

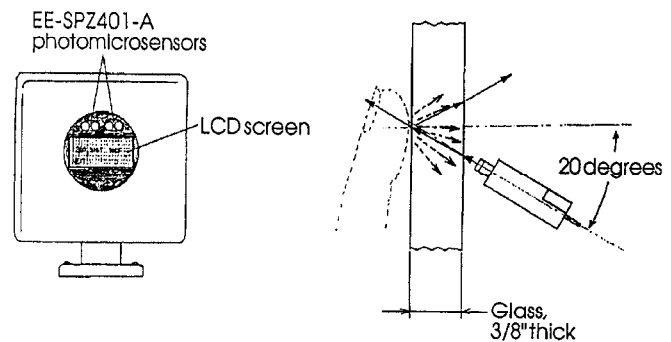
# Control of Display Data

## APPLICATION:

Used in gas flow computers for management of data, such as flow rate and pressure. Attaches directly to gas pipeline.

## FUNCTION:

Two EE-SPZ401-A photomicrosensors are used to activate and manipulate the data display of a completely sealed gas metering computer. The sensors, positioned to look through 3/8 inch thick glass, detect the presence of an operator's fingers. They function like arrow keys on a computer to scroll through parameter displays. The data is displayed on a small LCD screen visible to the operator.



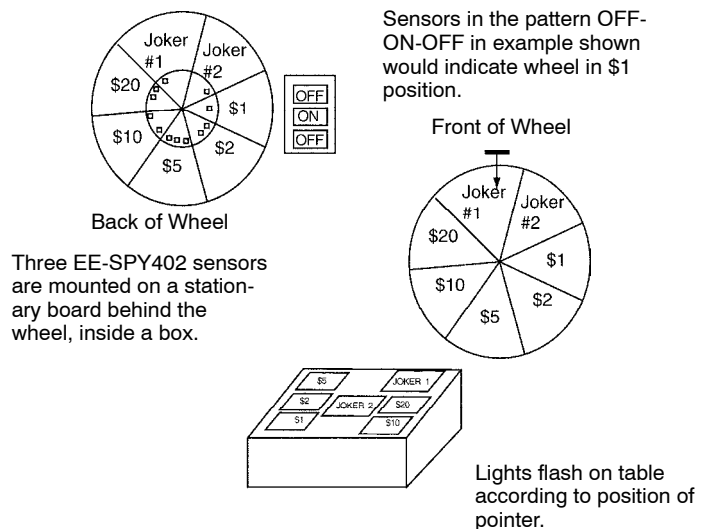
# Dollar Wheel Casino Games

## APPLICATION:

Casino dollar wheel games use three EE-SPY402 photomicrosensors to light the winning selection on the playing table.

## FUNCTION:

Reflective tape strips are positioned behind the wheel and used to activate the photomicrosensors for each betting category on the wheel. The on/off state of each sensor acts as part of a binary code, so that the position and number of tape strips on each portion of the wheel form a distinct code which makes the correct light on the table flash.



