OMRON

# Cylindrical Proximity Sensor

# E2EL

A new series of easy-to-use models for standard- and double-distance

- Stainless steel and brass housing
- Two housing length for each type
- Pre-wired and Plug-in connector types
- Short-circuit protection and reverse polarity protection

## Sensor 500 Ordering Information

**Note:** The tables below contain part numbers for those Proximity Sensors involved in the Sensor 500 Program only. A complete listing of all E2EL part numbers can be found on the following pages.

### ■ CABLE TYPES

**Brass housing**

| Item | | | | Part numbers | | | |
|---|---|---|---|---|---|---|---|
| Diameter | Length | Mounting | Sensing Distance | Output | | | |
| | | | | NPN/NO | NPN/NC | PNP/NO | PNP/NC |
| ∅6.5 | 30 mm | Shielded | 1.5 mm | **E2EL-C1R5E1** | **E2EL-C1R5E2** | **E2EL-C1R5F1** | **E2EL-C1R5F2** |
| | 32 mm | Non-shielded | 2.0 mm | **E2EL-C2ME1** | **E2EL-C2ME2** | **E2EL-C2MF1** | **E2EL-C2MF2** |
| M8 | 30 mm | Shielded | 1.5 mm | **E2EL-X1R5E1** | **E2EL-X1R5E2** | **E2EL-X1R5F1** | **E2EL-X1R5F2** |
| | 32 mm | Non-shielded | 2.0 mm | **E2EL-X2ME1** | **E2EL-X2ME2** | **E2EL-X2MF1** | **E2EL-X2MF2** |
| M12 | 41 mm | Shielded | 2.0 mm | **E2EL-X2E1** | **E2EL-X2E2** | **E2EL-X2F1** | **E2EL-X2F2** |
| | | Non-shielded | 4.0 mm | **E2EL-X4ME1** | **E2EL-X4ME2** | **E2EL-X4MF1** | **E2EL-X4MF2** |
| M18 | 40 mm | Shielded | 5.0 mm | **E2EL-X5E1** | **E2EL-X5E2** | **E2EL-X5F1** | **E2EL-X5F2** |
| | | Non-shielded | 8.0 mm | **E2EL-X8ME1** | **E2EL-X8ME2** | **E2EL-X8MF1** | **E2EL-X8MF2** |

### ■ PLUG TYPES

**Brass housing**

| Item | | | | Part numbers | | | |
|---|---|---|---|---|---|---|---|
| Diameter/ Connection | Length | Mounting | Sensing Distance | Output | | | |
| | | | | NPN / NO | NPN / NC | PNP / NO | PNP / NC |
| ∅6.5/Plug M8 | 45 mm | Shielded | 1.5 mm | **E2EL-C1R5E1-M3** | **E2EL-C1R5E2-M3** | **E2EL-C1R5F1-M3** | **E2EL-C1R5F2-M3** |
| | 47 mm | Non-shielded | 2.0 mm | **E2EL-C2ME1-M3** | **E2EL-C2ME2-M3** | **E2EL-C2MF1-M3** | **E2EL-C2MF2-M3** |
| M8/Plug M8 | 45 mm | Shielded | 1.5 mm | **E2EL-X1R5E1-M3** | **E2EL-X1R5E2-M3** | **E2EL-X1R5F1-M3** | **E2EL-X1R5F2-M3** |
| | 47 mm | Non-shielded | 2.0 mm | **E2EL-X2ME1-M3** | **E2EL-X2ME2-M3** | **E2EL-X2MF1-M3** | **E2EL-X2MF2-M3** |
| M12/Plug M12 | 49 mm | Shielded | 2.0 mm | **E2EL-X2E1-M1** | **E2EL-X2E2-M1** | **E2EL-X2F1-M1** | **E2EL-X2F2-M1** |
| | | Non-shielded | 4.0 mm | **E2EL-X4ME1-M1** | **E2EL-X4ME2-M1** | **E2EL-X4MF1-M1** | **E2EL-X4MF2-M1** |
| M18/Plug M12 | 53 mm | Shielded | 5.0 mm | **E2EL-X5E1-M1** | **E2EL-X5E2-M1** | **E2EL-X5F1-M1** | **E2EL-X5F2-M1** |
| | | Non-shielded | 8.0 mm | **E2EL-X8ME1-M1** | **E2EL-X8ME2-M1** | **E2EL-X8MF1-M1** | **E2EL-X8MF2-M1** |

# Ordering Information

**Note:** The tables below contain a complete listing of all E2EL part numbers. For information on Proximity Sensors involved in the **Sensor 500** Program refer to the previous page.

