Sensors for Detecting Transparent Objects

By definition, transparent objects allow light to pass freely through them, which is a primary reason why they can be so difficult to detect. Material color, shape, size, faceting, and reflectivity can further complicate detection. Additionally, the harsh, hazardous, washdown and aseptic environments common to many applications challenge the reliability, performance, and longevity of the sensors used to detect transparent materials.

Matching the design, sensing technology, and product features of a sensor to the specific needs of an application makes for a more effective solution. Some sensing technologies may work better in specific conditions or may be more effective with certain materials. Design and feature considerations for sensors used in hygienic environments may be quite different from those of sensors used in packaging applications. Fortunately, Banner Engineering offers sensors designed and developed to overcome these challenges and reliably solve a broad range of clear object detection applications.

Laser Based Photoelectric Sensors

The Q4X dual-mode laser sensor is capable of detecting very slight changes in distance and reflected light from a stable background condition. As an object enters the sensing beam it alters the perceived distance to and light intensity from the background condition, ensuring reliable object detection regardless of the material, size, shape, tint, faceting, contour, or opacity.

- No reflector required for operation

- Angled, four-digit display provides continuous feedback, facilitating setup and management

- Class 1 Laser provides a small, highly visible spot for greater precision and easier alignment than LED-based solutions

- Integral on/off delays can be used to regulate product flow and minimize accumulations

- ECOLAB certified, IP69K-rated FDA-grade 316L stainless steel housing resists high-pressure, high-temperature washdown and chemical clean-in-place procedures

- Models available featuring IO-Link communication, which enable remote configuration, sensor backup, and easier preventative maintenance

LED Based Photoelectric Sensors

Banner Engineering's LED-based photoelectric sensors for clear object detection utilize coaxial optical design. This technology enables higher positional accuracy, making them a good choice for leading edge detection, counting, and other precision applications. They are highly resistant to false detection from reflected light and have a short

dead zone, so they will perform reliably in tight spaces.


QS18 EXPERT CLEAR OBJECT SENSOR

- ClearTracking Adaptive Threshold compensates for dust and temperature changes
- Reliably detects transparent objects from up to 3 meters away, depending upon reflector
- Fast 400 μs response time with low jitter for high speed applications
- IP67-rated ABS housing provides an economical option for high volume applications
- Offers easy push-button TEACH-mode setup

