

NEW

## Proximity Sensors

DC 3-Wire Models

E2E NEXT Series

OMRON



9 mm

[Quadruple distance model of M12 sized]

Exceptional  
sensing  
range\*1

Enables easier and  
standardized design

 IO-Link

\*1. Based on December 2018 OMRON investigation.

# Enables easier and standardized designs previously not possible

PREMIUM Model  
 Easy design    Standardized design

Exceptional sensing range<sup>\*1</sup> **9** mm<sup>\*2</sup> [M12]

The PREMIUM Model, which has a longer detection range compared to previous models, allows for more spacious designs with less risk of contact. It also enables you to standardize your designs by letting you adopt a single one-size model instead of multiple models of different sizes.

<sup>\*1</sup>. Based on December 2018 OMRON investigation.  
<sup>\*2</sup>. Quadruple distance models of M12 sized

P.4-7



**BASIC Model**

In addition to our HIGH SPEC Models, we also offer mid/short-distance BASIC Models, to meet various facility design requirement specifications.

Double distance model  
4 mm [M12]

Single distance model  
2 mm [M12]

## New standards for usability

Early error detection  
**1** location, all new E2E Sensors can be monitored with IO-Link IO-Link P.8

Quick recovery  
**10** second replaceable with e-jig (adaptor) P.10

**360** degree view with high visibility LED indicator P.10

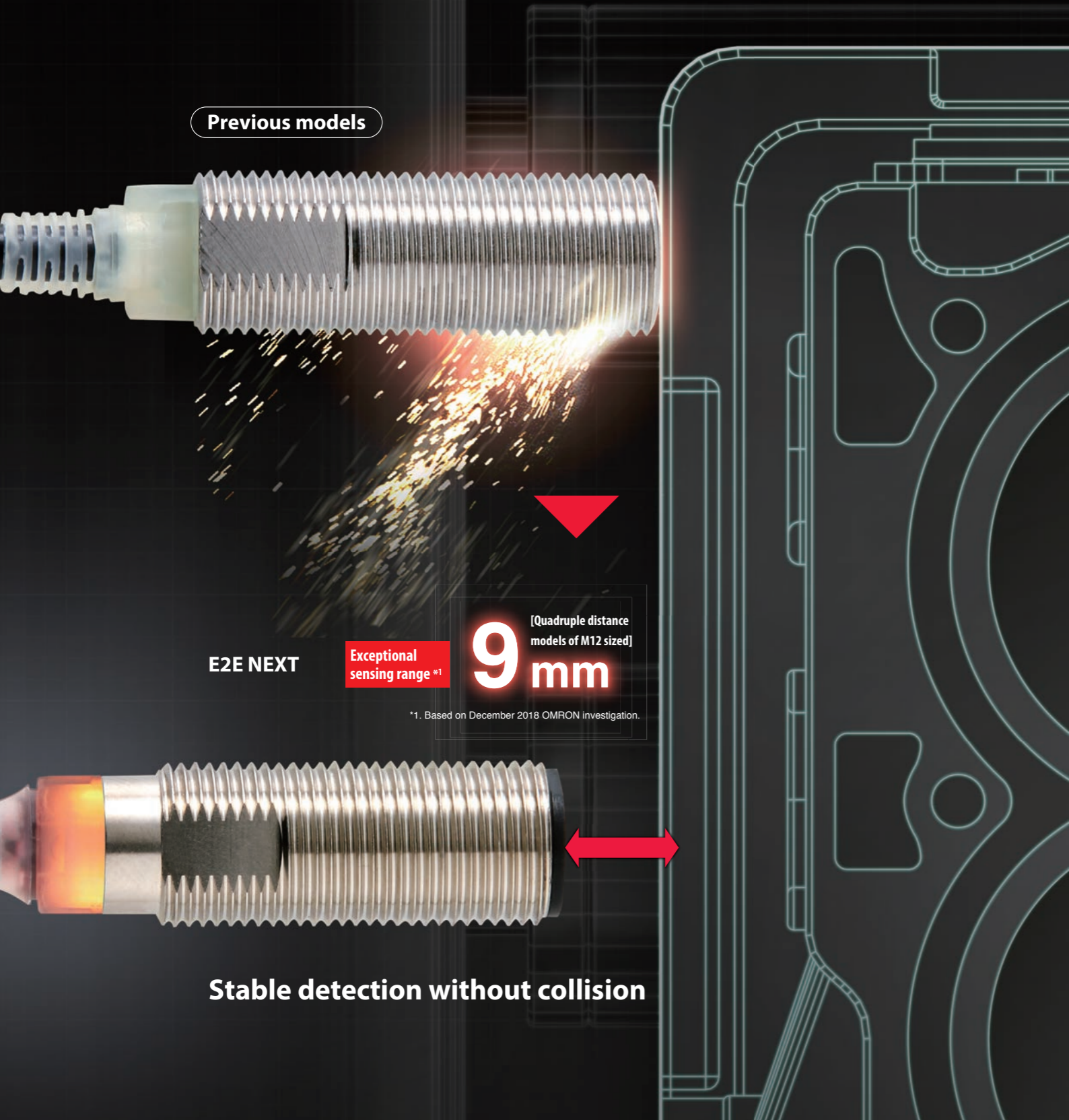
Less unexpected facility stoppages  
 Strong resistance to cutting oil **2**-year oil resistance<sup>\*3</sup> P.12

<sup>\*3</sup>. Pre-wired models and pre-wired connector models.