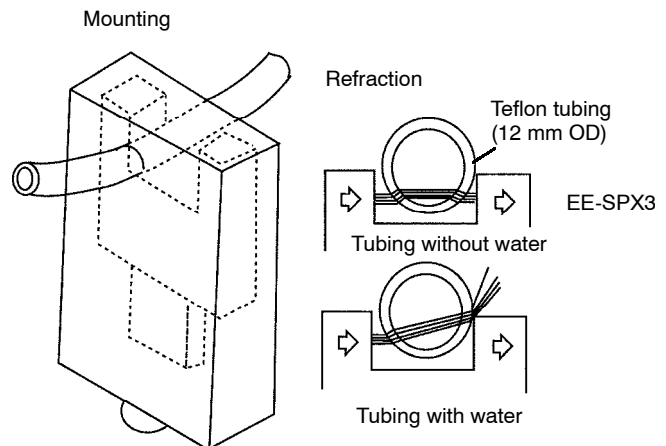
# Fluid Detection in Tubing

## APPLICATION:

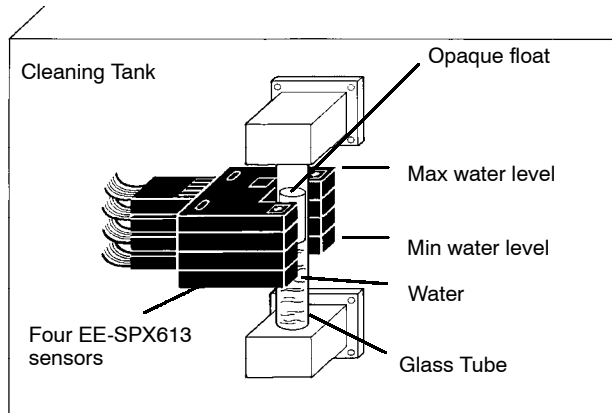
- The EE-SPX303 photomicrosensor is used in:
- liquid chemical management systems
  - any application that requires fluid detection in tubing.

## FUNCTION:

The photomicrosensor is positioned in such a way that the infrared light beam passes through the clear plastic tube. The different light refraction angles of an empty tube vs. the fluid media allow the sensor to detect the presence of the fluid.



## Detection of Water Levels

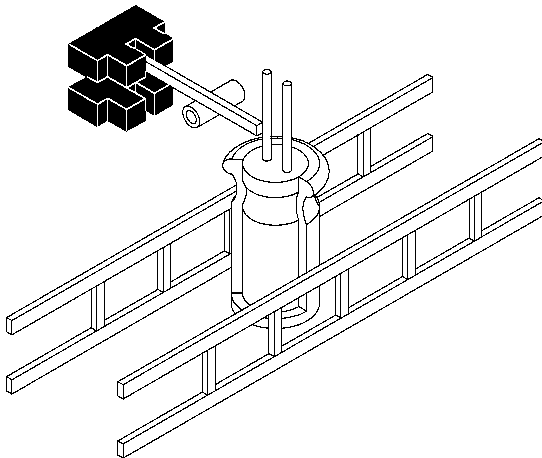


### APPLICATION:

Use a series of EE-SPX613 sensors as a sight-glass gauge in water processing equipment. In semiconductor and commercial applications, they are used in de-ionized water systems and small-scale water purification systems.

### FUNCTION:

The EE-SPX613 sensors strap onto clear tubing of 6 to 13 mm diameter using tie wraps. They detect water and other clear aqueous liquids in the tubing or can detect an opaque float. The bank of four sensors in the example detects minimum, midrange, and maximum levels as the water vapor rises in the tank.



## Checking Component Size

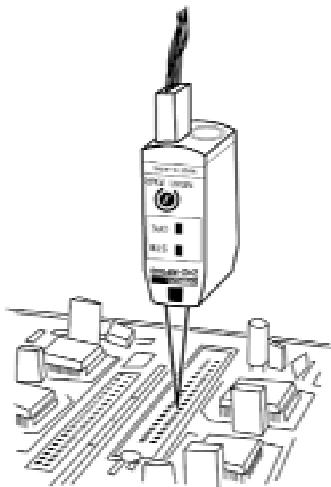
### APPLICATION:

The EE-SX470/670, EE-SX770/870, EE-SPX740/840 series are used in pairs to sense the displacement of a lever, which indicates component size.

## PCB Hole Detection

### APPLICATION:

With its built-in microprocessor, the Z4D-F04A/D is able to attain a 5  $\mu\text{m}$  resolution. The 5  $\mu\text{m}$  resolution of the Z4D-F04A/D make them ideal for use in detecting holes in printed circuit boards.



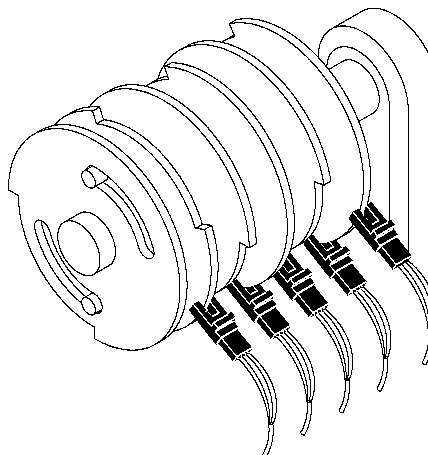
# Cam-timer Switching

## APPLICATION:

Get greater accuracy in cam timing outputs without contact bounce or signal failure when mechanical parts wear out. Omron's slotted sensors are available in space-saving sizes for close mounting.

