## Proximity Sensors

DC 2-Wire and 3-Wire Models

## E2E NEXT Series

9mm
M12 DC 3-wire

Four times the range of
a standard M12 sensor

# Exceptional sensing range

Reduces sensor failures
and increases productivity

**NEW**

IO-Link is standard for NO/PNP 3-wire models

IO-Link

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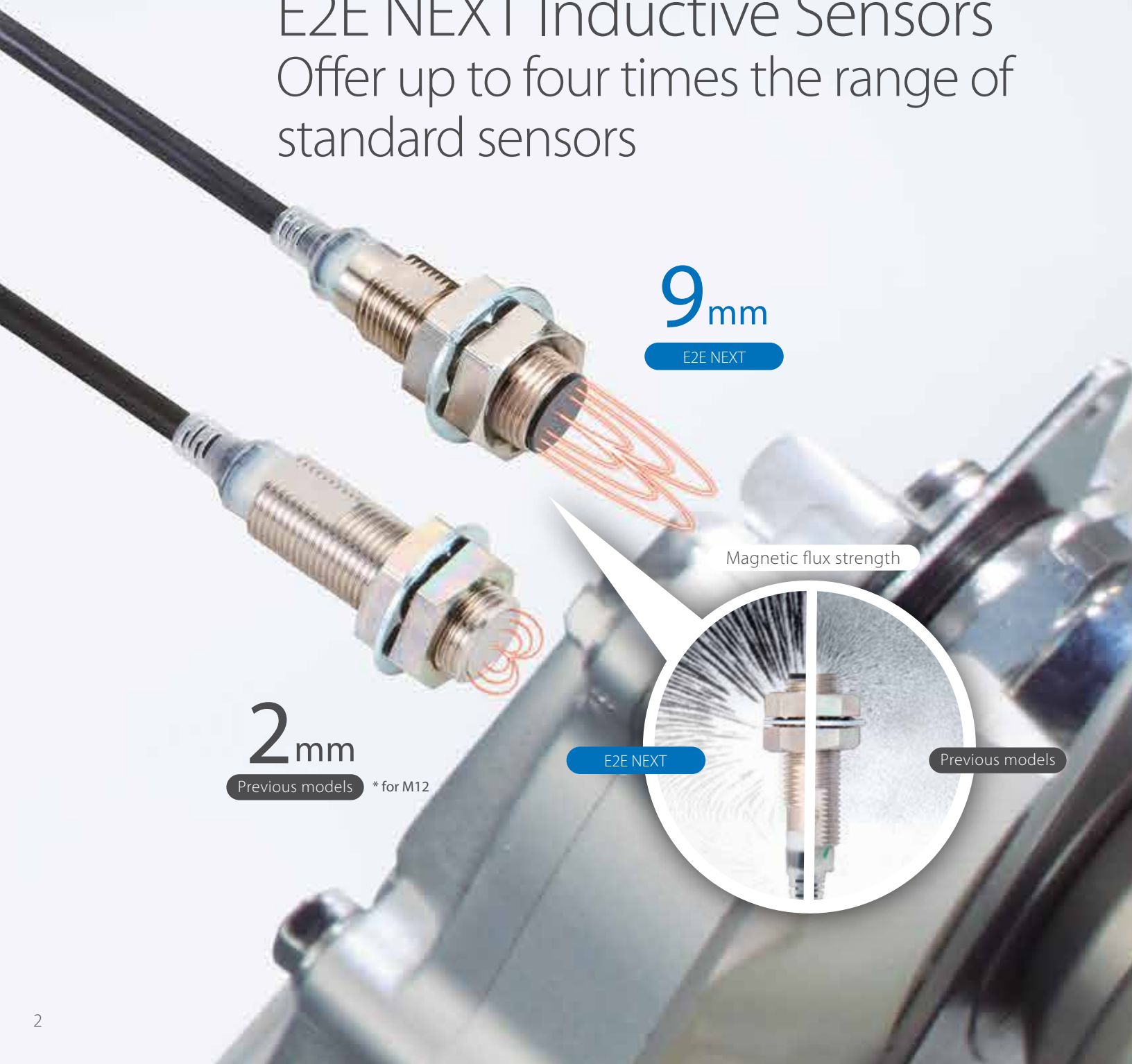
# E2E NEXT Inductive Sensors

