Slim Proximity Sensor

TL-T

CSM_TL-T_DS_E_2_1

Slim Model of Width 12 mm.

• Ideal for side-by-side mounting.

⚠ Be sure to read *Safety Precautions* on page 5.

Ordering Information

Appearance	Sensing distance	Output specifications		Model	
				Output configuration	
				NO	NC
Shielded	2 mm	DC 3-wire models	NPN	TL-T2E1	TL-T2E2
			PNP	TL-T2F1	---
		AC 2-wire models		TL-T2Y1	TL-T2Y2
Unshielded	5 mm	DC 3-wire models	NPN	TL-T5ME1	TL-T5ME2
		AC 2-wire models		TL-T5MY1	TL-T5MY2

Note: Models with a different frequency are available. The model numbers are TL-T□□□5. (e.g., TL-T2E15).

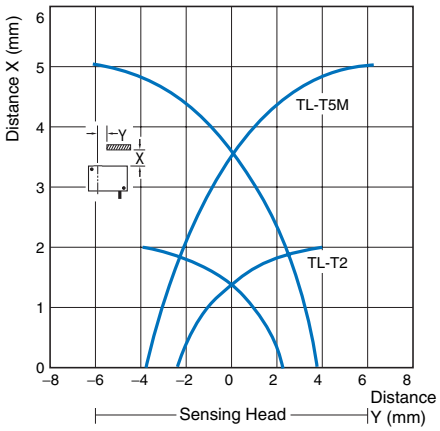
Ratings and Specifications

Item \ Model	TL-T2E1 TL-T2E2 TL-T2F1	TL-T2Y1 TL-T2Y2	TL-T5ME1 TL-T5ME2	TL-T5MY1 TL-T5MY2
Sensing distance	2 mm±10%		5 mm±10%	
Setting distance	0 to 1.6 mm		0 to 4 mm	
Differential travel	10% max. of sensing distance			
Sensing object	Ferrous metal (The sensing distance decreases with non-ferrous metal. Refer to *Engineering Data* on page 3.)			
Standard sensing object	Iron 12 × 12 × 1 mm		Iron 15 × 15 × 1 mm	
Response frequency	E and F models: 800 Hz, Y models: 20 Hz		E models: 250 Hz, Y models: 20 Hz	
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			
Control output – **Switching capacity**	E and F models: 100 mA max. at 12 VDC, 200 mA max. at 24 VDC Y models: 10 to 200 mA			
Control output – **Residual voltage**	E and F models: 1.0 V max. with a load current of 100 mA and cord length of 2 m Y models: Refer to *Residual Voltage (Typical)* on page 3.			
Indicators	Detection indicator (red)			
Operation mode (with sensing object approaching)	E1 models: NO E2 models: NC F1 models: NO Y1 models: NO Y2 models: NC Refer to *I/O Circuit Diagrams* Timing Chart on page 4.			
Circuit protection	E models: Reverse connection protection and surge absorber Y models: Surge absorber			
Ambient temperature	Operating/Storage: –25°C to 70°C (with no icing or condensation)			
Ambient humidity	Operating/Storage: 35% to 95% (with no condensation)			
Temperature influence	±10% max. of sensing distance at 23% in the temperature range of –25 to 70°C			
Voltage influence	E and F models: ±2.5% max. of sensing distance within a range of ±15% of the rated power supply voltage Y models: ±2.5% max. of sensing distance within a range of ±10% of the rated power supply voltage			
Insulation resistance	50 MΩ min. (at 500 VDC) between case and current-carrying parts			
Dielectric strength	E and F models: 1,000 VAC, 50/60 Hz for 1 min between case and current-carrying parts Y models: 2,000 VAC, 50/60 Hz for 1 min between case and current-carrying parts			
Vibration resistance (destruction)	10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions			
Shock resistance (destruction)	500 m/s^2 for 10 times each in X, Y, and Z directions			
Degree of protection	IEC IP67, in-house standard for oil-resistance			
Connection method	Pre-wired Models (Standard cable length: 2 m)			
Weight (packed state)	Approx. 70 g			
Material – **Case**	Heat-resistant ABS resin			
Material – **Sensing surface**				
Accessories	Instruction sheet			

Engineering Data (Typical)

