

Miniature Inductive Prox

TL-W

Subminiature, Flat-Pack DC Sensor  
Fits Tight Spaces

- Watertight construction conforms to IP67
- Space-saving mounting area, as small as 10 x 27 mm ( 0.39 x 1.06 in), is ideal for conveyor wall mounting
- Mounts directly onto metal base or rail
- Rugged diecast metal or low-profile plastic housing models available
- Choose NPN or PNP output models
- Ready to use: Prewired with 2 m (6.56 ft) length cable and mounting bracket included with TL-W3M sensors



Ordering Information

| Body type                  |               | Shielded         | Unshielded     |                |                 |
|----------------------------|---------------|------------------|----------------|----------------|-----------------|
| Body material              |               | Diecast aluminum | ABS plastic    |                |                 |
| Nominal detecting distance |               | 5 mm (0.20 in)   | 3 mm (0.12 in) | 5 mm (0.20 in) | 20 mm (0.79 in) |
| Part number                | NPN-NO output | TL-W5E1          | TL-W3MC1       | TL-W5MC1       | TL-W20ME1       |
|                            | NPN-NC output | TL-W5E2          | TL-W3MC2       | TL-W5MC2       | TL-W20ME2       |
|                            | PNP-NO output | TL-W5F1          | TL-W3MB1       | TL-W5MB1       | —               |
|                            | PNP-NC output | TL-W5F2          | —              | —              | —               |

# Specifications

## ■ UNSHIELDED, PLASTIC BODY SENSORS

|                                                             |                                  |                                         |                                                                                |                                                |                                                                                            |
|-------------------------------------------------------------|----------------------------------|-----------------------------------------|--------------------------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------------------------------------|
| Part number                                                 |                                  |                                         | TL-W3M□□                                                                       | TL-W5M□□                                       | TL-W20ME□                                                                                  |
| Sensor type                                                 |                                  |                                         | Inductive                                                                      |                                                |                                                                                            |
| Body                                                        | Size                             | Flat, rectangular                       |                                                                                |                                                |                                                                                            |
|                                                             | Type                             | Unshielded                              |                                                                                |                                                |                                                                                            |
| Supply voltage                                              |                                  |                                         | 10 to 30 VDC, maximum ripple 10% peak-to-peak                                  |                                                |                                                                                            |
| Current consumption                                         |                                  |                                         | 15 mA max.                                                                     | 10 mA max.                                     | 15 mA max.                                                                                 |
| Detectable object type                                      |                                  |                                         | Metal objects                                                                  |                                                |                                                                                            |
| Effective maximum detecting distance (with standard object) |                                  |                                         | 0 to 2.7 mm<br>(0 to 0.11 in)                                                  | 0 to 4.5 mm<br>(0 to 0.18 in)                  | 0 to 16 mm<br>(0 to 0.63 in)                                                               |
| Standard target size<br>(mild steel, LxWxH)                 |                                  |                                         | 12 x 12 x 1 mm<br>(0.47 x 0.47 x 0.04 in)                                      | 18 x 18 x 1 mm<br>(0.71 x 0.71 x 0.04 in)      | 50 x 50 x 1 mm<br>(1.97 x 1.97 x 0.04 in)                                                  |
| Differential travel                                         |                                  |                                         | 10% max. of effective maximum detecting distance                               |                                                |                                                                                            |
| Control output                                              | DC solid-state                   | Type                                    | NPN-NO (TL-W□MC1)<br>PNP-NO (TL-W□MB1)                                         |                                                | NPN-NO (TL-W20ME1)<br>with pull-up resistor<br>NPN-NC (TL-W20ME2)<br>with pull-up resistor |
|                                                             |                                  | Max. load                               | 100 mA max.                                                                    | 50 mA max. at 12 VDC,<br>100 mA max. at 24 VDC | 100 mA max. at 12 VDC<br>200 mA max. at 24 VDC                                             |
|                                                             |                                  | Max. on-state voltage drop              | 1.0 V max.                                                                     |                                                |                                                                                            |
| Response frequency                                          |                                  |                                         | 600 Hz                                                                         | 500 Hz                                         | 40 Hz                                                                                      |
| Circuit protection                                          | Output short-circuit             | Not provided                            |                                                                                |                                                |                                                                                            |
|                                                             | DC power supply reverse polarity | Provided                                |                                                                                |                                                |                                                                                            |
| Indicators                                                  |                                  |                                         | Target present (red LED)                                                       |                                                |                                                                                            |
| Materials                                                   | Housing                          | Plastic (ABS)                           |                                                                                |                                                |                                                                                            |
|                                                             | Sensing face                     | Plastic (ABS)                           |                                                                                |                                                |                                                                                            |
|                                                             | Cable sheath                     | Oil-proof vinyl                         |                                                                                |                                                |                                                                                            |
| Mounting                                                    |                                  |                                         | Bottom surface with 1 through hole, or mounting bracket supplied               | Bottom surface with 2 through holes            |                                                                                            |
| Connections                                                 | Prewired                         | 3-conductor cable, 2 m (6.56 ft) length |                                                                                |                                                |                                                                                            |
| Weight with cable                                           |                                  |                                         | 30 g (1.06 oz.)                                                                | 45 g (1.59 oz.)                                | 180 g (6.35 oz.)                                                                           |
| Enclosure ratings                                           | UL                               | —                                       |                                                                                |                                                |                                                                                            |
|                                                             | NEMA                             | 1, 2, 3, 4X, 6, 12, 13                  |                                                                                |                                                |                                                                                            |
|                                                             | IEC 144                          | IP67                                    |                                                                                |                                                |                                                                                            |
| Approvals                                                   | UL                               | —                                       |                                                                                |                                                |                                                                                            |
|                                                             | CSA                              | —                                       |                                                                                |                                                |                                                                                            |
| Ambient operating temperature                               |                                  |                                         | -25° to 70°C (-13° to 158°F)                                                   |                                                |                                                                                            |
| Vibration                                                   |                                  |                                         | 10 to 55 Hz, at 1.5 mm in X, Y, and Z directions, double amplitude for 2 hours |                                                |                                                                                            |
| Shock                                                       |                                  |                                         | Approx. 50 G, three times                                                      |                                                |                                                                                            |

