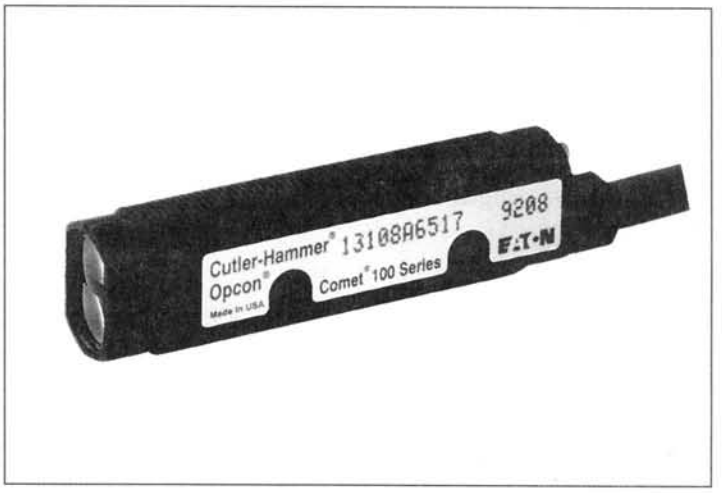
Photo Sensors

MODELS

37360-400	Thru-Beam, Source
37360-401	Thru-Beam, Detector
37360-402	Proximity (Diffuse Reflective) 24"
37360-403	Proximity (Diffuse Reflective) Perfect Prox.
37360-404	Visible Beam Reflex, Polarized
37360-405	Visible Beam Reflex
37360-406	Fiber Optic Sensor



These highly efficient sensors contain both the light source and detector in an 18 mm tubular housing. The light source is an LED that produces a modulated beam of infrared light. The detector responds only to the modulated light source. All of the electronics necessary to produce and detect the modulated beam are contained in one housing.

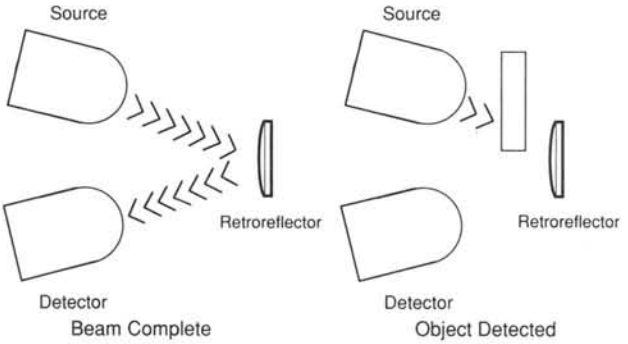
Three Modes of Detection
Photoelectric sensors operate in one of three modes: thru-beam, reflex, or proximity. An understanding of these modes is essential in choosing the correct sensor.

Reflex
The source and detector are installed in the same housing on one side of the object to be detected. The light beam is transmitted from the source to a retroreflector that returns the light to the detector. When an object breaks this reflected beam, the object is detected.

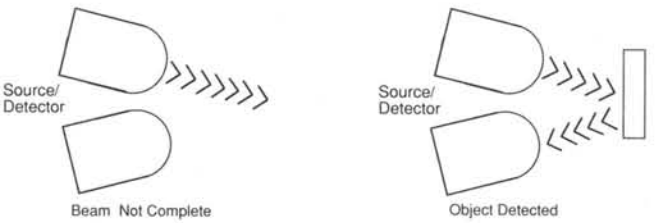
Most photoelectric sensors use the reflex mode because it is flexible, easy to install, and offers the best cost/performance ratio. The object to be detected must be less reflective than the retroreflector.

Polarized reflex sensors use a polarizing filter over the source and detector that "conditions" the light from the source such that the photoelectric sensor only sees light returned from the retroreflector. A polarized reflex sensor is used in applications where shiny surfaces such as metal or shrink wrapped boxes may falsely trigger the sensor.

Proximity (Diffuse Reflective)
The source and detector are installed in the same housing on one side of the object to be detected and are aimed at a point in front of the sensor. When an object passes in front of the source and detector, light from the source is reflected from the object's surface back to the detector, and the object is detected.



Reflex Detection



Proximity Detection

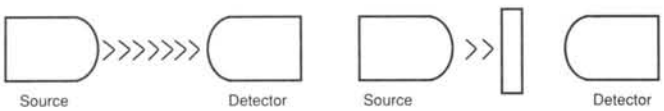
Photo Sensors

Proximity sensors are the easiest to install, but are affected by many variables. For example, the reflectivity of the object affects operation, and the sensor must be set to reject objects in the background. Special proximity sensors that focus on a point are good for detecting small objects, and allow detection of changes in surface reflectivity. Proximity sensors are the least expensive to install and maintain, since they do not require a retroreflector.

A Perfect Prox is a diffuse reflective sensor that features a special optical configuration providing high gain with very sharp cutoff. The Perfect Prox provides improved background rejection and detects light and dark objects at very similar ranges.

Thru-Beam
The source and detector are positioned opposite each other and the light beam is sent directly from source to detector. When an object passes between the source and detector, the beam is broken, signaling detection of the object.

Thru-beam detection generally provides the longest range of the three operating modes and provides high power at shorter ranges to penetrate steam, dirt, or other contaminants between the source and detector. Alignment of the source and detector must be accurate.



Thru-Beam Detection

Fiber Optics
The addition of fiber optics to photoelectric sensing has greatly expanded the application of these devices. Because they are small in diameter and flexible, fiber optics can bend and twist into tiny places formerly inaccessible to bulky electronic devices.

Fiber optics operate in the same sensing modes as standard photoelectric controls: thru-beam, proximity, and reflex. Two pre-cut fiber optic cables are offered: one designed for thru-beam and one for proximity-style sensing (see ordering information).

Application
In most cases, the demands of your application will immediately narrow the field. Questions to be answered are:

- What range is required? How far is the sensor from the object to be detected?
- How dirty is the environment?
- What access do you have to both sides of the object to be detected? Is wiring possible on one or both sides of the object?
- What size is the object?
- Is the object consistent in size, shape and reflectivity?
- What are the mechanical and electrical requirements?

TECHNICAL INFORMATION

Model	Maximum Count Speed	Field of View	Cutoff Range	Optimum Range	Maximum Range	
Thru-Beam (Source and detector)	60 Hz.	13 in. at 10 ft.	N/A	0-15 ft.	20 ft.	
Reflex-Visible Beam/Red	400 Hz.	1 in. at 50 in.	N/A	0-15 ft.	25 ft.	
Reflex-Polarized Visible Beam/Red	400 Hz.	1 in. at 50 in.	N/A	0-10 ft.	15 ft.	
Diffuse-Reflective (6 in.) Perfect Prox.	60 Hz.	0.6 in. at 50 in.	9 in. and beyond	N/A	6 in.	
Diffuse-Reflective (24 in.)	60 Hz.	5 in. at 15 in.	N/A	0-15 in.	24 in.	
Fiber Optic	400 Hz.	N/A	N/A	50% of max.	Thru Beam Mode 5 in.	Prox Mode 1.5 in.