## Offer up to four times the range of standard sensors



The exceptional range offered by the E2E NEXT Sensors allows them to be mounted further away from the intended target. The increased sensing distance reduces the risk of the target impacting the face of the sensor, extending its useful life. Long range sensors:

- Reduce downtime associated with replacing a damaged sensor. The cost of the sensor is minimal compared to the cost of lost production.
- Increases flexibility in mounting design. Use smaller diameter sensors in place of larger diameter sensors.
- Solve difficult applications with additional sensing range. The increased range of the E2E NEXT offers a solution to applications that couldn't be solved before due to lack of sensing range.

## E2E NEXT Sensors include a full range of 1x, 2x, 3x, and 4x sensors to meet the needs of any application.

## Features

- Up to four times the sensing range of standard inductive sensors
- DC 2-wire and DC 3-wire versions
- Shielded and unshielded versions
- PNP or NPN units (3-wire versions)
- 360° visible output indicator
- -25°C to 70°C operating temperature
- Pre-wired & pre-wired connector models: IP67; IP67G; IP69K
- Connector models: IP67; IP69K
- Short and long body housing options
- Available with splatter resistant coating
- Connection options:
  - Pre-wire PVC
  - Pre-wire Robot PVC
  - PVC pigtail
  - Robot PVC Pigtail
  - M8 3 pin
  - M8 4 pin
  - M12 4pin
- UL, CSA, CE Certifications

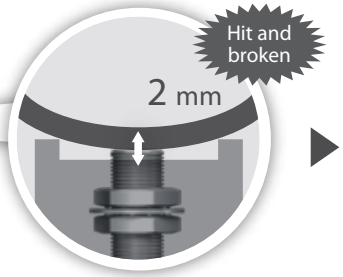
# Long distance detection
## reduces failures
### and improves design fexibility

## Reduce sensor damage

Metal plate position confirmation

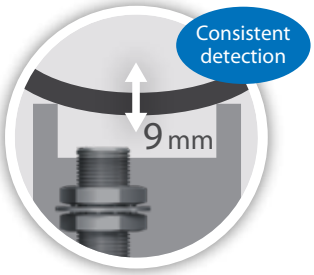
**Previous models**

Sliding targets collide with sensors causing failures and equipment downtime.



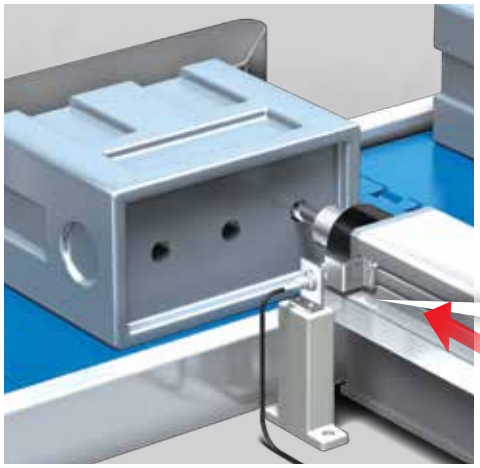

**E2E NEXT**

Long-distance detection maintains sufficient target distance from sensor, reducing the risk of impacting the sensor.




* M12

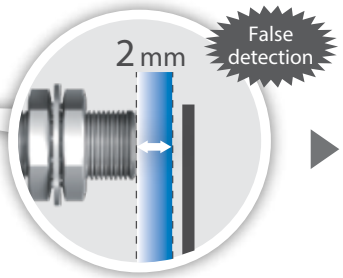
## Accommodate changing conditions



Spindle presence detection

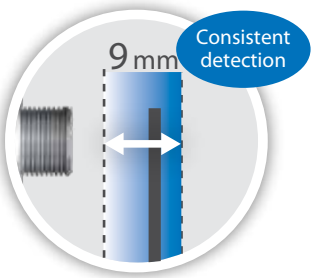
**Previous models**

Equipment vibration widens the distance between target and sensor causing false detection and equipment shutdown.




