

# Proximity Sensor Basics



Proximity Sensor Application Notes

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Proximity sensors are reed switches that are over-molded or assembled in housings to protect the switch and provide easy installation. Proximity sensors come in various housing sizes, shapes, and materials, and can be customized at HSI Sensing with a variety of wires, cables and connectors to suit your specific application.

## Basic Function

Proximity sensors are manufactured in one of several configurations described below. The contacts will either complete or interrupt a circuit when the actuator comes within proximity of the sensor.

## Basic Configurations

### Form A

SPST (Single pole, single throw) contains a normally open contact that closes when an actuator comes within the specified operate distance. When the actuator withdraws beyond the specified release distance, the proximity sensor returns to its original open state.

### Form B

SPST (Single pole, single throw) contains a normally closed contact that opens when an actuator comes within the specified operate distance. When the actuator withdraws beyond the specified release distance, the proximity sensor returns to its original closed state.

### Form C

SPDT (Single pole, double throw) contains two contacts. When an actuator comes within the specified operate distance, the normally closed contact opens, and then the normally open contact closes. When the actuator withdraws beyond the specified release distance, the proximity sensor returns to its original state.

### Latch Proximity Sensor

The proximity sensor contact(s) lock into either position until a reset by the reversal of the magnetic field from the actuator. Available in both SPST and SPDT.

### Steel Proximity Sensor

The proximity sensor can be configured with internal magnets, so that the activating device can be any type of steel including a frame component, control panel door, or any other component containing ferrous material. HSI Sensing patented this technology (5,293,523 and 5,233,322).

## Actuators

An actuator is a magnetic or ferrous material component that activates a proximity sensor.

### **Magnetic Actuator**

A magnetic actuator features a magnet placed in a housing and is often paired with the proximity sensor for a matching sensor package. The actuator housings provide a convenient way to mount the magnet onto a surface.

### **Ferrous Material**

Steel-sensing proximity sensors contain internal magnets, which enables them to be activated by ferrous material. HSI Sensing tests all of our steel sensing proximity sensors with a standard steel target composed of 1018 cold rolled steel that is 3" x 1" x 0.062" thick.