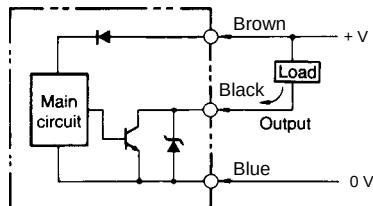
## ■ SHIELDED, METAL BODY SENSORS

|                                                             |                                  |                            |                                                                                  |                                                                                      |
|-------------------------------------------------------------|----------------------------------|----------------------------|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Part number                                                 |                                  |                            | TL-W5E□□                                                                         | TL-W5F□                                                                              |
| Sensor type                                                 |                                  |                            | Inductive                                                                        |                                                                                      |
| Body                                                        | Size                             |                            | Flat, rectangular                                                                |                                                                                      |
|                                                             | Type                             |                            | Shielded                                                                         |                                                                                      |
| Supply voltage                                              |                                  |                            | 10 to 30 VDC, maximum ripple 10% peak-to-peak                                    |                                                                                      |
| Current consumption                                         |                                  |                            | 15 mA max. at 24 VDC                                                             |                                                                                      |
| Detectable object type                                      |                                  |                            | Metal objects                                                                    |                                                                                      |
| Effective maximum detecting distance (with standard object) |                                  |                            | 0 to 4 mm<br>(0 to 0.16 in)                                                      |                                                                                      |
| Standard target size<br>(mild steel, LxWxH)                 |                                  |                            | 18 x 18 x 1 mm<br>(0.71 x 0.71 x 0.04 in)                                        |                                                                                      |
| Differential travel                                         |                                  |                            | 10% max. at effective maximum detecting distance                                 |                                                                                      |
| Control output                                              | DC solid-state                   | Type                       | NPN-NO (TL-W5E1) with pull-up resistor<br>NPN-NC (TL-W5E2) with pull-up resistor | PNP-NO (TL-W5F1) with pull-down resistor<br>PNP-NC (TL-W5F2) with pull-down resistor |
|                                                             |                                  | Max. load                  | 200 mA max.                                                                      |                                                                                      |
|                                                             |                                  | Max. on-state voltage drop | 2.0 V max.                                                                       |                                                                                      |
| Response frequency                                          |                                  |                            | 300 Hz                                                                           |                                                                                      |
| Circuit protection                                          | Output short-circuit             |                            | Not provided                                                                     |                                                                                      |
|                                                             | DC power supply reverse polarity |                            | Provided                                                                         |                                                                                      |
| Indicators                                                  |                                  |                            | Target present (red LED)                                                         |                                                                                      |
| Materials                                                   | Housing                          |                            | Diecast aluminum                                                                 |                                                                                      |
|                                                             | Sensing face                     |                            | Plastic (ABS)                                                                    |                                                                                      |
|                                                             | Cable sheath                     |                            | Oil-proof vinyl                                                                  |                                                                                      |
| Mounting                                                    |                                  |                            | Bottom surface with 2 through holes                                              |                                                                                      |
| Connections                                                 | Prewired                         |                            | 3-conductor cable, 2 m (6.56 ft) length                                          |                                                                                      |
| Weight with cable                                           |                                  |                            | 70 g (2.5 oz.)                                                                   |                                                                                      |
| Enclosure ratings                                           | UL                               |                            | —                                                                                |                                                                                      |
|                                                             | NEMA                             |                            | 1, 2, 3, 4X, 6, 12, 13                                                           |                                                                                      |
|                                                             | IEC 144                          |                            | IP67                                                                             |                                                                                      |
| Approvals                                                   | UL                               |                            | —                                                                                |                                                                                      |
|                                                             | CSA                              |                            | —                                                                                |                                                                                      |
| Ambient operating temperature                               |                                  |                            | -25° to 70°C (-13° to 158°F)                                                     |                                                                                      |
| Vibration                                                   |                                  |                            | 10 to 55 Hz, at 1.5 mm in X, Y, and Z directions, double amplitude for 2 hours   |                                                                                      |
| Shock                                                       |                                  |                            | Approx. 50 G, three hours                                                        |                                                                                      |

