TL-N/TL-Q

CSM_TL-N/TL-Q_DS_E_14_1

A Wealth of Models for All Types of Applications

- Easy installation, high-speed pulse generator, high-speed rotation control, and more.
- Direct mounted to metal (-N Models).
- A wealth of models ideal for limit control, counting control, and other applications (-N Models).



For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

Ordering Information

Sensors [Refer to Dimensions on page 10.]

DC 2-Wire Models

Appearance		Sensing distance		Model Operation mode		
					17 × 17	5 mm
Unshielded	25 × 25	7 mm		TL-N7MD1 2M *1	TL-N7MD2 2M *1	
	30 ×30	12 m	nm	TL-N12MD1 2M *1	TL-N12MD2 2M *1	
	40 × 40		20 mm	TL-N20MD1 2M *1	TL-N20MD2 2M *1	

^{*1.} Models with a different frequency are available to prevent mutual interference. The model numbers are TL-N DD 5 and TL-Q5MD 5 (e.g., TL-N7MD 15).

DC 3-Wire and AC 2-Wire Models

Appearance		Sensing distance Output configuratio		Model		
				Output configuration	Operation mode	
					NO NC	
	8 × 9	2 mm		DC 3-wire, NPN	TL-Q2MC1 2M	_
	17 × 17	E mm		DC 3-WIIE, INFIN	TL-Q5MC1 2M *1 *2	TL-Q5MC2 2M
	17 × 17	5 mm		DC 3-wire, PNP	TL-Q5MB1 2M	_
	25 × 25			DC 3-wire, NPN	TL-N5ME1 2M *1 *2	TL-N5ME2 2M *1
Unshielded		5 mm		AC 2-wire	TL-N5MY1 2M *1	TL-N5MY2 2M *1
	30 × 30			DC 3-wire, NPN	TL-N10ME1 2M *1 *2	TL-N10ME2 2M *1
1772		10 mm	m	DC 3-wire, PNP	TL-N10MF1 2M *1	_
				AC 2-wire	TL-N10MY1 2M *1	TL-N10MY2 2M *1
	40 × 40		00	DC 3-wire, NPN	TL-N20ME1 2M *1 *2	TL-N20ME2 2M *1
	40 × 40		20 mm	AC 2-wire	TL-N20MY1 2M *1	TL-N20MY2 2M *1

^{*1.} Models with a different frequency are available to prevent mutual interference. The model numbers are TL-□□M□□5 (e.g., TL-N5ME15).

^{*2.} Models are also available with robotics (bend resistant) cables . Add "-R" to the model number. (e.g., TL-Q5MD1-R 2M)

 $^{^{\}star}2$. Models are also available with robotics (bend resistant) cables . Add $^{\circ}-R$ to the model number. (e.g., TL-Q5MC1-R 2M)

Accessories (Order Separately)

Mounting Brackets A Mounting Bracket is provided with the Sensor depending on the model number. Check the column for the applicable Sensor. [Refer to *Dimensions* on page 11.]

Туре	Model	Applicable Sensors		
Туре	Woder	Provided with these Sensors	Order separately	
	Y92E-C5	TL-N5ME□, TL-N7MD□	TL-N5MY□	
Mounting Brackets	Y92E-C10	TL-N10ME□, TL-N12MD□, TL-N10MF1□	TL-N10MY□	
	Y92E-C20	TL-N20ME□, TL-N20MD□	TL-N20MY□	
Mounting Brackets for Conduits	Y92E-N5C15		TL-N5ME□, TL-N5MY□	
Modifiling Brackets for Conduits	Y92E-N10C15		TL-N10ME□, TL-N10MY□	