## FUNCTION:

- Single-side mounting possible (EE-SX673/473)
- Easy adjustment and optical axis monitoring with an indicator (EE-SX670/470, EE-SPX)
- Light modulation effectively reduces external light interference (EE-SPX)
- For narrow mounting space installations, alternate models incorporating an operation indicator and those without an indicator



# Robot Control

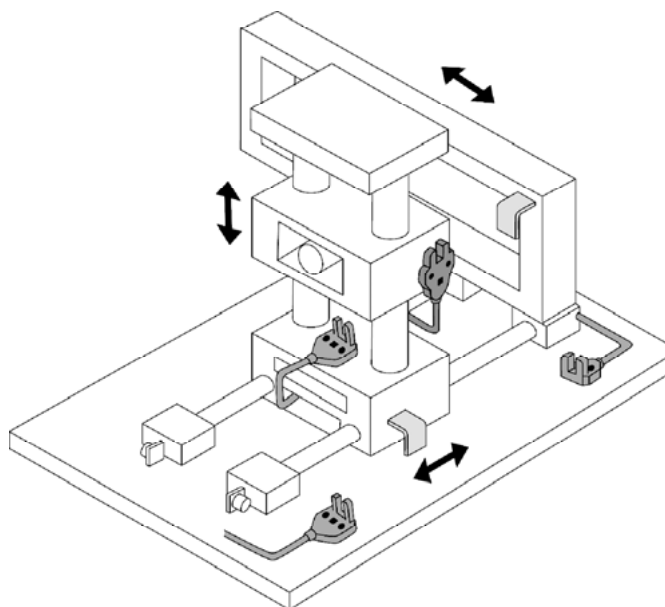
## APPLICATION:

Use the EE-SX470/670, EE-SX770/870 and EE-SPX740/840 series of sensors to detect end of travel and positioning on robot controlled devices. These slotted sensors can provide return-to-origin confirmation and home position detection.

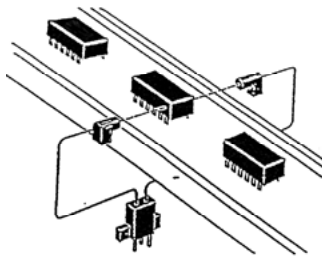
## FUNCTION:

EE-SX770/870 sensors come prewired, have an indicator visible from both sides and an aiming guide to simplify installation. EE-SX470/670 uses EE-1006 connectors for easy maintenance without rewiring.

EE-SPX740/840 has powerful light modulation which minimizes light interference. This sensor also comes with a built-in safety lock to minimize the effects of shock and vibration.

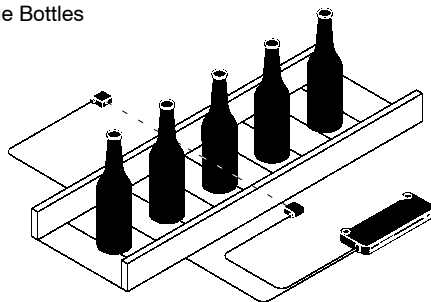


## Counting



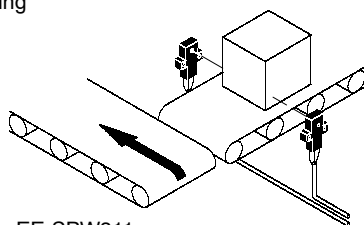
Sensor: EE-SPZ301-W01  
Feature: Fiber Optic Cables

## Sensing Opaque Bottles



Sensor: EE-SPW421-A  
Feature: 30 cm distance

## Conveyor Sensing



Sensor: EE-SPW311  
Feature: 1 m distance

# Material Handling Systems

## APPLICATION:

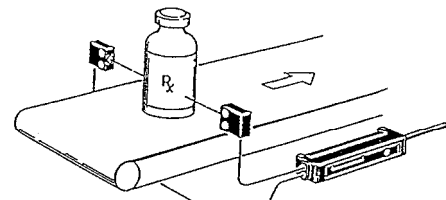
The illustrations on this page show five sensor applications related to material handling.

