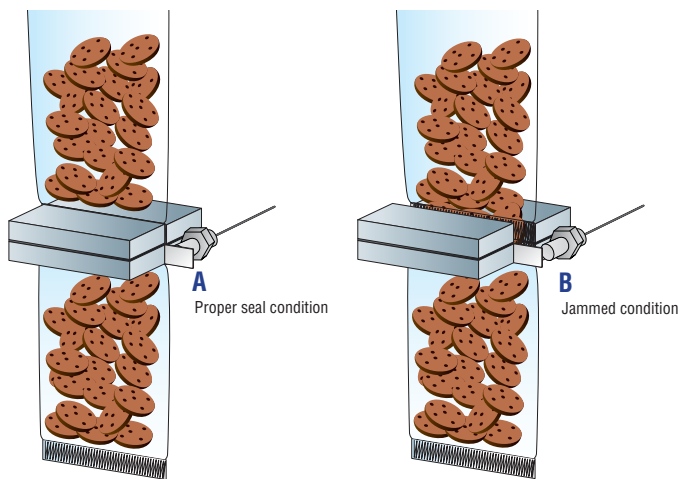
The built-in control outputs from the sensor can be used to directly shut down the machine and/or alert operators without the need for an additional controller. This shortens response time and simplifies overall system complexity.

The ZX sensor's advanced functions include a "Bottom Hold" function that effectively serves as a self-trigger mechanism and eliminates the need for a separate "trigger" sensor.

The sensor's available setup and monitoring software simplifies setup and allows the user to graphically display real-time control outputs and inspection results.

Results

Packagers can improve profits, reduce waste and increase machine uptime and throughput by more quickly identifying and correcting packaging defects. 100% non-contact inspection using Omron's ZX sensors ensures immediate, reliable and repeatable detection of jams and does it without compromising machine speeds.



"A" – Measured value output of proper seal condition
"B" – Measured value output of jammed condition

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