## ■ CABLE TYPES

### Brass housing

| Item | | | | Part numbers | | | |
|---|---|---|---|---|---|---|---|
| Diameter | Length | Mounting | Sensing Distance | Output | | | |
| | | | | NPN/NO | NPN/NC | PNP/NO | PNP/NC |
| ∅6.5 | 30 mm | Shielded | 1.5 mm | **E2EL-C1R5E1** | **E2EL-C1R5E2** | **E2EL-C1R5F1** | **E2EL-C1R5F2** |
| | 32 mm | Non-shielded | 2.0 mm | **E2EL-C2ME1** | **E2EL-C2ME2** | **E2EL-C2MF1** | **E2EL-C2MF2** |
| | 45 mm | Shielded | 1.5 mm | **E2EL-C1R5E1-L** | **E2EL-C1R5E2-L** | **E2EL-C1R5F1-L** | **E2EL-C1R5F2-L** |
| | 47 mm | Non-shielded | 2.0 mm | **E2EL-C2ME1-L** | **E2EL-C2ME2-L** | **E2EL-C2MF1-L** | **E2EL-C2MF2-L** |
| M8 | 30 mm | Shielded | 1.5 mm | **E2EL-X1R5E1** | **E2EL-X1R5E2** | **E2EL-X1R5F1** | **E2EL-X1R5F2** |
| | 32 mm | Non-shielded | 2.0 mm | **E2EL-X2ME1** | **E2EL-X2ME2** | **E2EL-X2MF1** | **E2EL-X2MF2** |
| | 45 mm | Shielded | 1.5 mm | **E2EL-X1R5E1-L** | **E2EL-X1R5E2-L** | **E2EL-X1R5F1-L** | **E2EL-X1R5F2-L** |
| | 47 mm | Non-shielded | 2.0 mm | **E2EL-X2ME1-L** | **E2EL-X2ME2-L** | **E2EL-X2MF1-L** | **E2EL-X2MF2-L** |
| M12 | 41 mm | Shielded | 2.0 mm | **E2EL-X2E1** | **E2EL-X2E2** | **E2EL-X2F1** | **E2EL-X2F2** |
| | | Shielded | 4.0 mm | **E2EL-X4E1-D** | **E2EL-X4E2-D** | **E2EL-X4F1-D** | **E2EL-X4F2-D** |
| | | Non-shielded | 4.0 mm | **E2EL-X4ME1** | **E2EL-X4ME2** | **E2EL-X4MF1** | **E2EL-X4MF2** |
| | 53 mm | Shielded | 2.0 mm | **E2EL-X2E1-L** | **E2EL-X2E2-L** | **E2EL-X2F1-L** | **E2EL-X2F2-L** |
| | | Shielded | 4.0 mm | **E2EL-X4E1-DL** | **E2EL-X4E2-DL** | **E2EL-X4F1-DL** | **E2EL-X4F2-DL** |
| | | Non-shielded | 4.0 mm | **E2EL-X4ME1-L** | **E2EL-X4ME2-L** | **E2EL-X4MF1-L** | **E2EL-X4MF2-L** |
| M18 | 40 mm | Shielded | 5.0 mm | **E2EL-X5E1** | **E2EL-X5E2** | **E2EL-X5F1** | **E2EL-X5F2** |
| | | Shielded | 8.0 mm | **E2EL-X8E1-D** | **E2EL-X8E2-D** | **E2EL-X8F1-D** | **E2EL-X8F2-D** |
| | | Non-shielded | 8.0 mm | **E2EL-X8ME1** | **E2EL-X8ME2** | **E2EL-X8MF1** | **E2EL-X8MF2** |
| | 73 mm | Shielded | 5.0 mm | **E2EL-X5E1-L** | **E2EL-X5E2-L** | **E2EL-X5F1-L** | **E2EL-X5F2-L** |
| | | Shielded | 8.0 mm | **E2EL-X8E1-DL** | **E2EL-X8E2-DL** | **E2EL-X8F1-DL** | **E2EL-X8F2-DL** |
| | | Non-shielded | 8.0 mm | **E2EL-X8ME1-L** | **E2EL-X8ME2-L** | **E2EL-X8MF1-L** | **E2EL-X8MF2-L** |
| M30 | 40 mm | Shielded | 10.0 mm | **E2EL-X10E1** | **E2EL-X10E2** | **E2EL-X10F1** | **E2EL-X10F2** |
| | | Non-shielded | 15.0 mm | **E2EL-X15ME1** | **E2EL-X15ME2** | **E2EL-X15MF1** | **E2EL-X15MF2** |
| | 80 mm | Shielded | 10.0 mm | **E2EL-X10E1-L** | **E2EL-X10E2-L** | **E2EL-X10F1-L** | **E2EL-X10F2-L** |
| | | Non-shielded | 15.0 mm | **E2EL-X15ME1-L** | **E2EL-X15ME2-L** | **E2EL-X15MF1-L** | **E2EL-X15MF2-L** |

### Stainless steel housing

| Item | | | | Part numbers | | | |
|---|---|---|---|---|---|---|---|
| Diameter | Length | Mounting | Sensing Distance | Output | | | |
| | | | | NPN/NO | NPN/NC | PNP/NO | PNP/NC |
| ∅6.5 | 30 mm | Shielded | 2.0 mm | **E2EL-C2E1-DS** | **E2EL-C2E2-DS** | **E2EL-C2F1-DS** | **E2EL-C2F2-DS** |
| | 45 mm | Shielded | 2.0 mm | **E2EL-C2E1-DSL** | **E2EL-C2E2-DSL** | **E2EL-C2F1-DSL** | **E2EL-C2F2-DSL** |
| M8 | 30 mm | Shielded | 2.0 mm | **E2EL-X2E1-DS** | **E2EL-X2E2-DS** | **E2EL-X2F1-DS** | **E2EL-X2F2-DS** |
| | 45 mm | Shielded | 2.0 mm | **E2EL-X2E1-DSL** | **E2EL-X2E2-DSL** | **E2EL-X2F1-DSL** | **E2EL-X2F2-DSL** |
| M12 | 41 mm | Shielded | 4.0 mm | **E2EL-X4E1-DS** | **E2EL-X4E2-DS** | **E2EL-X4F1-DS** | **E2EL-X4F2-DS** |
| | 53 mm | Shielded | 4.0 mm | **E2EL-X4E1-DSL** | **E2EL-X4E2-DSL** | **E2EL-X4F1-DSL** | **E2EL-X4F2-DSL** |
| M18 | 40 mm | Shielded | 8.0 mm | **E2EL-X8E1-DS** | **E2EL-X8E2-DS** | **E2EL-X8F1-DS** | **E2EL-X8F2-DS** |
| | 73 mm | Shielded | 8.0 mm | **E2EL-X8E1-DSL** | **E2EL-X8E2-DSL** | **E2EL-X8F1-DSL** | **E2EL-X8F2-DSL** |

