

## 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    |                 |
|                |         |                  |  | NO                | NC              |
| Unshielded<br> | 17 × 17 | 5 mm             |  | TL-Q5MD1 2M *1 *2 | TL-Q5MD2 2M *1  |
|                | 25 × 25 | 7 mm             |  | TL-N7MD1 2M *1    | TL-N7MD2 2M *1  |
|                | 30 × 30 | 12 mm            |  | 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□MD□5 (e.g., TL-N7MD15).

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

### DC 3-Wire and AC 2-Wire Models

| Appearance     |         | Sensing distance |  | Output configuration | Model              |                 |
|----------------|---------|------------------|--|----------------------|--------------------|-----------------|
|                |         |                  |  |                      | Operation mode     |                 |
|                |         |                  |  |                      | NO                 | NC              |
| Unshielded<br> | 8 × 9   | 2 mm             |  | DC 3-wire, NPN       | TL-Q2MC1 2M        | —               |
|                | 17 × 17 | 5 mm             |  |                      | TL-Q5MC1 2M *1 *2  | TL-Q5MC2 2M     |
|                |         |                  |  | DC 3-wire, PNP       | TL-Q5MB1 2M        | —               |
|                | 25 × 25 | 5 mm             |  |                      | TL-N5ME1 2M *1 *2  | TL-N5ME2 2M *1  |
|                |         |                  |  | AC 2-wire            | TL-N5MY1 2M *1     | TL-N5MY2 2M *1  |
|                | 30 × 30 | 10 mm            |  |                      | TL-N10ME1 2M *1 *2 | TL-N10ME2 2M *1 |
|                |         |                  |  | DC 3-wire, PNP       | TL-N10MF1 2M *1    | —               |
|                |         |                  |  |                      | TL-N10MY1 2M *1    | TL-N10MY2 2M *1 |
|                | 40 × 40 | 20 mm            |  | AC 2-wire            | TL-N20ME1 2M *1 *2 | TL-N20ME2 2M *1 |
|                |         |                  |  |                      | 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-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.]**

| Type                           | Model       | Applicable Sensors               |                      |
|--------------------------------|-------------|----------------------------------|----------------------|
|                                |             | Provided with these Sensors      | Order separately     |
| Mounting Brackets              | Y92E-C5     | TL-N5ME□, TL-N7MD□               | TL-N5MY□             |
|                                | 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□   |
|                                | Y92E-N10C15 | ---                              | TL-N10ME□, TL-N10MY□ |

## Ratings and Specifications

### DC 2-Wire Models

| Item                                             | Model            | TL-Q5MD□                                                                                                              | TL-N7MD□                                                               | TL-N12MD□                                                              | TL-N20MD□                                                              |
|--------------------------------------------------|------------------|-----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|
| Sensing distance                                 |                  | 5 mm ±10%                                                                                                             | 7 mm ±10%                                                              | 12 mm ±10%                                                             | 20 mm ±10%                                                             |
| Set distance                                     |                  | 0 to 4 mm                                                                                                             | 0 to 5.6 mm                                                            | 0 to 9.6 mm                                                            | 0 to 16 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 5.)    |                                                                        |                                                                        |                                                                        |
| Standard sensing object                          |                  | Iron, 18 × 18 × 1 mm                                                                                                  | Iron, 30 × 30 × 1 mm                                                   | Iron, 40 × 40 × 1 mm                                                   | Iron, 50 × 50 × 1 mm                                                   |
| Response frequency *                             |                  | 500 Hz                                                                                                                |                                                                        |                                                                        | 300 Hz                                                                 |
| Power supply voltage (operating voltage range)   |                  | 12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.                                                                   |                                                                        |                                                                        |                                                                        |
| Leakage current                                  |                  | 0.8 mA max.                                                                                                           |                                                                        |                                                                        |                                                                        |
| Control output                                   | Load current     | 3 to 100 mA                                                                                                           |                                                                        |                                                                        |                                                                        |
|                                                  | Residual voltage | 3.3 V max. (Load current: 100 mA, Cable length: 2 m)                                                                  |                                                                        |                                                                        |                                                                        |
| Indicators                                       |                  | D1 Models: Operation indicator (red), Setting indicator (green)<br>D2 Models: Operation indicator (red)               |                                                                        |                                                                        |                                                                        |
| Operation mode (with sensing object approaching) |                  | D1 Models: NO<br>D2 Models: NC    Refer to the timing charts under <i>I/O Circuit Diagrams</i> on page 7 for details. |                                                                        |                                                                        |                                                                        |
| Protection circuits                              |                  | Load short-circuit protection, 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)                                                                  |                                                                        |                                                                        |                                                                        |
| Temperature influence                            |                  | ±10% 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 the rated voltage ±15% range                                       |                                                                        |                                                                        |                                                                        |
| Insulation resistance                            |                  | 50 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                                                           |                                                                        |                                                                        |                                                                        |
| 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/s² 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 standards: oil-resistant                                                                     |                                                                        |                                                                        |                                                                        |
| Connection method                                |                  | Pre-wired Models (Standard cable length: 2 m)                                                                         |                                                                        |                                                                        |                                                                        |
| Weight (packed state)                            |                  | Approx. 85 g                                                                                                          | Approx. 165 g                                                          | Approx. 235 g                                                          | Approx. 330 g                                                          |
| Materials                                        | Case             | Heat-resistant ABS                                                                                                    |                                                                        |                                                                        |                                                                        |
|                                                  | Sensing surface  |                                                                                                                       |                                                                        |                                                                        |                                                                        |
| Accessories                                      |                  | 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