**E2E NEXT**

Long-distance detection enhances the degree of the detection margin resulting in consistent detection even when the target moves further away from the sensor.




* M12

# Increase flexibility in mounting design

The long sensing distance means that smaller sensors can be used for the same tasks, creating more space for additional functionality.

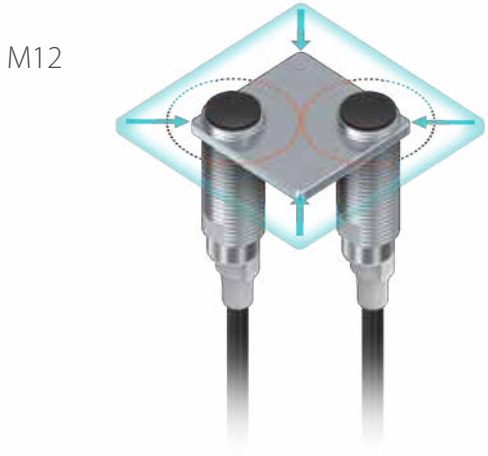
**For the space of 50 mm × 50 mm**

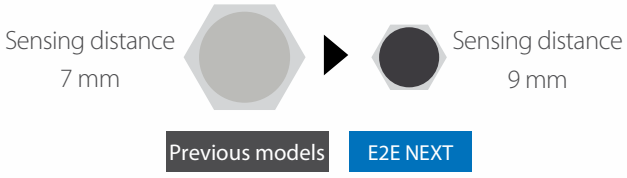
Previous models

**The number of sensors is limited due to mutual interference.**

E2E NEXT

**Space-saving**
**Reduce to 30 mm × 30 mm**



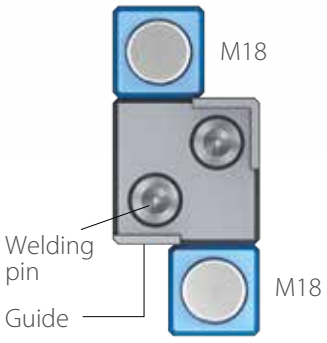




Previous models E2E NEXT

# Facilitate installation in tight spaces

Previous models

Due to the guide surrounding the welding pin, it is difficult to install a sensor near the pin to check the sitting position.

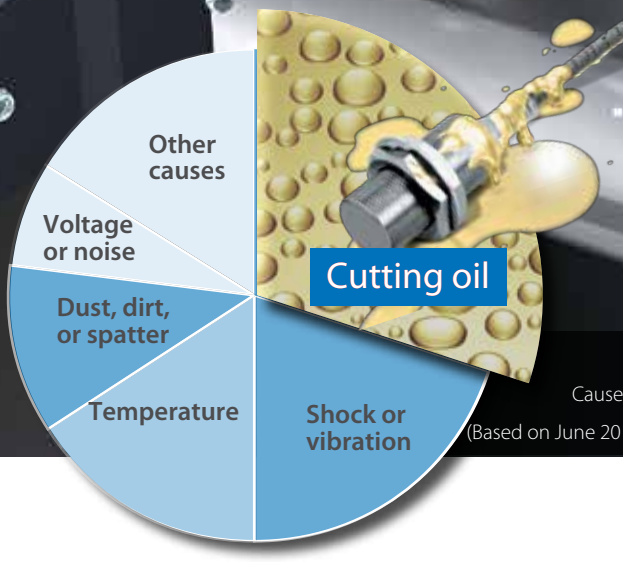



E2E NEXT

Reduced mutual interference allows compact installation in welding jigs.