Ratings and Specifications

DC 2-Wire Models

Item	Model	TL-Q5MD□	TL-N7MD□	TL-N12MD□	TL-N20MD□		
Sensing d	listance	5 mm ±10%	7 mm ±10%	12 mm ±10%	20 mm ±10%		
Set distan	ice	0 to 4 mm	0 to 5.6 mm	0 to 9.6 mm	0 to 16 mm		
Differentia	al travel	10% max. of sensing distance					
Detectable	e object	Ferrous metal (The sensing dista	nce decreases with non-ferrous me	tal. Refer to <i>Engineering Data</i> on p	page 5.)		
Standard object	sensing	Iron, 18 × 18 × 1 mm	Iron, 30 × 30 × 1 mm	Iron, 40 × 40 × 1 mm	Iron, 50 × 50 × 1 mm		
Response		500 Hz			300 Hz		
Power sur (operating range)	pply voltage g voltage	12 to 24 VDC (10 to 30 VDC), rip	ole (p-p): 10% max.				
Leakage o	current	0.8 mA max.					
Control	Load current	3 to 100 mA					
output	Residual voltage	3.3 V max. (Load current: 100 mA	a, Cable length: 2 m)				
Indicators	•	D1 Models: Operation indicator (r D2 Models: Operation indicator (r					
Operation (with sens approach	sing object	ing object Dr Models: NO Refer to the timing charts under I/O Circuit Diagrams on page 7 for details.					
Protection	n circuits	Load short-circuit protection, Surg	ge suppressor				
Ambient temperatu	ıre range	Operating/Storage: -25 to 70°C (with no icing or condensation)				
Ambient humidity	range	Operating/Storage: 35% to 95% (with no condensation)				
Temperat	ure influence	±10% max. of sensing distance a	t 23°C in the temperature range of	–25 to 70°C			
Voltage in	fluence	±2.5% max. of sensing distance a	t rated voltage in the rated voltage	±15% range			
Insulation	resistance	50 M $Ω$ min. (at 500 VDC) betwee	n current-carrying parts and case				
Dielectric	strength	1,000 VAC for 1 min between cur	rent-carrying parts and case				
Vibration resistance	е	Destruction: 10 to 55 Hz, 1.5-mm	double amplitude for 2 hours each	in X, Y, and Z directions			
Shock res	sistance	Destruction: 500 m/s ² 3 times each in X, Y, and Z directions	Destruction: 1,000 m/s² 10 times	each in X, Y, and Z directions			
Degree of	protection	IEC 60529 IP67, in-house standa	rds: oil-resistant				
Connection method Pre-w		Pre-wired Models (Standard cable	e length: 2 m)				
Weight (p	acked state)	Approx. 85 g	Approx. 165 g	Approx. 235 g	Approx. 330 g		
	Case			•	•		
Materials	Sensing surface	Heat-resistant ABS					
Accessor	ies	Instruction manual	Mounting Bracket, Mounting phillips screws (M4 × 25), Instruction manual	Mounting Bracket, Mounting phillips screws (M4 × 30), Instruction manual	Mounting Bracket, Mounting phillips screws (M5 × 40), Instruction manual		

^{*} The response frequency is an average value.

Measurement conditions are as follows: standard sensing object, a distance of twice the standard sensing object, and a set distance of half the sensing distance.

