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N E W

Welding Proximity Sensors

DC 3-Wire Models

E2EW Series

OMRON

Stable detection
in lines containing both
aluminum and iron



Full Metal Body

Equivalent sensing distances for iron and aluminum

12 mm
<M18 quadruple distance models>

Exceptional sensing range*

*Based on December 2019 OMRON investigation.

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Catches it all, whether it's iron or aluminum

PREMIUM Models

OMRON's full metal body proximity sensors deliver

Exceptionalsensing range

Equivalent sensing distances for iron and aluminum 12 mm

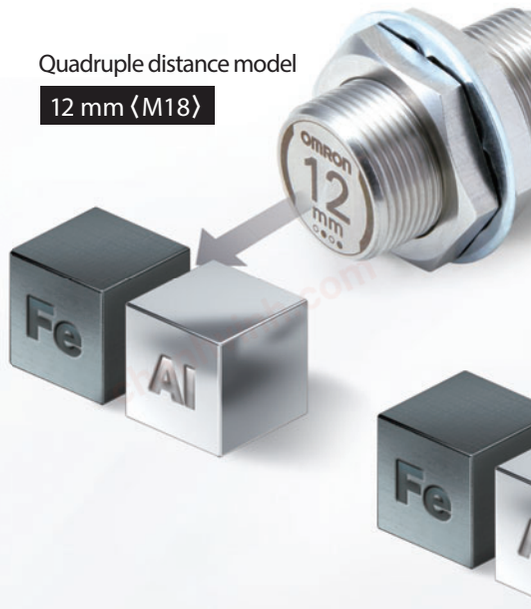
〈M18〉 P.4

Less design work | Better operation rates

The E2EW Proximity Sensor offers equivalent sensing distances for both iron and aluminum. This means that a common design can be adopted to detect the sitting of both iron and aluminum workpieces in welding processes. It also boasts the exceptional sensing range, which means fewer false detections and thereby fewer unexpected stoppages. It is equipped with a function, which effectively cancels pulse noise of current magnetic field generated during welding. *2

Quadruple distance model

12 mm〈M18〉



*1. Based on December 2019 OMRON investigation. *2. PREMIUM Models only.

BASIC Models

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

Single distance model

5 mm〈M18〉



*For BASIC Models, the sensing distances for aluminum are approximately one third of those for iron. Refer to the *Engineering Data* on the datasheet.

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Triple distance model

10 mm ⟨M18⟩

New standards for usability

Withstands harsh environments

Lasts 60*3 times longer than previous OMRON models

Long-lasting spatter resistance*4



P.6

Durable full metal body to reduce unexpected stoppages

P.8

Clear status visualization

Detection level and temperature visualization

With IO-Link*5 IO-Link

P.10

All-around detection status visibility

High-brightness LED indicators

P.12

*3. Comparison with E2EF-Q products. Based on June 2019 OMRON investigation.
*4. Models with spatter-resistant coating only.
*5. PREMIUM Models only.