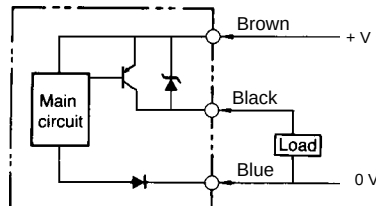
## Operation

### ■ OUTPUT CIRCUIT DIAGRAMS

NPN Output TL-W□MC□

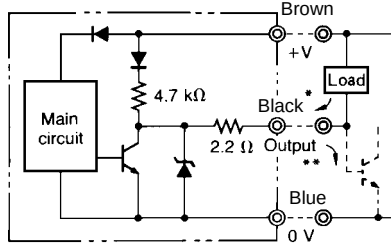


PNP Output TL-W□MB□



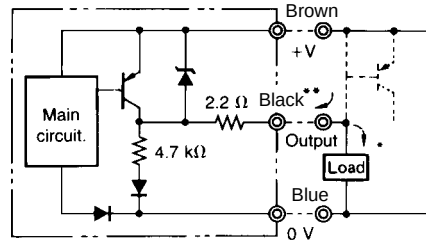
## OUTPUT CIRCUIT DIAGRAMS (continued)

### NPN Output TL-W5E□, TL-W20ME□



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

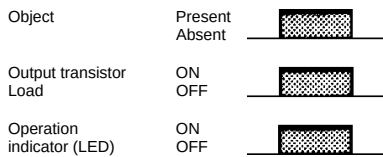
### PNP Output TL-W5F□



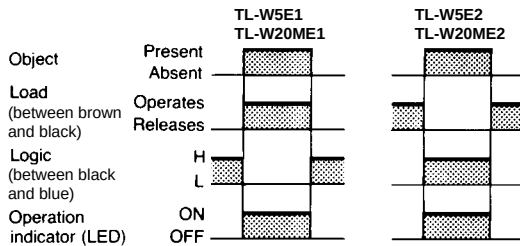
\* 200 mA max. (load current)  
\*\* When a transistor is connected

