

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).

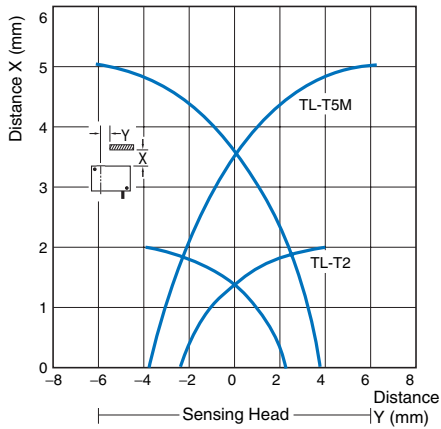
Ratings and Specifications

Model		TL-T2E1 TL-T2E2 TL-T2F1	TL-T2Y1 TL-T2Y2	TL-T5ME1 TL-T5ME2	TL-T5MY1 TL-T5MY2
Item					
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 <i>Engineering Data</i> 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			
	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 <i>Residual Voltage (Typical)</i> on page 3.			
Indicators		Detection indicator (red)			
Operation mode (with sensing object ap- proaching)		E1 models: NO E2 models: NC F1 models: NO Refer to <i>I/O Circuit Diagrams</i> Timing Chart on page 4. Y1 models: NO Y2 models: NC			
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			
	Sensing surface				
Accessories		Instruction sheet			

Engineering Data (Typical)

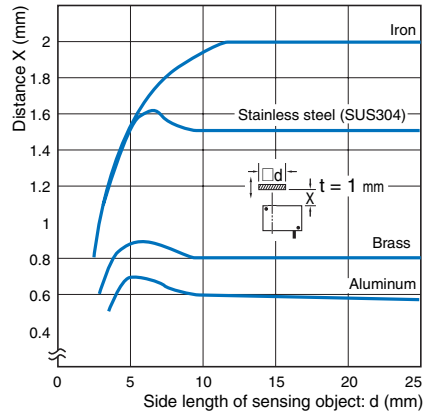
Operating Range

TL-T2□/T5□

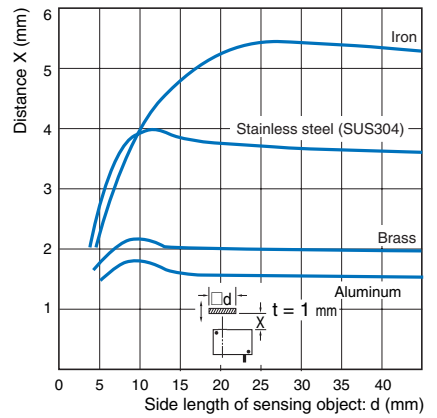


Sensing Object Size and Material Influence

TL-T2



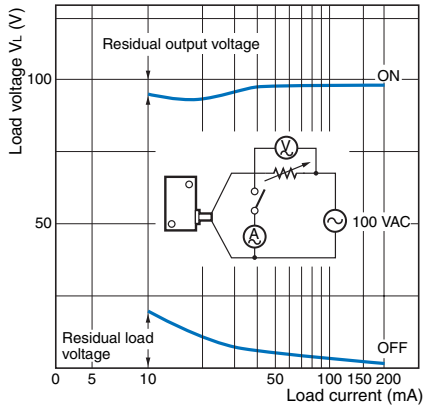
TL-T5M



Residual Voltage (Typical)