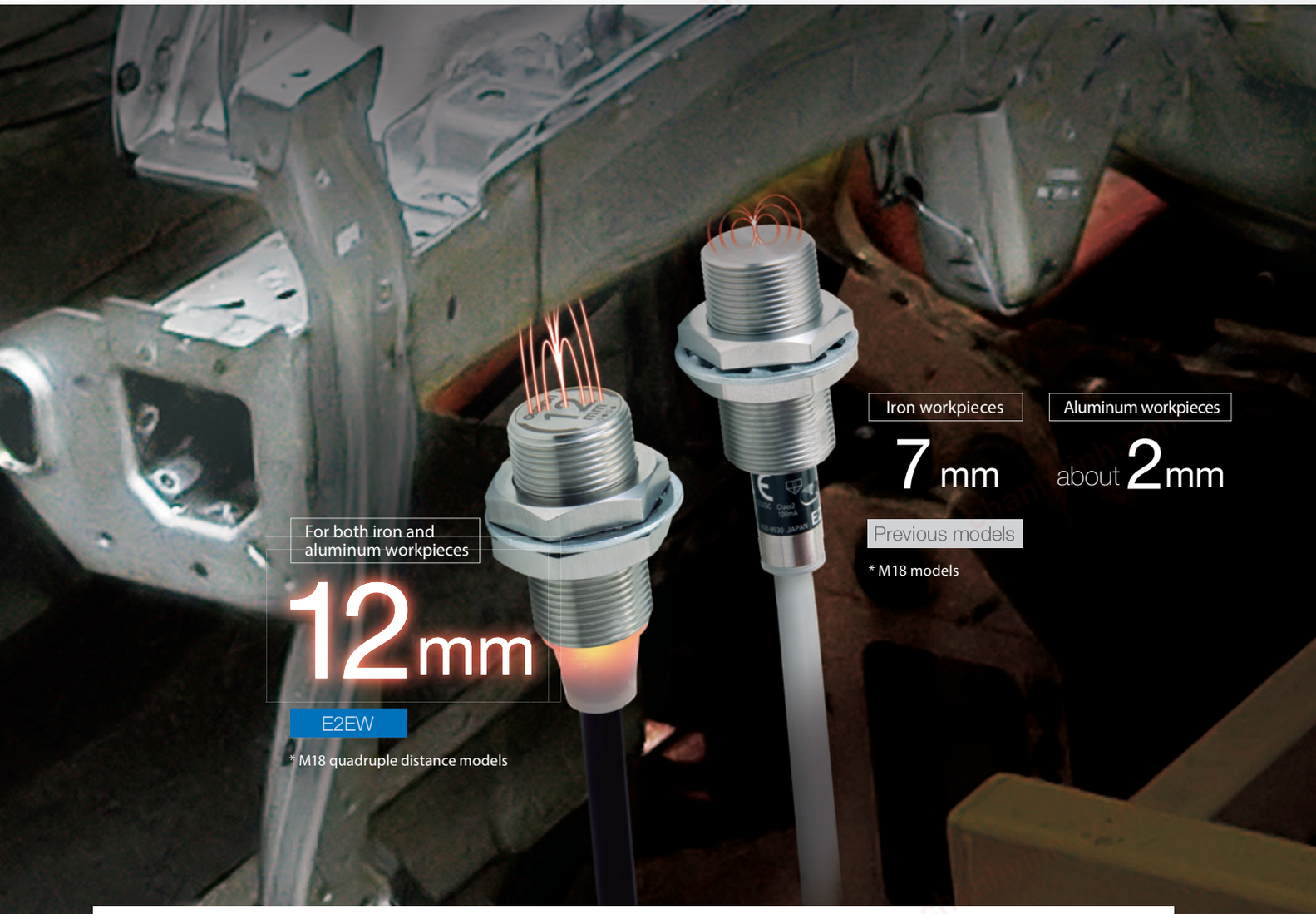
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Equivalent sensing distances

for iron and aluminum <exceptional sensing range*1 of 12 mm>

Enables facility design with fewer unexpected stoppages even in lines with both iron and aluminum workpieces

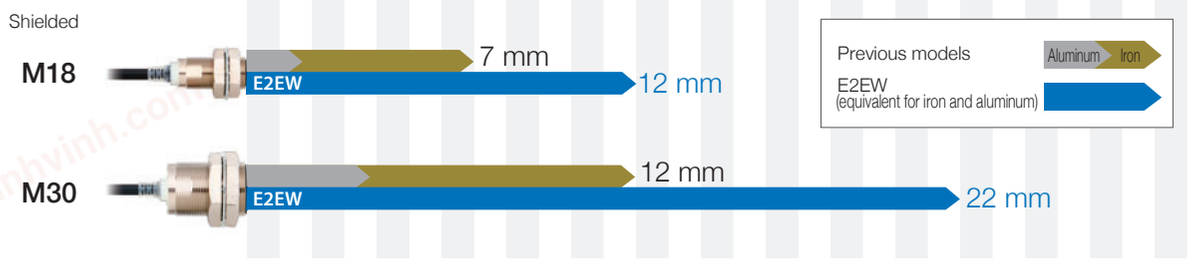
*1 Based on December 2019 OMRON investigation. Applies to M18 quadruple distance models.



Approximately double*2 the sensing distance of previous models
<quadruple distance models>

Exceptional sensing range*3

Sensing distance comparison



*2. Comparison with E2EF products. *3. Based on December 2019 OMRON investigation.

