





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

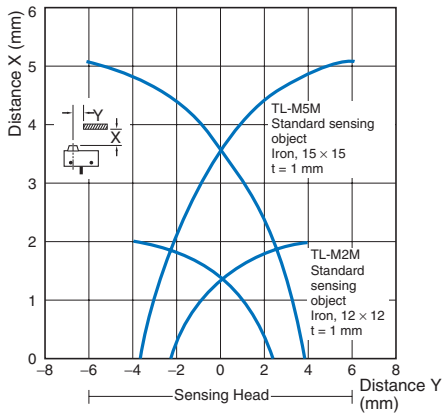
Item		Model	TL-M2ME1, TL-M2ME2, TL-M2MY1	TL-M5ME1, TL-M5ME2, TL-M5MY1
Sensing distance			2 mm ±10%	5 mm ±10%
Set distance			0 to 1.6 mm	0 to 4 mm
Differential travel			10% max. of sensing distance	
Detectable object			Ferrous metal (The sensing distance decreases with non-ferrous metal. Refer to <i>Engineering 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		$\pm 10\%$ max. of sensing distance at 23°C in the temperature range of -25 to 70°C	
Voltage influence		E Models: $\pm 2.5\%$ max. of sensing distance at rated voltage in the rated voltage $\pm 15\%$ range Y Models: $\pm 1\%$ max. of sensing distance at rated voltage in the rated voltage $\pm 10\%$ range	
Insulation resistance		50 M Ω 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 ² 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)