Easy design

# Equipped with exceptional sensing range\*<sup>1</sup> to enable collision-free sensor installation

Enables designs with more distance between the sensor and the sensing object, thereby reducing unexpected facility stoppages due to collision and false detection, which occurred with previous proximity sensors.



Previous models

E2E NEXT

Exceptional sensing range\*<sup>1</sup>

[Quadruple distance models of M12 sized]  
**9 mm**

\*1. Based on December 2018 OMRON investigation.

Stable detection without collision

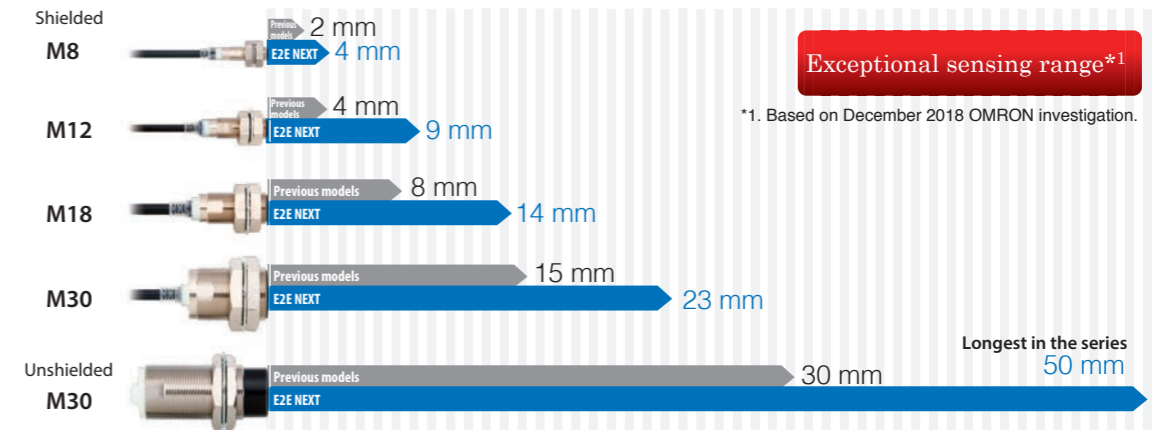
## Allows for more spacious design with less risk of contact

With previous models, to avoid false detections, you were forced to adopt sensor installation designs that risked contact. The E2E NEXT PREMIUM Proximity Sensor can detect accurately from a greater distance, which means you can adopt designs with more space and less risk of contact.

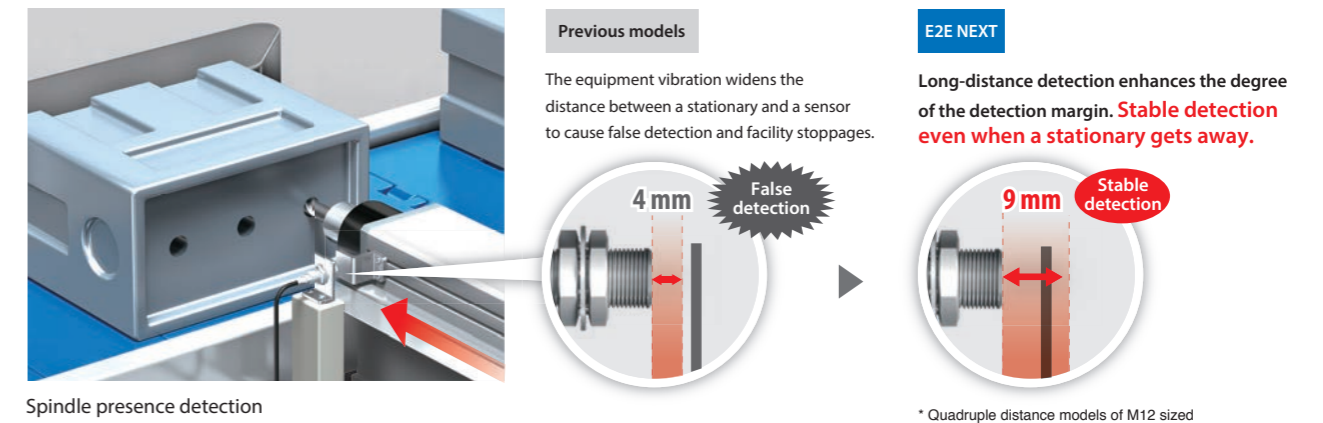


### Approximately double the sensing distance of previous models

Sensing distance comparisons (Quadruple distance models)