## ■ PLUG TYPES

### Brass housing

| Item | | | | Part numbers | | | |
|---|---|---|---|---|---|---|---|
| Diameter/ Connection | Length | Mounting | Sensing Distance | Output | | | |
| | | | | NPN / NO | NPN / NC | PNP / NO | PNP / NC |
| ∅6.5/Plug M8 | 45 mm | Shielded | 1.5 mm | **E2EL-C1R5E1-M3** | **E2EL-C1R5E2-M3** | **E2EL-C1R5F1-M3** | **E2EL-C1R5F2-M3** |
| | 47 mm | Non-shielded | 2.0 mm | **E2EL-C2ME1-M3** | **E2EL-C2ME2-M3** | **E2EL-C2MF1-M3** | **E2EL-C2MF2-M3** |
| | 54 mm | Shielded | 1.5 mm | **E2EL-C1R5E1-M3L** | **E2EL-C1R5E2-M3L** | **E2EL-C1R5F1-M3L** | **E2EL-C1R5F2-M3L** |
| | 56 mm | Non-shielded | 2.0 mm | **E2EL-C2ME1-M3L** | **E2EL-C2ME2-M3L** | **E2EL-C2MF1-M3L** | **E2EL-C2MF2-M3L** |
| M8/Plug M8 | 45 mm | Shielded | 1.5 mm | **E2EL-X1R5E1-M3** | **E2EL-X1R5E2-M3** | **E2EL-X1R5F1-M3** | **E2EL-X1R5F2-M3** |
| | 47 mm | Non-shielded | 2.0 mm | **E2EL-X2ME1-M3** | **E2EL-X2ME2-M3** | **E2EL-X2MF1-M3** | **E2EL-X2MF2-M3** |
| | 54 mm | Shielded | 1.5 mm | **E2EL-X1R5E1-M3L** | **E2EL-X1R5E2-M3L** | **E2EL-X1R5F1-M3L** | **E2EL-X1R5F2-M3L** |
| | 56 mm | Non-shielded | 2.0 mm | **E2EL-X2ME1-M3L** | **E2EL-X2ME2-M3L** | **E2EL-X2MF1-M3L** | **E2EL-X2MF2-M3L** |
| M8/Plug M12 | 44 mm | Shielded | 1.5 mm | **E2EL-X1R5E1-M1** | **E2EL-X1R5E2-M1** | **E2EL-X1R5F1-M1** | **E2EL-X1R5F2-M1** |
| | 46 mm | Non-shielded | 2.0 mm | **E2EL-X2ME1-M1** | **E2EL-X2ME2-M1** | **E2EL-X2MF1-M1** | **E2EL-X2MF2-M1** |
| | 60 mm | Shielded | 1.5 mm | **E2EL-X1R5E1-M1L** | **E2EL-X1R5E2-M1L** | **E2EL-X1R5F1-M1L** | **E2EL-X1R5F2-M1L** |
| | 62 mm | Non-shielded | 2.0 mm | **E2EL-X2ME1-M1L** | **E2EL-X2ME2-M1L** | **E2EL-X2MF1-M1L** | **E2EL-X2MF2-M1L** |
| M12/Plug M12 | 49 mm | Shielded | 2.0 mm | **E2EL-X2E1-M1** | **E2EL-X2E2-M1** | **E2EL-X2F1-M1** | **E2EL-X2F2-M1** |
| | | Shielded | 4.0 mm | **E2EL-X4E1-DM1** | **E2EL-X4E2-DM1** | **E2EL-X4F1-DM1** | **E2EL-X4F2-DM1** |
| | | Non-shielded | 4.0 mm | **E2EL-X4ME1-M1** | **E2EL-X4ME2-M1** | **E2EL-X4MF1-M1** | **E2EL-X4MF2-M1** |
| | 60 mm | Shielded | 2.0 mm | **E2EL-X2E1-M1L** | **E2EL-X2E2-M1L** | **E2EL-X2F1-M1L** | **E2EL-X2F2-M1L** |
| | | Shielded | 4.0 mm | **E2EL-X4E1-DM1L** | **E2EL-X4E2-DM1L** | **E2EL-X4F1-DM1L** | **E2EL-X4F2-DM1L** |
| | | Non-shielded | 4.0 mm | **E2EL-X4ME1-M1L** | **E2EL-X4ME2-M1L** | **E2EL-X4MF1-M1L** | **E2EL-X4MF2-M1L** |
| M18/Plug M12 | 53 mm | Shielded | 5.0 mm | **E2EL-X5E1-M1** | **E2EL-X5E2-M1** | **E2EL-X5F1-M1** | **E2EL-X5F2-M1** |
| | | Shielded | 8.0 mm | **E2EL-X8E1-DM1** | **E2EL-X8E2-DM1** | **E2EL-X8F1-DM1** | **E2EL-X8F2-DM1** |
| | | Non-shielded | 8.0 mm | **E2EL-X8ME1-M1** | **E2EL-X8ME2-M1** | **E2EL-X8MF1-M1** | **E2EL-X8MF2-M1** |
| | 80 mm | Shielded | 5.0 mm | **E2EL-X5E1-M1L** | **E2EL-X5E2-M1L** | **E2EL-X5F1-M1L** | **E2EL-X5F2-M1L** |
| | | Shielded | 8.0 mm | **E2EL-X8E1-DM1L** | **E2EL-X8E2-DM1L** | **E2EL-X8F1-DM1L** | **E2EL-X8F2-DM1L** |
| | | Non-shielded | 8.0 mm | **E2EL-X8ME1-M1L** | **E2EL-X8ME2-M1L** | **E2EL-X8MF1-M1L** | **E2EL-X8MF2-M1L** |
| M30/Plug M12 | 55 mm | Shielded | 10.0 mm | **E2EL-X10E1-M1** | **E2EL-X10E2-M1** | **E2EL-X10F1-M1** | **E2EL-X10F2-M1** |
| | | Non-shielded | 15.0 mm | **E2EL-X15ME1-M1** | **E2EL-X15ME2-M1** | **E2EL-X15MF1-M1** | **E2EL-X15MF2-M1** |
| | 80 mm | Shielded | 10.0 mm | **E2EL-X10E1-M1L** | **E2EL-X10E2-M1L** | **E2EL-X10F1-M1L** | **E2EL-X10F2-M1L** |
| | | Non-shielded | 15.0 mm | **E2EL-X15ME1-M1L** | **E2EL-X15ME2-M1L** | **E2EL-X15MF1-M1L** | **E2EL-X15MF2-M1L** |

### Stainless steel housing

| Item | | | | Part numbers | | | |
|---|---|---|---|---|---|---|---|
| Diameter/ Connection | Length | Mounting | Sensing Distance | Output | | | |
| | | | | NPN / NO | NPN / NC | PNP / NO | PNP / NC |
| M8/Plug M8 | 54 mm | Shielded | 2.0 mm | **E2EL-X2E1-DM3SL** | **E2EL-X2E2-DM3SL** | **E2EL-X2F1-DM3SL** | **E2EL-X2F2-DM3SL** |
| M12/Plug M12 | 49 mm | Shielded | 4.0 mm | **E2EL-X4E1-DM1S** | **E2EL-X4E2-DM1S** | **E2EL-X4F1-DM1S** | **E2EL-X4F2-DM1S** |
| | 60 mm | Shielded | 4.0 mm | **E2EL-X4E1-DM1SL** | **E2EL-X4E2-DM1SL** | **E2EL-X4F1-DM1SL** | **E2EL-X4F2-DM1SL** |
| M18/Plug M12 | 53 mm | Shielded | 8.0 mm | **E2EL-X8E1-DM1S** | **E2EL-X8E2-DM1S** | **E2EL-X8F1-DM1S** | **E2EL-X8F2-DM1S** |
| | 80 mm | Shielded | 8.0 mm | **E2EL-X8E1-DM1SL** | **E2EL-X8E2-DM1SL** | **E2EL-X8F1-DM1SL** | **E2EL-X8F2-DM1SL** |