DC 3-Wire Models

Sendidistance	Item	Model	TL-Q2MC1	TL-Q5MC□/TL-Q5MB1			
Differential travel 10% max. of sensing distance 10% max. of sensing distance decreases with non-ferrous metal. Refer to Engineering Data on page 6.)			2 mm ±15%	5 mm ±10%			
Detectable object Ferrous metal (The sensing distance decreases with non-ferrous metal. Refer to Engineering Dafa on page 6.) Standard Iron, 8 × 8 × 1 mm Iron, 15 × 15 × 1	Set dista	ance	0 to 1.5 mm	0 to 4 mm			
Iron, 15 × 15 × 1 mm Iron, 15 × 15 × 1 mm Iron, 15 × 15 × 1 mm	Different	ferential travel 10% max. of sensing distance					
Iron, 19 x 19 x 1 mm Iron, 19 x 19 x 10 mm Iron, 19 x 19 x 19 x 10 mm Iron, 19 x 19 x 19 x 10 mm Iron, 19 x 19 x 19 x 19 x 10 mm Iron, 19 x 19	Detectab	ole object	Ferrous metal (The sensing distance decreases with non-ferrous metal. Refer to Engineering Data on page 6.)				
Response frequency Frequen		~	Iron, 8 × 8 × 1 mm	Iron, 15 × 15 × 1 mm			
Power supply voltage (operating voltage range) Load Current Consumption 15 mA max. at 24 VDC (no-load) 10 mA max. at 24 VDC 10 mA max. at 24 VDC 10 mA max. at 24 VDC 10 mA max. at 30 VDC max. 10 mA max. at 30 V	Respons	se time		2 ms max.			
age (operating voltage range) Current consumption Load Control current output Residual voltage Indicators Detection indicator incincuits Refer to the timing charts under DC 3-Wire Models on page 7 for details. Reverse polarity protection, Surge suppressor Ambient temperature range Ambient femileunce 12.5% max. of sensing distance at rated voltage influence 12.5% max. of sensing distance at rated voltage influence 12.5% max. of sensing distance at rated voltage in rated voltage influence 12.5% max. of sensing distance at rated voltage influence 15.0% MC Protection 10.0% Call for incincuits 10			500) Hz			
The max at 24 VDC (no-load) The max at 24 VDC (no-load) The max at 24 VDC (no-load)	age (ope	erating volt-	12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.				
Load current Control output Contr		ption	15 mA max. at 24 VDC (no-load)	10 mA max. at 24 VDC			
voltage 2 m Detection indicator (red)				50 mA max. at 30 VDC max. TL-Q5MB□: PNP open collector,			
Operation mode (with sensing object approaching) NO B1/C1 Models: NO C2 Models: NO C2 Models: NO C2 Models: NO Refer to the timing charts under DC 3-Wire Models on page 7 for details. Protection circuits Reverse polarity protection, Surge suppressor Ambient emperature range Operating/Storage: -10 to 60°C (with no icing or condensation) Operating/Storage: -25 to 70°C (with no icing or condensation) Temperature influence ±10% max. of sensing distance at 23°C in the temperature range of -10 to 60°C ±20% max. of sensing distance at 23°C in the temperature range of -25 to 70°C Voltage influence ±2.5% max. of sensing distance at rated voltage in rated voltage ±10% range Insulation resistance 50 MΩ min. (at 500 VDC) between current-carrying parts and case 5 MΩ min. (at 500 VDC) between current-carrying parts and case Dielectric strength 1,000 VAC for 1 min between current-carrying parts and case 500 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: 1,000 m/s² 10 times each in X, Y, and Z directions Destruction: 200 m/s² 10 times each in X, Y, and Z directions Degree of protection IEC 60529 IP67, in-house standards: oil-resistant IEC IP67 Case Sensing surface Sensing surface			,				
Refer to the timing charts under DC 3-Wire Models on page 7 for details. Protection circuits Reverse polarity protection, Surge suppressor Ambient temperature range Ambient humidity range 110% max. of sensing distance at 23°C in the temperature range of -10 to 60°C Voltage influence 12.5% max. of sensing distance at 23°C in the temperature range of -25 to 70°C Voltage influence 15.5% max. of sensing distance at 23°C in the temperature range of -25 to 70°C Voltage influence 15.5% max. of sensing distance at 23°C in the temperature range of -25 to 70°C Voltage influence 15.5% max. of sensing distance at 23°C in the temperature range of -25 to 70°C Voltage influence 15.5% max. of sensing distance at 23°C in the temperature range of -25 to 70°C Voltage influence 15.5% max. of sensing distance at 23°C in the temperature range of -25 to 70°C Voltage influence 15.5% max. of sensing distance at 23°C in the temperature range of -25 to 70°C Voltage influence 15.5% max. of sensing distance at 23°C in the temperature range of -25 to 70°C Voltage influence 15.0% max. of sensing distance at 23°C in the temperature range of -25 to 70°C 16.6% max. of sensing distance at 23°C in the temperature range of -25 to 70°C Voltage influence 15.0% max. of sensing distance at 23°C in the temperature range of -25 to 70°C 15.0% max. of sensing distance at 23°C in the temperature range of -25 to 70°C 15.0% max. of sensing surface 15.0% max. of sensing distance at 23°C in the temperature range of -25 to 70°C Weight (packed state) Approx. 60 g Approx. 90 g Approx. 90 g Approx. 90 g	Indicato	rs	Detection indicator (red)				
Protection circuits Reverse polarity protection, Surge suppressor Operating/Storage: -10 to 60°C (with no icing or condensation) Operating/Storage: -25 to 70°C (with no icing or condensation) Operating/Storage: -25 to 70°C (with no icing or condensation) Temperature range ± 10% max. of sensing distance at 23°C in the temperature range of -10 to 60°C Voltage influence ± 2.5% max. of sensing distance at rated voltage in rated voltage ± 10% range Insulation resistance Dielectric strength Vibration Destruction: 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions Destruction: 1,000 m/s² 10 times each in X, Y, and Z directions Degree of protection in-house standards: oil-resistant Pre-wired Models (Standard cable length: 2 m) Weight (packed state) Case Sensing surface Perevired Models (Standard cable length: 2 m) Ambient (Departing/Storage: -25 to 70°C (with no icing or condensation) Departing/Storage: -25 to 70°C (with no icing or condensation) Departing/Storage: -25 to 70°C (with no icing or condensation) **Loop Condensation** Leo Condensation	(with ser	nsing object	NO				