Note: Make sure to factor the influence of surrounding metal into your designs. (Refer to • Influence of Surrounding Metal upon Design in the data sheets for details.)

Unexpected component failures:
**Approx. 30%** are caused by cutting oil.




Environmental Causes of Component Failures
(Based on June 2016 Omron investigation.)

# 2 year oil resistant*1 components
## reduce unexpected equipment shutdowns

**Previous models** Cable deterioration due to cutting oil

PUR cables get cracks in environments where water-soluble cutting oil is used.

Oil resistance: 2 years*1

**E2E NEXT** Verification of 2-year oil resistance*1 based on IP67G and Omron's oil-resistant component evaluation standards

Omron's E2E NEXT series Proximity Sensor use PVC cables with enhanced oil resistance.

| IP67G | |
|---|---|
| Oil type | N3 (water-insoluble cutting oil) |
| Evaluation time | 48 hours |
| Evaluation temperature | Room temperature |
| Dilution concentration | |
| Criteria | Appearance and performance |

| OMRON's Oil-resistant Component Evaluation Standards | |
|---|---|
| Oil type | A1 (water-soluble cutting oil) |
| Evaluation time | 1,000 hours of machining |
| Evaluation temperature | 55 °C |
| Dilution concentration | Undiluted |
| Criteria | Appearance, performance, and no label text loss |

*1. Applicable oil types: specified in JIS K 2241:2000 "2-year oil resistance" refers to median values (=Typical values) of the product designs and the oil-resistance performance evaluation results. Products to be shipped will have around 2 years of oil resistance; actual oil resistance will vary depending on the product. The pre-wired connector model has a verified oil resistance of 2 years when mated with XS5 NEXT series round oil-resistant connectors. This value has not been verified for 3-wire connector models (M1/M3/M5).

## Thermal Distance Control × IoT: technologies for stable long-distance detection

- E2E Next Series Proximity Sensors solve temperature effects on sensing distance with Thermal Distance control (TDC) technology for stable long-distance detection and analog digital hybrid ICs.

### DC 2-wire triple distance models (**TDC**)

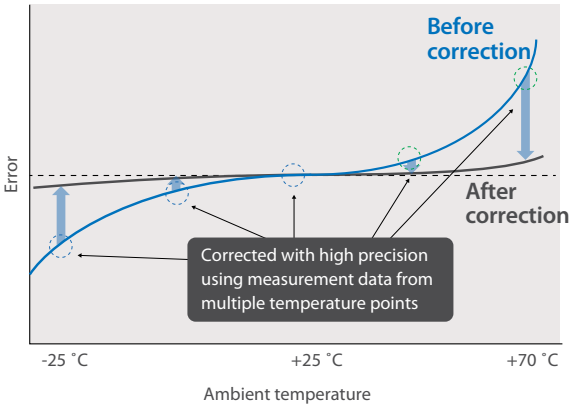
- Temperature correction values are written into the analog digital hybrid IC (PROX2) to minimize the influence of temperature changes on sensing distances.

NEW Patent Pending

### DC 3-wire quadruple models (**TDC** × IoT)

- In-line measurements of each sensor's temperature characteristics are possible in IoT-enabled production processes. Optimal correction values then minimize differences the influence of temperature change on sensing distances.

Sensing distance fluctuation due to ambient temperature

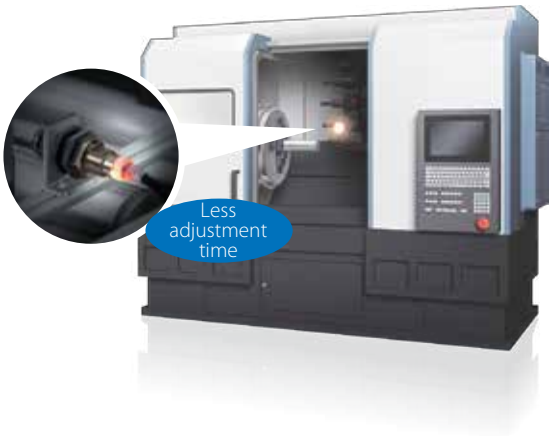



# User friendly design reduces equipment downtime

## Indicator can be seen regardless of orientation

Previous models — Detection validation during installation can be difficult based on the location of the detector on the equipment.