| Item                                             |                  | Model | TL-Q2MC1                                                                                                           | TL-Q5MC□/TL-Q5MB1                                                                                                        |
|--------------------------------------------------|------------------|-------|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Sensing distance                                 |                  |       | 2 mm ±15%                                                                                                          | 5 mm ±10%                                                                                                                |
| Set distance                                     |                  |       | 0 to 1.5 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 6.) |                                                                                                                          |
| Standard sensing object                          |                  |       | Iron, 8 × 8 × 1 mm                                                                                                 | Iron, 15 × 15 × 1 mm                                                                                                     |
| Response time                                    |                  |       | ---                                                                                                                | 2 ms max.                                                                                                                |
| Response frequency *                             |                  |       | 500 Hz                                                                                                             |                                                                                                                          |
| Power supply voltage (operating voltage range)   |                  |       | 12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.                                                                |                                                                                                                          |
| Current consumption                              |                  |       | 15 mA max. at 24 VDC (no-load)                                                                                     | 10 mA max. at 24 VDC                                                                                                     |
| Control output                                   | Load current     |       | NPN open collector<br>100 mA max. at 30 VDC max.                                                                   | TL-Q5MC□: NPN open collector,<br>50 mA max. at 30 VDC max.<br>TL-Q5MB□: PNP open collector,<br>50 mA max. at 30 VDC max. |
|                                                  | Residual voltage |       | 1 V max. (under load current of 100 mA with cable length of 2 m)                                                   | 1 V max. (under load current of 50 mA with cable length of 2 m)                                                          |
| Indicators                                       |                  |       | Detection indicator (red)                                                                                          |                                                                                                                          |
| Operation mode (with sensing object approaching) |                  |       | NO                                                                                                                 | B1/C1 Models: NO<br>C2 Models: NC                                                                                        |
|                                                  |                  |       | Refer to the timing charts under <i>DC 3-Wire Models</i> on page 7 for details.                                    |                                                                                                                          |
| Protection circuits                              |                  |       | Reverse polarity protection, Surge suppressor                                                                      |                                                                                                                          |
| Ambient temperature range                        |                  |       | Operating/Storage: -10 to 60°C (with no icing or condensation)                                                     | Operating/Storage: -25 to 70°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/s <sup>2</sup> 10 times each in X, Y, and Z directions                                        | Destruction: 200 m/s <sup>2</sup> 10 times each in X, Y, and Z directions                                                |
| Degree of protection                             |                  |       | IEC 60529 IP67,<br>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             |       | Heat-resistant ABS                                                                                                 |                                                                                                                          |
|                                                  | Sensing surface  |       |                                                                                                                    |                                                                                                                          |
| Accessories                                      |                  |       | 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□,<br>TL-N10MF1                                                                                       | TL-N20ME□, TL-N20MY□                                                                                                   |
|------------------------------------------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Sensing distance                                     |                  | 5 mm ±10%                                                                                                                                                                      | 10 mm ±10%                                                                                                               | 20 mm ±10%                                                                                                             |
| Set distance                                         |                  | 0 to 4 mm                                                                                                                                                                      | 0 to 8 mm                                                                                                                | 0 to 16 mm                                                                                                             |
| Differential travel                                  |                  | 15% max. of sensing distance                                                                                                                                                   |                                                                                                                          |                                                                                                                        |
| Detectable object                                    |                  | Ferrous metal (The sensing distance decreases with non-ferrous metal. Refer to <i>Engineering Data</i> on pages 6 and 7.)                                                      |                                                                                                                          |                                                                                                                        |
| Standard sensing object                              |                  | Iron, 30 × 30 × 1 mm                                                                                                                                                           | Iron, 40 × 40 × 1 mm                                                                                                     | Iron, 50 × 50 × 1 mm                                                                                                   |
| Response frequency *1                                |                  | E/F Models: 500 Hz<br>Y Models: 10 Hz                                                                                                                                          |                                                                                                                          | E Models: 40 Hz<br>Y Models: 10 Hz                                                                                     |
| Power supply voltage *2<br>(operating voltage range) |                  | E/F Models: 12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.<br>Y Models: 100 to 220 VAC (90 to 250 VAC), 50/60 Hz                                                          |                                                                                                                          |                                                                                                                        |
| Current consumption                                  |                  | E/F Models: 8 mA max. at 12 VDC, 15 mA max. at 24 VDC                                                                                                                          |                                                                                                                          |                                                                                                                        |
| Leakage current                                      |                  | Y Models: Refer to <i>Engineering Data</i> on page 5.                                                                                                                          |                                                                                                                          |                                                                                                                        |
| Control output                                       | Load current     | E/F Models: 100 mA max. at 12 VDC, 200 mA max. at 24 VDC<br>Y Models: 10 to 200 mA                                                                                             |                                                                                                                          |                                                                                                                        |
|                                                      | Residual voltage | E/F Models: 1 V max. (load current: 200 mA)<br>Y Models: Refer to <i>Engineering Data</i> on page 5.                                                                           |                                                                                                                          |                                                                                                                        |
| Indicators                                           |                  | E/F Models: Detection indicator (red)<br>Y Models: Operation indicator (red)                                                                                                   |                                                                                                                          |                                                                                                                        |
| Operation mode<br>(with sensing object approaching)  |                  | E1/F1/Y1 Models: NO<br>E2/Y2 Models: NC                                                                                                                                        |                                                                                                                          |                                                                                                                        |
|                                                      |                  | Refer to the timing charts under <i>I/O Circuit Diagrams</i> on page 7 for details.                                                                                            |                                                                                                                          |                                                                                                                        |
| Protection circuits                                  |                  | E Models: Reverse polarity protection, Surge suppressor<br>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)                                                                                                                           |                                                                                                                          |                                                                                                                        |
| Temperature influence                                |                  | ±10% max. of sensing distance at 23°C in the temperature range of –25 to 70°C                                                                                                  |                                                                                                                          |                                                                                                                        |
| Voltage influence                                    |                  | E/F Models: ±2.5% max. of sensing distance at rated voltage in rated voltage ±10% range<br>Y Models: ±1% 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                                                                                                                |                                                                                                                          |                                                                                                                        |
| Dielectric strength                                  |                  | E/F Models: 1,000 VAC, 50/60 Hz for 1 min between current-carrying parts and case<br>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. 190 g                                                                                                                                                                  | Approx. 240 g                                                                                                            | Approx. 340 g                                                                                                          |
| Materials                                            | Case             | Heat-resistant ABS                                                                                                                                                             |                                                                                                                          |                                                                                                                        |
|                                                      | Sensing surface  |                                                                                                                                                                                |                                                                                                                          |                                                                                                                        |
| Accessories                                          |                  | E Models: Mounting Bracket,<br>Mounting phillips screws (M4×25),<br>Instruction manual<br>Y Models: Instruction manual                                                         | E/F Models: Mounting Bracket,<br>Mounting phillips screws (M4×30),<br>Instruction manual<br>Y Models: Instruction manual | E Models: Mounting Bracket,<br>Mounting phillips screws (M5×40),<br>Instruction manual<br>Y Models: Instruction manual |