# Specifications

## ■ BRASS TYPE

| Type | | | ∅6.5 | | M8 | | M12 | | | M18 | | | M30 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating voltage | | | 10 to 35 VDC | | | | | | | | | | | |
| Rated supply voltage | | | 24 VDC | | | | | | | | | | | |
| Current consumption | | | max. 15 mA at 24 VDC | | | | | | | | | | | |
| Sensing object | | | Ferrous metals | | | | | | | | | | | |
| Mounting ((s)hielded, (n)on-shielded) (see note) | | | s | n | s | n | s | s | n | s | s | n | s | n |
| Operating distance in mm | | | 1.5 | 2.0 | 1.5 | 2.0 | 2.0 | 4.0 | 4.0 | 5.0 | 8.0 | 8.0 | 10.0 | 15.0 |
| Tolerance of operating distance | | | ±10% | | | | | | | | | | | |
| Standard target size in mm (L x W x H in mm, FE 37) | | | 6.5x6.5x1 | | 8x8x1 | | 12x12x1 | | | 18x18x1 | 24x24x1 | | 30x30x1 | 45x45x1 |
| Differential travel | | | 1 % ... 15 % of operating distance | | | | | | | | | | | |
| Max. response frequency in kHz | | | 5.0 | | 5.0 | | 2.0 | 0.6 | 1.0 | 0.5 | 0.3 | 0.5 | 0.25 | 0.15 |
| Control output | Type | | E2EL-... E1 type: NPN-NO<br>E2 type: NPN-NC<br>F1 type: PNP-NO<br>F2 type: PNP-NC | | | | | | | | | | | |
| | Max-Load | | 200 mA | | | | | | | | | | | |
| | Max-on-state Voltage drop | | 2.5 VDC (at 200mA load current and with 2 m cable) | | | | | | | | | | | |
| Circuit protection | | | Reverse polarity, output short-circuit | | | | | | | | | | | |
| Indicator | | | Operating indicator (yellow LED) | | | | | | | | | | | |
| Ambient temperature | | | Operating: -25° to 70°C | | | | | | | | | | | |
| Humidity | | | 35 to 95 % RH | | | | | | | | | | | |
| Influence of temperature | | | ± 10 % max. of Sn at 23°C in temperature range of -25° to 70°C | | | | | | | | | | | |
| Dielectric strength | | | 1,500 VAC, 50/60 Hz for 1 min. between current carry parts and case | | | | | | | | | | | |
| Electromagnetic compatibility EMC | | | EN 60947-5-2 | | | | | | | | | | | |
| Vibration resistance | | | 10 to 70 Hz, 1.5 mm double amplitude for 1 hour each in X, Y and Z directions | | | | | | | | | | | |
| Shock resistance | | | 300 m/s$^2$ (approx. 30 G) for 6 times each in X, Y and Z directions | | | | | | | | | | | |
| Enclosure rating | | | IP 67 (EN 60947-1) | | | | | | | | | | | |
| Connection | Pre-wired | | 2 m PVC-cable, 3 x 0.14 mm$^2$ | | | | 2 m PVC-cable, 3 x 0.25 mm$^2$ | | | | | | 2m PVC-cable, 3 x 0.5 mm$^2$ | |
| | Connector | | M8 plug | | M8 plug<br>M12 plug | | M12 plug | | | | | | | |
| Weight in g | Pre-wired | long | 45 | | 50 | | 75 | | | 115 | | | 260 | |
| | | short | 43 | | 48 | | 70 | | | 100 | | | 200 | |
| | Connector | long | 10 | | 15 | | 25 | | | 60 | | | 155 | |
| | | short | 8 | | 13 | | 20 | | | 50 | | | 110 | |
| Material | Case | | Brass | | | | | | | | | | | |
| | Sensing face | | PBTP | | | | | | | | | | | |

