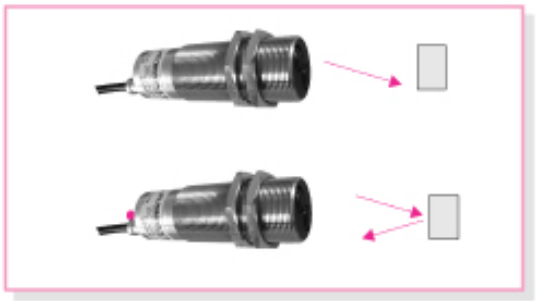
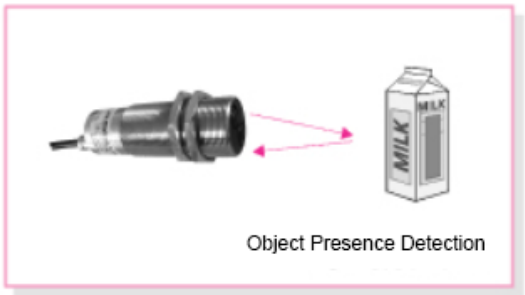
Diffiuse optical sensors

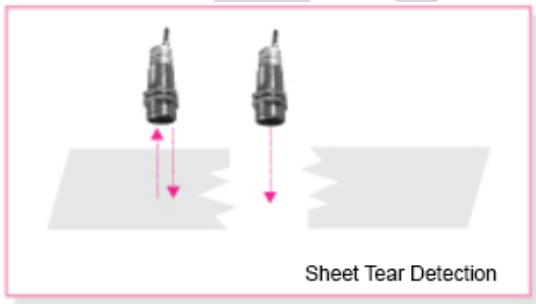
These sensors operate based on the transmission of modulated infrared waves and the reception of their reflections from various surfaces.



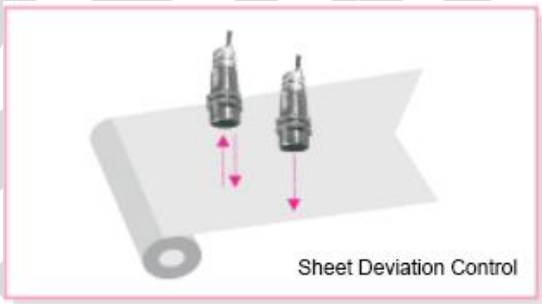
Some applications of these sensors are shown in the figure below.



Used to detect the presence or absence of objects by sensing the reflection of infrared waves from the object's surface.

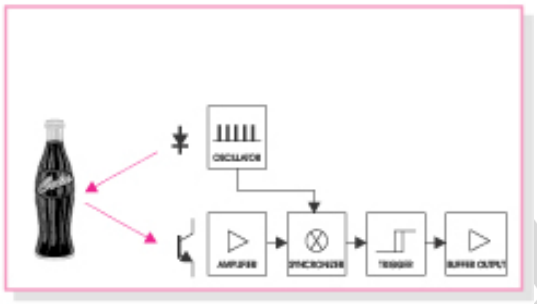


Used to identify tears or breaks in sheets (such as paper, metal, or fabric) by detecting changes in the reflected infrared waves.



Used to monitor and control the alignment or deviation of sheets during processing by detecting shifts in the reflected infrared waves.

These sensors consist of the following components:



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In these sensors, modulated infrared waves are emitted directly into the environment by the transmitter. When these waves encounter an obstacle, they are reflected, with the amount of reflection depending on the color and material of the surface, and the reflection is not in a straight line. Bright and polished surfaces reflect more than dark and non-polished surfaces, and the switching distance of these sensors depends on the amount of reflected light. When an obstacle is placed in front of the sensor and the reflected waves are received by the sensor's receiver, the sensor's output changes state.

In general, these sensors are divided into two types:

Normally Open:

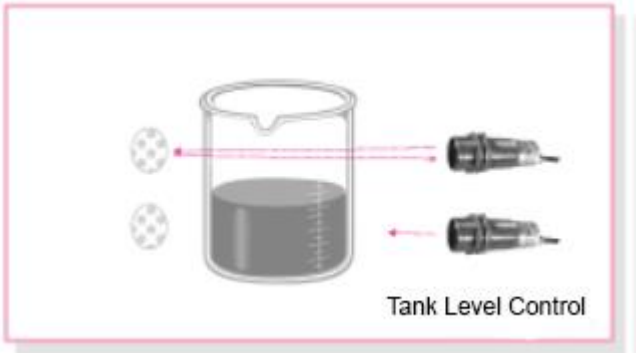
In the normal state, when there is no obstacle in front of the sensor and the transmitted light does not reach the receiver, the sensor output is inactive (light on). When an obstacle causes the infrared waves to reach the receiver, the output changes from inactive to active.