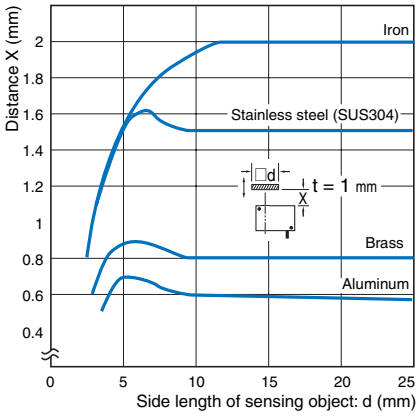
Operating Range

TL-T2□/T5□

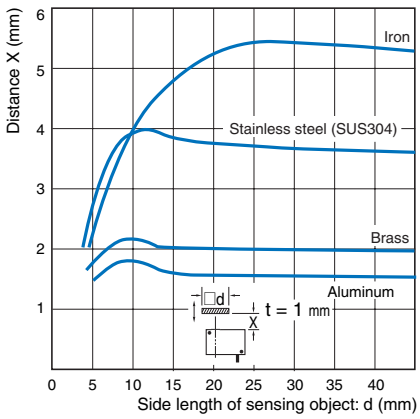


Sensing Object Size and Material Influence

TL-T2

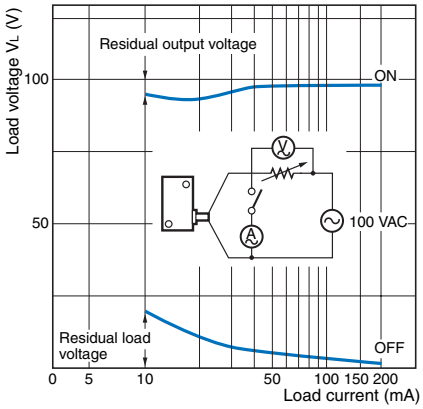


TL-T5M

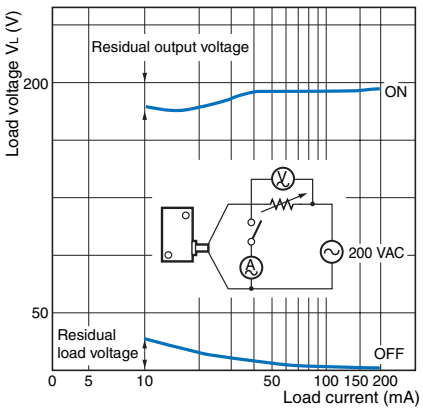


Residual Voltage (Typical)

TL-T□(M)Y□ at 100 VAC

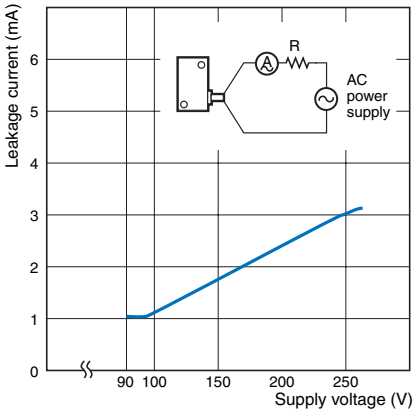


TL-T□(M)Y□ at 200 VAC



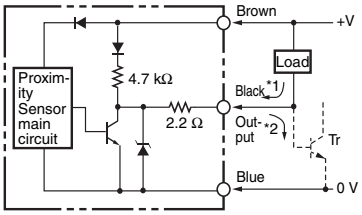
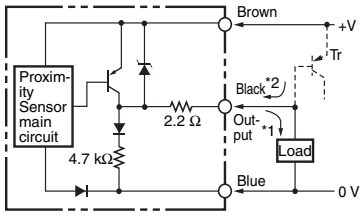
Leakage Current (Typical)

TL-T□Y

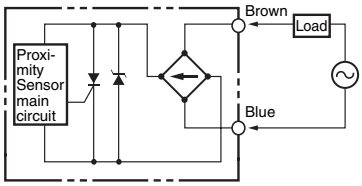


I/O Circuit Diagrams

DC 3-wire Models

Operation mode	Output specifications	Models	Timing charts	Output circuits
NO	NPN	**TL-T2E1** **TL-T5ME1**	Sensing object: Present / Not present Load (between brown and black): Operate / Reset Output voltage (between black and blue): H / L Detection indicator (red): ON / OFF	 *1. 200 mA (load current) *2. When a transistor is connected
NC		**TL-T2E2** **TL-T5ME2**	Sensing object: Present / Not present Load (between brown and black): Operate / Reset Output voltage (between black and blue): H / L Detection indicator (red): ON / OFF	
NO	PNP	**TL-T2F1**	Sensing object: Present / Not present Load (between brown and black): Operate / Reset Output voltage (between black and blue): H / L Detection indicator (red): ON / OFF	 *1. 200 mA (load current) *2. When a transistor is connected