The EE-SPW321-A/421-A work at a sensing distance of 30 cm and are used to detect and count objects such as pill bottles with labels or opaque bottles.

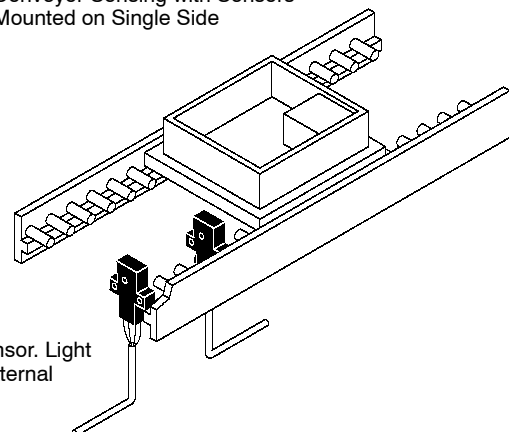
The EE-SPZ301-W01 with fiber optic cables attached performs similar counting functions.

The EE-SPW311 works at a greater sensing distance (1 m) for larger objects such as boxes. In the example shown, it detects the presence of boxes in a conveyor line and sends a signal to activate the next conveyor.

## Counting



## Conveyor Sensing with Sensors Mounted on Single Side



Sensor: EE-SPY312  
Feature: Reflective sensor. Light modulation reduces external interference

# Medical Applications

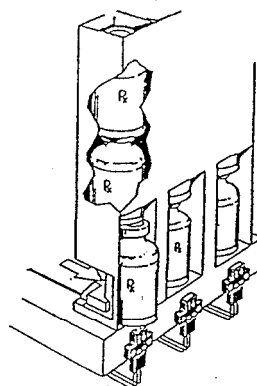
## APPLICATION:

The photomicrosensors are used to detect the presence of test tubes in computerized analyzers and the position of test tubes in a motorized turntable. In another application, a bank of sensors is used to detect the presence of pill bottles in dispenser slots.

## FUNCTION:

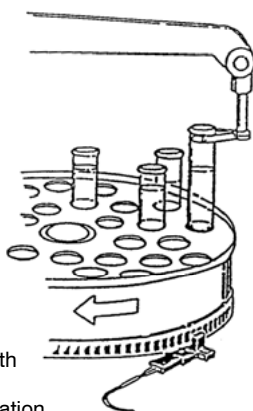
In all three examples, the specified sensors are used in conjunction with EE-1006 connectors. See the illustrations for the sensor part numbers.

### Presence Detection in Dispenser



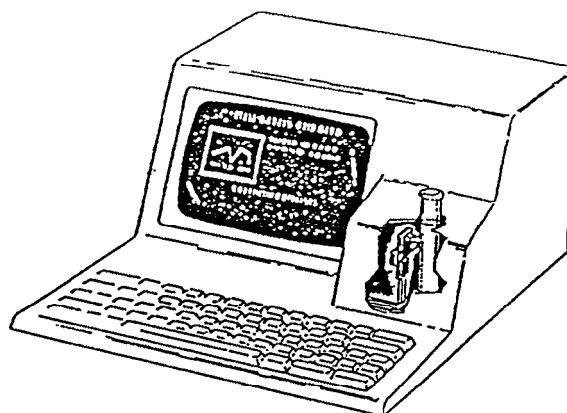
Sensors: EE-SPY312 with  
EE-1006 connector  
Feature: Convergent Lens  
with Operation Indication