**Note:** For detailed mounting instruction please refer to *Installation* section.

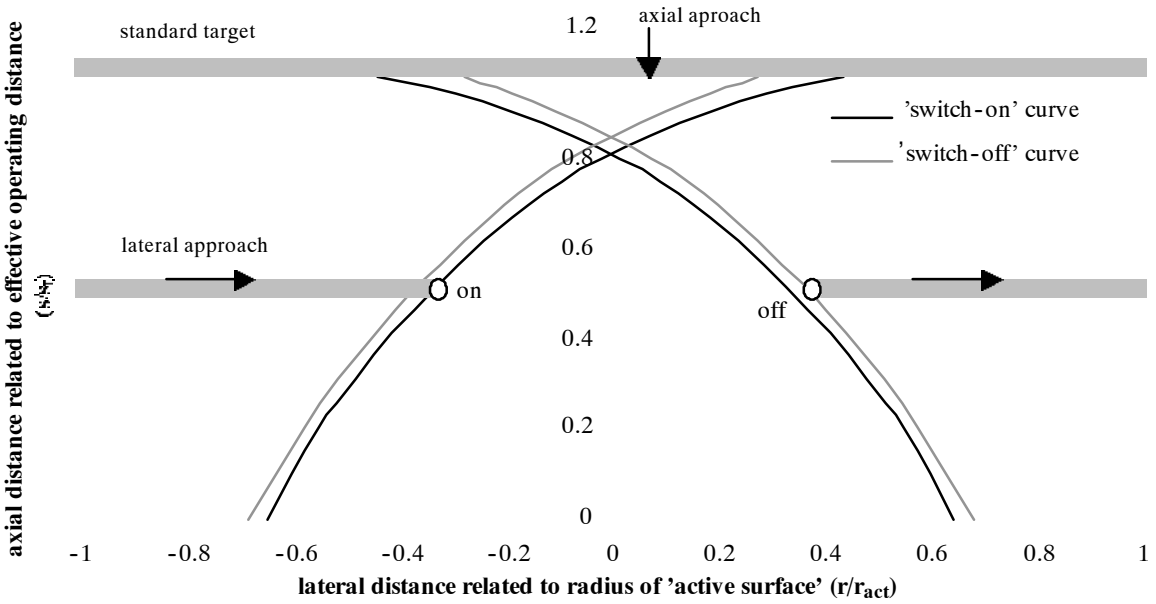
## ■ STAINLESS STEEL TYPE

| Type | | | ∅6.5 | M8 | M12 | M18 |
|---|---|---|---|---|---|---|
| Operating voltage | | | 10 to 35 VDC | | | |
| Rated supply voltage | | | 24 VDC | | | |
| Current consumption | | | max. 15 mA at 24 VDC | | | |
| Mounting (see note) | | | Shielded | | | |
| Sensing object | | | Ferrous metals | | | |
| Operating distance in mm | | | 2.0 | 2.0 | 4.0 | 8.0 |
| Tolerance of operating distance | | | ±10% | | | |
| Standard target size (L x W x H in mm, FE 37) | | | 6.5x6.5x1 | 8x8x1 | 12x12x1 | 24x24x1 |
| Differential travel | | | 1 % ... 15 % of operating distance | | | |
| Max. response frequency in kHz | | | 4.0 | 4.0 | 0.6 | 0.25 |
| Control output | Type | | E2EL-... E1 type: NPN-NO<br>E2 type: NPN-NC<br>F1 type: PNP-NO<br>F2 type: PNP-NC | | | |
| | Max-Load | | 200 mA | | | |
| | Max-on-state Voltage drop | | 2.5 VDC (at 200mA load current and with 2 m cable) | | | |
| Circuit protection | | | Reverse polarity, output short-circuit | | | |
| Indicator | | | Operating indicator (yellow LED) | | | |
| Ambient temperature | | | Operating: -25° to 70°C | | | |
| Humidity | | | 35 to 95 % RH | | | |
| Influence of temperature | | | ± 10 % max. of Sn at 23°C in temperature range of -25° to 70°C | | | |
| Dielectric strength | | | 1,500 VAC, 50/60 Hz for 1 min. between current carry parts and case | | | |
| Electromagnetic compatibility EMC | | | EN 60947-5-2 | | | |
| Vibration resistance | | | Destruction: 10 to 70 Hz, 1.5 mm double amplitude for 1 hour each in X, Y and Z directions | | | |
| Shock resistance | | | Destruction: 300 m/s$^2$ (approx. 30 G) for 6 times each in X, Y and Z directions | | | |
| Enclosure rating | | | IP 67 (EN 60947-1) | | | |
| Connection | Pre-wired | | 2 m PVC-cable, 3 x 0.14 mm$^2$ | | 2 m PVC-cable, 3 x 0.25 mm$^2$ | |
| | Connector | | - | M8 plug | M12 plug | |
| Weight in g | Pre-wired | long | 45 | 50 | 75 | 120 |
| | | short | 43 | 48 | 70 | 105 |
| | Connector | long | - | 10 | 25 | 65 |
| | | short | - | - | 20 | 55 |
| Material | Case | | stainless steel 1.4305 / AISI 303 | | | |
| | Sensing face | | PBTP | | | |

**Note:** For detailed mounting instruction please refer to *Installation* Section.

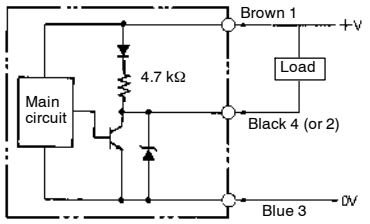
# Engineering Data

## ■ STANDARDIZED CHARACTERISTIC FOR LATERAL APPROACH

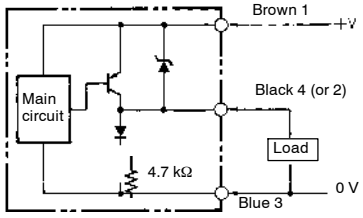



## ■ OUTPUT CIRCUIT DIAGRAM AND TIMING CHART

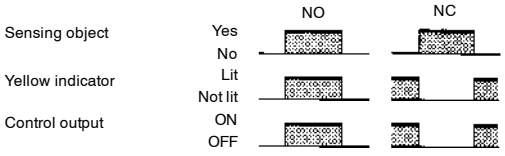
**E2EL-X□E□**
**NPN Output**



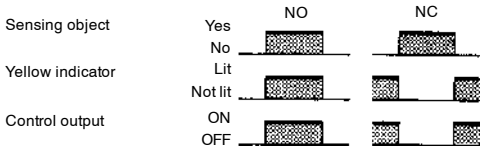

**E2EL-X□F□**
**PNP Output**




**E2EL-X□E□**
**NPN Output**

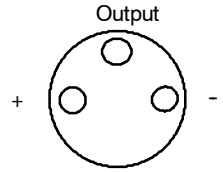



**E2EL-X□F□**
**PNP Output**



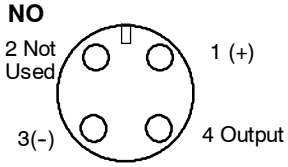
## ■ PIN ARRANGEMENT AT CONNECTOR TYPES

**1. Connector M8 (viewed to plug pins)**

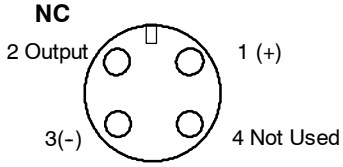



**2. Connector M12 (viewed to plug pins)**

**NO**




**NC**




# Dimensions

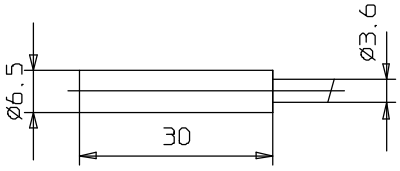
**Note:** 1. All units are in millimeters unless otherwise indicated.

2. Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions. Values in parentheses () are cumulative values and may exceed tolerance of ±0.4 mm.

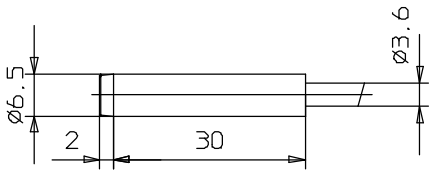
3. The square □ in the models represents the output configuration. Refer to *Ordering Information*.