circuits Heverse polarity protection, Surge suppressor Ambient emperature range temperature range Operating/Storage: -10 to 60°C (with no icing or condensation) Ambient humidity range Operating/Storage: 35% to 95% (with no condensation) Temperature influence ±10% max. of sensing distance at 23°C in the temperature range of -10 to 60°C ±20% max. of sensing distance at 23°C in the temperature range of -25 to 70°C Voltage influence ±2.5% max. of sensing distance at rated voltage in rated voltage ±10% range Insulation resistance 50 MΩ min. (at 500 VDC) between current-carrying parts and case 5 MΩ min. (at 500 VDC) between current-carrying parts and case Dielectric strength 1,000 VAC for 1 min between current-carrying parts and case 500 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: 1,000 m/s² 10 times each in X, Y, and Z directions Destruction: 200 m/s² 10 times each in X, Y, and Z directions Connection method Pre-wired Models (Standard cable length: 2 m) Approx. 90 g Approx. 90 g Materials Sensing surface Heat-resistant ABS	approac	hing)	Refer to the timing charts under <i>DC 3-Wire Models</i> on page 7 for details.				
Ambient humidity range ± 10% max. of sensing distance at 23°C in the temperature influence ± 20% max. of sensing distance at 23°C in the temperature range of −10 to 60°C Voltage influence ± 2.5% max. of sensing distance at rated voltage in rated voltage ± 10% range Insulation resistance 50 MΩ min. (at 500 VDC) between current-carrying parts and case 5 MΩ min. (at 500 VDC) between current-carrying parts and case Dielectric strength 1,000 VAC for 1 min between current-carrying parts and case 500 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: 1,000 m/s² 10 times each in X, Y, and Z directions Destruction: 200 m/s² 10 times each in X, Y, and Z directions Degree of protection IEC 60529 IP67, in-house standards: oil-resistant IEC IP67 Connection method Pre-wired Models (Standard cable length: 2 m) Approx. 90 g Materials Case Sensing surface Sensing surface Heat-resistant ABS		on	Reverse polarity protection, Surge suppressor				
Temperature influence			, , ,				
Influence range of -10 to 60°C range of -25 to 70°C Voltage influence ±2.5% max. of sensing distance at rated voltage in rated voltage ±10% range Insulation resistance 50 MΩ min. (at 500 VDC) between current-carrying parts and case 5 MΩ min. (at 500 VDC) between current-carrying parts and case Dielectric strength 1,000 VAC for 1 min between current-carrying parts and case 500 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: 1,000 m/s² 10 times each in X, Y, and Z directions Destruction: 200 m/s² 10 times each in X, Y, and Z directions Degree of protection IEC 60529 IP67, in-house standards: oil-resistant IEC IP67 Connection method Pre-wired Models (Standard cable length: 2 m) Weight (packed state) Approx. 60 g Approx. 90 g Materials Sensing surface Heat-resistant ABS			Operating/Storage: 35% to 95% (with no condensation)				
Insulation resistance±2.5% max. of sensing distance at rated voltage ±10% rangeInsulation resistance50 MΩ min. (at 500 VDC) between current-carrying parts and case5 MΩ min. (at 500 VDC) between current-carrying parts and caseDielectric strength1,000 VAC for 1 min between current-carrying parts and case500 VAC, 50/60 Hz for 1 min between current-carrying parts and caseVibration resistanceDestruction: 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directionsShock resistanceDestruction: 1,000 m/s² 10 times each in X, Y, and Z directionsDegree of protectionIEC 60529 IP67, in-house standards: oil-resistantDestruction: 200 m/s² 10 times each in X, Y, and Z directionsConnection methodPre-wired Models (Standard cable length: 2 m)Approx. 90 gMaterialsCase Sensing surfaceHeat-resistant ABS							
resistanceand casecasecaseDielectric strength1,000 VAC for 1 min between current-carrying parts and case500 VAC, 50/60 Hz for 1 min between current-carrying parts and caseVibration resistanceDestruction: 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directionsShock resistanceDestruction: 1,000 m/s² 10 times each in X, Y, and Z directionsDegree of protectionIEC 60529 IP67, in-house standards: oil-resistantIEC IP67Connection methodPre-wired Models (Standard cable length: 2 m)Weight (packed state)Approx. 60 gApprox. 90 gMaterialsCase Sensing surfaceHeat-resistant ABS		e	±2.5% max. of sensing distance at rated voltage in rated vo	Itage ±10% range			
Vibration resistance Destruction: 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions Destruction: 1,000 m/s² 10 times each in X, Y, and Z directions Degree of protection Destruction: 200 m/s² 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. 60 g Materials Case Sensing surface Approx. 4BS				, , , , , , , , , , , , , , , , , , , ,			
Shock resistance Destruction: 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions Destruction: 1,000 m/s² 10 times each in X, Y, and Z directions Degree of protection Destruction: 200 m/s² 10 times each in X, Y, and Z directions IEC 60529 IP67, in-house standards: oil-resistant Connection method Pre-wired Models (Standard cable length: 2 m) Weight (packed state) Approx. 60 g Materials Case Sensing surface Heat-resistant ABS	Dielectri	c strength					
Degree of protection IEC 60529 IP67, in-house standards: oil-resistant IEC IP67 Connection method Pre-wired Models (Standard cable length: 2 m) Weight (packed state) Approx. 60 g Approx. 90 g Materials Case Sensing surface Heat-resistant ABS			Destruction: 10 to 55 Hz, 1.5-mm double amplitude for 2 ho	urs each in X, Y, and Z directions			
protection in-house standards: oil-resistant Connection method Pre-wired Models (Standard cable length: 2 m) Weight (packed state) Approx. 60 g Approx. 90 g Materials Sensing surface Heat-resistant ABS	Shock re	esistance					
Weight (packed state) Approx. 60 g Approx. 90 g Materials Sensing surface Heat-resistant ABS				IEC IP67			
(packed state) Approx. 60 g Materials Case Sensing surface Heat-resistant ABS		ion	Pre-wired Models (Standard cable length: 2 m)				
Materials Sensing surface Heat-resistant ABS		state)	Approx. 60 g	Approx. 90 g			
als Sensing surface Heat-resistant ABS	Motori	Case					
Accessories Instruction manual			Heat-resistant ABS				
	Accesso	ories	Instruction manual				

