# BULLETIN 871TM

# INDUCTIVE PROXIMITY SENSOR

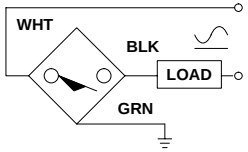
133–547(B)

## SPECIFICATIONS

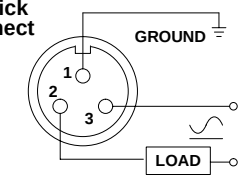
| | |
|---|---|
| Load Current | ≤ 400 mA (maximum), 5 mA (minimum) |
| Inrush Current | ≤ 4 A |
| Leakage Current | ≤ 1.7 mA at 120VAC |
| Operating Voltage | 40–250 V AC/DC |
| Voltage Drop | ≤ 5 V at 400 mA, 10 V at 10 mA |
| Repeatability | ≤ 1% at constant temperature |
| Hysteresis | 10% typical |
| Short Circuit Protection | Incorporated (trigger at 8A typical) |
| Overload Protection | Incorporated (trigger at 550 mA typical) |
| False Pulse Protection | Incorporated |
| Transient Noise Protection | Incorporated |
| UL | Listed or Recognized |
| Enclosure | Stainless steel face and barrel |
| Cable | 3 conductor |
| Quick Disconnect | 3 pin, Micro and Mini types |
| LEDs | Red: Target Green: Power, Flashing: SCP |
| Temperature: | Operating: –25° C to + 70° C (–13° F to 158° F) |
| Shock and Vibration | 5G, 30–120 Hz 3 mutally perpendicular & 1 worst plane |

## WIRING DIAGRAMS

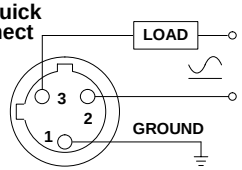
**Cable**




**Mini Quick Disconnect**




**Micro Quick Disconnect**



# INSTALLATION INSTRUCTIONS

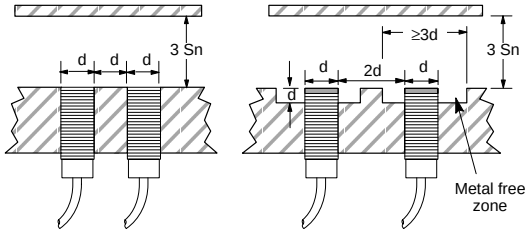
**CAUTION;** Solid state devices can be susceptible to radio frequency (RF) interference, depending on the frequency of the transmitting source. If RF transmitting equipment is to be used in the vicinity of the solid state devices, thorough testing should be performed to assure that the transmitter operation is restricted to a safe operating distance from the control equipment and wiring.

**WARNING:** Do not let METAL objects that are not to be sensed come within three times the sensing distance of this device. Unintended process activation may result in a hazardous condition.

**IMPORTANT:** Save these instructions for future use. For additional information and proper operating guidance, refer to the Allen–Bradley Proximity Catalog 871–1.2 or the product data sheet 871TM–2.0

## EFFECTS OF NEARBY METAL SURFACES

Metals immediately opposite the sensing face should be no closer than three times the rated operating distance of the sensor.




Sensors embedded in metal
Shielded

Sensors not embedded in metal
Not shielded

Sn = rated operating distance

d = diameter of sensing surface

## SENSING DISTANCE

The standard target is a square of mild steel (ST37), 1mm thick. The side of the square is equal to the diameter of the sensor or three times the sensing distance, whichever is larger. Targets smaller than standard size may shorten the sensing distance. Targets larger than standard may lengthen the sensing distance.

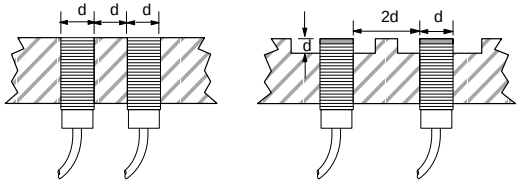
## CORRECTION FACTORS

To determine the sensing distance for materials other than the standard mild steel, multiply the sensing distance by the factor given below:

| | |
|---|---|
| Steel | 1.0 |
| Stainless Steel | 0.9 to 1.0 |
| Brass | 0.3 to 0.5 |
| Aluminum | 0.1 to 0.4 |
| Aluminum ≤.012 thick | 0.9 to 1.1 |
| Copper | 0.4 to 0.6 |

## SPACING BETWEEN SENSORS

When installing side by side, the minimum spacing distance should be maintained. When mounting face to face, use two times the diameter.




Shielded

Not shielded

Sensors embedded in metal

Sensors not embedded in metal

d = diameter of sensing surface

## SERIES CONNECTED SWITCHES

When connected in series, the operating load voltage must be less than or equal to the minimum supply voltage, minus the voltage drops across the proximity switches connected in series. The load will energize when the connected outputs of all proximity switches are energized.

## PARALLEL CONNECTED SWITCHES

To determine the maximum number of switches for an application, the sum of the maximum OFF–state currents of the switches connected in parallel must be less than the maximum OFF–state current of the load device. The load will be energized when the output of any proximity switch energizes. NOTE: Parallel operation of switches does not provide higher load current capability and may generate a “false pulse” under certain conditions.