## TIMING CHARTS

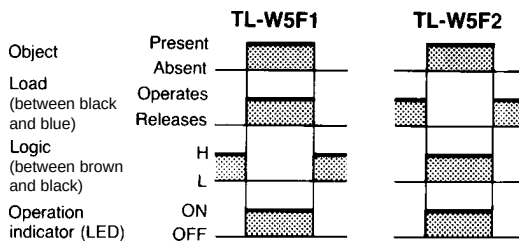
### TL-W3M, TL-W5M



### NPN Output TL-W5E□, TL-W20ME□



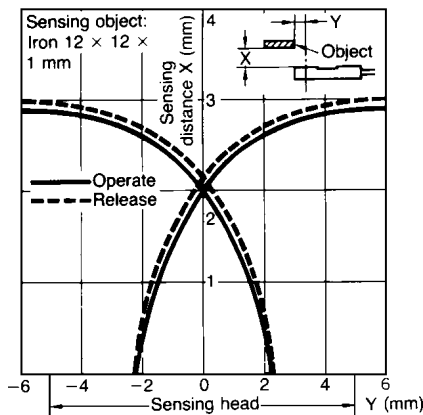
### PNP Output TL-W5F□



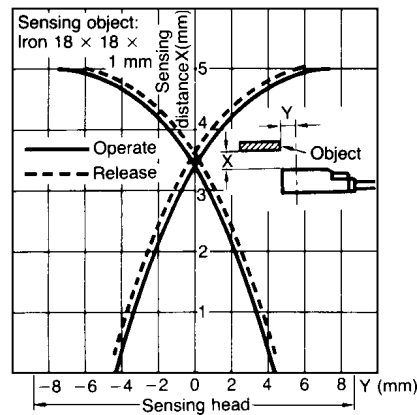
## Engineering Data

### OPERATING RANGE

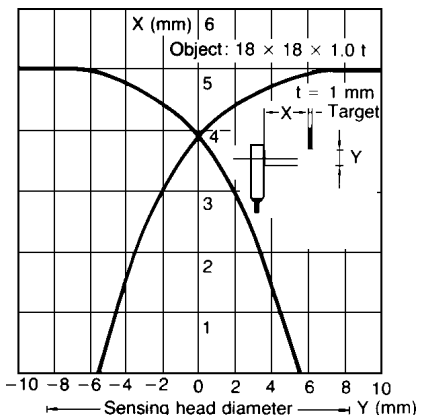
#### TL-W3M□



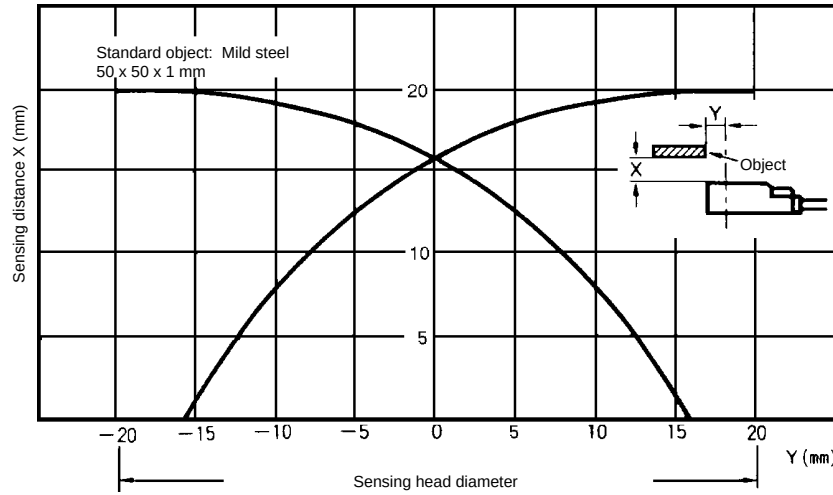
#### TL-W5M□



#### TL-W5□□

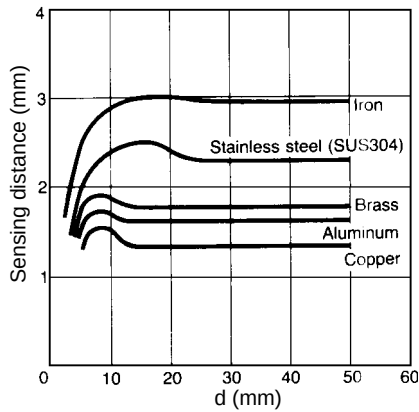


### TL-W20M□□

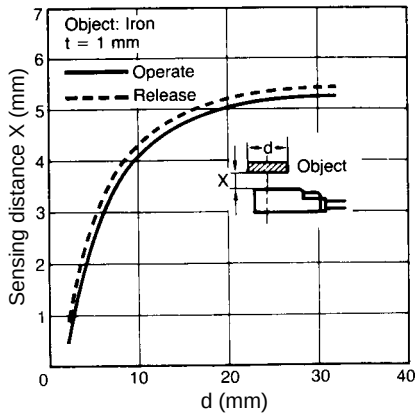