^{*} The response frequency is an average value. Measurement conditions are as follows: standard sensing object, a distance of twice the standard sensing object, and a set distance of half the sensing distance.

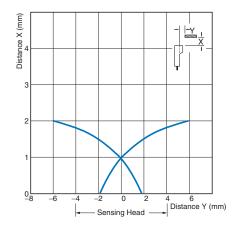
Item	Model	TL-N5ME□, TL-N5MY□	TL-N10ME□, TL-N10MY□, TL-N10MF1	TL-N20ME□, TL-N20MY□			
Sensing of	distance	5 mm ±10%	10 mm ±10%	20 mm ±10%			
Set dista	nce	0 to 4 mm	0 to 8 mm	0 to 16 mm			
Differenti	al travel	15% max. of sensing distance					
Detectable	le object	Ferrous metal (The sensing distance de	creases with non-ferrous metal. Refer to	Engineering Data on pages 6 and 7.)			
Standard sensing of		Iron, $30 \times 30 \times 1 \text{ mm}$	Iron, 40 × 40 × 1 mm	Iron, $50 \times 50 \times 1$ mm			
Response frequency		E/F Models: 500 Hz Y Models: 10 Hz		E Models: 40 Hz Y Models: 10 Hz			
Power su voltage *2 (operatin range)	2	E/F Models: 12 to 24 VDC (10 to 30 VD Y Models: 100 to 220 VAC (90 to 250 V					
Current consump	tion	E/F Models: 8 mA max. at 12 VDC, 15 r	mA max. at 24 VDC				
Leakage	current	Y Models: Refer to Engineering Data or	n page 5.				
Control	Load current	E/F Models: 100 mA max. at 12 VDC, 2 Y Models: 10 to 200 mA	00 mA max. at 24 VDC				
output	Residual voltage	E/F Models: 1 V max. (load current: 200 Y Models: Refer to <i>Engineering Data</i> or					
Indicators	s	E/F Models: Detection indicator (red) Y Models: Operation indicator (red)					
Operation (with sen ject appro	sing ob-	E1/F1/Y1 Models: NO E2/Y2 Models: NC Refer to the timing charts under I/O Circ	cuit Diagrams on page 7 for details.				
Protectio	otection circuits E Models: Reverse polarity protection, Surge suppressor Y Models: Surge suppressor						
Ambient temperat	ure range	Operating/Storage: -25 to 70°C (with no	o icing or condensation)				
Ambient humidity	range	Operating/Storage: 35% to 95% (with no condensation)					
Temperatinfluence		±10% max. of sensing distance at 23°C	in the temperature range of -25 to 70°C	;			
Voltage i	E/F Models: ±2.5% max. of sensing distance at rated voltage in rated voltage ±10% range Y Models: ±1% max. of sensing distance at rated voltage in rated voltage ±10% range						
Insulation resistanc		50 M Ω min. (at 500 VDC) between curre	ent-carrying parts and case				
Dielectric	strength		min between current-carrying parts and in between current-carrying parts and ca				
Vibration resistanc		Destruction: 10 to 55 Hz, 1.5-mm double	e amplitude for 2 hours each in X, Y, and	d Z directions			
Shock re	sistance	Destruction: 500 m/s² 10 times each in 2	X, Y, and Z directions				
Degree of protection		IEC 60529 IP67, in-house standards: oi	l-resistant				
Connection method Pre-wired Models (Standard cable length: 2 m)							
Weight (packed s	state)	Approx. 190 g	Approx. 240 g	Approx. 340 g			
Materi-	Case	Heat-resistant ABS					
als	Sensing surface						
Accessor		E Models: Mounting Bracket, Mounting phillips screws (M4 × 25), Instruction manual Y Models: Instruction manual	E/F Models: Mounting Bracket, Mounting phillips screws (M4 × 30), Instruction manual Y Models: Instruction manual	E Models: Mounting Bracket, Mounting phillips screws (M5 × 40) Instruction manual Y Models: Instruction manual			

^{*1.} The response frequency is an average value. Measurement conditions are as follows: standard sensing object, a distance of twice the standard sensing object, and a set distance of half the sensing distance.
*2. E Models (DC switching models): A full-wave rectification power supply of 24 VDC ±10% (average value) can be used.

