

Slim Rectangular Inductive Prox



TL-T

Miniature, Slim-styled Type Proximity

- Space-saving prox ideal for timing cam and dog detection
- Four mounting holes provided: two from the side and two from the rear of the housing
- Ganged mounting possible for multiple pulse generation
- Alternate frequency models available to avoid mutual interference



Ordering Information

| Type | Sensing Distance | Part number | | | | | |
|---|------------------|--------------------------|-----------------|-----------------|-----------------|-------------------|-----------------|
| | | DC 3-wire switching type | | | | AC switching type | |
| | | NPN-NO | NPN-NC | PNP-NO | PNP-NC | SCR-NO | SCR-NC |
| Shielded  | 2 mm (0.08 in) | TL-T2E1 | TL-T2E2 | TL-T2F1 | TL-T2F2 | TL-T2Y1 | TL-T2Y2 |
| Unshielded  | 5 mm (0.20 in) | TL-T5ME1 | TL-T5ME2 | TL-T5MF1 | TL-T5MF2 | TL-T5MY1 | TL-T5MY2 |

- Note: 1. To avoid mutual interference, this sensor can be ordered with a different oscillating frequency. Add a "5" to the end of the part number (e.g. TL-N2E15).
2. Add suffix "G" to the model number when placing your order for European models with color-coded cables conforming to CENELEC standard (EN50044). Refer to the color code table in the "Output Stage Circuit Diagram" for the cable color codes of the European models.

Specifications

■ RATINGS/CHARACTERISTICS

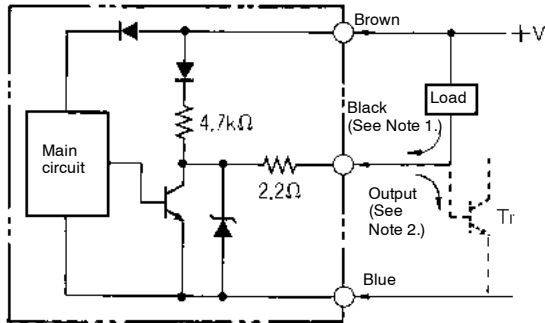
| | | | | | |
|--|--------------------|--|------------------|--|--------------------|
| Part number | | TL-T2E1, TL-T2E2, TL-T2F1, TL-T2F2 | TL-T2Y1, TL-T2Y2 | TL-T5ME1, TL-T5ME2, TL-T5MF1, TL-T5MF2 | TL-T5MY1, TL-T5MY2 |
| Supply voltage (operating voltage range) | | E and F models: 12 to 24 VDC (10 to 30 VDC), ripple (p-p): 20% max. Y models: 100 to 220 VAC (90 to 250 VAC), 50/60 Hz | | | |
| Current consumption | | E and F models: 15 mA max. at 24 VDC | | | |
| Leakage current | | Y models: 2.5 mA max. at 200 VAC | | | |
| Sensing object | | Magnetic metal (The sensing distance decreases with non-magnetic metal.) | | | |
| Sensing distance | | 2 mm \pm 10% (0.08 \pm 10%) | | 5 mm \pm 10% (0.19 \pm 10%) | |
| Sensing distance (standard object) | | 0 to 1.6 mm (iron, 12 x 12 x 1 mm) 0 to 0.06 in (iron 0.47, 47 x 0.04 in) | | 0 to 4 mm (iron, 15 x 15 x 1 mm) 0 to 0.157 in (iron 0.59 x 0.59 x 0.39 in) | |
| Differential travel | | 10% max. of sensing distance | | | |
| Response frequency | | E and F models: 800 Hz, Y models: 20 Hz | | E and F models: 250 Hz, Y models: 20 Hz | |
| Operating status (with sensing object approaching) | | E1 models: L output signal with load ON E2 models: H output signal with load OFF F1 models: H output signal with load ON Y1 models: Load ON Y2 models: Load OFF | | | |
| Control output | Type | E1: NPN-NO Y1: SCR-NO E2: NPN-NC Y2: SCR-NC F1: PNP-NO F2: PNP-NC | | | |
| | Switching capacity | E and F models: 100 mA max. at 12 VDC and 200 mA max. at 24 VDC Y models: 10 to 200 mA | | | |
| Circuit protection | | E and F models: Reverse connection protection and surge absorber Y models: Surge absorber | | | |
| Indicator | | Operation indicator (red LED) | | | |
| Ambient temperature | Operating | -25°C to 70°C (-13°F to 158°F) with no icing | | | |
| Ambient humidity | Operating | 35% to 95% | | | |
| Temperature influence | | \pm 10% max. of sensing distance at 23°C (73.4°F) in the temperature range of -25°C to 70°C (-13°F to 158°F) | | | |
| Voltage influence | | E and F models: \pm 2.5% max. of sensing distance within a range of \pm 15% of the rated power supply voltage Y models: \pm 2.5% max. of sensing distance within a range of \pm 10% of the rated power supply voltage | | | |
| Residual voltage | | E and F models: 1.0 V max. with a load current of 100 mA and a cord length of 2 m Y models: Refer to <i>Residual Load Voltage (Typical)</i> on page 4. | | | |
| Insulation resistance | | 50 M Ω min. (at 500 VDC) between case and current carry parts | | | |
| Dielectric strength | | DC switching models: 1,000 VAC, 50/60 Hz for 1 min between case and current carry parts AC switching models: 2,000 VAC, 50/60 Hz for 1 min between case and current carry parts | | | |
| Vibration resistance | | 10 to 55 Hz, 1.5-mm (0.06 in) double amplitude for 2 hours each in X, Y, and Z directions | | | |
| Shock resistance | | 500 m/s ² (1640 ft/s ²) approx. 50G for 10 times each in X, Y, and Z directions | | | |
| Enclosure rating | | IEC IP67 | | | |
| Weight (with 2-m cord) | | Approx. 70 g (2.47 oz) | | | |
| Material | Case | Heat-resistant ABS resin | | | |
| | Sensing surface | Heat-resistant ABS resin | | | |