QM26 WASHDOWN SENSOR

- Washdown rated sensor for use in splash zone areas where particles may splash and accumulate, but do not return to the process
- ECOLAB certified, IP69K-rated FDA-grade 316L stainless steel housing provides chemical resistance for the most demanding environments
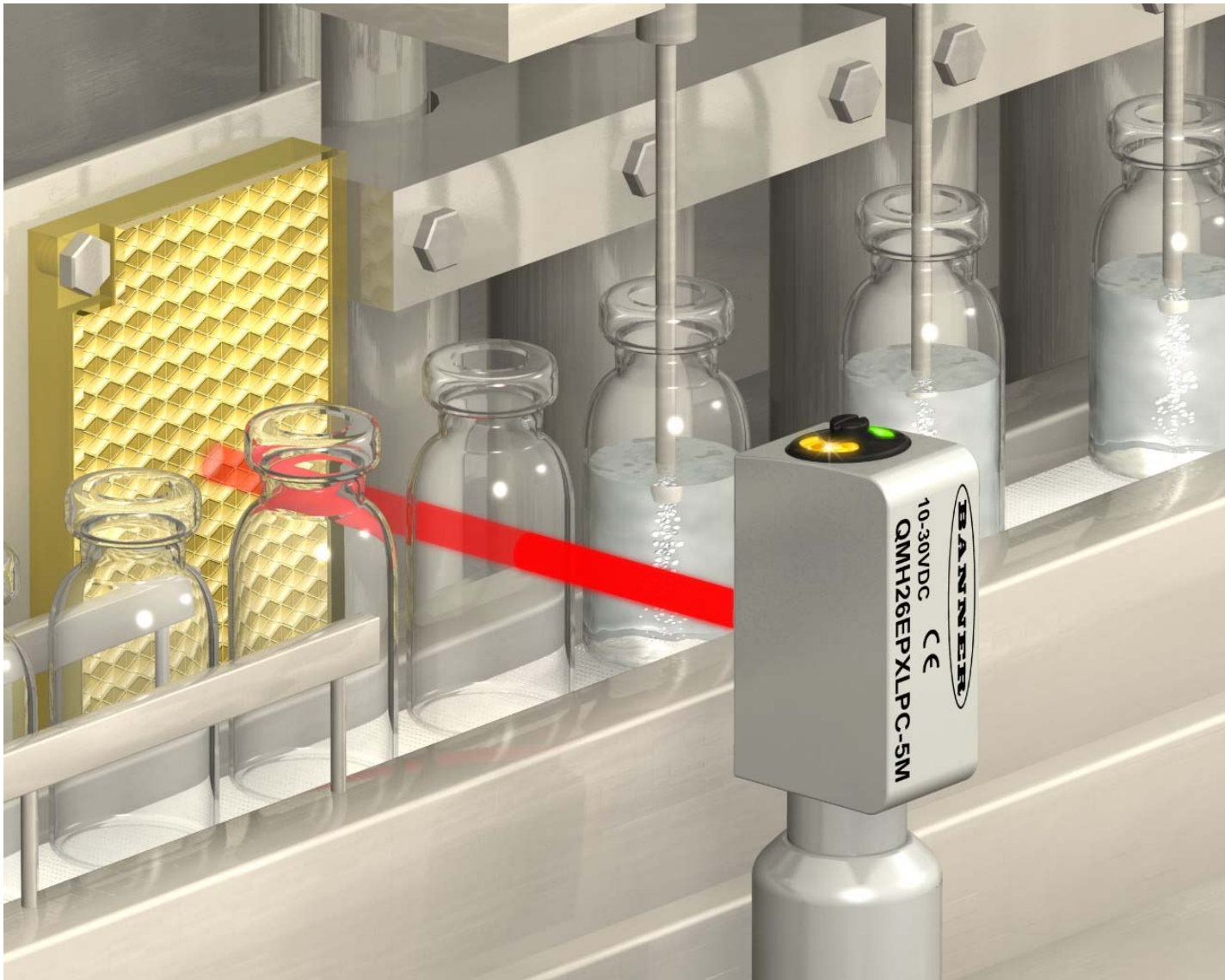
QMH26 HYGIENIC SENSOR