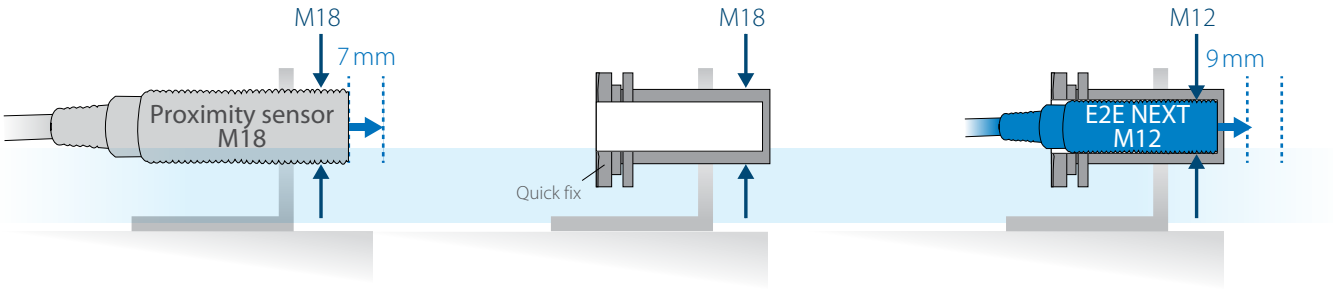
E2E NEXT — With high-brightness LED, the indicator is visible 360° around, making detection validation easy.




## Easily upgrade existing equipment with 10-second proximity sensor replacements

The sensing distance of E2E-NEXT is approximately twice that of previous models. For example, the sensing distance of the M12 models is 7 mm, which is about the same as conventional M18 models. Using these sensors together with Quick fix allows easy upgrades to existing equipment in just 10 seconds.*

1. Dismount the M18 proximity sensor from the existing facility.
2. Mount an M18-sized Quick fix.
3. Insert an E2E NEXT Series M12 Proximity Sensor into the Quick fix.




Note: All sensing distances are for 2-wire models.

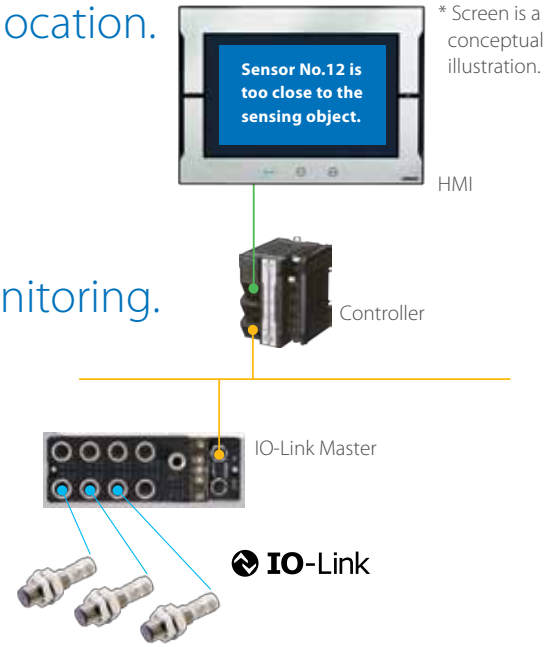
* Time required to adjust the distance when installing a sensor. Based on OMRON investigation.

# IO-Link 3-wire models
## allow early identification of sensor failures

Using the IO-Link Master to connect IO-Link sensors to controllers enables replacement time reduction by detecting the location and cause of failures in real time.

## Monitors real-time sensor failure from a single location.

By using the IO-Link Master to connect proximity sensors and controllers, HMI's can be used for early detection of location and nature of sensor failures.




* Screen is a conceptual illustration.