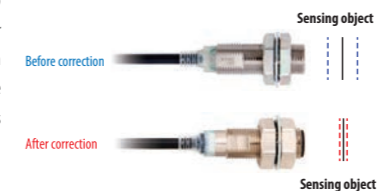


## Less false detection even when a stationary gets away from the sensor due to equipment vibration

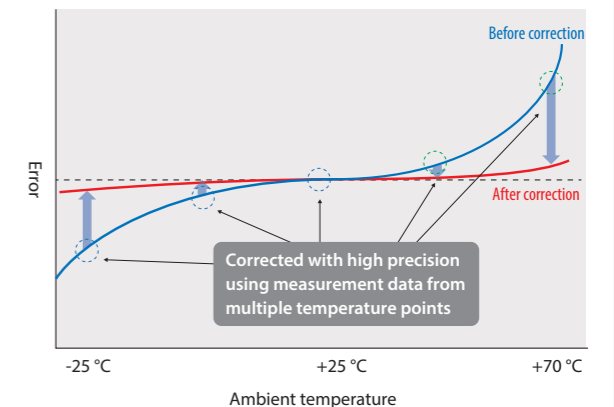


### PROX3 hybrid circuitry with Thermal Distance Control 2 eliminates ambient temperature influence to enable extended sensing ranges.

Proximity sensors with longer sensing distance require increased sensitivity. However, with the increased sensitivity, temperature changes will have bigger influence in sensing distance, and differences between individual sensors will be bigger. E2E NEXT Proximity Sensors (3-wire models) solve these issues by newly implementing Thermal Distance Control 2, a technology to enable extended sensing ranges. It enables in-line measurements of each sensor's temperature characteristics, using multiple temperature points, in IoT-enabled production processes. The optimal correction values are then calculated based on our unique algorithm. The values are written into the analog digital hybrid IC (PROX3) for shipping to minimize differences between sensors and the influence of temperature changes that may occur in the customer's environments.