Operation

OUTPUT CIRCUITS

E Models

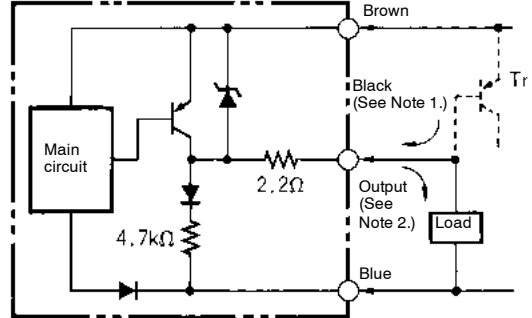
NPN (DC 3-wire)



Note: 1. 200 mA max. (load current)
2. When a transistor is connected

F Models

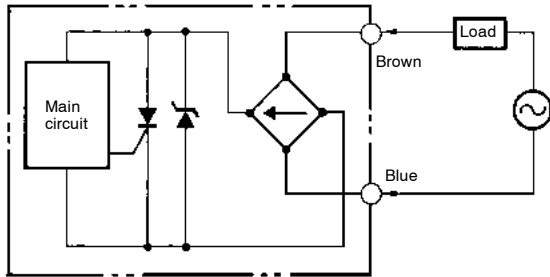
PNP (DC 3-wire)



Note: 1. 200 mA max. (load current)
2. When a transistor is connected

Y Models

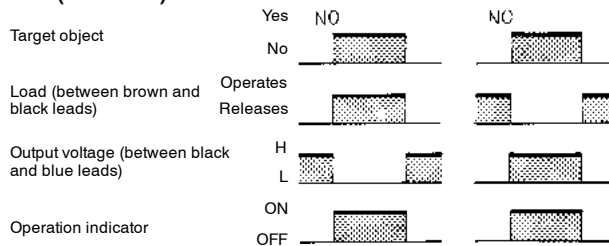
(AC 2-wire)



TIMING CHARTS

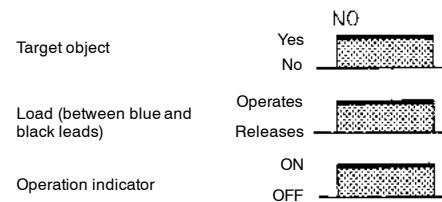
E Models

NPN (DC 3-wire)



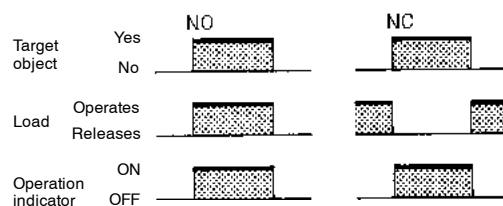
F Models

PNP (DC 3-wire)