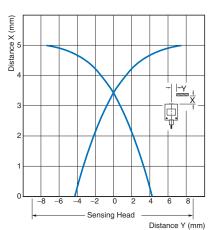
Engineering Data (Reference Value)

Sensing Area

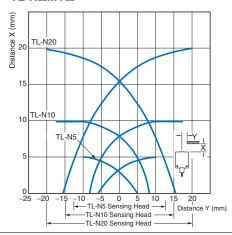
TL-Q2MC1



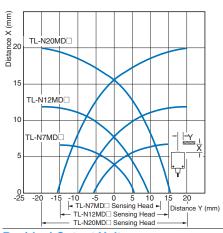
TL-Q5M□□



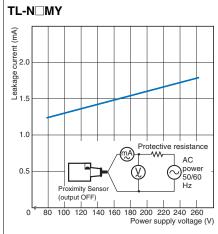
TL-N ME TL-N MY



$\mathsf{TL} ext{-}\mathsf{N}\square\mathsf{MD}\square$

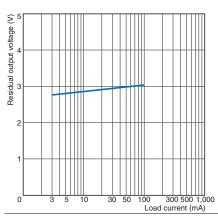


Leakage Current

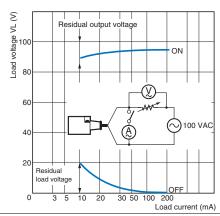


Residual Output Voltage

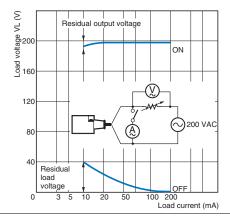
TL-N□MD



TL-N□MY at 100 VAC

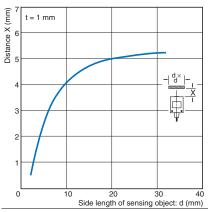


TL-N□MY at 200 VAC



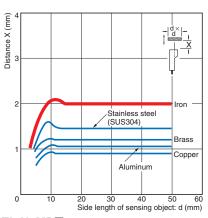
Sensing Object Size vs. Sensing Distance