#### Sensing distance fluctuation due to ambient temperature



Patent Pending Thermal Distance Control 2 technology reduces the extent of error

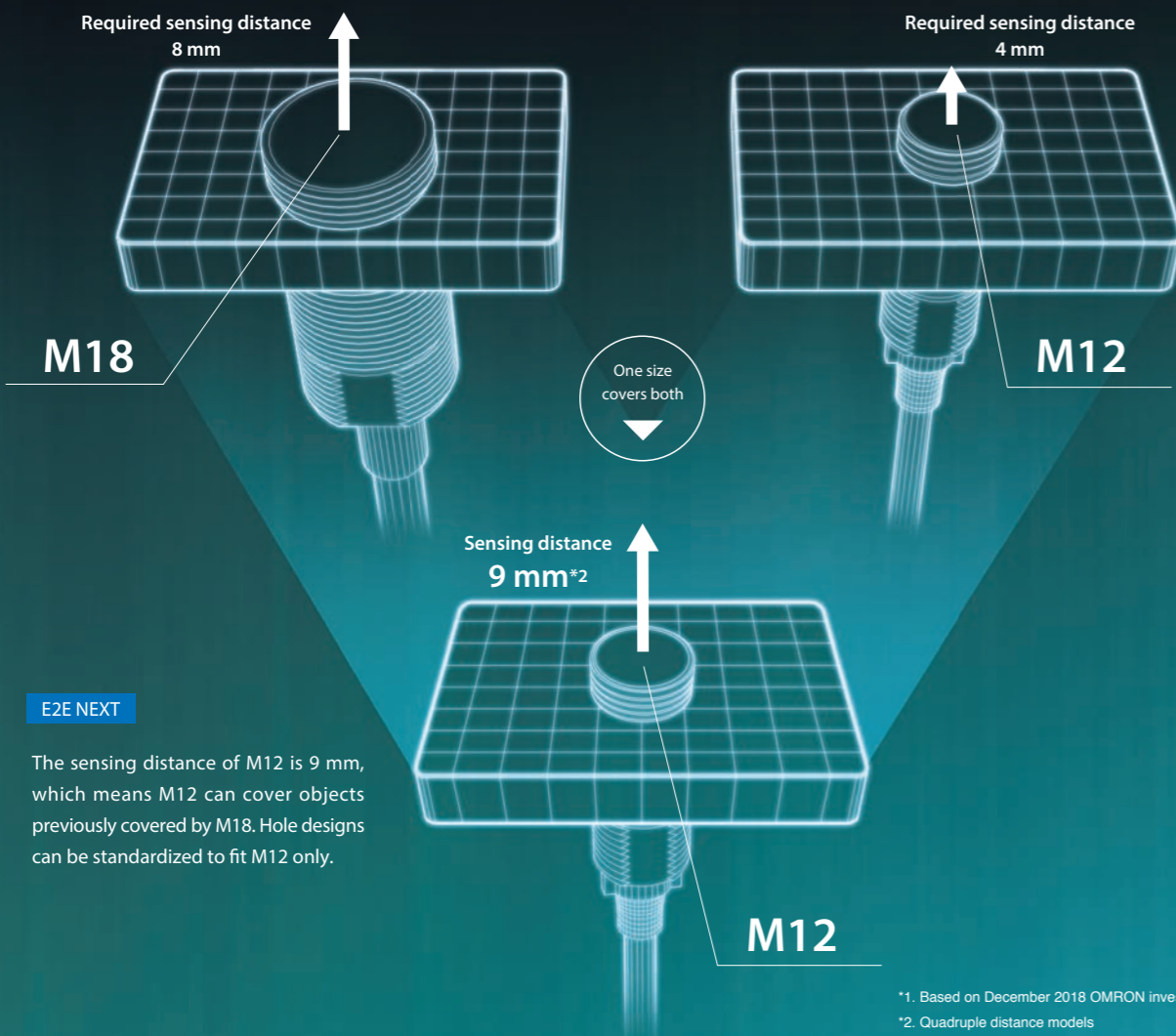
**Standardized design**

# Exceptional sensing range\*<sup>1</sup> allows you to standardize your design with a single one-size model

Ensures equivalent sensing distance while being one size smaller than previous models. Equipment and facilities formerly designed to use sensors of multiple sizes can now be designed to use sensors that are all the same size, allowing you to standardize your designs.

**Case where either M12 or M18 is used depending on sensing distance**

**Previous models** Two different types of hole designs were required for the sensing distance of 4 mm and 8 mm.



**E2E NEXT**  
The sensing distance of M12 is 9 mm, which means M12 can cover objects previously covered by M18. Hole designs can be standardized to fit M12 only.

\*1. Based on December 2018 OMRON investigation.  
\*2. Quadruple distance models

**Four types of M12 size sensors are available to meet the need for variable sensing distances for different installation sites.**



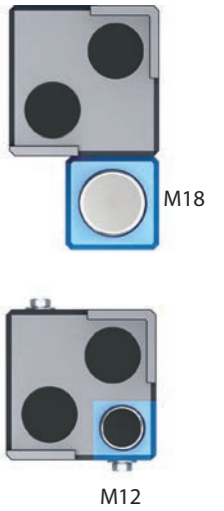
## Easy to install, even where space is limited

E2E NEXT PREMIUM Model Proximity Sensors ensure equivalent sensing distance while being one size smaller than previous models, allowing you to install them in spaces where conventional sensors were too big to fit.



**Previous models** Proximity sensors could not be installed due to limited space.

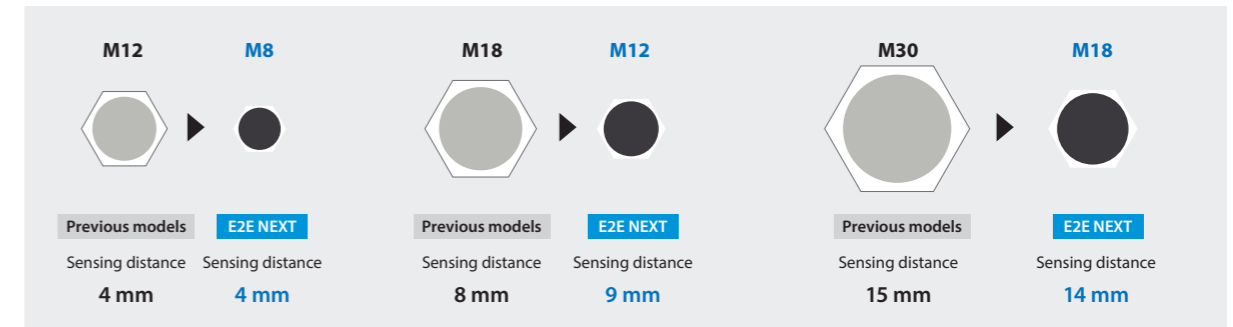
**E2E NEXT** They can be installed due to limited space. One size smaller to allow you to install proximity sensors where space is limited.



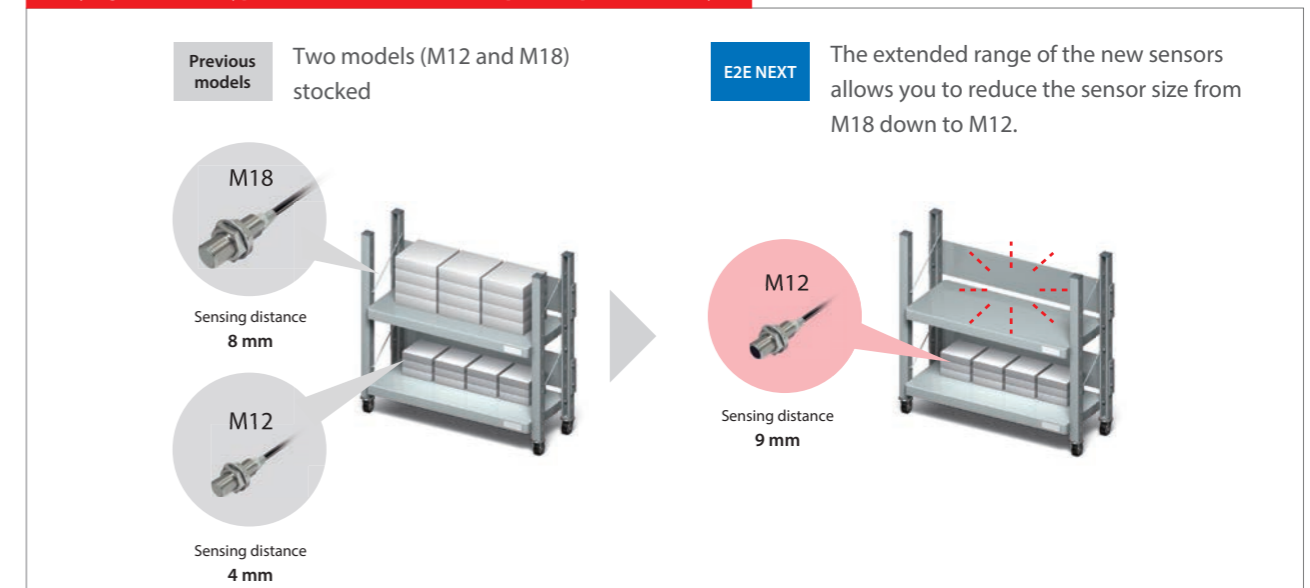
Note: When installing proximity sensors, make sure to factor the influence of surrounding metal into your designs. (Refer to •Influence of Surrounding Metal upon Design on page 62 and page 80 for details.)