- Hygienic design perfect for clean-in-place (CIP) applications
- Ideal for contact zone applciations where food or materials that come in contact with surfaces may enter back into the process
- Self-draining shape with fewer trap points minimizes contamination risk in sanitary environments
- ECOLAB certified, IP69K-rated FDA-grade 316L stainless steel housing provides chemical resistance for the most demanding environments
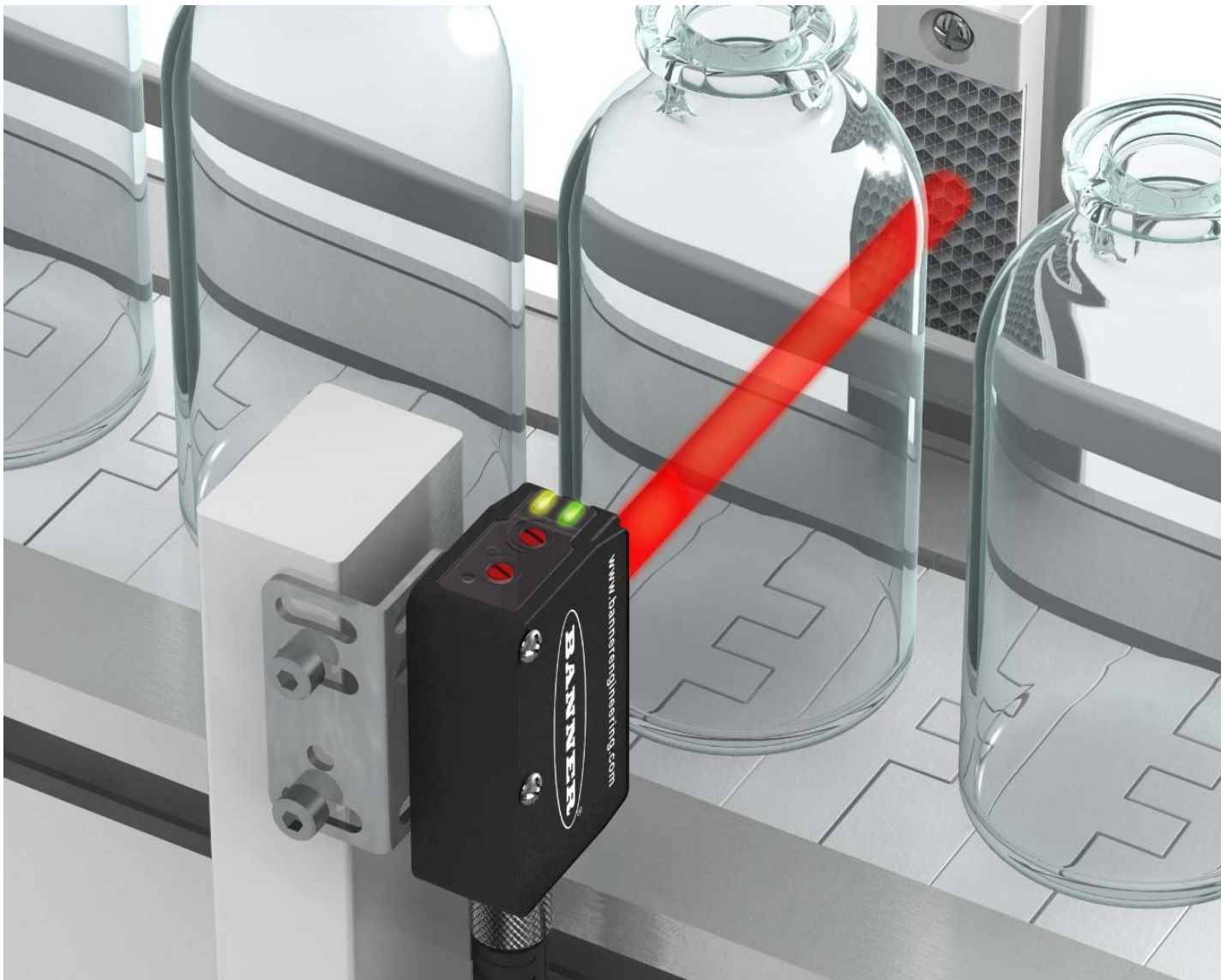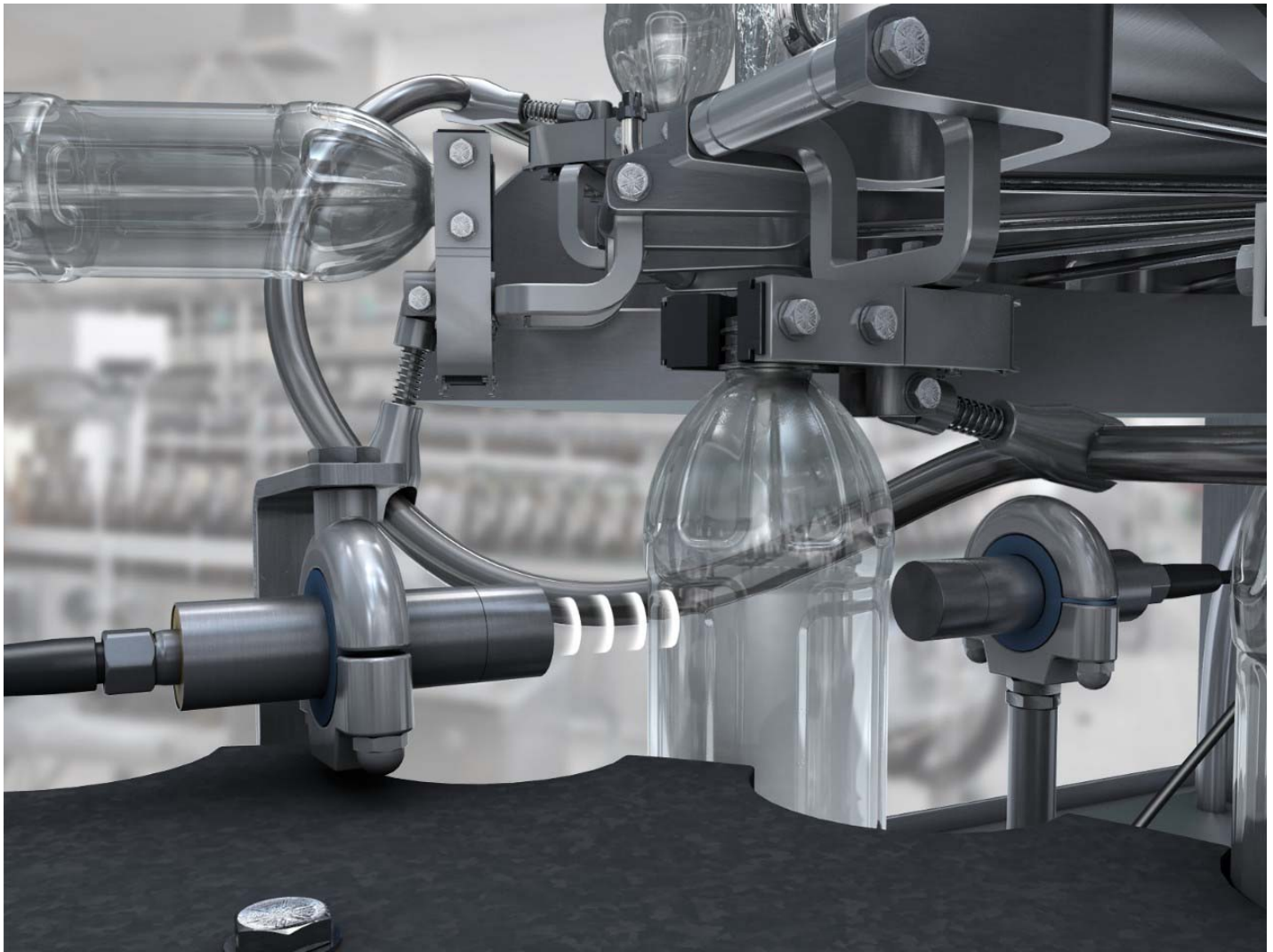
Q26 CLEAR OBJECT SENSOR