## ■ SENSITIVITY

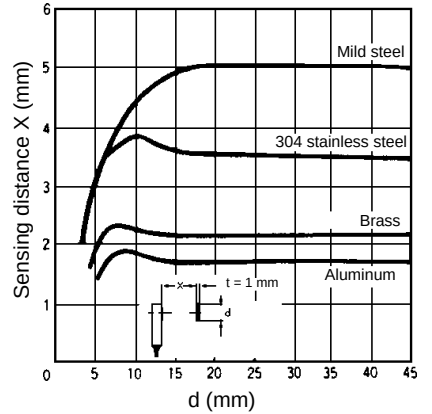
### TL-W3M□1



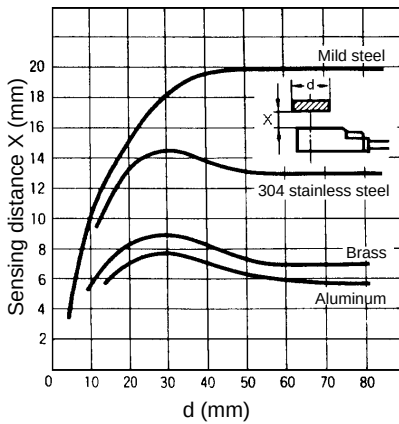
### TL-W5M□1



### TL-W5□



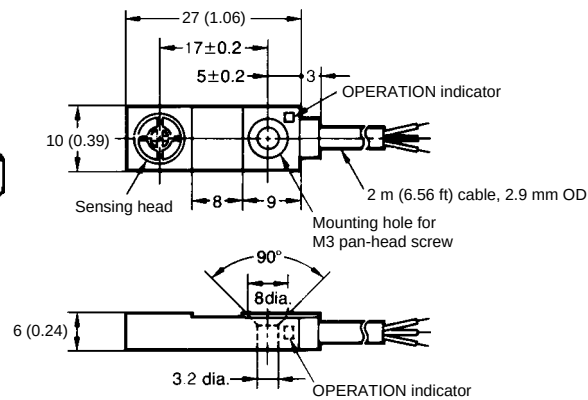
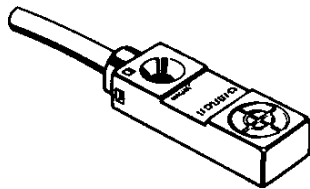
### TL-W20M□



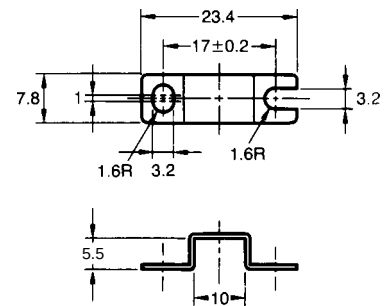
# Dimensions

Unit: mm (inch)

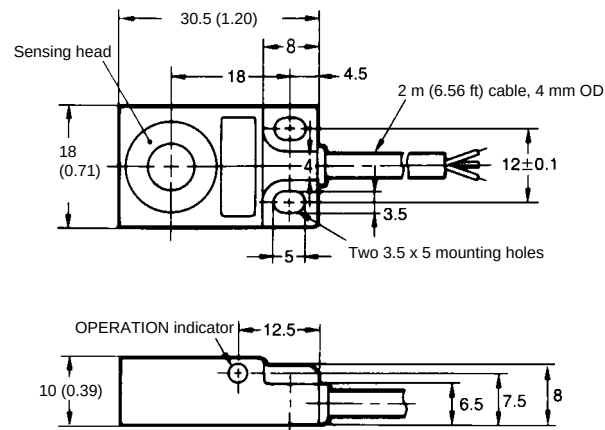
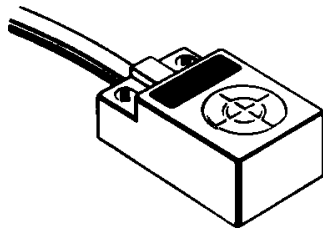
## TL-W3M□1



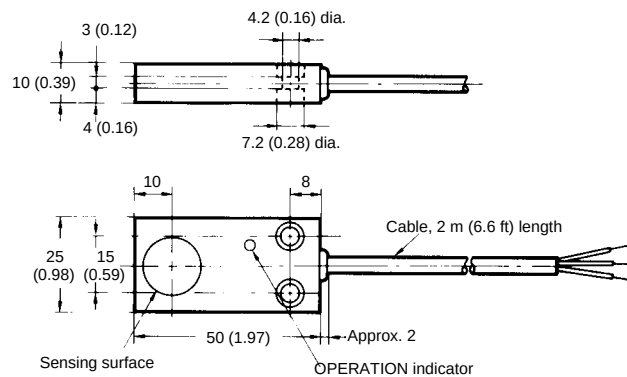
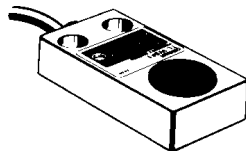
## Mounting bracket (included)