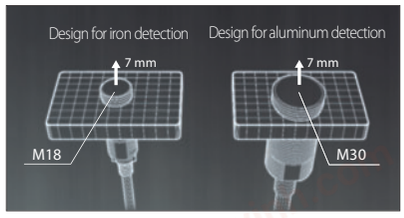
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Less design work

Enables common design for lines with both iron and aluminum

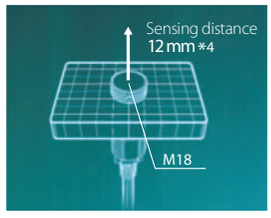
Previously, in order to stably detect sitting in mixed production lines containing both iron and aluminum, facility designs needed to accommodate sensors of different sizes for different sensing distances. With the same sensing distance for iron and aluminum, E2EW Proximity Sensors eliminate the need to change sensors according to workpieces, enabling the standardization of production facilities and mechanical drawings.

Previous models



Installation design must accommodate two sensor sizes

E2EW



Standardized design with a single one-size model

Allows for more spacious sensor installation design

With previous models, to avoid false detections, you were forced to adopt sensor installation designs that risked contact. The E2EW Proximity Sensor, with the exceptional sensing range, can detect accurately from a certain level of distance, which means you can adopt designs with more space to reduce the risk of contact.

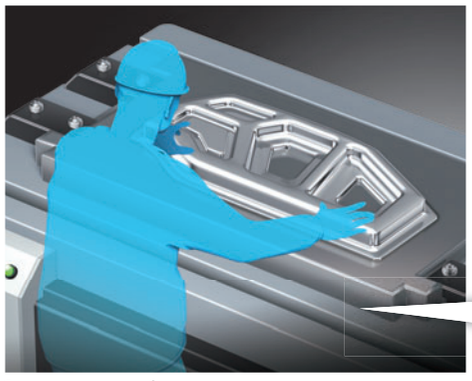


*4. Quadruple distance models.

Better operation rates

Reduces unexpected stoppages due to false detections

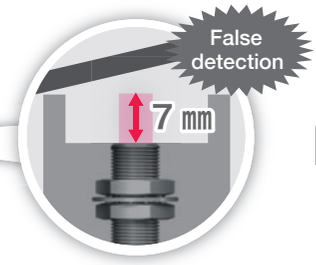
E2EW Proximity Sensors can detect both iron and aluminum from equally long distances. This longer detection margin means less false detections, even if workpieces are moved from their intended sitting positions. Furthermore, the sensors' installation distances do not need to be strictly adjusted, making them easy for anyone to install.



Sitting position confirmation

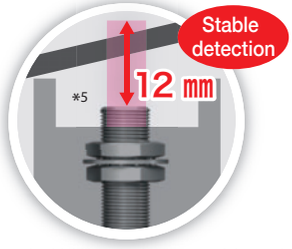
Previous models

Workpieces not in their exact sitting positions would cause false detections, leading to facility stoppage



E2EW

Long-distance detection means improved detection margins,
enabling stable detection even when a workpiece gets away



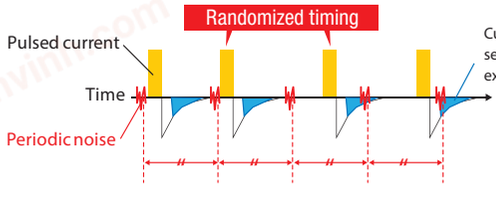
*5. Embeddable triple-distance models are also available. Refer to page17 for details.

Omron's unique technologies provide equivalent long sensing distances for both iron and aluminum

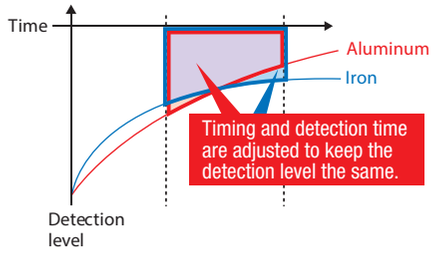
The problem of previous full-metal body proximity sensors was the short sensing distance. E2EW Proximity Sensors are equipped with Omron's unique technology for suppressing noise influence as well as the PRD*6 technology. The technologies reduce the influence of noise, enabling the extended sensing distance. Furthermore, equivalent long distance detection for iron and aluminum is possible by adjusting the timing and time to detect current changes of sensing objects.

■ Technology for suppressing noise influence Patent Pending *7

Random timing of pulsed current reduces the periodic noise effect on the detection signals.