## One size smaller than previous models

Size comparisons between models with equivalent sensing distance ("E2E NEXT" refers to quadruple distance models)



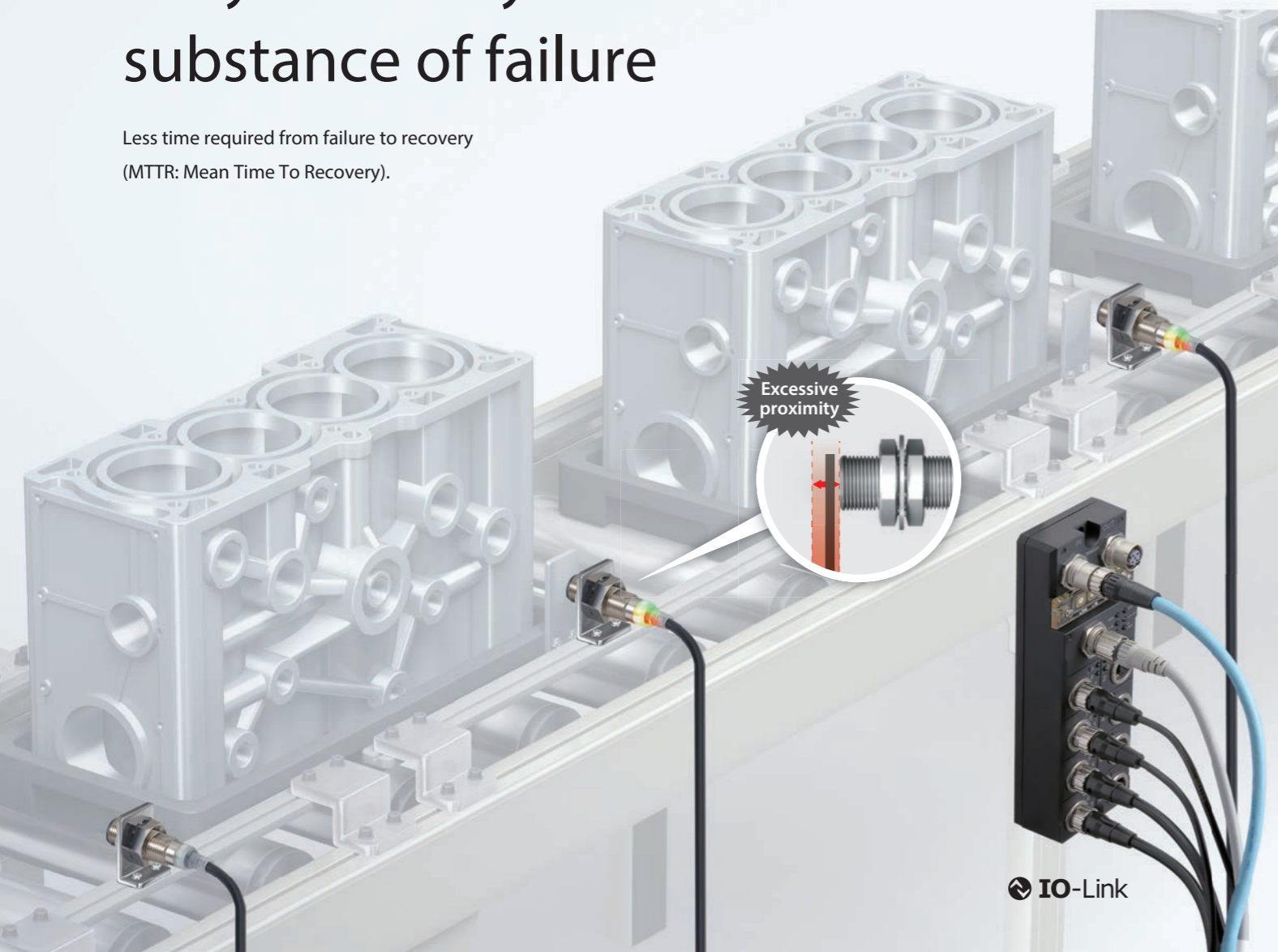
## Unifying the model types to reduce the number of parts kept in inventory.



