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## As Easy To Install as a Microswitch

- A compact Proximity Sensor with the feel of a microswitch.



 Be sure to read *Safety Precautions* on page 4.

## Ordering Information

Appearance	Sensing distance		Output specifications	Model	
				Operation mode	
				NO	NC
Microswitch type 	2 mm		DC 3-wire, NPN voltage output	TL-M2ME1 2M	TL-M2ME2 2M
			AC 2 wire	TL-M2MY1 2M	---
	5 mm		DC 3-wire, NPN voltage output	TL-M5ME1 2M	TL-M5ME2 2M
			AC 2 wire	TL-M5MY1 2M	---

Note: Models with different frequencies are also available. The model numbers are TL-M□M□□5 (e.g., TL-M2ME15).

## Ratings and Specifications

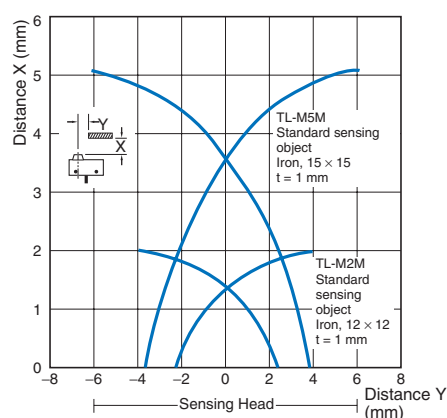
Item	Model	TL-M2ME1, TL-M2ME2, TL-M2MY1	TL-M5ME1, TL-M5ME2, TL-M5MY1
Sensing distance		2 mm ±10%	5 mm ±10%
Set distance		0 to 1.6 mm	0 to 4 mm
Differential travel		10% max. of sensing distance	
Detectable object		Ferrous metal (The sensing distance decreases with non-ferrous metal. Refer to <i>Engineering Data</i> on page 2.)	
Standard sensing object		Iron, 15 × 15 × 1 mm	
Response frequency		E Models: 500 Hz, Y Models: 20 Hz	E Models: 250 Hz, Y Models: 20 Hz
Power supply voltage (operating voltage range)		E 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 Models: 15 mA max. at 24 VDC (no-load)	
Leakage current		Y Models: 2.5 mA max. at 200 VAC	
Control output	Load current	E Models: 100 mA max. at 12 VDC, 200 mA max. at 24 VDC Y Models: 10 to 200 mA	
	Residual voltage	E Models: 1 V max. Y Models: Refer to <i>Residual Output Voltage</i> under <i>Engineering Data</i> on page 3.	
Indicators		E Models: Detection indicator (red) Y Models: Operation indicator (red)	
Operation mode (with sensing object approaching)		E1/Y1 Models: NO E2 Models: NC Refer to the timing charts under <i>I/O Circuit Diagrams</i> on page 3 for details.	
Protection circuits		E Models: Reverse polarity protection, Surge suppressor Y Models: Surge suppressor	
Ambient temperature range		Operating/Storage: -25 to 70°C (with no icing or condensation)	
Ambient humidity range		Operating/Storage: 35% to 95% (with no condensation)	

Item	Model	TL-M2ME1, TL-M2ME2, TL-M2MY1	TL-M5ME1, TL-M5ME2, TL-M5MY1
Temperature influence		±10% max. of sensing distance at 23°C in the temperature range of -25 to 70°C	
Voltage influence		E Models: ±2.5% max. of sensing distance at rated voltage in the rated voltage ±15% range Y Models: ±1% max. of sensing distance at rated voltage in the rated voltage ±10% range	
Insulation resistance		50 MΩ min. (at 500 VDC) between current-carrying parts and case	
Dielectric strength		E Models: 500 VAC, 50/60 Hz for 1 min between current-carrying parts and case Y Models: 2,000 VAC, 50/60 Hz for 1 min between current-carrying parts and case	
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 <sup>2</sup> 10 times each in X, Y, and Z directions	
Degree of protection		IEC 60529 IP67, in-house standards: oil-resistant	
Connection method		Pre-wired Models (Standard cable length: 2 m)	
Weight (packed state)		Approx. 75 g	
Materials	Case	Heat-resistant ABS	
	Sensing surface		
Accessories		Instruction manual	