### Cable Types

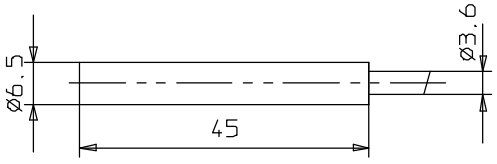
**E2EL- C1□R5 2M, E2EL- C2□- DS**



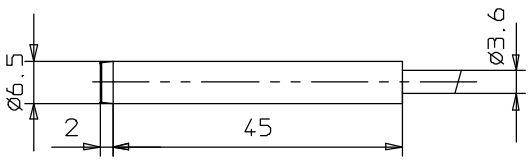

**E2EL- C2M□**



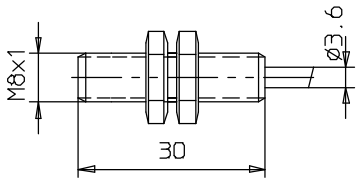

**E2EL- C1R5□- L 2M, E2EL- C2□- DSL**



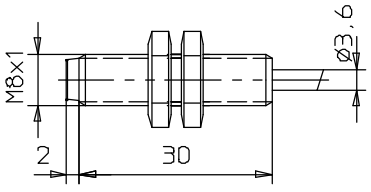

**E2EL- C2M□- L**



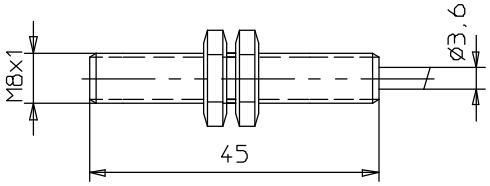

**E2EL- X1R5□ 2M, E2EL- X2□- DS**



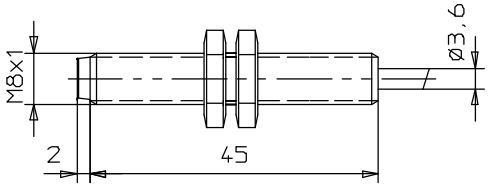

**E2EL- X2M□**



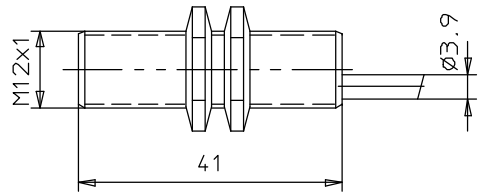

**E2EL- X1R5□- L 2M, E2EL- X2□- DSL**



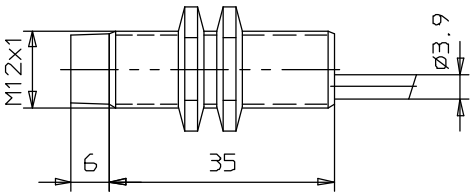

**E2EL- X2M□- L**



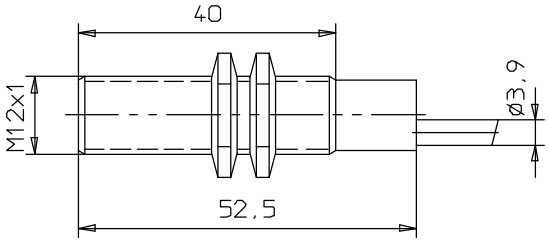
**E2EL-X2□ 2M, E2EL-X4□-D 2M, E2EL-X4□-DS**