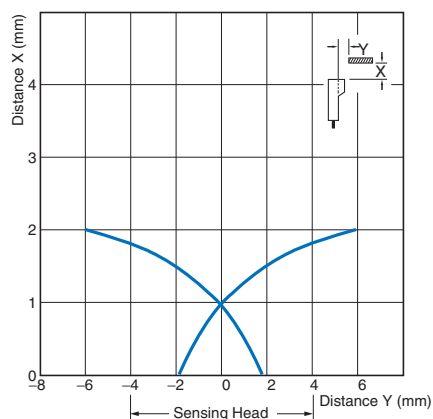
\*1. The response frequency is an average value. Measurement conditions are as follows: standard sensing object, a distance of twice the standard sensing object, and a set distance of half the sensing distance.

\*2. E Models (DC switching models): A full-wave rectification power supply of 24 VDC ±10% (average value) can be used.

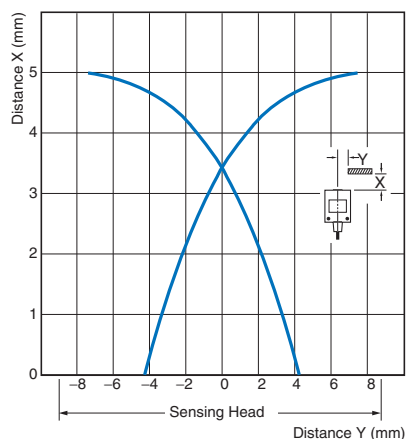
# Engineering Data (Reference Value)

