

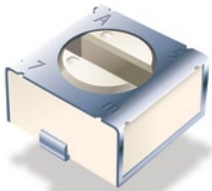


APPLICATION NOTE

3312

Inductive Proximity Switch

Bourns® Model 3312 trimmer. A better choice.

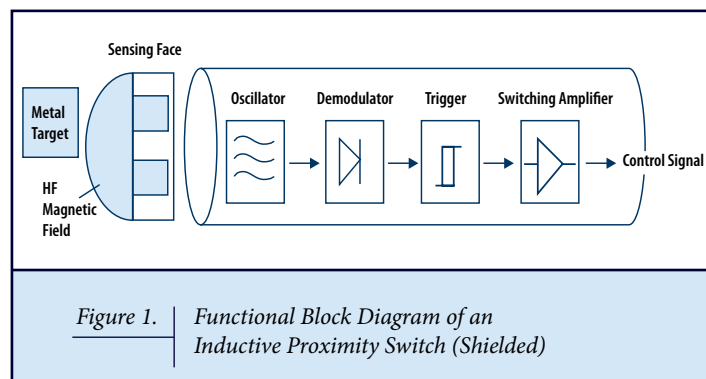


Inductive proximity switches are sensors that detect different metal objects. Their main use is to provide no-touch detection by generating an electromagnetic field to sense metal targets within a few inches of their sensor face. They are designed in small packages and are either shielded (embeddable) or unshielded (non-embeddable).

System Components:

- **Oscillator Coil** – creates a high frequency field that is emitted in the sensing face
- **Operating Distance (Sensing Range)** – the distance at which the target approaching the sensor face is close enough to trigger a sensor output state change
- **Detection Circuit** – sends a signal to the switch to change state when the oscillator stops
- **Solid State Switching Device** – transistor in DC switches and thyristor in AC switches

When a metal target enters the high frequency electromagnetic field of the oscillator coil, eddy currents are induced in the metal target. As the target enters the sensing range of the sensor, the energy maintaining the eddy currents becomes too great for the oscillator and stops. This condition triggers the detection circuit to signal the switch to change state. When the metal target exits the sensing range, the oscillator will resume functioning in its normal state. The normal state is either 'Normally Open' or 'Normally Closed.'



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Where the trimmer is located and how it functions:

The trimmer would be in the load connection. The switching element is connected between the output wire and a negative terminal and the trimmer, acting as a load, is connected between the output wire and the positive terminal. In the ON state, the current will sink from the load into the switching element.

The Bourns® Model 3312 trimmer is a better choice because it is suitable for the small package of an inductive proximity switch. It is sealed to withstand a standard wash process and is available in a wide range of resistance values.

Bourns® products have not been specifically designed or tested for critical life support applications and their use in such applications is neither recommended nor supported.

For more information on the 3312 and other resistive products from Bourns, please visit

www.bourns.com

SPECIFICATIONS

Electrical Characteristics

Standard Resistance Range	10 Ω to 2 MΩ
Resistance Tolerance	±20 % std.
Adjustability	
Voltage Divider	±0.2 %
Rheostat	±0.4 %
Resolution	Essentially Infinite
Adjustment Angle	240 ° nom.

Environmental Characteristics

Power Rating (50 volts max.)	
70 °C	0.1 watt
125 °C	0 watt
Operating Temperature Range	-55 °C to +125 °C
Temperature Coefficient	≤100 Ω ±150 PPM/°C; >100 Ω ±100 PPM/°C
Vibration	20 G TRS ±1 %; VRS ±1 %
Shock	100 G TRS ±1 %; VRS ±1 %
Rotational Life	25 cycles TRS ±3 %

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