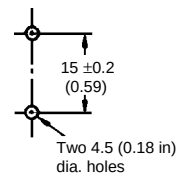
## TL-W5M□1



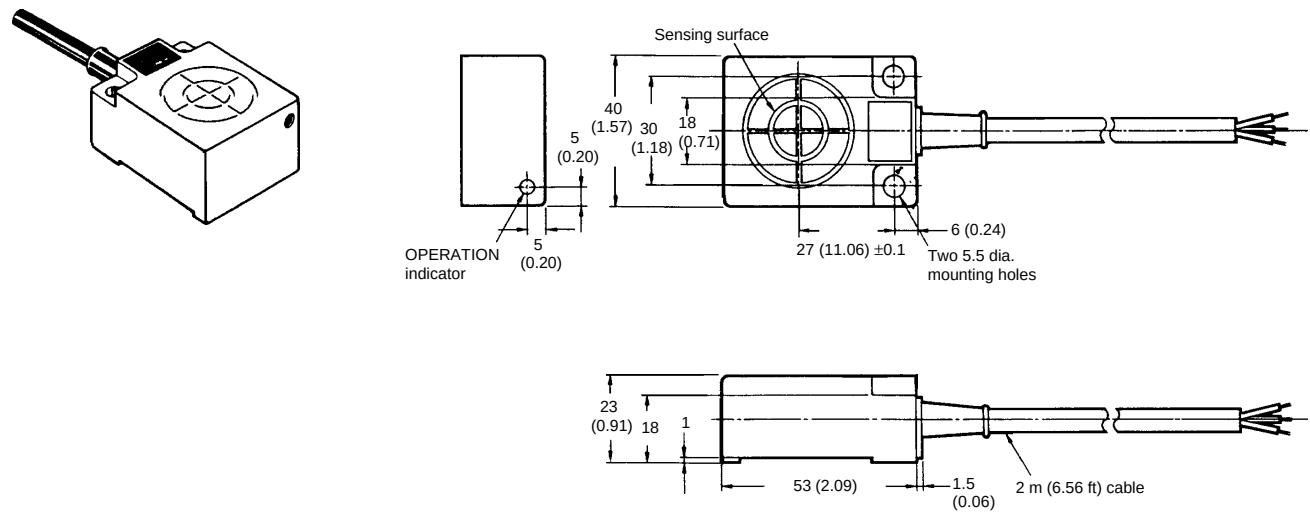
## TL-W5E, TL-W5F



## Mounting holes



# TL-W20ME□

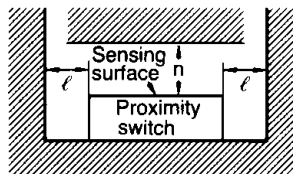


## Precautions

### INFLUENCE OF SURROUNDING METALS

When mounting the proximity sensor flush with a metallic panel, be sure to allow a minimum distance as shown in the table below. If the other side is open, the value of "ℓ" is zero.

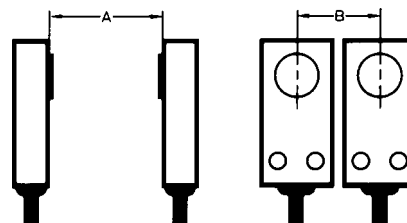
| Distance | " ℓ "           | n                |
|----------|-----------------|------------------|
| TL-W3M   | 3 mm (0.12 in)  | 12 mm (0.47 in)  |
| TL-W5M   | 5 mm (0.20 in)  | 20 mm (0.79 in)  |
| TL-W20M  | 25 mm (0.98 in) | 100 mm (0.34 in) |



### MUTUAL INTERFERENCE

When mounting two or more sensors of the same type face to face or side by side, be sure to provide a minimum distance as shown in the table below.

| Distance | A                | B                |
|----------|------------------|------------------|
| TL-W3M   | 90 mm (3.54 in)  | 30 mm (1.18 in)  |
| TL-W5M   | 120 mm (4.72 in) | 60 mm (2.36 in)  |
| TL-W5□   | 50 mm (1.97 in)  | 35 mm (1.38 in)  |
| TL-W20M  | 200 mm (7.87 in) | 200 mm (7.87 in) |



NOTE: DIMENSIONS ARE SHOWN IN MILLIMETERS. To convert millimeters to inches divide by 25.4.



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Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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**Факс:** 8 (812) 320-02-42

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**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.