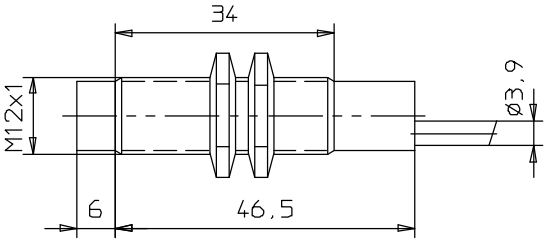

**E2EL-X4M□**



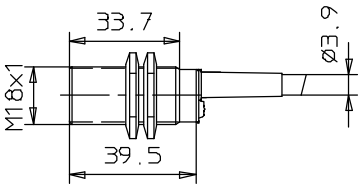

**E2EL-X2□-L 2M, E2EL-X4□-DL 2M, E2EL-X4□-DSL**



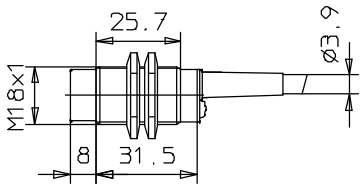

**E2EL-X4M□-L**



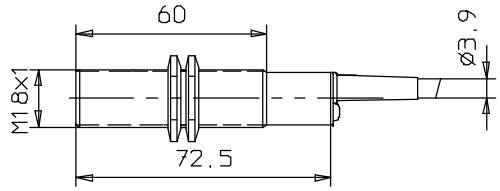

**E2EL-X5□ 2M, E2EL-X8□-D 2M, E2EL-X8□-DS**



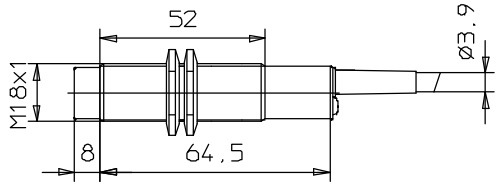

**E2EL-X8M□**



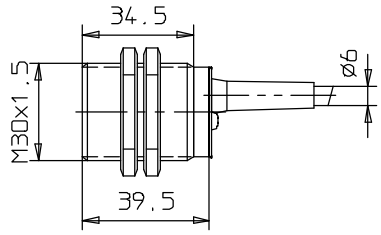

**E2EL-X5□-L 2M, E2EL-X8□-DL 2M, E2EL-X8□-DSL**



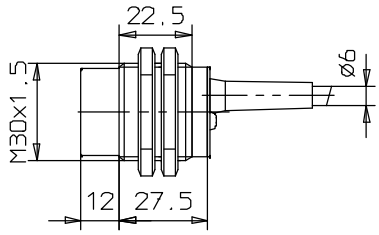

**E2EL-X8M□-L**



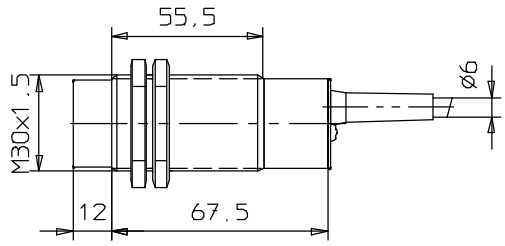

**E2EL-X10□**



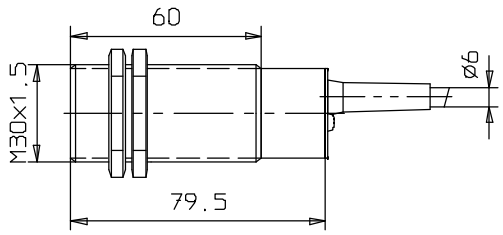

**E2EL-X15M□**




**E2EL-X10□-L**

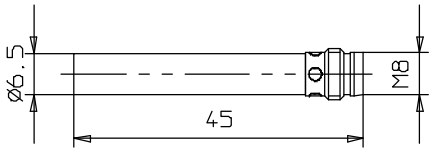



**E2EL-X15M□-L**

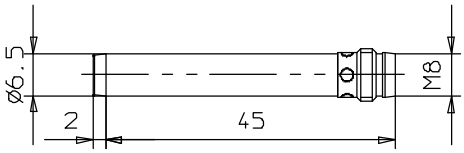


## Plug Types

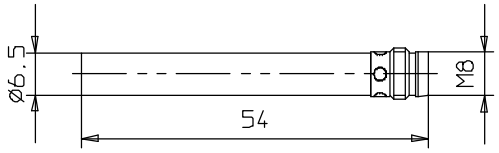
**E2EL- C1R5□- M3**



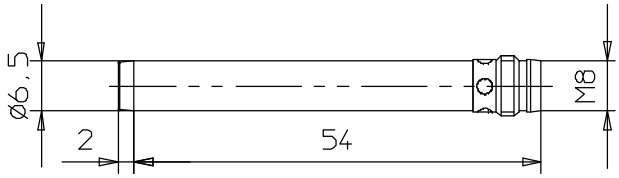

**E2EL- C2M□- M3**



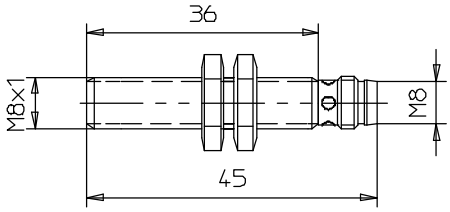

**E2EL- C1R5□- M3L**



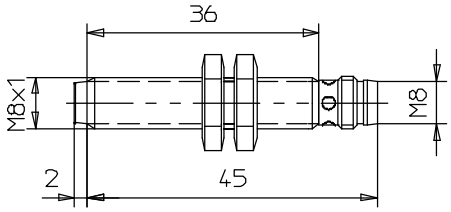

**E2EL- C2M□- M3L**



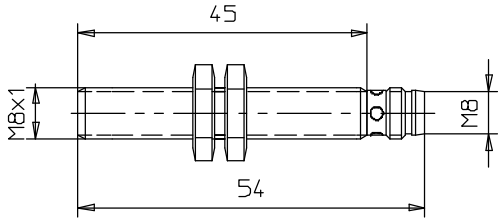

**E2EL- X1R5□- M3**



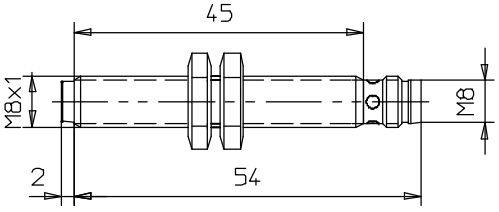

**E2EL- X2M□- M3**



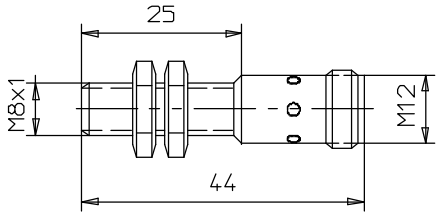

**E2EL- X1R5□- M3L, E2EL- X2□DM3S**



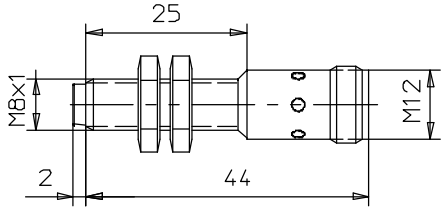

**E2EL- X2M□- M3L**



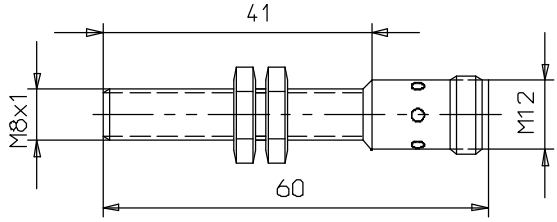

**E2EL- X1R5□- M1**



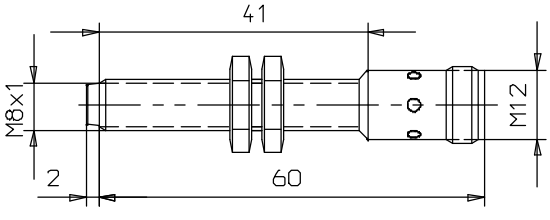

**E2EL- X2M□- M1**



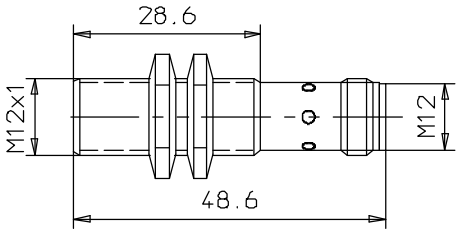

**E2EL- X1R5□- M1L**



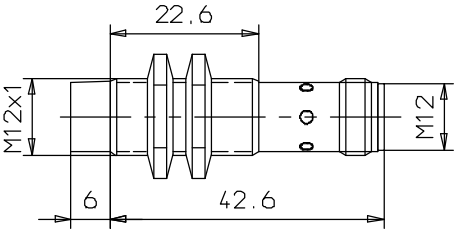

**E2EL- X2M□- M1L**



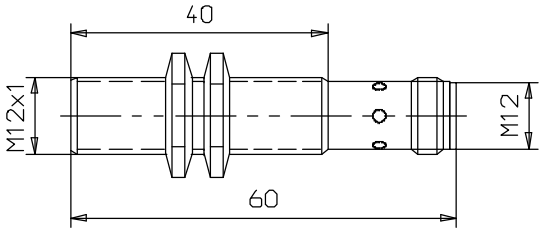
**E2EL-X2□-M1, E2EL-X4□-DM1, E2EL-X4□-DM1S**