### Position Sensing



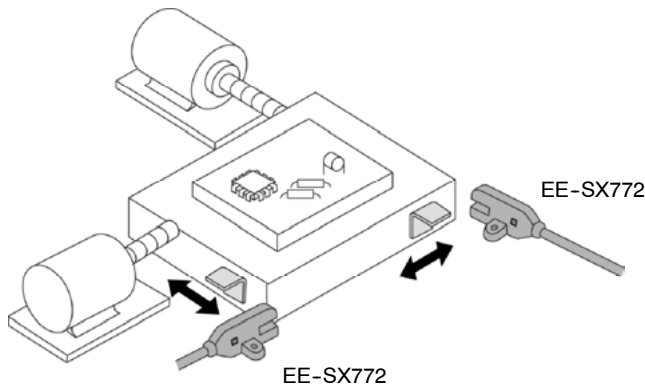
Sensors: EE-SPX672 with  
EE-1006 connector  
Feature: Operation Indication

### Presence Detection in Analyzer



Sensor: EE-SPY411 with EE-1006 connector  
Feature: convergent lens

## Home Position Detection, 2-Axis System



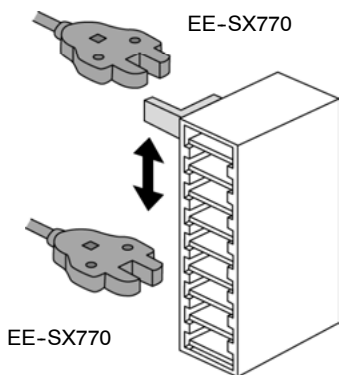
### APPLICATION:

The EE-SX772 sensors detect origin points on an X-Y positioning table to assure precise component placement on printed circuit boards. If both X and Y direction tabs arrive at the home position at different times, an alarm can be triggered to indicate a board with incorrectly placed components and generate a maintenance call.

### FUNCTION:

The EE-SX772 is prewired for direct connection to controllers. Reliable positioning is assured by the 0.8 mm aperture width. An operation indicator allows easy monitoring of status. Optical axis aiming guides simplify installation.

## Home position Detection, 1-Axis System



### APPLICATION:

The EE-SX770 sensors provide top and bottom position signals for parts or wafer carriers. These home position signals trigger reloading and direction change operations.

### FUNCTION:

The EE-SX770 is prewired for direct connection to controllers. Reliable positioning is assured by the 0.8 mm aperture width. The slim flat housing allows gang mounting side by side for an array of sensors monitoring positional progress. Built-in operation indicator and aiming guide simplify installation.

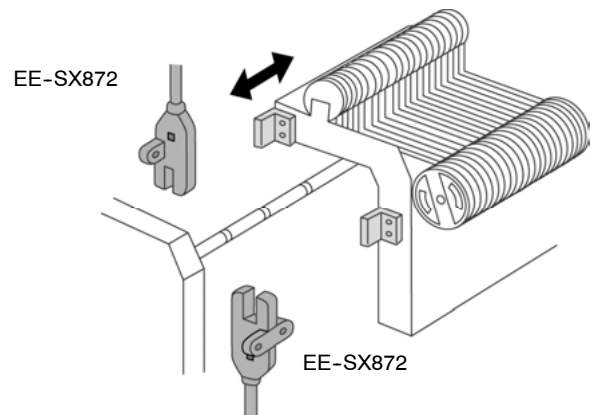
## End-of-Travel Detection

### APPLICATION:

The EE-SX872 sensors can be used for slow and stop inputs for end-of-travel applications in automatic parts assembly machines. The carrier containing reels of tape-mounted components for automatic insertion moves horizontally during operation. However, to prevent carrier overtravel and possible damage, use a pair of sensors to signal end of travel.

### FUNCTION:

The ultra-slim mounting tab allows installation anywhere in the machine, even tight spaces. The EE-SX872 series is prewired for direct connection to controllers. Reliable positioning is assured by the 0.8 mm aperture width. Operation indicator and aiming guide, visible from both sides, simplifies installation.



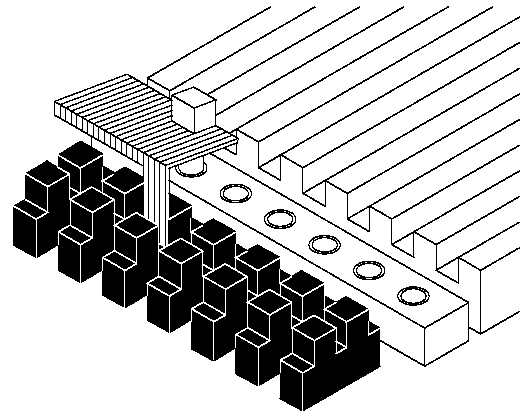
## Component Discrimination

### APPLICATION:

Use a combination of dogs and pushers with sensors to determine the type of component being carried on a conveyor.