- Easy cleaning in hygienic environments
- Quick and easy adjustment of sensitivity with single-turn potentiometer
- Light Operate and Dark Operate selection by rotary switch

Ultrasonic Sensors

Ultrasonic sensors use sound waves to detect objects, making them immune to target color, reflectivity, and transparency. They are unaffected by area light conditions and perform well in dirty as well as wet environments. Opposed mode versions, like the M25U, are well suited for applications requiring faster response times and greater levels of precision than typically associated with ultrasonic sensors. View all Ultrasonic Sensors.

M25U ULTRASONIC SENSORS

- Dual range/dual speed opposed mode ultrasonic sensors ideal for sensing clear objects or materials
- FDA-compliant 316 stainless steel housing rated IP69K, IEC IP67 (NEMA 6) with fully encapsulated electronics to withstand challenging sanitary environments
- Built-in temperature compensation automatically adjusts to the environment to maintain accuracy in changing conditions
- Great for beverage filling machines

Resources for Selecting the Right Product

VIDEOS

Watch these product videos for a quick understanding of their unique features for clear object detection applications.

QS18 Series

Clear Object
Detection

BANNER®

QS18 SERIES CLEAR OBJECT SENSOR

1 min 27 secs

Q26 CLEAR OBJECT DETECTION SENSOR

1 min 23 secs

BANNER®

Q4X LASER DISTANCE SENSOR

1 min 47 secs

APPLICATIONS

DETECTING CLEAR GLASS AND PLASTIC PET BOTTLES IN WASHDOWN ENVIRONMENTS

Washdown environment, IP69K ratings required

TRANSPARENT GLASS BOTTLE, VIAL, OR PLATE DETECTION

Recognize clear glass in high-speed applications

DETECTING PET BOTTLES TO REGULATE PRODUCT FLOW

Identifying gaps and accumulations to regulate product flow

DETECT INSTALLED GLASS ON AUTOMOBILE

Detect moonroof presence from extended range

DETECTION OF CLEAR LIQUIDS IN TRANSPARENT PACKAGING

Pharmaceutical packaging fill level inspections

DETECTING CLEAR BOTTLES TO TRIGGER SHRINK SLEEVE LABELER

High-speed labeler processing 800 bottles per minute

CLEAR CONTAINER DETECTION IN A CLEAN-IN-PLACE ROTARY FILLER

Track bottles as they move through the rotary filter

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