## Engineering Data (Typical)

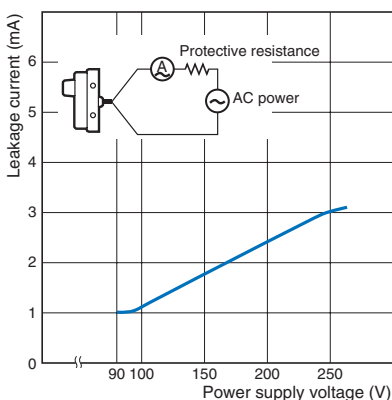
### Sensing Area

TL-M2□/M5□



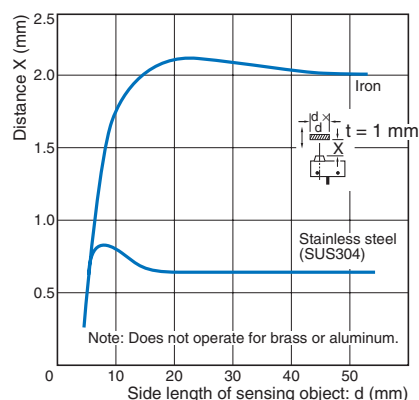
### Leakage Current

TL-M□MY1

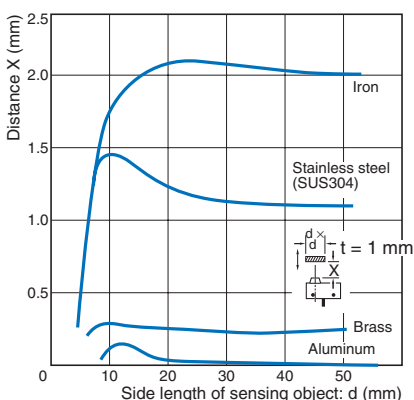


### Influence of Sensing Object Size and Material

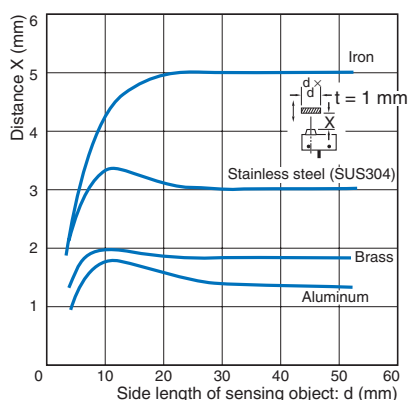
TL-M2ME



TL-M2MY1

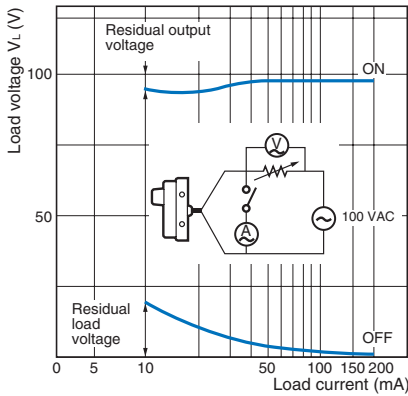


TL-M5M

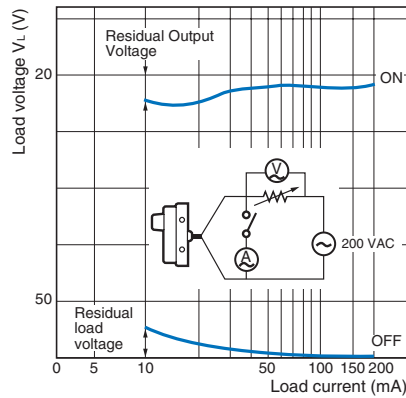


Residual Output Voltage

TL-M□MY1 at 100 VAC



TL-M□MY1 at 200 VAC



I/O Circuit Diagrams

DC 3-Wire Models

Operation mode	Output specifications	Model	Timing chart	Output circuit
NO	NPN	TL-M2ME1 TL-M5ME1	Sensing object: Present (High), None (Low) Load (between brown and black leads): Operate (High), Reset (Low) Output voltage (between black and blue leads): High, Low Detection indicator (red): ON, OFF	
		TL-M2ME2 TL-M5ME2	Sensing object: Present (High), None (Low) Load (between brown and black leads): Operate (High), Reset (Low) Output voltage (between black and blue leads): High, Low Detection indicator (Red): ON, OFF	

\*1. 200 mA max. (load current).  
\*2. When a transistor is connected.