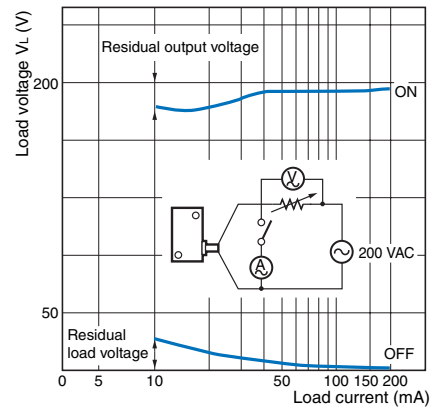
TL-T□(M)Y□

at 100 VAC



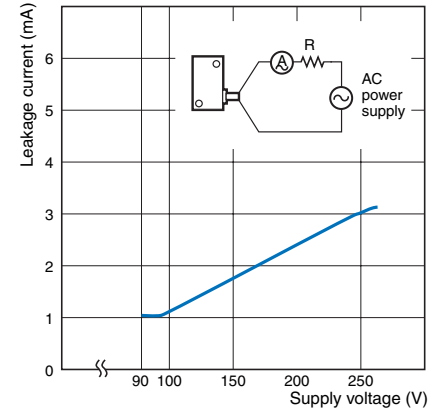
TL-T□(M)Y□

at 200 VAC



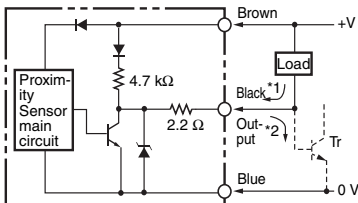
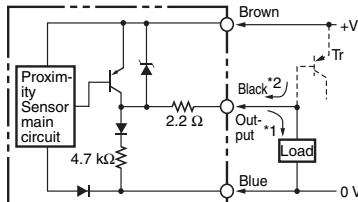
Leakage Current (Typical)

TL-T□Y

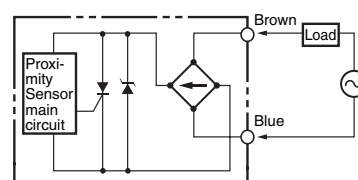


I/O Circuit Diagrams

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



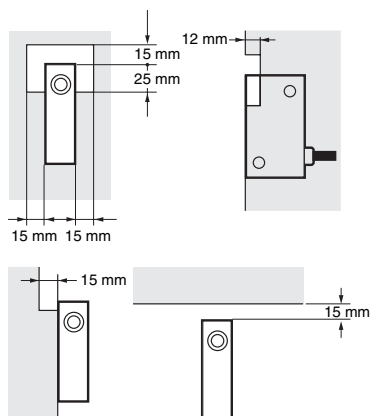
Precautions for Correct Use

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

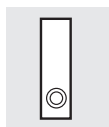
● Design

Effect of Surrounding Metals

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

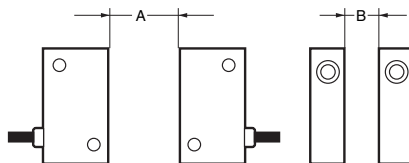


- The TL-T2 will not be influenced by metal when it is embedded in metal.



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

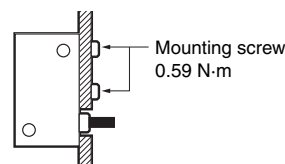
(Unit: mm)

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

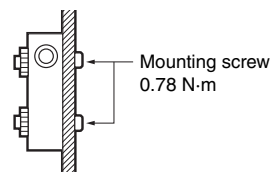
Note: Figures in parentheses will apply if the Sensors in use are different from each other in response frequency.

● 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.

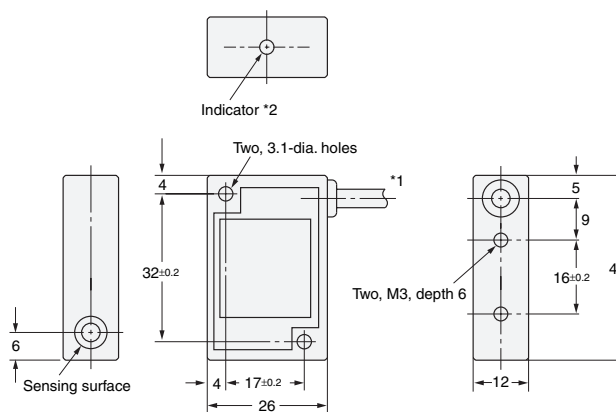
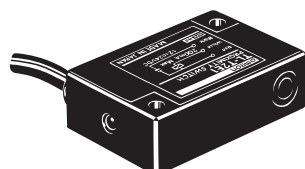


(Unit: mm)

Dimensions

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.