■ Long sensing distances for both iron and aluminum



*6. PRD (Pulse Response Detection) is a technology to detect current changes of sensing objects when pulsed currents are applied to coils.
*7. "Patented pending" means that we applied for a patent in Japan, and "Patented" means that we obtained a patent in Japan. (As of June 2019)

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New standards for usability | Withstands harsh environments

Last 60[*1] times longer than previous OMRON models

Long-lasting spatter resistance



OMRON's unique fluororesin coating technologies enable long-lasting spatter resistance.

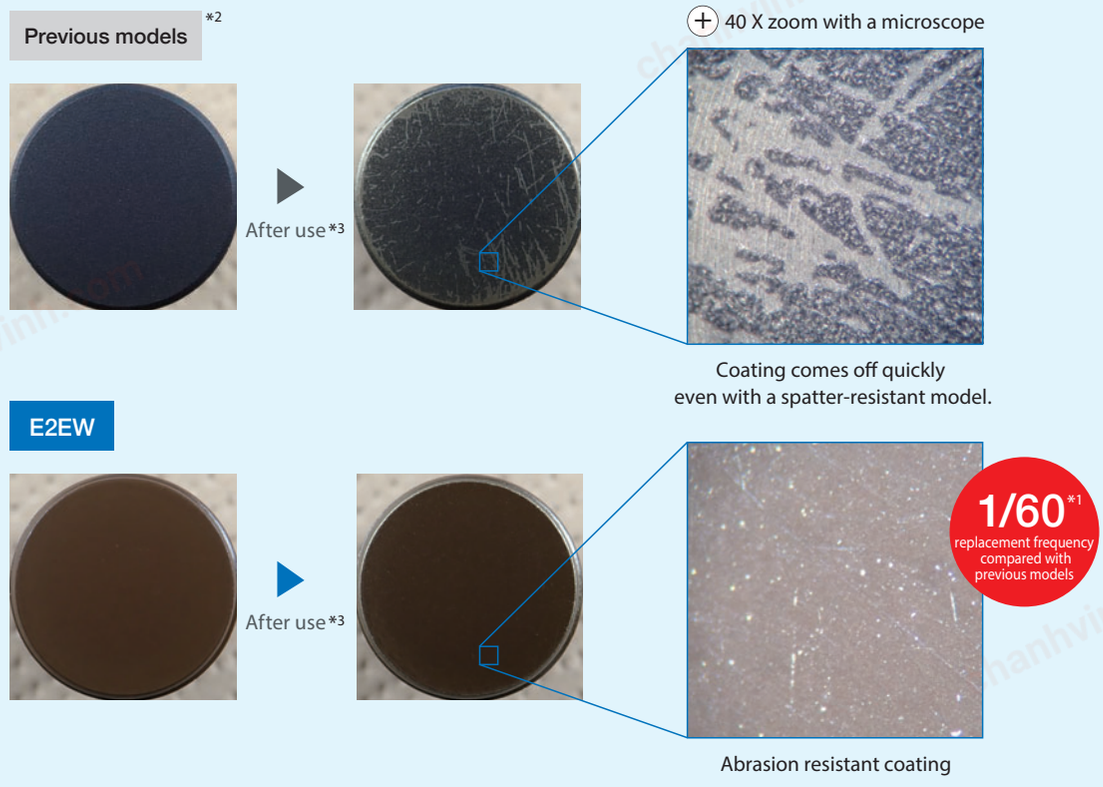
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PREMIUM Models | BASIC Models

Less sensor replacements

Abrasion resistant fluororesin coating enables long-lasting spatter resistance against cleaning, allowing for less frequent replacement.

Abrasion resistant coating reduces maintenance work

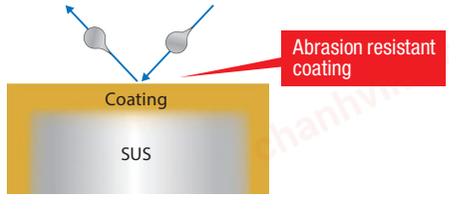


*1. Comparison with E2EF-Q products. Based on June 2019 OMRON investigation. *2. E2EF-Q products.
*3. Brush 10 times vertically and horizontally for each maintenance. Repeat 6 times.