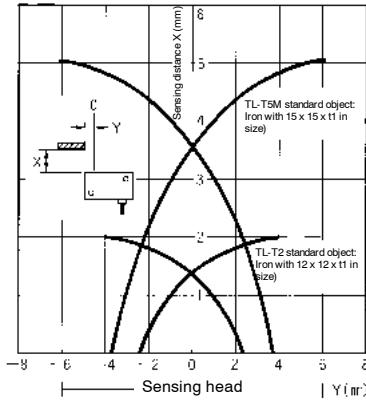
Y Models

(DC 2-wire)



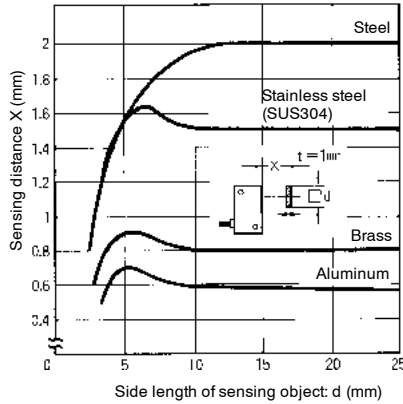
Engineering Data

OPERATING RANGE (TYPICAL)

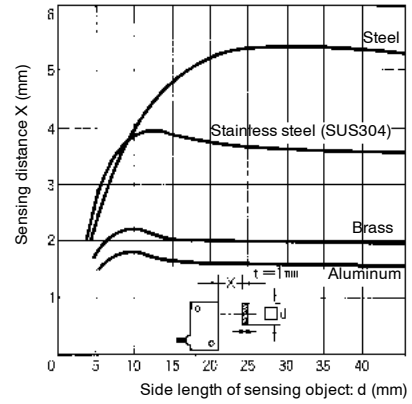


SENSING OBJECT SIZE AND MATERIAL VS. SENSING DISTANCE (TYPICAL)

TL-T2

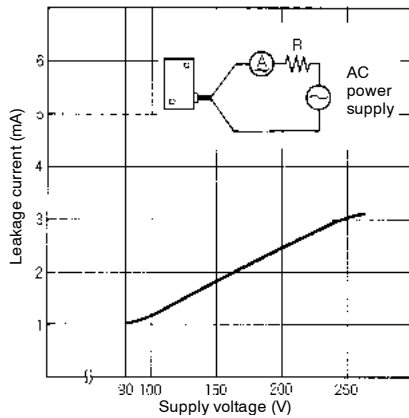


TL-T5M



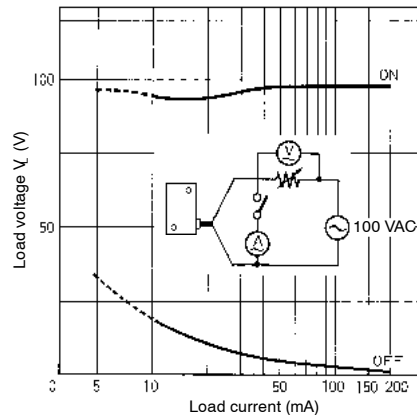
LEAKAGE CURRENT (TYPICAL)

TL-T□Y

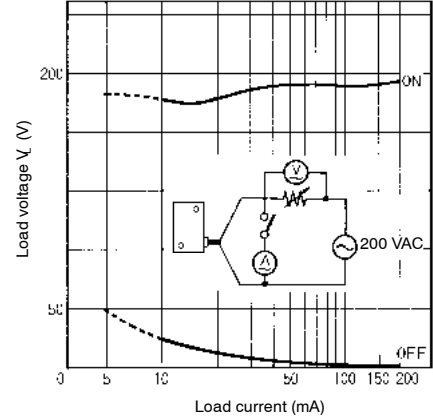


RESIDUAL LOAD VOLTAGE (TYPICAL)

(at constant 100 VAC)

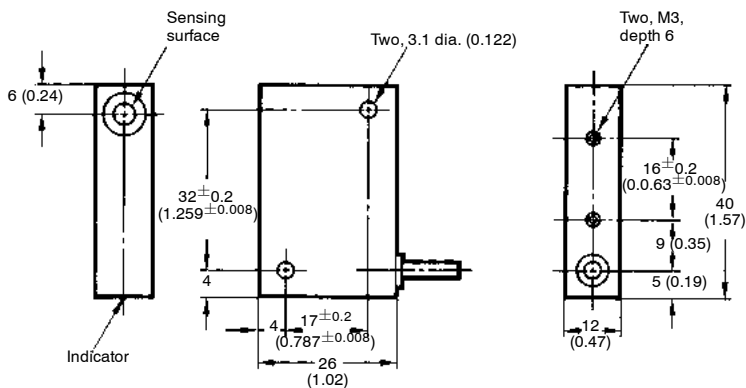


(at constant 200 VAC)