New standards for usability | Early error detection

# Enables facility designs that allow for early discovery of the site and substance of failure

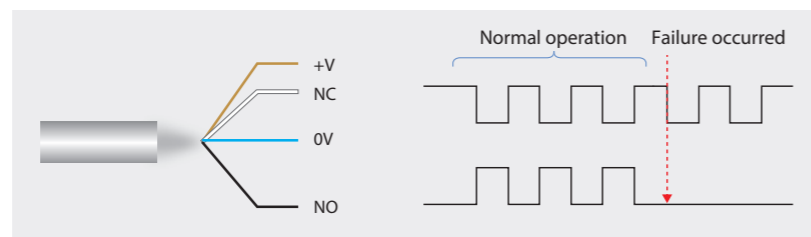
Less time required from failure to recovery (MTTR: Mean Time To Recovery).



## Detects sensor failures through two output types, NO and NC

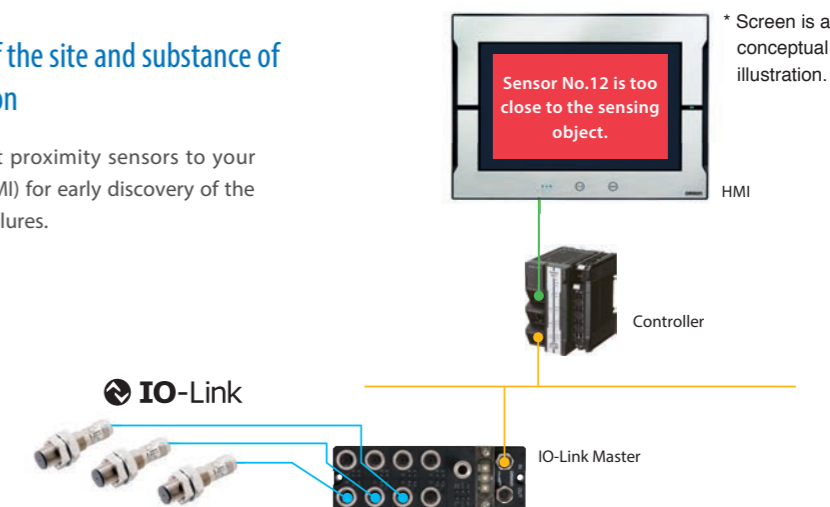
Enables failure discovery by wiring two outputs, NO and NC.

When NO cable is disconnected



## Enables real-time identification of the site and substance of sensor failure from a single location

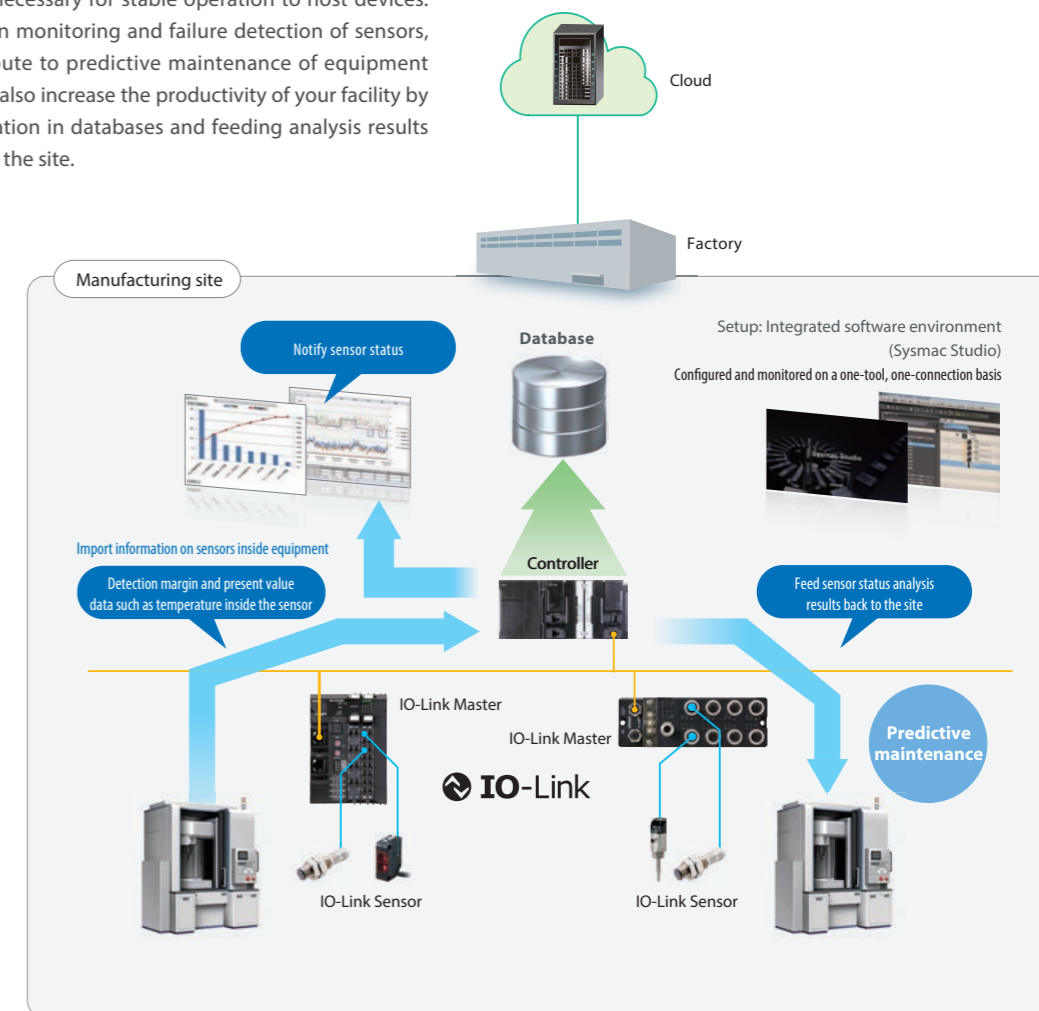
By using the IO-Link Master to connect proximity sensors to your controller, you can use your monitor (HMI) for early discovery of the site and substance of proximity sensor failures.