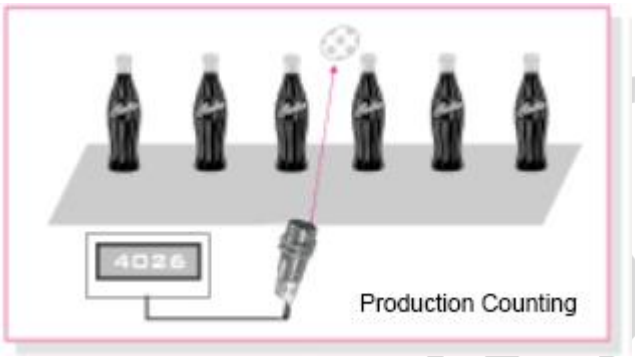
Normally Closed:

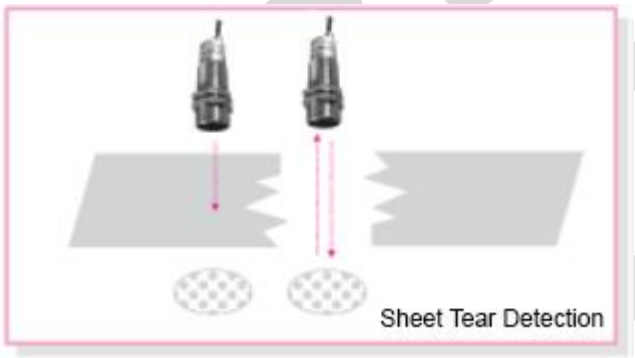
In the normal state, when there is no obstacle in front of the sensor and the transmitted light does not reach the receiver, the sensor output is active (dark on). When an obstacle causes the infrared waves to reach the receiver, the output changes from active to inactive.

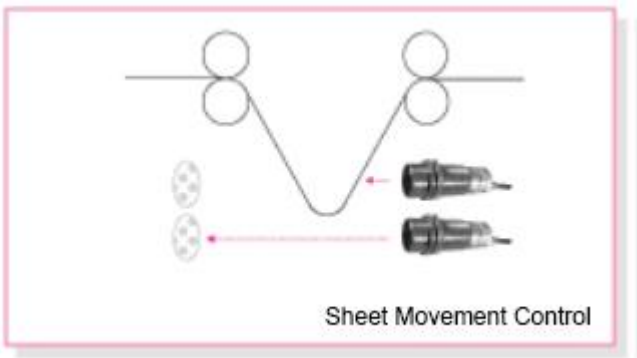
Retro-Reflective Optical Sensors

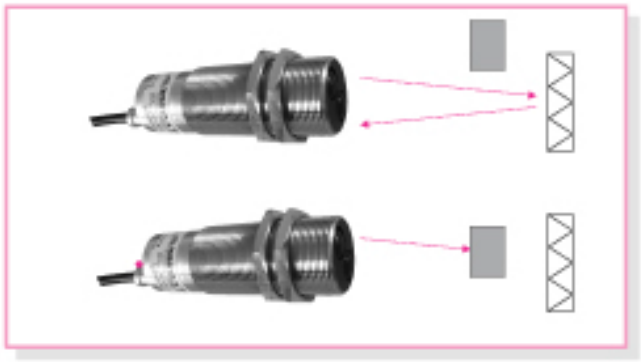
These sensors operate based on the transmission of modulated infrared waves and the reception of their reflections from a reflector. Some applications of these sensors are shown in the figure below.



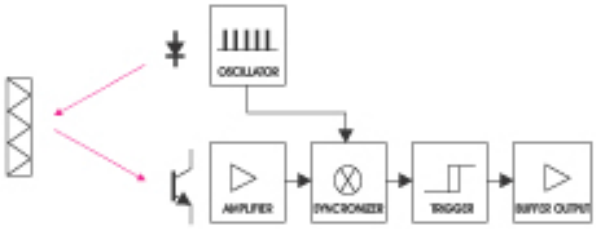








These sensors consist of the following components:



In these sensors, polarized infrared waves are emitted into the environment. A reflector is placed in front of the sensor at a specific distance. The emitted waves, upon hitting the reflector, are reflected back to the receiver at a 90-degree angle relative to the emitted waves.