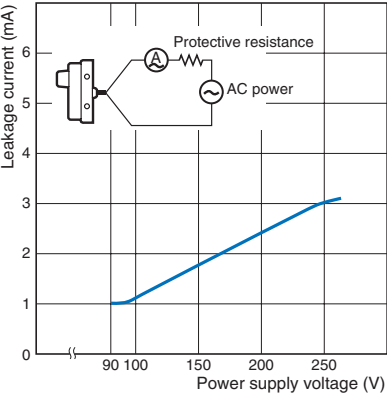
Sensing Area

TL-M2□/M5□



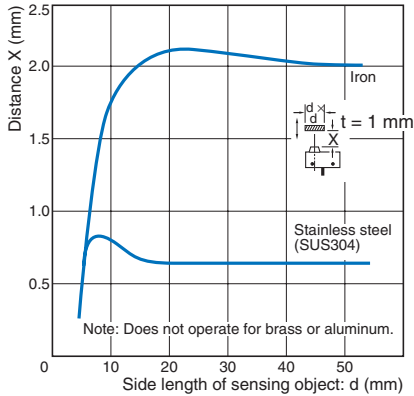
Leakage Current

TL-M□MY1

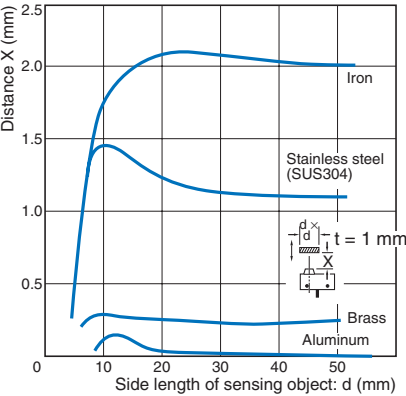


Influence of Sensing Object Size and Material

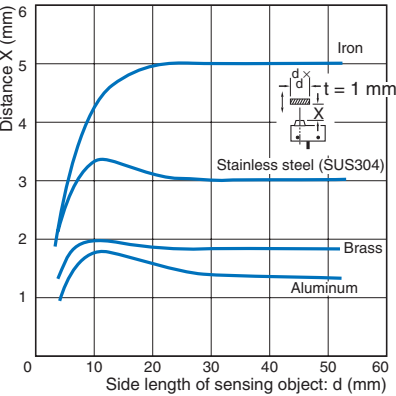
TL-M2ME



TL-M2MY1

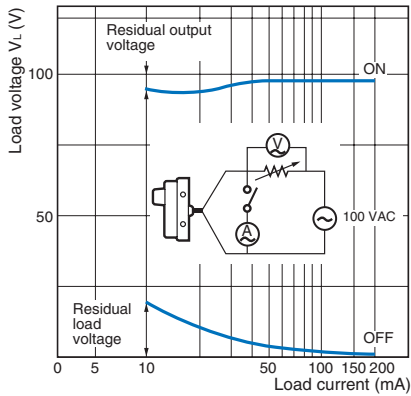


TL-M5M

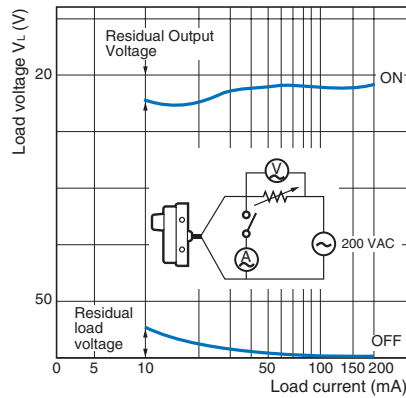


Residual Output Voltage

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 (ON), None (OFF) Load (between brown and black leads): Operate (ON), Reset (OFF) Output voltage (between black and blue leads): High (ON), Low (OFF) Detection indicator (red): ON (ON), OFF (OFF)	<p>*1. 200 mA max. (load current). *2. When a transistor is connected.</p>
NC		TL-M2ME2 TL-M5ME2	Sensing object: Present (ON), None (OFF) Load (between brown and black leads): Operate (ON), Reset (OFF) Output voltage (between black and blue leads): High (ON), Low (OFF) Detection indicator (Red): ON (ON), OFF (OFF)	

AC 2-Wire Models

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



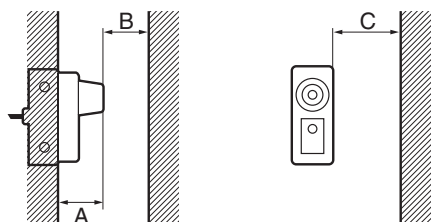
Precautions for Correct Use

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.

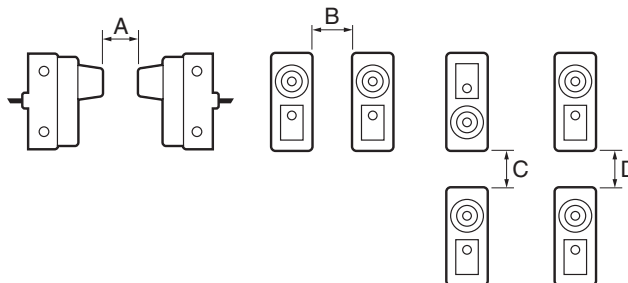
Influence of Surrounding Metal

(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.

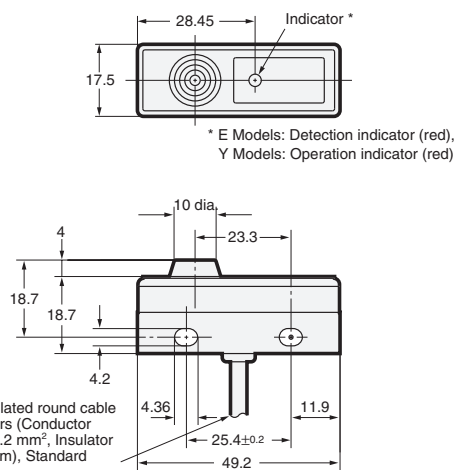
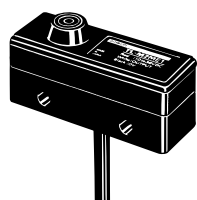
● Mounting

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

Dimensions

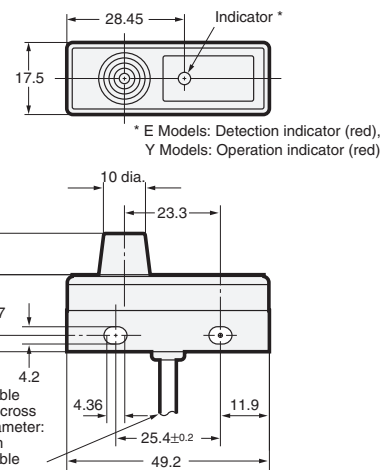
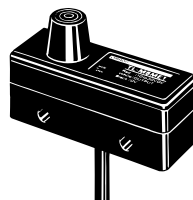
(Unit: mm)
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

TL-M2M



E Models: 4-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.2 mm², 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 mm², Insulator diameter: 1.3 mm), Standard length: 2 m

TL-M5M



E Models: 4-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.2 mm², 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 mm², Insulator diameter: 1.3 mm), Standard length: 2 m

Read and Understand This Catalog

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

Warranty and Limitations of Liability

WARRANTY

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

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The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products:

- Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this catalog.
- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCTS ARE PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

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OMRON shall not be responsible for the user's programming of a programmable product, or any consequence thereof.

Disclaimers

CHANGE IN SPECIFICATIONS

Product specifications and accessories may be changed at any time based on improvements and other reasons.

It is our practice to change model numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the products may be changed without any notice. When in doubt, special model numbers may be assigned to fix or establish key specifications for your application on your request. Please consult with your OMRON representative at any time to confirm actual specifications of purchased products.

DIMENSIONS AND WEIGHTS

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

PERFORMANCE DATA

Performance data given in this catalog is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of OMRON's test conditions, and the users must correlate it to actual application requirements. Actual performance is subject to the OMRON Warranty and Limitations of Liability.

ERRORS AND OMISSIONS

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2008.11

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