AC 2-wire Models

Operation mode	Models	Timing charts	Output circuits
NO	**TL-T2Y1** **TL-T5MY1**	Sensing object: Present / Not present Load: Operate / Reset Detection indicator (red): ON / OFF	
NC	**TL-T2Y2** **TL-T5MY2**	Sensing object: Present / Not present Load: Operate / Reset Detection indicator (red): ON / OFF	

Safety Precautions

⚠ WARNING

This product is not designed or rated for ensuring safety of persons.
Do not use it for such purposes.

- Do not short the load. Explosion or burning may result.
- Do not supply power to the Sensor with no load connected, otherwise internal parts may be damaged or burnt.
  Applicable Models: AC 2-wire Models

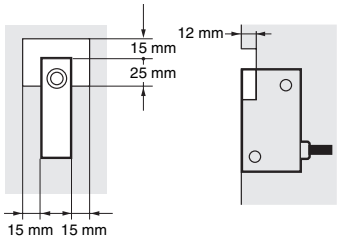
Precautions for Correct Use

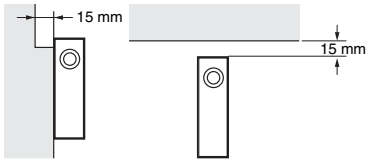
Do not use this product under ambient conditions that exceed the ratings.

● Design

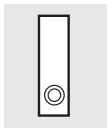
Effect of Surrounding Metals

- Be sure to separate the Sensor from surrounding metal objects as shown in the following illustration.



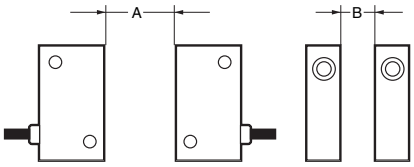


- The TL-T2 will not be influenced by metal when it is embedded in metal.



Mutual Interference

When two or more 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.



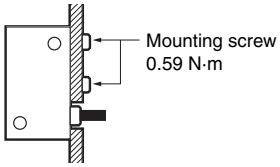
Mutual Interference (Unit: mm)

Model \ Distance	A	B
TL-T2	40 (10)	12 (0)
TL-T5	120 (60)	80 (40)

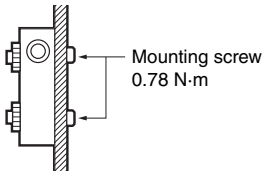
Note: Figures in parentheses will apply if the Sensors in use are different from each other in response frequency.

● Mounting

- At the time of rear mounting, be sure that the tightening torque does not exceed 0.59 N·m.



- At the time of side mounting, be sure that the tightening torque does not exceed 0.78 N·m.

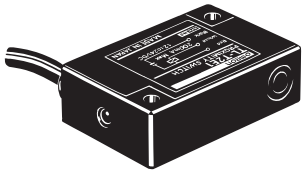


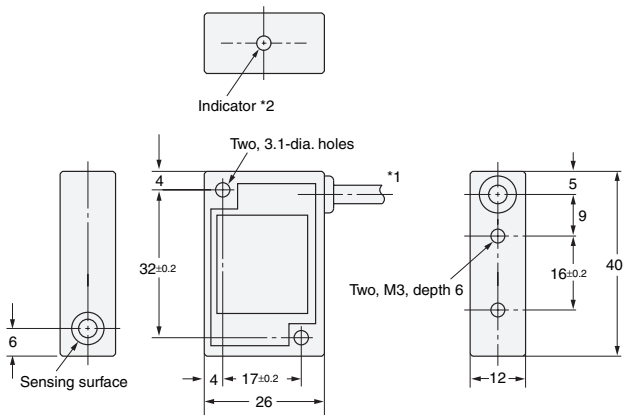
Dimensions

(Unit: mm)

Unless otherwise specified, the tolerance class IT16 is used for dimensions in this data sheet.

TL-T□





*1. DC-switching model: 4.0-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.2 mm², Insulator diameter: 1.2 mm), Standard length: 2 m
AC-switching model: 4.0-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.3 mm², Insulator diameter: 1.3 mm), Standard length: 2 m
*2. Detection indicator (red)

In the interest of product improvement, specifications are subject to change without notice.