In general, these sensors are divided into two types:

Normally Open:

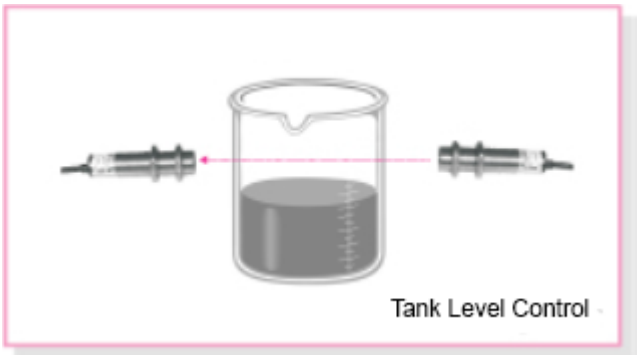
In the normal state, when there is no obstacle in front of the sensor and the transmitted light reaches the receiver, the sensor output is inactive (dark on). When an obstacle prevents the infrared waves from reaching the receiver, the output changes from inactive to active.

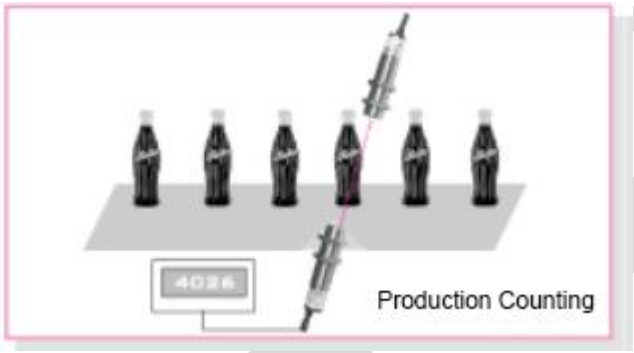
Normally Closed:

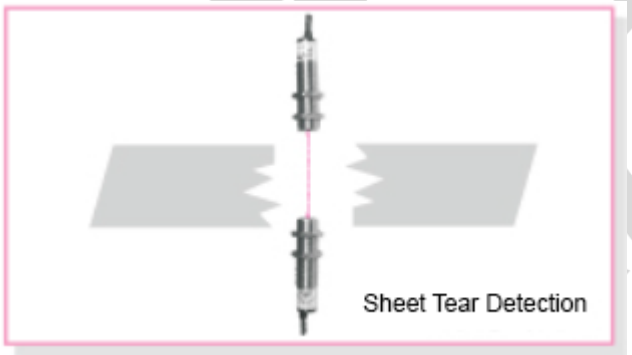
In the normal state, when there is no obstacle in front of the sensor and the transmitted light reaches the receiver, the sensor output is active (light on). When an obstacle prevents the infrared waves from reaching the receiver, the output changes from active to inactive.

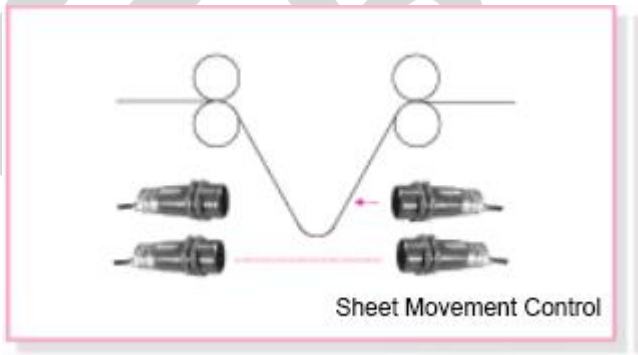
Trough-beam Optical Sensors

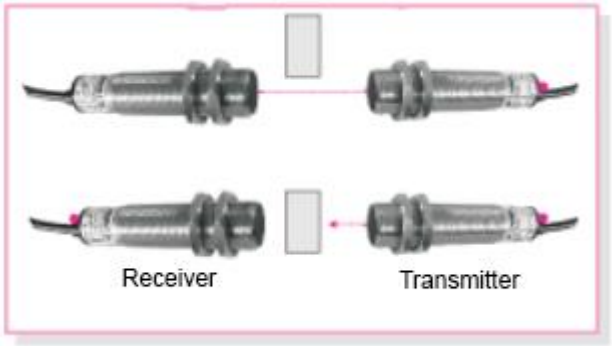
These sensors operate based on the transmission of modulated infrared waves from the transmitter and the reception of these waves by a receiver installed opposite the transmitter. Some applications of these sensors are shown in the figure below.











These sensors consist of the following components:

In these sensors, the transmitter and receiver are separate units. Modulated infrared waves are emitted by the transmitter, and the receiver is installed opposite the transmitter. When there is no obstacle between the transmitter and receiver, the waves do not reach the receiver.

In general, these sensors are divided into two types:

Normally Open:

In the normal state, when there is no obstacle in front of the sensor and the transmitted light does not reach the receiver, the sensor output is inactive (light on). When an obstacle causes the infrared waves to reach the receiver, the output changes from inactive to active.

Normally Closed:

In the normal state, when there is no obstacle in front of the sensor and the transmitted light does not reach the receiver, the sensor output is active (dark on). When an obstacle causes the infrared waves to reach the receiver, the output changes from active to inactive.