Technologies for increasing spatter resistance

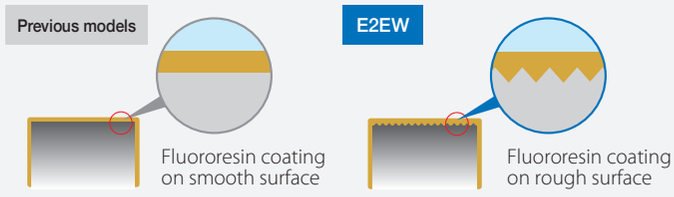
Patent Pending *4

Technologies that can prevent the coating from being worn away during spatter cleanup are key to maintaining spatter resistance over a long period of time.
OMRON focused on this point to deliver long-lasting spatter resistance.



■ Technologies to prevent coating abrasion

OMRON's unique coating film formation technologies coupled with a specially treated base surface greatly reduces abrasion, to approximately 1/60 of previous models.



*4. "Patented pending" means that we applied for a patent in Japan, and "Patented" means that we obtained a patent in Japan. (As of June 2019)

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New standards for usability | Withstands harsh environments

Durable full metal body

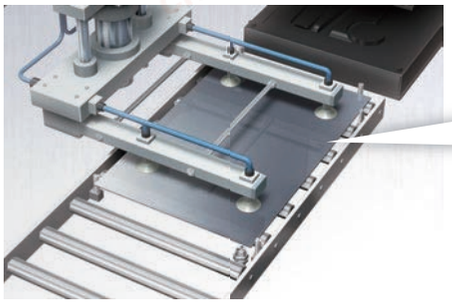
to reduce unexpected stoppages



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PREMIUM Models | BASIC Models

Resistance to friction/collisions with workpieces delivers long service life



Sitting position detection of metal plates



Resin head

Friction/collisions with workpieces causes the sensing surface (head) to wear out, eventually leading to insulation breakdown

E2EW (Full Metal Body)

Exceptional sensing range and thick full metal head eliminate abrasion factors to deliver insulation breakdown resistance

Thick metal head structure

Resistant to friction with workpieces and metal cleaning brushes

In wear resistance tests using stainless-steel brushes rotating at 130 rpm, insulation breakdown occurred in 50 minutes for resin heads, while no insulation breakdown occurred even after 400 minutes for metal heads.

*Tests performed on an M18 quadruple distance model (with 0.4 mm sensing surface thickness).