### FUNCTION:

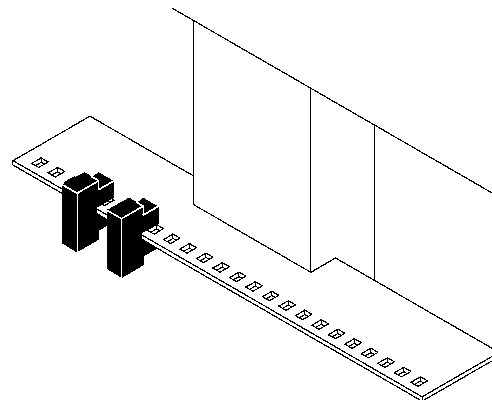
The EE-SX470/670 and EE-SX770/870 series sensors accept EE-1006 connector for easy maintenance; EE-SX770/870 series sensors are prewired for direct connection to a controller. All series offer a reliable narrow slot to precisely determine the size of components riding a carrier.



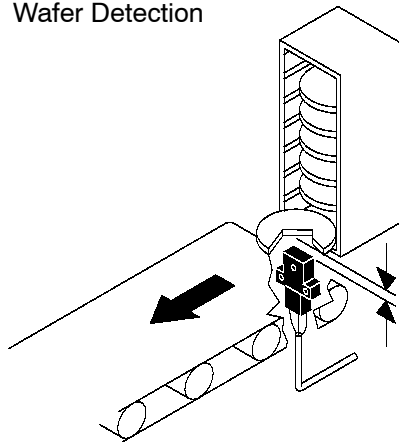
## Vertical or Horizontal Position Detection

### APPLICATION:

In this application example, two EE-SX670/470 Photomicrosensors sense the slits on the table which are evenly spaced. The position of the table is detected from the detectable slits that are different in phase. Reliable operation is assured by transmissive, high-resolution Photomicrosensors with narrow slots.

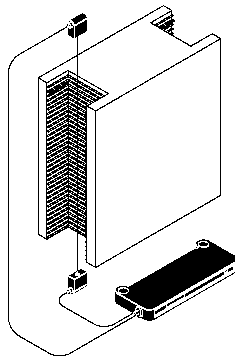


## Wafer Detection



Sensor: EE-SPY312 with EE-1006 connector  
Feature: detects dark objects

## Lead Frame Detection



Sensor: EE-SPW321  
Feature: slim amplifier (7.5 mm)

# Semiconductor Applications

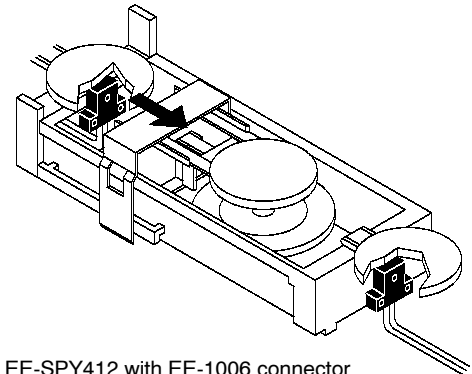
## APPLICATION:

As shown in the illustration, sensors are used to detect the presence of semiconductor wafers as they are dispensed onto a conveyor and processed. They are also used to check the alignment of lead frames in transport carriers or processing magazines.

## FUNCTION:

Diffuse sensors, set to detect dark objects, monitor wafer handling processes and can even detect shiny versus etched sides in applications where a wafer may flip over. EE-SPY312/412 sensors accept EE-1006 connectors for easy maintenance. EE-SPW321 through-beam (transmissive) sensing heads and slim cable amplifier fit space-confined detection systems.

## Semiconductor Manufacturing Equipment



Sensor: EE-SPY412 with EE-1006 connector  
Feature: detects dark objects