

## Application Brief: E3ZM Sensors

# Meat/Poultry/Fish Processing

### APPLICATION

Providing sensing capability in food processing equipment subject to frequent washdowns with high-pressure, high-temperature water and harsh detergents.

### PROBLEM

Accurate sensing and switching is critical in food processing equipment. Frequent washdowns involving high-pressure, high-temperature water and aggressive detergents cause deformation and damage to conventional sensor cases, allowing corrosion and infiltration of liquids causing early failure of sensor components. Replacing failing sensors on a weekly basis is costly and involves frequent line shutdowns that significantly affect productivity and profitability.

### OMRON ADVANTAGE

**E3ZM Photoelectric Sensor in a Stainless Steel Housing**  
Omron has combined the sensing power of its E3Z photoelectric sensor, known for its quality performance, with a compact stainless steel 316L housing that withstands the harsh attack of frequent washdowns. The result is a working sensor life shown to be 200 times longer than that of sensors in conventional plastic or die cast housings. Stainless steel provides corrosion resistance and hygienic properties that make the E3ZM ideal for food processing applications.



Conventional sensors fail frequently and prematurely due to caustic washdown chemicals and disinfectants.



Omron's E3ZM sensor in corrosion resistant 316L stainless steel housing offers the superior sensing features of the E3Z Series:

- Long sensing distances
- Fully encapsulated construction
- Resistance to electrical noise from inverters and other inductive loads
- Through-beam, retroreflective, diffuse, background suppression models available

## E3ZM Photoelectric Sensor in a Stainless Steel Housing

### ISSUE

Continuous operation of food processing equipment is essential to controlling operational costs and optimizing productivity, and durable and reliable sensors are critical to ensuring that productivity. In an environment requiring frequent washdowns with high-pressure/high-temperature water and harsh detergents to eliminate cross contamination, sensors in conventional housings fail prematurely. Maintaining and replacing these sensors, often on a weekly basis, results in increased maintenance costs and severely compromised productivity. Further, the design of conventional sensor housings can promote bacterial growth and cross contamination.

### CAUSE

Plastic sensor housings and optical lenses often deform or crack after only a week of service in harsh washdown environments. Once housing integrity is compromised, chemicals and water can infiltrate the sensor to cause electrical failure. Chemicals may also wick along cables to dissolve seals and enter the sensor itself, also causing failure.

Conventional sensor housings often include indentations and/or seams, which can serve as refuge for bacteria even after washdown. Paper or plastic identification labels can deteriorate and become further source for contamination.

### OMRON'S UNIQUE SOLUTION

The Omron E3ZM houses the proven E3Z photoelectric sensor in a high-grade SUS316L stainless steel housing resistant to corrosion and attacks from aggressive cleaning chemicals. Molded in a unique process, the housing minimizes seams and surface indentations for easy cleaning.

Other construction features include:

- PVC-protected cabling is secured into the housing to prevent wicking and chemical infiltration
- Connector models for faster servicing
- Optical lenses are molded of detergent-resistant PMMA (polymethylmethacrylate) to prevent chemical deterioration
- Through-beam, retroreflective, diffuse, and background suppression diffuse versions available
- Housings are laser marked, eliminating add-on labels that deteriorate and promote contamination

### RESULTS

These unique features give the E3ZM sensor a working life of 200 times that of conventional sensors in plastic or die cast alloy housings, while contributing to a cleaner processing environment. Cost savings, both in maintenance labor and sensor replacement, will be significant, and will be overshadowed only by the resulting gains in productivity and profitability.



#### 200 Times Longer Working Life

The E3ZM stainless steel housing is resistant to harsh alkaline and acidic cleaning chemicals and rigorous, high-pressure cleaning methods resulting in a working sensor life more than 200 times that of sensors in conventional housings.

#### Superior Washdown Resistance

The E3ZM housing is hermetically sealed against high-temperature, high-pressure jet water washdown environments, including those rated at IP69K (DIN40050-9: 1,100 to 1,450 psi at 80°C for 14-16 minutes).

#### Smoother Shape for Easier Hygiene

The E3ZM molded housing includes few seams or surface indentations to collect dust particles or moisture that can cause cross-contamination. The housing is identified by laser markings rather than paper or film labels to prevent foreign matter being introduced.

#### RoHS Compliance

The E3ZM housing contains no lead or hazardous materials.