AC 2-Wire Models

Operation mode	Model	Timing chart	Output circuit
NO	TL-M2MY1 TL-M5MY1	Sensing object: Present (High), None (Low) Load: Operate (High), Reset (Low) Operation indicator (Red): ON, OFF	

## Safety Precautions

Refer to *Warranty and Limitations of Liability*.

### ⚠ WARNING

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



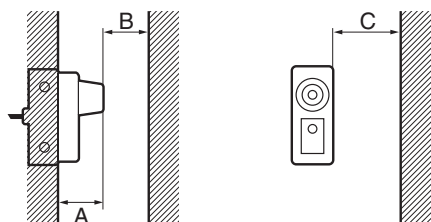
### Precautions for Correct Use

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

#### ● Design

##### Influence of Surrounding Metal

When installing Sensors on metal surfaces or near metal, ensure that the minimum distances given in the following table are maintained.



Note: For direct mounting, the distance "C" will equal 0 only in the shaded section of the above left-side section.

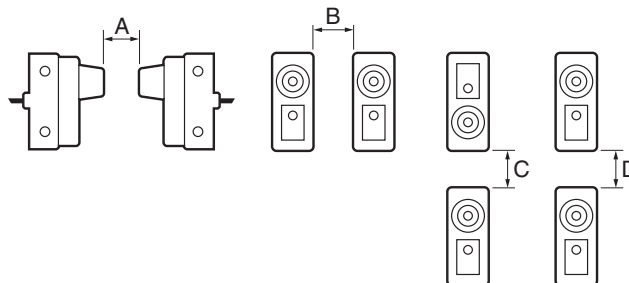
##### Influence of Surrounding Metal

(Unit: mm)

Model	Distance	A	B	C
TL-M2M		12	10	15
TL-M5M		18	25	30

#### Mutual Interference

When installing Sensors face-to-face or side-by-side, ensure that the minimum distances given in the following table are maintained.



#### Mutual Interference

(Unit: mm)

Model	Distance	A	B	C	D
TL-M2M		60 (30)	40 (0)	30 (0)	10 (0)
TL-M5M		120 (60)	80 (40)	70 (30)	50 (10)

Note: Values in parentheses apply to Sensors operating at different frequencies.

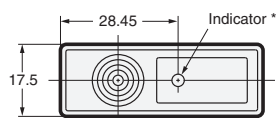
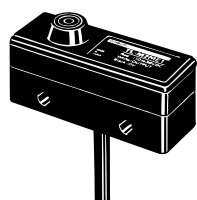
#### ● Mounting

The maximum tightening torque that should be applied to the mounting screws is 0.98 N·m.

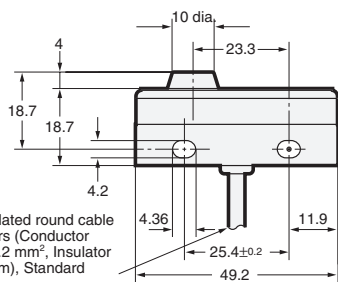
## Dimensions

(Unit: mm)  
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

### TL-M2M

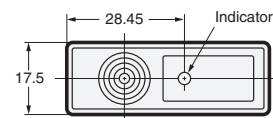
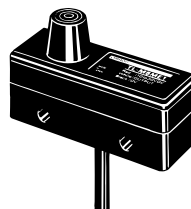


\* E Models: Detection indicator (red),  
Y Models: Operation indicator (red)

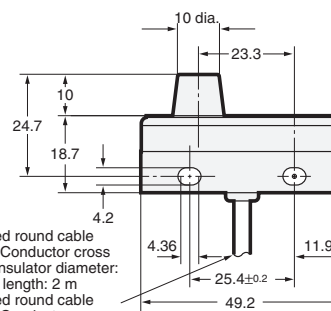


E Models: 4-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.2 mm<sup>2</sup>, Insulator diameter: 1.2 mm), Standard length: 2 m  
Y Models: 4-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.3 mm<sup>2</sup>, Insulator diameter: 1.3 mm), Standard length: 2 m

### TL-M5M



\* E Models: Detection indicator (red),  
Y Models: Operation indicator (red)



E Models: 4-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.2 mm<sup>2</sup>, Insulator diameter: 1.2 mm), Standard length: 2 m  
Y Models: 4-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.3 mm<sup>2</sup>, Insulator diameter: 1.3 mm), Standard length: 2 m

## Read and Understand This Catalog

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2008.11

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