\* Screen is a conceptual illustration.

## Enables predictive maintenance through condition monitoring

Connecting sensors with controllers using IO-Link Master enables to send information necessary for stable operation to host devices. This enables condition monitoring and failure detection of sensors, which in turn contribute to predictive maintenance of equipment and facilities. You can also increase the productivity of your facility by accumulating information in databases and feeding analysis results back to equipment on the site.



New standards for usability | Quick recovery

# Enables facility designs that allow for quick recovery in case of failure

Less time required from failure to recovery (MTTR: Mean Time To Recovery).



## All around visible high-brightness LED indicator

Adopts high-brightness LED that is more luminous and visible than those in previous models. The indicator is visible from all angles, reducing the time required for operation checks after sensor replacement.



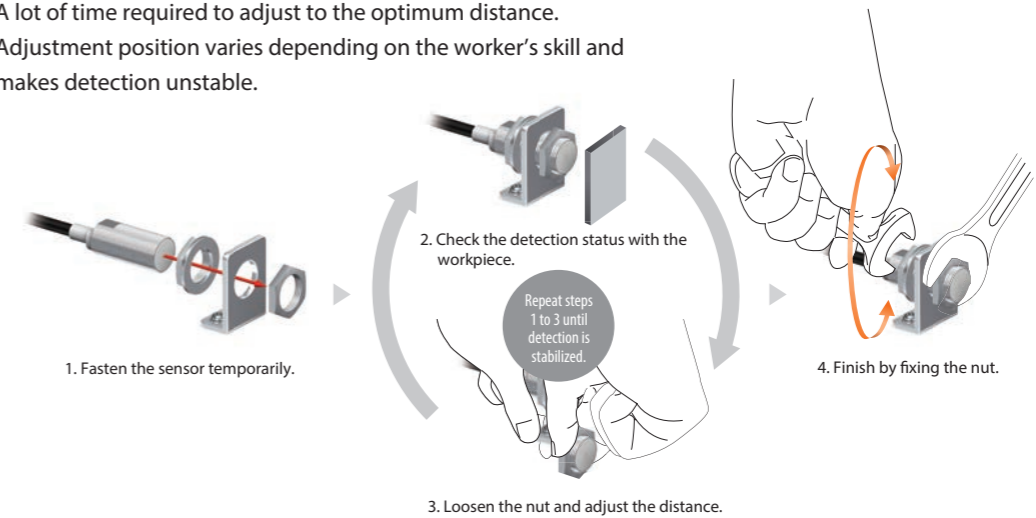
Visible even in areas deep inside the equipment, allowing for quicker replacement

## Replacements in as little as 10 seconds\*<sup>1</sup> using e-jig

Using e-jig eliminates the need for adjustment so that anyone can install in the same position.

Previous models

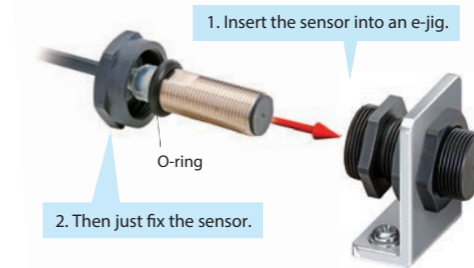
A lot of time required to adjust to the optimum distance. Adjustment position varies depending on the worker's skill and makes detection unstable.



E2E NEXT

Replacement time reduced significantly to approx. 10 sec.\*<sup>1</sup>

Eliminating the need for adjustment allows for installation in the same position by any worker.