## Sensing Area

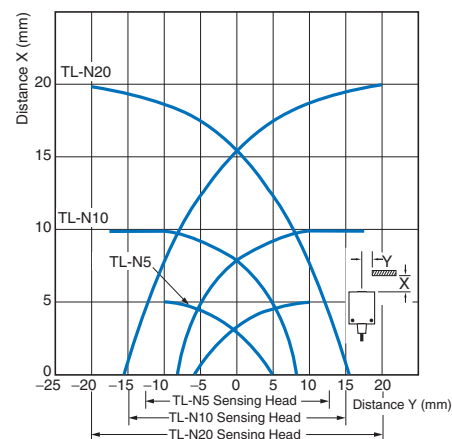
### TL-Q2MC1



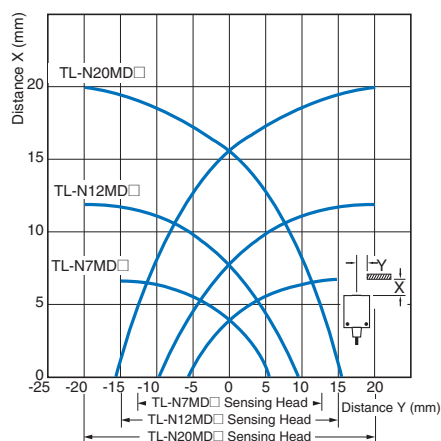
### TL-Q5M□□



### TL-N□ME□ TL-N□MY□

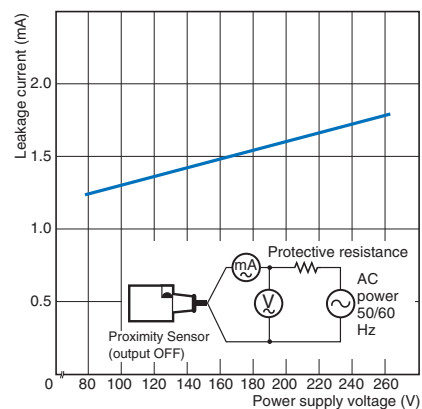


### TL-N□MD□



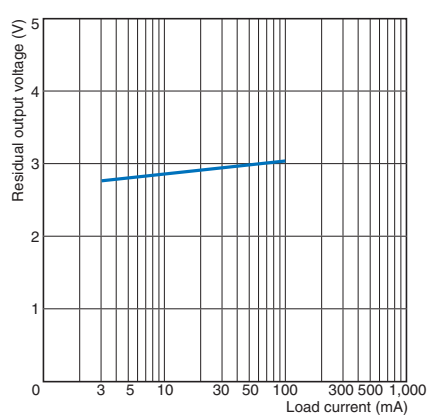
## Leakage Current

### TL-N□MY

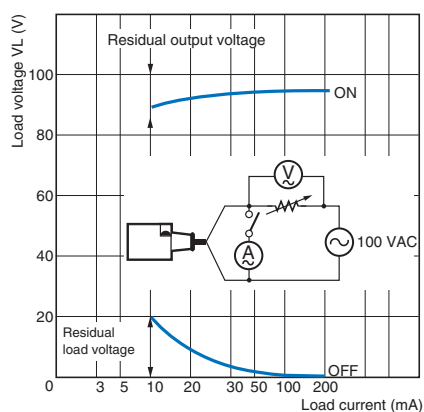


## Residual Output Voltage

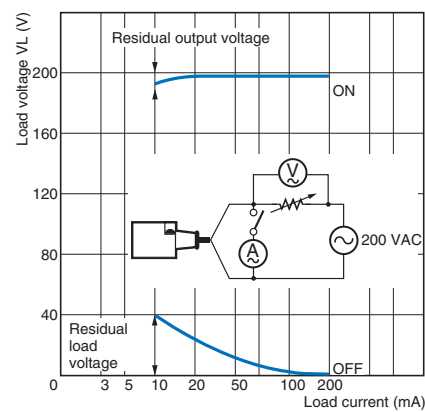
### TL-N□MD



### TL-N□MY at 100 VAC

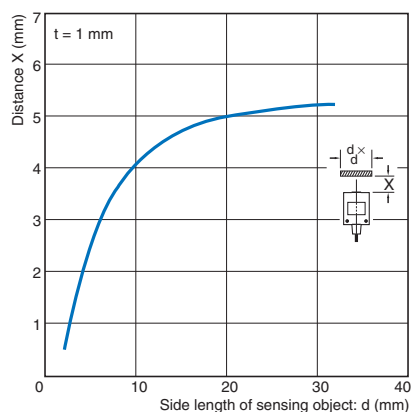


### TL-N□MY at 200 VAC



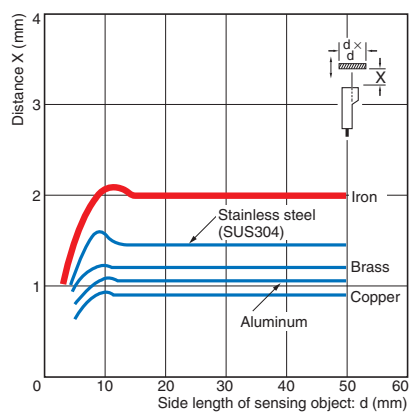
## Sensing Object Size vs. Sensing Distance