Brush test

Resin head proximity sensors E2E-X7D1

Initial state



After 50 minutes



Insulation breakdown in 50 minutes

Metal head proximity sensors E2EW-X12□18

Initial state



After 50 minutes



After 400 minutes

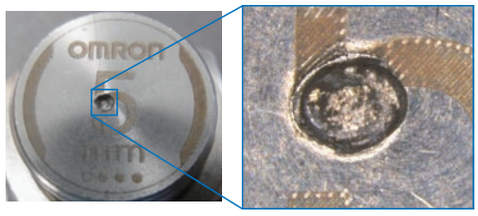


No insulation breakdown after 400 minutes

Resistant to workpiece collision



Continuous impact test



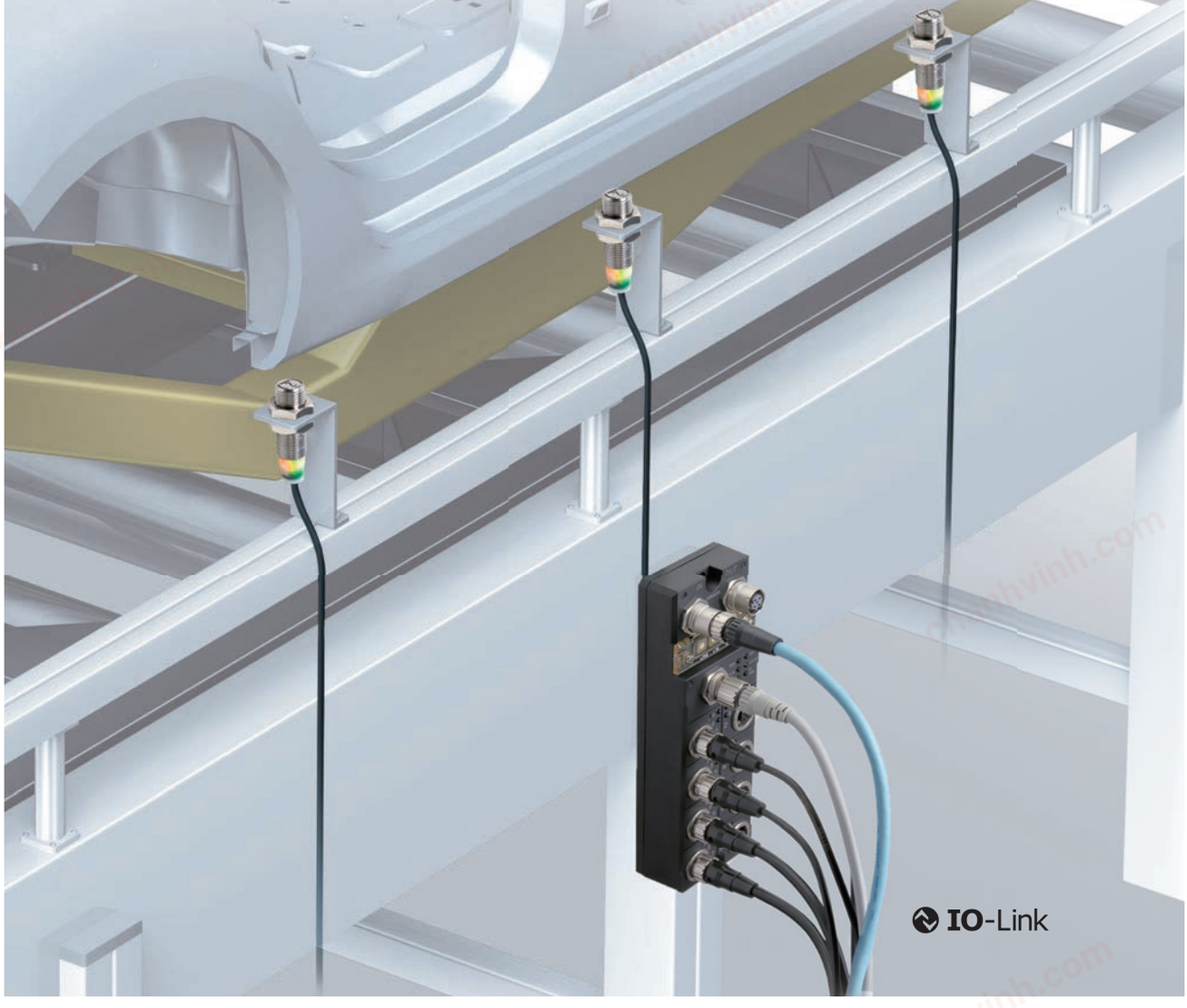
Continuous impact test results showed that the sensing surface was not penetrated even after being impacted 200,000 times. No insulation breakdown occurred.

*Sensing surface thickness varies for different models. Please refer to the datasheet for details.

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New standards for usability | Clear status visualization

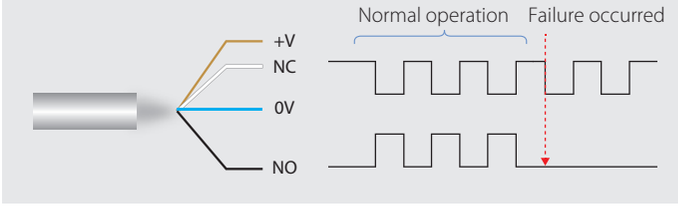
Detection level and temperature visualization With IO-Link