Dimensions

Unit: mm (inch)

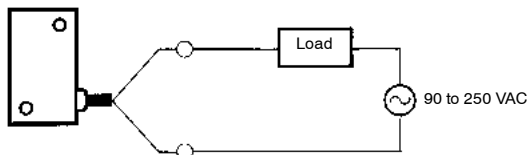


DC switching model: Three, 0.2-mm (0.007 in) conductors
 AC switching model: Two, 0.3-mm (0.012 in) conductors
 Oil- and vibration-resistant, vinyl-insulated round cord,
 4 external dia.; standard length: 2 m (6.56 ft)

Precautions

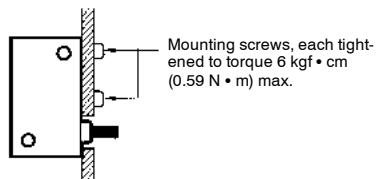
■ CONNECTION TO THE LOAD

Be sure to connect the Proximity Sensor to the power source through a load. Direct connection of the Sensor may damage the Sensor.

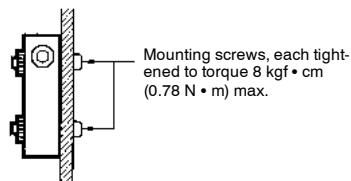


■ MOUNTING

At the time of rear mounting, be sure that the tightening torque does not exceed 6 kgf • cm (0.59 N • m) 5.22 in • lbf.

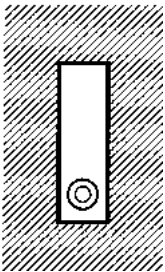
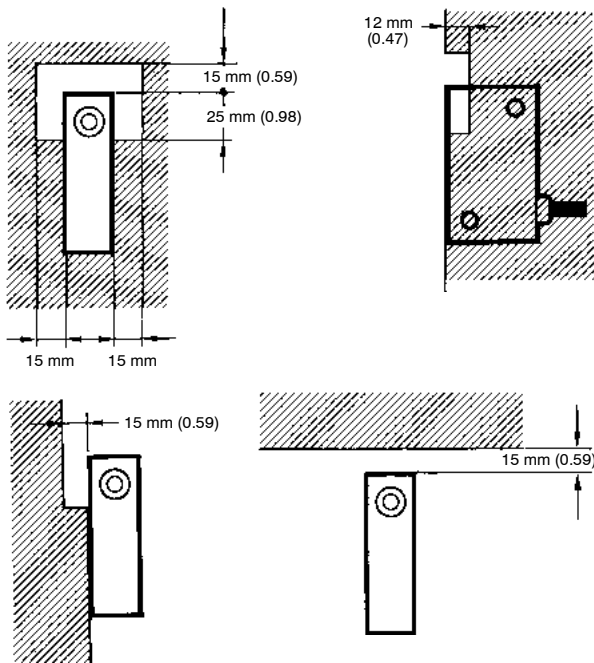


At the time of side mounting, be sure that the tightening torque does not exceed 8 kgf • cm (0.78 N • m) 2.02 in • lbf.



EFFECT OF SURROUNDING METALS

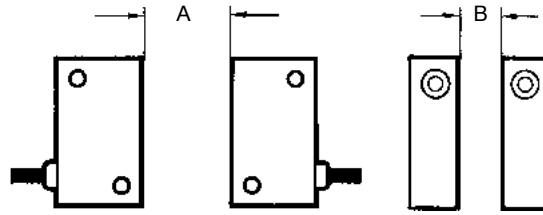
If the TL-T5M is embedded in metal, keep at least the following distances between the TL-T and the metal.



If the TL-T2 is embedded in metal, the TL-T2 will not be influenced by metal.

MUTUAL INTERFERENCE

When two or more TL-T sensors are mounted face-to-face or side-by-side, separate them as shown below. The table below indicates the minimum distances A and B.



| Distance | A | B |
|----------|------------------|-----------------|
| TL-T5□□ | 120 mm (4.72 in) | 80 mm (3.15 in) |
| TL-T5□□5 | 60 mm (2.36 in) | 40 mm (1.57 in) |
| TL-T2□□ | 40 mm (1.57 in) | 12 mm (0.47 in) |
| TL-T2□□5 | 10 mm (0.39 in) | 0 mm |

Note: Figures in parentheses will apply if the Sensors in use are different from each other in response frequency.

NOTE: DIMENSIONS SHOWN ARE IN MILLIMETERS. To convert millimeters to inches divide by 25.4.

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