### TL-Q5MC□

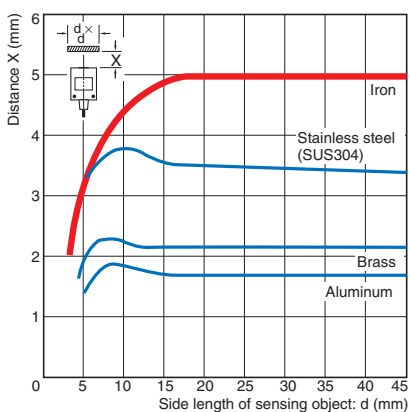


## Influence of Sensing Object Size and Material

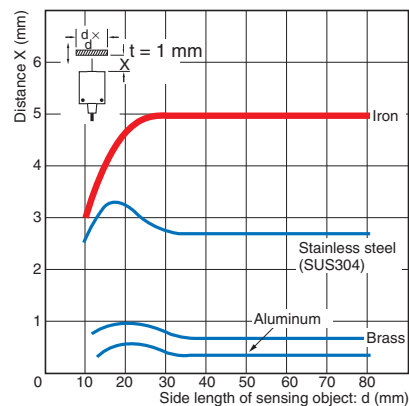
### TL-Q2MC1



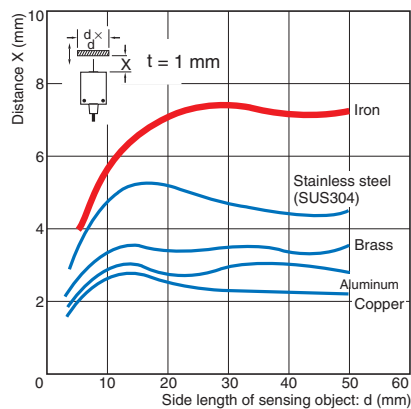
### TL-Q5M□□



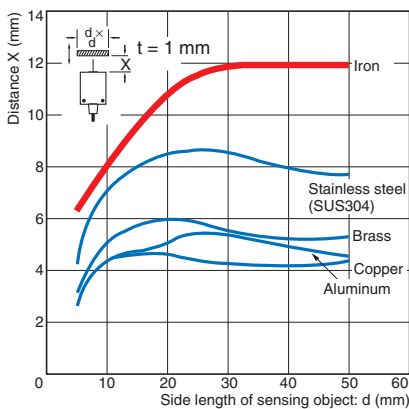
### TL-N5□



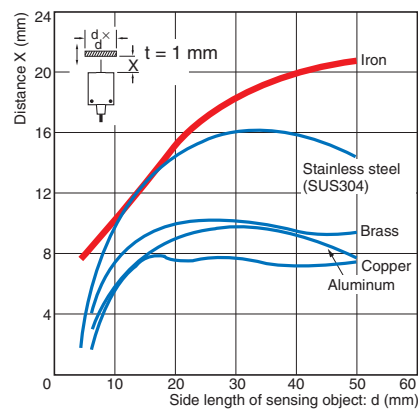
### TL-N7MD□



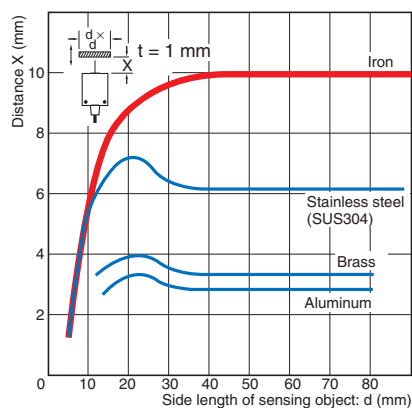
### TL-N12MD□



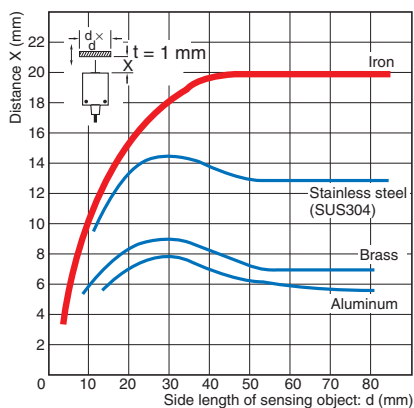
### TL-N20MD□



TL-N10□



TL-N20□



## I/O Circuit Diagrams

| Model                                          | Operation mode | Output configuration | Timing chart                                                                                                                                                                                                                                                                            | Output circuit                                                       |
|------------------------------------------------|----------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| TL-Q5MD1<br>TL-N7MD1<br>TL-N12MD1<br>TL-N20MD1 | NO             | DC 3-wire, NPN       | <p>Non-sensing area    Unstable sensing area    Stable sensing area</p> <p>Sensing object</p> <p>(%)    100    80 (TYP)    0</p> <p>Rated sensing distance</p> <p>ON Setting indicator (green)<br/>OFF</p> <p>ON Operation indicator (red)<br/>OFF</p> <p>ON Control output<br/>OFF</p> | <p>Note: The load can be connected to either the +V or 0 V side.</p> |
| TL-Q5MD2<br>TL-N7MD2<br>TL-N12MD2<br>TL-N20MD2 | NC             |                      | <p>Non-sensing area    Sensing area</p> <p>Sensing object</p> <p>(%)    100    0</p> <p>Rated sensing distance</p> <p>ON Operation indicator (red)<br/>OFF</p> <p>ON Control output<br/>OFF</p>                                                                                         |                                                                      |