TL-Q5MC□

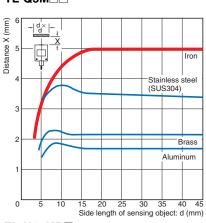


Influence of Sensing Object Size and Material

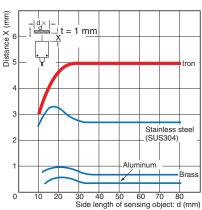
TL-Q2MC1



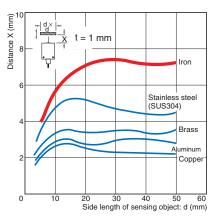
TL-Q5M□□



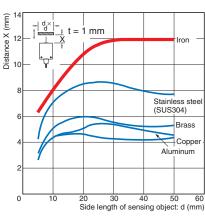
TL-N5□



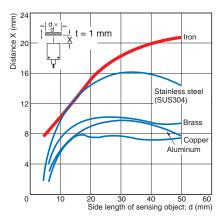
TL-N7MD□

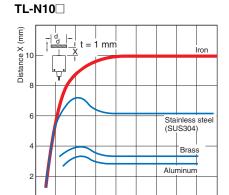


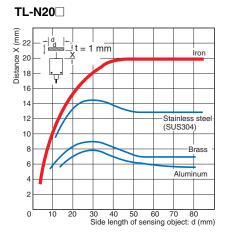
TL-N12MD□



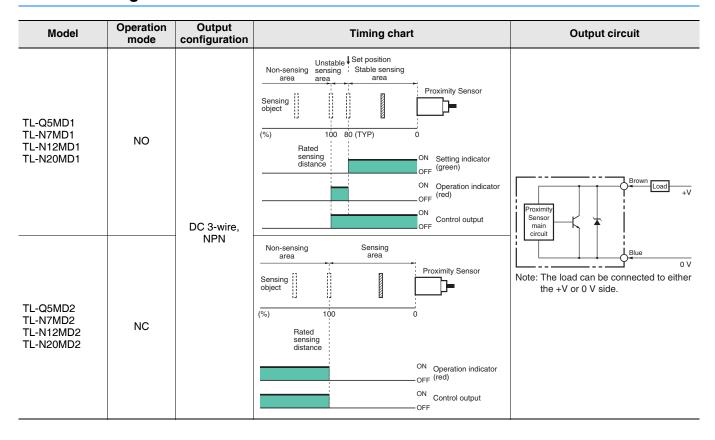
TL-N20MD□







I/O Circuit Diagrams



TL-N/TL-Q

Model	Operation mode	Output configuration	Timing chart	Output circuit
TL-Q2MC1 TL-Q5MC1	NO	DC 3-wire,	Sensing object Not present Output transistor (load) Detection indicator (red) OFF	Proximity Sensor main circuit Proximity Sensor Output
TL-Q5MC2	NC	NPN	Sensing object Not present Output transistor (load) OFF Detection indicator (red) Present ON ON OFF	* Load current: 100 mA max., TL-Q2MC1 Load current: 50 mA max., TL-Q5MC1
TL-Q5MB1	NO	DC 3-wire, PNP	Sensing object Not present Output transistor (load) Detection indicator (red) OFF	Proximity Sensor Output Output Load Current: 50 mA max.
TL-N5ME1 TL-N10ME1 TL-N20ME1	NO	DC 3-wire,	Sensing object Not present Not present Load (between brown and black leads) Output voltage (between black and blue leads) Detection indicator (red) Present Not present Not present High Low ON OFF	Proximity Sensor main circuit 2.2 Ω Output
TL-N5ME2 TL-N10ME2 TL-N20ME2	NC	NPN	Sensing object Not present Load (between brown and black leads) Output voltage (between black and blue leads) Detection indicator (red) Present Not present Not present Not present High Low ON OFF	*1. Load current: 200 mA max. *2. When a transistor is connected.
TL-N10MF1	NO	DC 3-wire, PNP	Sensing object Not present Load (between black and blue leads) Output voltage (between brown and black leads) Detection indicator (red) Present Not present Reset Operate Reset ON ON OFF	Brown +V 2.2 Ω Black *2/ Tr Sensor main circuit 4.7 kΩ Output Load 100 Ω Blue 0 V *1. Load current: 200 mA max. *2. When a transistor is connected.
TL-N5MY1 TL-N10MY1 TL-N20MY1	NO	- AC 2-wire	Sensing object Not present Load Operate Reset ON OFF	Proximity Sensor main
TL-N5MY2 TL-N10MY2 TL-N20MY2	NC		Sensing object Not present Load Operate Reset Operation indicator (red) OFF	Blue

Safety Precautions

Refer to Warranty and Limitations of Liability.

MARNING

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



- Do not short-circuit the load, otherwise the Sensor may be damaged.
- Do not supply power to the Sensor with no load, otherwise the Sensor may be damaged.
 Applicable Models: AC 2-Wire Models



Precautions for Correct Use

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

Design

Influence of Surrounding Metal

When mounting the Sensor within a metal panel, ensure that the clearances given in the following table are maintained. Failure to maintain these distances may cause deterioration in the performance of the Sensor.







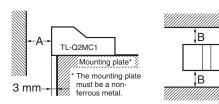
0

TL-Q2MC1

Influence of Surrounding Metal (Unit: mm)

Model Distance	Α	B *1
TL-Q5M□□, TL-Q5MB1	20	20
TL-N7MD□	40	35
TL-N12MD□	50	40
TL-N20MD□	70	60
TL-N5ME□, TL-N5MY□	20	23
TL-N10ME□, TL-N10MF1, TL-N10MY□	40	30
TL-N20ME□, TL-N20MY□	80	45

- *1. The B dimension applies to the top, right-side, and left-side surfaces.
- *2. The values for A or B for the TL-N apply when there is metal on only one side of the sensor. If there is metal on two or more sides of the sensor, the value must be multiplied by two or more.



Influence of Surrounding Metal (Unit: mm)

Model	Distance	Α	В
TL-Q2MC1		12	3

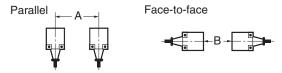
Mounting

When tightening the mounting screws, do not exceed the torque in the following table.

Model	Torque
TL-Q2MC1	0.59 N·m
TL-Q5M□□	0.59 11111
TL-N\(M\) \(\)	0.9 to 1.5 N·m

Mutual Interference

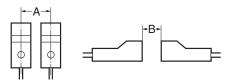
When installing Sensors face-to-face or side-by-side, ensure that the minimum distances given in the following table are maintained.



Mutual Interference (Unit: mm)

Model Distance	A *	B *
TL-Q5MC□, TL-Q5MB1	60 (17)	120 (60)
TL-Q5MD□	60 (30)	120 (80)
TL-N7MD	100 (50)	120 (60)
TL-N12MD□	120 (60)	200 (100)
TL-N20MD□	200 (100)	300 (150)
TL-N5ME	80 (40)	80 (40)
TL-N5MY	80 (40)	90 (40)
TL-N10ME , TL-N10MF1, TL-N10MY	120 (60)	120 (60)
TL-N20ME□, TL-N20MY□	200 (100)	120 (60)

^{*} Values in parentheses apply to Sensors operating at different frequencies.