Sensor failures can be detected in 3-wire 2-output (NO+NC) models as well

Enables failure discovery by wiring two outputs, NO and NC

When NO cable is disconnected



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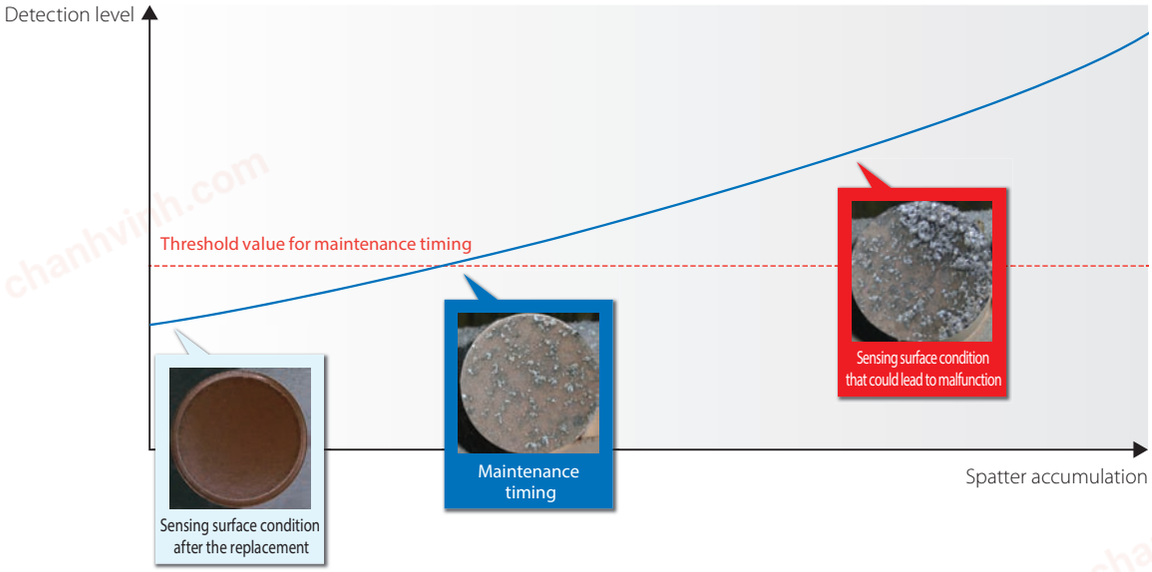
Detection level visualization

A real-time view of how the proximity sensors are detecting objects provides understanding of everyday changes in facility conditions that may not be visible to the naked eye.

*PREMIUM Models only

■ Application example: Maintenance management based on spatter accumulation

Weld spatter can cause proximity sensors to malfunction. Monitoring detection level changes can allow for timely maintenance.

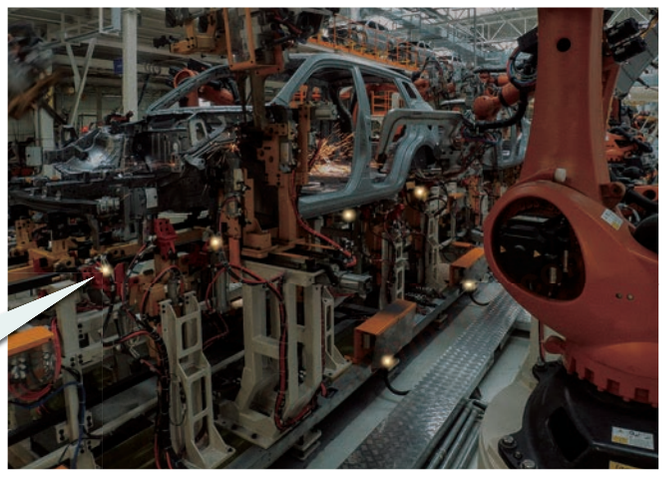


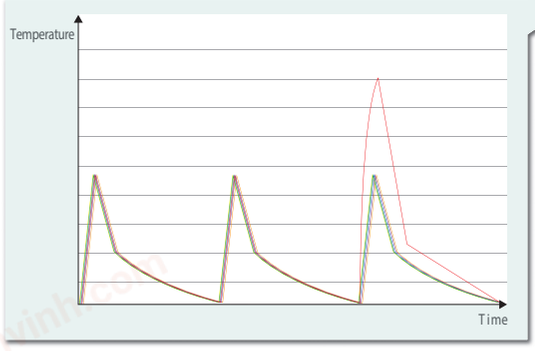
Temperature visualization

Temperature changes in tough environments are visualized in real time, enabling detection of facility malfunction.

■ Application example: Identifying temperature changes during welding

Proximity sensors installed in multiple sites provide understanding of temperature changes in different locations.





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New standards for usability > Clear status visualization

All-around detection status visibility

High-brightness LED indicators



High-brightness LEDs provide 360-degree indicator visibility no matter where the sensors are fixed, allowing for speedy installation regardless of sensor orientation. The LEDs also provide easy access to detection status information during operation.

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PREMIUM Models | BASIC Models

Other excellent usability reduces maintenance work

Flexible cables to save time and work when replacing and wiring sensors

Wiring can be flexibly routed along the equipment.