## Predictive maintenance through condition monitoring.

- Send info from sensor to controller using IO-Link Master for stable connections with host equipment
- Facilitate real time condition monitoring and predictive maintenance with IO-Link
- Increase productivity through data collection and analysis

# Ordering information

E2E (1) - X (2)(3)(4)(5)(6)(7) - (8) - (9) - (10) (11)

## E2E/E2EQ NEXT Series model number legend

## DC 3-wire

| No. | Type | Code | Meaning |
|---|---|---|---|
| (1) | Case | Blank | Without splatter-resistant coating |
| | | Q | With splatter resistant coating |
| (2) | Sensing distance | Number | Sensing distance (Unit: mm)<br>(R: Indication of decimal point) |
| (3) | Shielding | Blank | Shielded |
| | | M | Unshielded |
| (4) | Output configuration | B | PNP open collector |
| | | C | NPN open collector |
| (5) | Operation mode | 1 | Normally open (NO) |
| | | 2 | Normally closed (NC) |
| | | 3 | Normally open, Normally closed (NO+NC) |
| (6) | IO-Link baud rate | Blank | IO-Link baud rate |
| | | D | COM2 (38.4 kbps) |
| | | T | COM3 (230.4 kbps) |
| (7) | Body Size | Blank | Standard |
| | | L | Long Body |
| (8) | Size | 8 | M8 |
| | | 12 | M12 |
| | | 18 | M18 |
| | | 30 | M30 |
| (9) | Connection method | Blank | Pre-wired Models |
| | | M1 | M12 Connector Models |
| | | M3 | M8 (4-pin) Connector Models |
| | | M5 | M8 (3-pin) Connector Models |
| | | M1TJ | M12 Pre-wired Smartclick Connector Models (pigtail) |
| | | M1TJR | M12 Pre-wired Smartclick Connector Models<br>Robot (bending-resistant) cable (robot pigtail) |
| (10) | Cable specifications * | Blank | Standard PVC cable |
| | | R | Robot (bending-resistant) cable |
| (11) | Cable length | Number M | Cable length |

* (10) is only shown in the model number of Pre-wired Models.
Note: The purpose of this model number legend is to provide understanding of the meaning of specifications from the model number.
Models are not available for all combinations of code numbers.

## E2E NEXT Series (Quadruple distance model part number example)

| Size (Sensing Distance) | Connection Method | Body Size | Operation Mode | Model | |
|---|---|---|---|---|---|
| | | | | PNP | NPN |
| M8 (4mm) | Pre-wired (2M) | 38 mm *2 | NO | E2E-X4B1D8 2M | E2E-X4C18 2M |
| | | | NC | E2E-X4B28 2M | E2E-X4C28 2M |
| | | 48 mm | NO | E2E-X4B1DL8 2M | E2E-X4C1L8 2M |
| | | | NC | E2E-X4B2L8 2M | E2E-X4C2L8 2M |
| | M12 Connector | 43 mm *3 | NO | E2E-X4B1D8-M1 | E2E-X4C18-M1 |
| | | | NC | E2E-X4B28-M1 | E2E-X4C28-M1 |
| | | 53 mm | NO | E2E-X4B1DL8-M1 | E2E-X4C1L8-M1 |
| | | | NC | E2E-X4B2L8-M1 | E2E-X4C2L8-M1 |

*1. Models with 5-m cable length are also available with "5M" suffix. (Example: E2E-X9B1D12 5M)
*2. Models with 2-m and 5-m robot (bending-resistant) cables are also available with "-R" in the model number.
(Example: E2E-X9B1D12-R 2M/E2E-X9B1D12-R 5M)
*3. Models with M12 Smartclick connector model robot (bending-resistant) cables are also available with "R" in the model number. (Example: E2EX9B1D12-M1TJR 0.3M)

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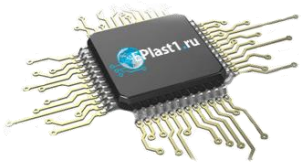


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