Mutual Interference (Unit: mm)

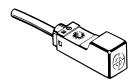
Model	Distance	A *	B *
TL-Q2MC1		30 (8)	90 (45)

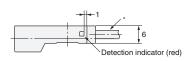
^{*} Values in parentheses apply to Sensors operating at different frequencies.

Dimensions

Sensors

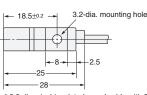
TL-Q2MC1





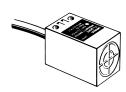
Sensing surface

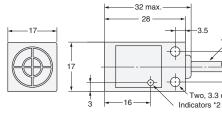




2.9-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.15 $\text{mm}^2,$ Insulator diameter: 0.9 mm), Standard length: 2 m

TL-Q5M□□





Mounting Hole Dimensions 10.5±0.1 Two, 3.3-dia. holes

*1. B/C 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

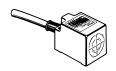
D Models: 4-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.3 mm²,

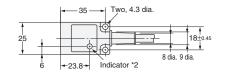
Insulator diameter: 1.3 mm), Standard length: 2 m

*2. B/C Models: Detection indicator (red)

D Models: Operation indicator (red), Setting indicator (green)

TL-N7MD□, TL-N5ME□





Mounting Hole Dimensions

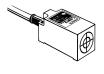


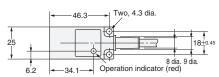
Rubber bushing -18.5 -38.5 1.5

*1. D Models: 6-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m E Models: 6-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m 2.0 D Models: Operation indicator (red), Setting indicator (green)

D2 Models: Operation indicator (red) E Models: Detection indicator (red)

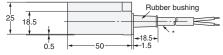
TL-N5MY





Mounting Hole Dimensions

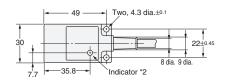




* 6-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m

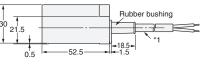
TL-N12MD□, TL-N10ME□, TL-N10MY





Mounting Hole Dimensions





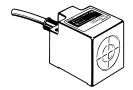
*1. D/Y Models: 6-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m E/Y Models: 6-dia. vinyl-insulated round cable with 3

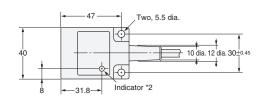
conductors (Conductor cross section: 0.5 mm2

Insulator diameter: 1.9 mm), Standard length: 2 m Operation indicator (red) and Setting indicator (green)

D2 Models: Operation indicator (red) E/Y Models: Detection indicator (red) Operation indicator (red)

TL-N20MD□, TL-N20ME□, TL-N20MY□





Mounting Hole Dimensions Two, 5.5-dia. or M5 holes 30-

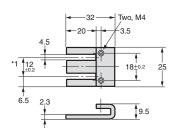
Rubber bushing

*1. D/Y Models: 6-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m E Models: 6-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m '2. D1 Models: Operation indicator (red) and Setting indicator (green) D2 Models: Operation indicator (red) E Models: Operation indicator (red) Operation indicator (red)

Accessories (Order Separately)

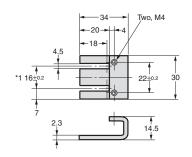
Mounting Bracket

Y92E-C5



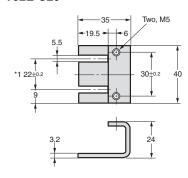
Applicable Models: TL-N5ME□ *2 Applicable Models: TL-N5MY□ Applicable Models: TL-N7MD□ *2 Material: Mounting Bracket: Zinc-plated iron Mounting Pan-head Phillips Screws: Nickel-plated iron (Size: M4, Length: 25 mm)

Y92E-C10



Applicable Models: TL-N10ME□ *2 Applicable Models: TL-N10MY□ Applicable Models: TL-N12MD□ *2 Material: Mounting Bracket: Zinc-plated iron Mounting Pan-head Phillips Screws: Nickel-plated iron (Size: M4, Length: 30 mm)

Y92E-C20

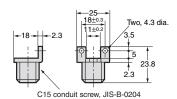


Applicable Models: TL-N20ME□ *2 Applicable Models: TL-N20MY□ Applicable Models: TL-N20MD□ *2
Material: Mounting Bracket: Zinc-plated iron
Mounting Pan-head Phillips Screws: Nickel-plated iron (Size: M5, Length: 40 mm)

- *1. These are the mounting dimensions of the base of the Mounting Bracket.

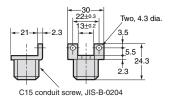
Mounting Brackets for Wiring Conduit Use (Sold Separately)

Y92E-N5C15



Applicable Models: TL-N5ME□ Applicable Models: TL-N5MY□
Applicable Models: TL-N7MD□ Material: Zinc-plated iron

Y92E-N10C15



Applicable Models: TL-N10ME□ Applicable Models: TL-N10MY□ Applicable Models: TL-N12MD□ Material: Zinc-plated iron

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