| Model                              | Operation mode | Output configuration | Timing chart                                                                                                                                                                                                   | Output circuit                                                                  |
|------------------------------------|----------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| TL-Q2MC1<br>TL-Q5MC1               | NO             | DC 3-wire,<br>NPN    | Sensing object<br>Present<br>Not present<br>Output transistor (load)<br>ON<br>OFF<br>Detection indicator (red)<br>ON<br>OFF                                                                                    | <br>* Load current: 100 mA max., TL-Q2MC1<br>Load current: 50 mA max., TL-Q5MC1 |
| TL-Q5MC2                           | NC             |                      | Sensing object<br>Present<br>Not present<br>Output transistor (load)<br>ON<br>OFF<br>Detection indicator (red)<br>ON<br>OFF                                                                                    |                                                                                 |
| TL-Q5MB1                           | NO             | DC 3-wire,<br>PNP    | Sensing object<br>Present<br>Not present<br>Output transistor (load)<br>ON<br>OFF<br>Detection indicator (red)<br>ON<br>OFF                                                                                    | <br>* Load current: 50 mA max.                                                  |
| TL-N5ME1<br>TL-N10ME1<br>TL-N20ME1 | NO             | DC 3-wire,<br>NPN    | Sensing object<br>Present<br>Not present<br>Load (between brown and black leads)<br>Operate<br>Reset<br>Output voltage (between black and blue leads)<br>High<br>Low<br>Detection indicator (red)<br>ON<br>OFF | <br>*1. Load current: 200 mA max.<br>*2. When a transistor is connected.        |
| TL-N5ME2<br>TL-N10ME2<br>TL-N20ME2 | NC             |                      | Sensing object<br>Present<br>Not present<br>Load (between brown and black leads)<br>Operate<br>Reset<br>Output voltage (between black and blue leads)<br>High<br>Low<br>Detection indicator (red)<br>ON<br>OFF |                                                                                 |
| TL-N10MF1                          | NO             | DC 3-wire,<br>PNP    | Sensing object<br>Present<br>Not present<br>Load (between black and blue leads)<br>Operate<br>Reset<br>Output voltage (between brown and black leads)<br>High<br>Low<br>Detection indicator (red)<br>ON<br>OFF | <br>*1. Load current: 200 mA max.<br>*2. When a transistor is connected.        |
| TL-N5MY1<br>TL-N10MY1<br>TL-N20MY1 | NO             | AC 2-wire            | Sensing object<br>Present<br>Not present<br>Load<br>Operate<br>Reset<br>Operation indicator (red)<br>ON<br>OFF                                                                                                 |                                                                                 |
| TL-N5MY2<br>TL-N10MY2<br>TL-N20MY2 | NC             |                      | Sensing object<br>Present<br>Not present<br>Load<br>Operate<br>Reset<br>Operation indicator (red)<br>ON<br>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.



- 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

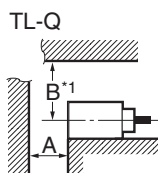
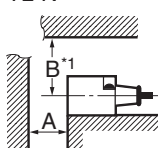
Do not use this product under ambient conditions that exceed the ratings.

#### ● 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.

##### Rectangular Models TL-N\*2

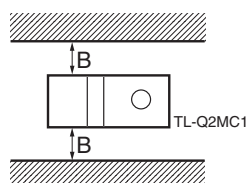
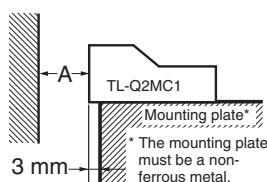


##### Influence of Surrounding Metal (Unit: mm)

| Model                           | Distance | A  | 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 | A  | B |
|----------|----------|----|---|
| TL-Q2MC1 |          | 12 | 3 |

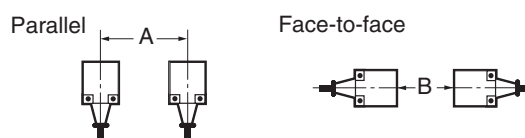
#### ● Mounting

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

| Model    | Torque         |
|----------|----------------|
| TL-Q2MC1 | 0.59 N·m       |
| TL-Q5M□□ |                |
| TL-N□M□□ | 0.9 to 1.5 N·m |

##### Mutual Interference

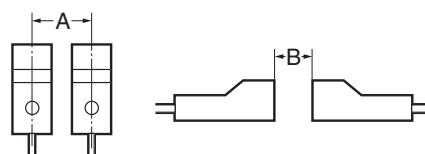
When installing Sensors face-to-face or side-by-side, ensure that the minimum distances given in the following table are maintained.