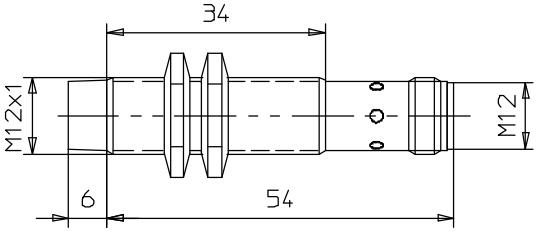

**E2EL-X4M□-M1**



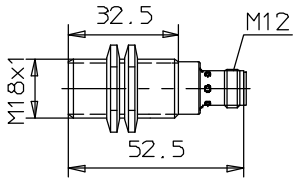

**E2EL-X2□-M1L, E2EL-X4□-DM1L, E2EL-X4□-DM1SL**



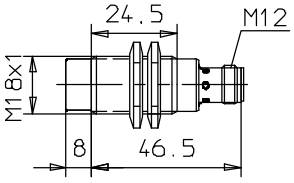

**E2EL-X4M□-M1L**



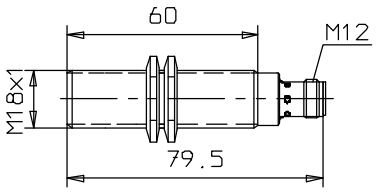

**E2EL-X5□-M1, E2EL-X8□-DM1, E2EL-X8□-DM1S**



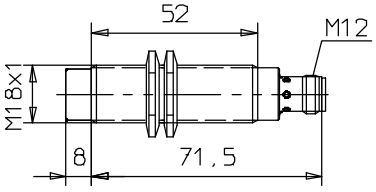

**E2EL-X8M□-M1**



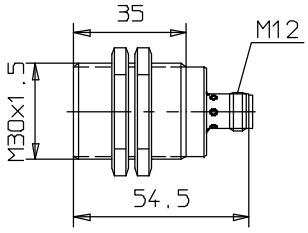

**E2EL-X5□-M1L, E2EL-X8□-DM1L, E2EL-X8□-DM1SL**



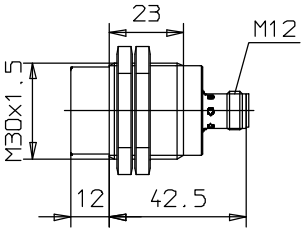

**E2EL-X8M□-M1L**



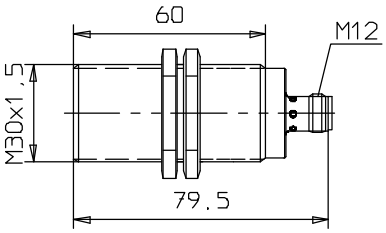

**E2EL-X10□-M1**



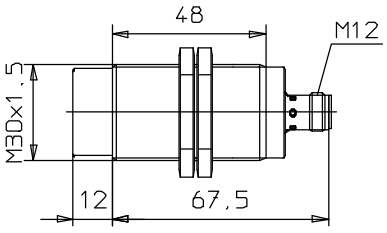

**E2EL-X15M□-M1**




**E2EL-X10□-M1L**

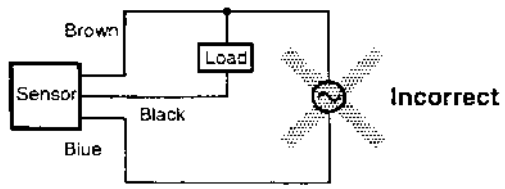
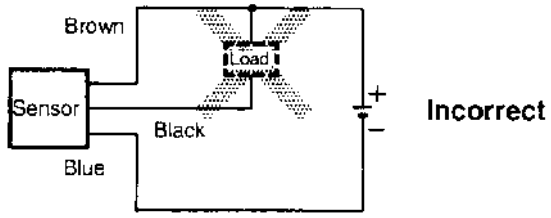
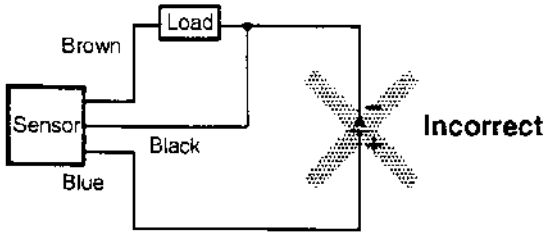



**E2EL-X15M□-M1L**



# Installation

## ■ CAUTION

| Item | Examples |
|---|---|
| Power Supply<br>Do not impose an excessive voltage on the E2EL, otherwise it may explode or burn.<br>Do not impose 24 VAC on any E2EL model, otherwise it may explode or burn. |  |
| Load short-circuit<br>Do not short-circuit the load, or the E2EL may explode or burn.<br>The E2EL's short-circuit protection function is valid, if the polarity of the supply voltage imposed is incorrect and within the rated voltage range. |  |
| Wiring<br>Be sure to wire the E2EL and load correctly, otherwise it may explode or burn. |  |

## ■ CORRECT USE

### Installation

#### Power Reset Time

The Proximity Sensor is ready to operate within 100 ms after power is supplied. If power supplies are connected to the Proximity Sensor and load respectively, be sure to supply power to the Proximity Sensor before supplying power to the load.

#### Power OFF

The Proximity Sensor may output a pulse signal when it is turned off. Therefore, it is recommended to turn off the load before turning off the Proximity Sensor.

#### Power Supply Transformer

When using a DC power supply, make sure that the DC power supply has an insulated transformer. Do not use a DC power supply with an auto-transformer.

#### Sensing Object

Metal Coating:

The sensing distance of the Proximity Sensor vary with the metal coating on sensing objects.

### Wiring

#### High- tension Lines

Wiring through Metal Conduit

If there a power or high-tension line near the cord of the Proximity Sensor, wire the cord through an independent metal conduit to prevent against Proximity Sensor damage or malfunctioning.

#### Core Tractive Force

Do not pull cords with the tractive force exceeding the following:

pull force (N) = 20 x cable diameter ( mm)

#### Mounting

The Proximity Sensor must not be subjected to excessive shock with a ha mmer when it is installed, otherwise the Proximity Sensor may be damaged or lose the water-resistivity.

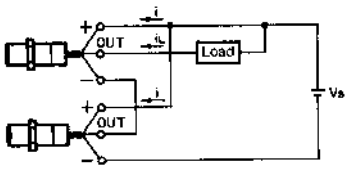
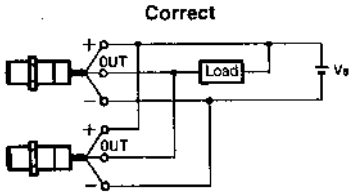
### Environment

#### Water- Resistivity

Do not use the Proximity Sensor underwater, outdoors or in the rain.

#### Operating Environment

Be sure to use the Proximity Sensor within operating ambient temperature range and do not use the Proximity Sensor outdoors so that its reliability and life expectancy can be maintained. Although the Proximity Sensor is water resistive, a cover to protect the Proximity Sensor from water or soluble machining oil is reco mmended so that its reliability and life expectancy can be maintained. Do not use the Proximity Sensor in an environment with chemical gas (e. G., strong alkaline or acid gases including nitric, chromic, and concentrated sulfuric acid gases).

| Item | Examples | Item |
|---|---|---|
| AND<br>(serial connection) | Correct<br>  <br> | The Sensors connected together must satisfy the following conditions:<br>$i_L + (N-1) \times i$ = Upper-limit of control output of each Sensor<br>$V_S - N \times V_R$ = Load operating voltage<br>N = No. of Sensors<br>$V_R$ = Residual voltage of each Sensor<br>$V_S$ = Supply voltage<br>i = Current consumption of the Sensor<br>$i_L$ = Load current<br>If the MY Relay, which operate at 24 VDC, is used as a load for example, a maximum of two Proximity Sensors can be connected to the load. |
| OR<br>(parallel connection) | Correct<br>  <br> | The number of Sensors connected in parallel varies with the Proximity Sensor model. |

## Effects of Surrounding Metal

**Shielded types**

Shielded types allow direct installation on metal plates in an embedded manner without performance change. A minimum distance of $3s_n$ is required between the active surface and a metallic surface in front of the device. (Fig. 1).

For SUS shielded types the following minimum distances are required to avoid performance change (see Fig.2 and table below):

| Shielded SUS Types | Free zone |
|---|---|
| E2EL-C2□-DS | 0.5 mm |
| E2EL-X2□-DS | 0.5 mm |
| E2EL-X4□-D□S | 1.0 mm |
| E2EL-X8□-D□S | 2.0 mm |

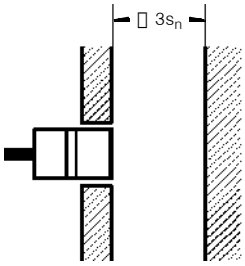



**Fig.1: Shielded type (except SUS)**

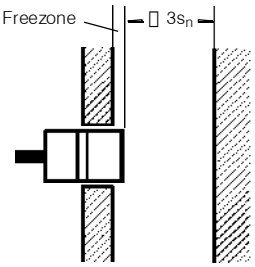



**Fig.2: Shielded SUS type**

**Non-shielded types**

Installation of non-shielded types in metal require the minimum distances according to Fig. 3.

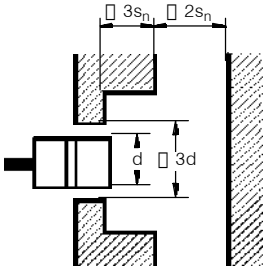



**Fig.3: Non- shielded type**

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

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