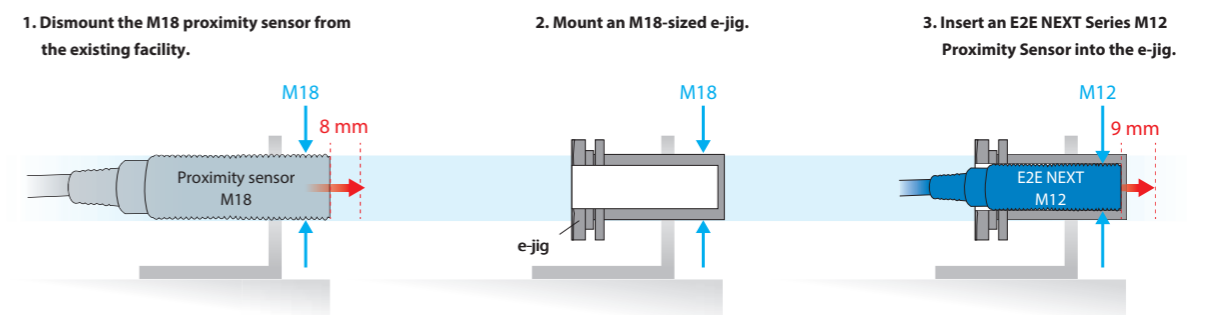
Patent Pending

The O-ring blocks the ingress of foreign matter, including cutting oil, into the e-jig and ensures positioning precision (IP67G).

\*1. Time required to adjust the distance when installing a sensor. Based on OMRON investigation.

## Easily upgrade existing facilities to enable "10-second\*<sup>1</sup> proximity sensor replacements"

The HIGH SPEC Model's sensing distance is approximately twice that of previous models. For example, the sensing distance of the quadruple distance model of M12 sized is 9 mm, which is about the same as conventional M18 models. Using these sensors together with the e-jig allows you to easily upgrade your existing facilities so that you can replace their sensors in just 10 seconds.\*

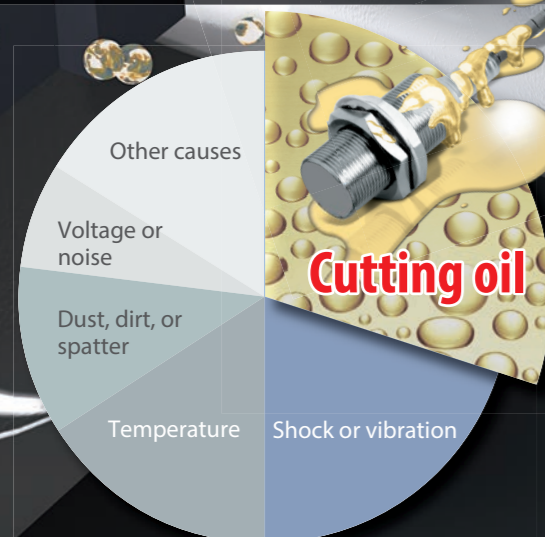


New standards for usability | Less unexpected facility stoppages

# Excellent environmental resistance enables robust facility design

Reduces sudden facility stoppages by reducing the number of failures, even in severe environments.

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



## Environmental Causes of Component Failures

(Based on June 2016 OMRON investigation.)

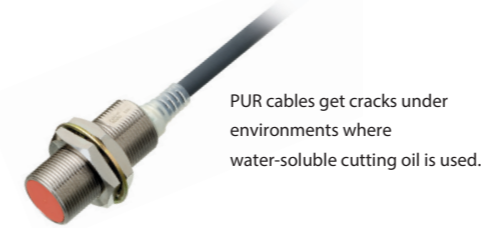
## Cables with enhanced oil resistance shut out cutting oil for 2 years\*1

Our new PVC compound protects against damage caused by swelling, deterioration or cracking, preventing oil from seeping into and destroying internal circuits. Designed to resist oil ingress for up to two years.

### Two years\*1 of stable operation verified by OMRON's unique evaluation technology

Previous models

Cables damaged by cutting oil



E2E NEXT

Verified 2-year oil resistance,\*1 based on IP67G and OMRON's oil-resistant component evaluation standards

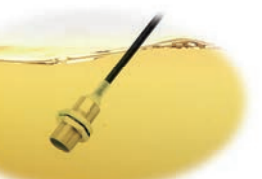


Oil resistance: **2 years** \*1

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



### Two years\*1 of stable operation verified for pre-wired connector models as well, using similar oil resistance tests

- Delivers 2-year oil resistance\*1 by adopting technologies unique to OMRON and PVC cables with enhanced oil resistance. **Patent Pending**
- Smartclick connector cables block the ingress of cutting oil, and with the same torque, no matter who connects them.



Smartclick is a registered trademark of OMRON Corporation.

For machining processes where the amount of splashing cutting oil is large, **oil-resistant Proximity Sensors E2ER/E2ERZ**


**Oil Resistance: 4 years**



\*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 connector models(M1/M3/M5).

## IP69K compliant for water resistance and wash resistance

IEC 60529 compliant. Ensures water resistance during hot pressure washing, where equipment is washed intensively with high-pressure water or steam. (8,000 to 10,000 kPa pressure, 80°C hot water, 30 seconds for each angle)

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