##### 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) |

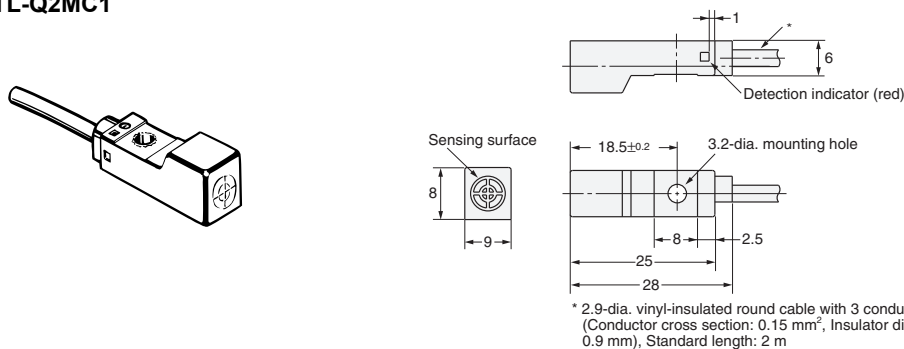
\* Values in parentheses apply to Sensors operating at different frequencies.

## Dimensions

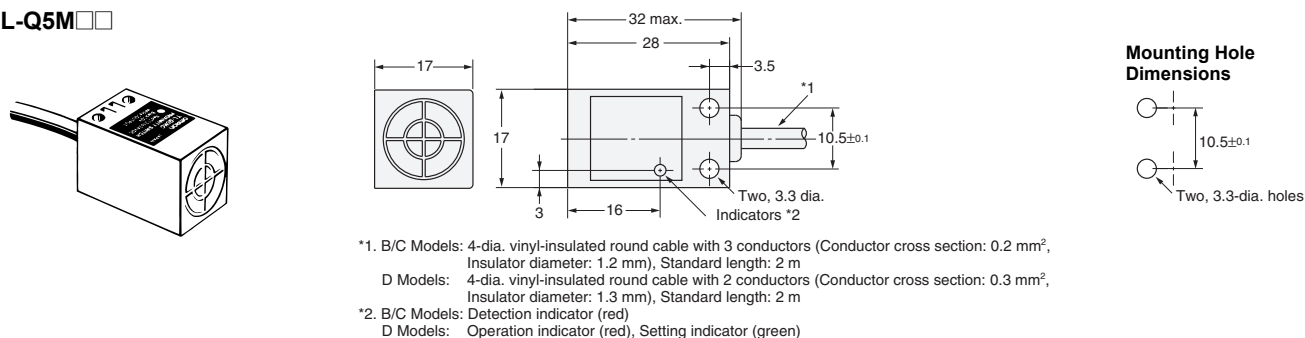
(Unit: mm)  
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

