

## Standard Flat Sensors in Many Different Variations

- Only 6 mm thick yet provides a sensing distance of 3 mm (TL-W3MC1).
- Aluminum die-cast models also available.



CE



Be sure to read *Safety Precautions* on page 7.

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 8.]

### DC 2-Wire Models

| Appearance                                                                                        | Sensing distance | Model             |                |
|---------------------------------------------------------------------------------------------------|------------------|-------------------|----------------|
|                                                                                                   |                  | Operation mode    |                |
|                                                                                                   |                  | NO                | NC             |
| Unshielded<br> | 5 mm             | TL-W5MD1 2M *1 *3 | TL-W5MD2 2M *3 |

### DC 3-Wire Models

| Appearance                                                                                        | Sensing distance | Output configuration | Model                        |                            |
|---------------------------------------------------------------------------------------------------|------------------|----------------------|------------------------------|----------------------------|
|                                                                                                   |                  |                      | Operation mode               |                            |
|                                                                                                   |                  |                      | NO                           | NC                         |
| Unshielded<br> | 1.5 mm           | DC 3-wire, NPN       | TL-W1R5MC1 2M *1<br>*2<br>*3 | ---                        |
|                                                                                                   | 3 mm             |                      | TL-W3MC1 2M *1<br>*2<br>*3   | TL-W3MC2 2M *1<br>*2<br>*3 |
|                                                                                                   | 5 mm             |                      | TL-W5MC1 2M *1<br>*2<br>*3   | TL-W5MC2 2M *2             |
|                                                                                                   | 20 mm            |                      | TL-W20ME1 2M *1<br>*2<br>*3  | TL-W20ME2 2M *1            |
| Shielded<br>   | 5 mm             | DC 3-wire, NPN       | TL-W5E1 2M                   | TL-W5E2 2M                 |
|                                                                                                   |                  | DC 3-wire, PNP       | TL-W5F1 2M                   | TL-W5F2 2M                 |

\*1. Models with a different frequency are also available to prevent mutual interference. The model numbers are TL-W□M□□5 (e.g., TL-W5MD15).

\*2. Models with PNP outputs are also available. Ask your OMRON representative for details.

\*3. Models are also available with robotics (bend resistant) cables. Add "R" to the model number. (e.g., TL-W5MC1-R 2M)

## Ratings and Specifications

### DC 2-Wire Models

| Item                                             |                  | Model | TL-W5MD□                                                                                                              |
|--------------------------------------------------|------------------|-------|-----------------------------------------------------------------------------------------------------------------------|
| Sensing distance                                 |                  |       | 5 mm $\pm$ 10%                                                                                                        |
| Set distance                                     |                  |       | 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 5.)    |
| Standard sensing object                          |                  |       | Iron, 18 × 18 × 1 mm                                                                                                  |
| Response frequency *1                            |                  |       | 500 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.                                                                                                           |
| Con-<br>trol<br>output                           | Load current     |       | 3 to 100 mA                                                                                                           |
|                                                  | Residual voltage |       | 3.3 V max. (under load current of 100 mA with cable length of 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    Refer to the timing charts under <i>I/O Circuit Diagrams</i> on page 6 for details.<br>D2 Models: NC |
| Protection circuits                              |                  |       | Load short-circuit protection, Surge suppressor                                                                       |
| Ambient temperature range                        |                  |       | Operating/Storage: -25 to 70°C (with no icing or condensation) *2                                                     |
| Ambient humidity range                           |                  |       | Operating/Storage: 35% to 95% (with no condensation)                                                                  |
| Temperature influence                            |                  |       | $\pm$ 10% max. of sensing distance at 23°C in the temperature range of -25 to 70°C                                    |
| Voltage influence                                |                  |       | $\pm$ 2.5% max. of sensing distance at rated voltage in the rated voltage $\pm$ 15% range                             |
| Insulation resistance                            |                  |       | 50 M $\Omega$ 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/s <sup>2</sup> 3 times each in X, Y, and Z directions                                              |
| Degree of protection                             |                  |       | IEC 60529 IP67, in-house standards: oil-resistant *2                                                                  |
| Connection method                                |                  |       | Pre-wired Models (Standard cable length: 2 m)                                                                         |
| Weight (packed state)                            |                  |       | Approx. 80 g                                                                                                          |
| Materials                                        | Case             |       | Heat-resistant ABS                                                                                                    |
|                                                  | Sensing surface  |       |                                                                                                                       |
| Accessories                                      |                  |       | 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. For environments that require oil resistance, the upper limit of the ambient operating temperature range is 40°C.