### Sensors

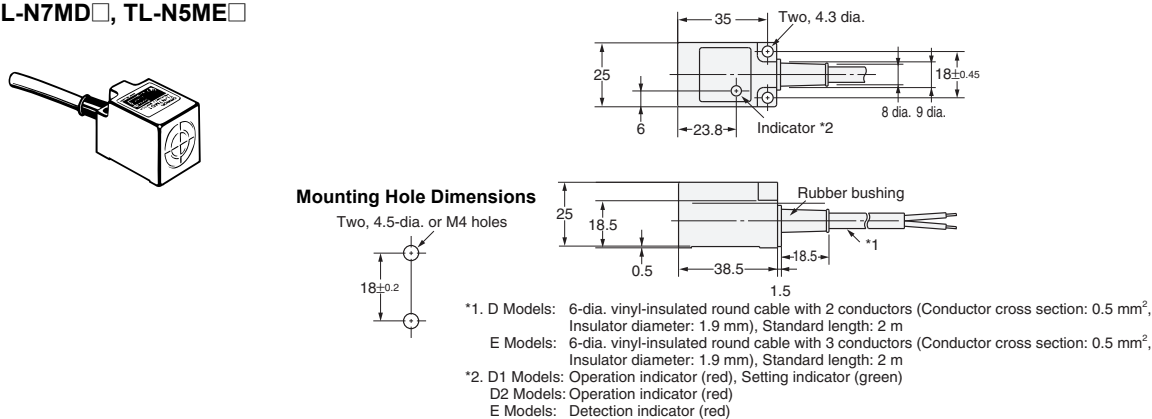
#### TL-Q2MC1



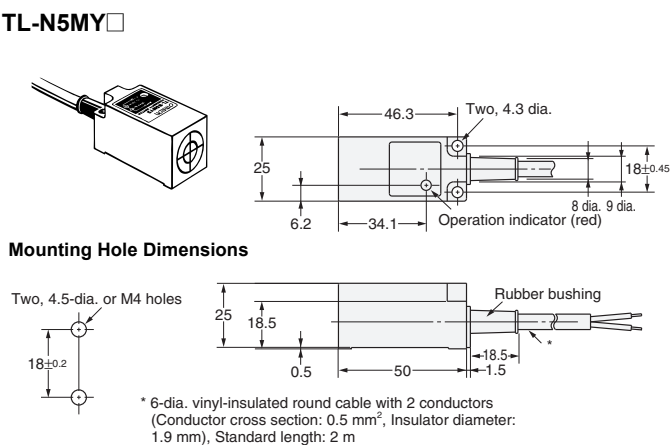
#### TL-Q5M□□



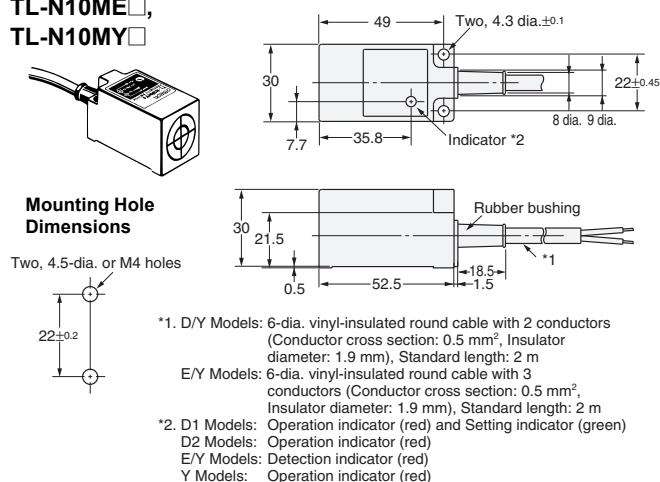
#### TL-N7MD□, TL-N5ME□



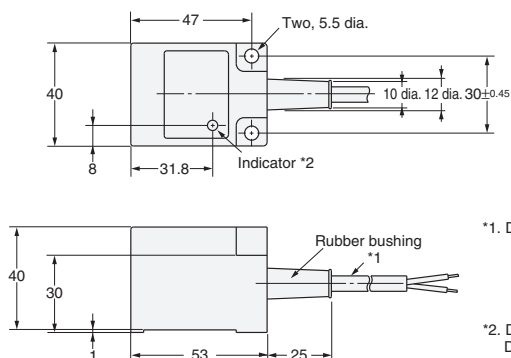
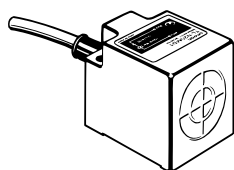
#### TL-N5MY□



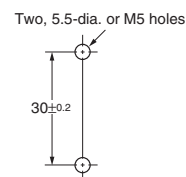
#### TL-N12MD□, TL-N10ME□, TL-N10MY□



TL-N20MD□, TL-N20ME□, TL-N20MY□



Mounting Hole Dimensions

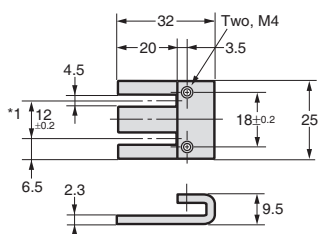


- \*1. D/Y Models: 6-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm), Standard length: 2 m  
E Models: 6-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9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

Accessories (Order Separately)

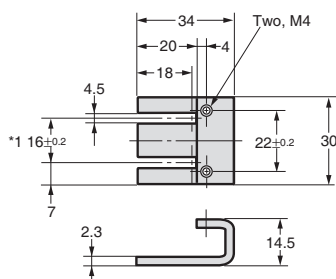
Mounting Bracket

Y92E-C5



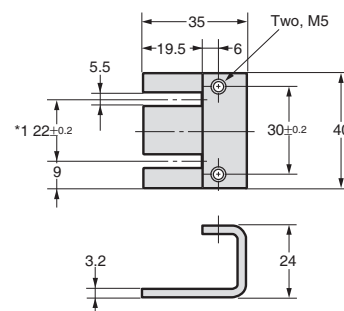
Applicable Models: TL-N5ME□ \*2  
Applicable Models: TL-N5MY□  
Applicable Models: TL-N7MD□ \*2  
Material: Mounting Bracket: Zinc-plated iron  
Mounting Pan-head Phillips Screws:  
Nickel-plated iron  
(Size: M4, Length: 25 mm)

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



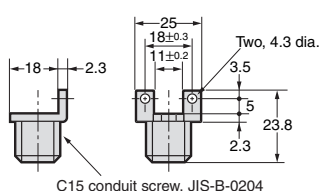
Applicable Models: TL-N20ME□ \*2  
Applicable Models: TL-N20MY□  
Applicable Models: TL-N20MD□ \*2  
Material: Mounting Bracket: Zinc-plated iron  
Mounting Pan-head Phillips Screws:  
Nickel-plated iron  
(Size: M5, Length: 40 mm)

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

\*2. Provided with the product.

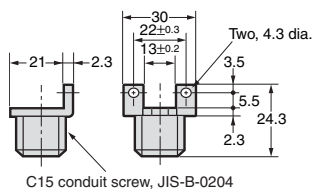
Mounting Brackets for Wiring Conduit Use (Sold Separately)

Y92E-N5C15



C15 conduit screw, JIS-B-0204  
Applicable Models: TL-N5ME□  
Applicable Models: TL-N5MY□  
Applicable Models: TL-N7MD□  
Material: Zinc-plated iron

Y92E-N10C15



C15 conduit screw, JIS-B-0204  
Applicable Models: TL-N10ME□  
Applicable Models: TL-N10MY□  
Applicable Models: TL-N12MD□  
Material: Zinc-plated iron

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