The sensor's sensing distance is printed on its head to prevent replacement errors

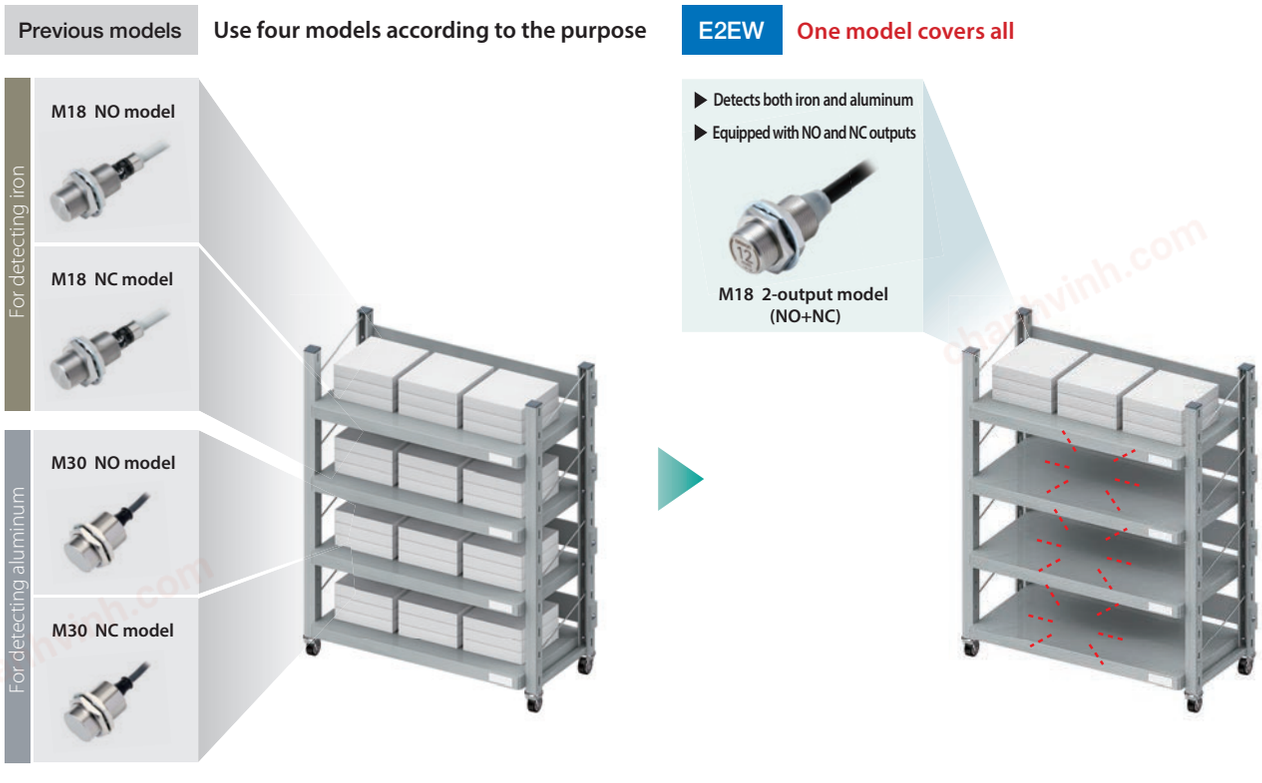
The laser printing on the sensor head let you know the sensing distance at glance.

Note: Models without spatter-resistant coating only.



Simplify your inventory to a single model

A customer may currently stock, for example, a total of four models: M18 and M30 models for iron and aluminum, and NO and NC output types for each. The customer now has the option of simplifying their inventory to a single model, the NO+NC 2-output M18 model of the E2EW Proximity Sensor, which meets all these requirements.
This would significantly streamline inventory management and save a great deal of inventory space.



E2EW Series
Selection Guide

DC 3-wire

Premium model capable of long-sensing distance with enhanced user-friendliness

E2EW Series IO-Link
DC 3-wire Models
(Pre-wired Model/Pre-wired Connector Model) *
P16



Spatter-resistant model

* M12 PREMIUM Models are scheduled for release in 2020.

E2EW Series IO-Link
DC 3-wire Models (Connector Models)
Scheduled for release

Basic model with the same sensing distance as the previous model, but with enhanced user-friendliness

E2EW Series
DC 3-wire Models
(Pre-wired Model/Pre-wired Connector Model)
P20



Spatter-resistant model

DC 2-wire

Basic model with the same sensing distance as the previous model, but with enhanced user-friendliness

E2EW Series
DC 2-wire Models
(Pre-wired Model/Pre-wired Connector Models)
Scheduled for release

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Welding Proximity Sensor

E2EW Series

DC 3-wire

Stable detection in lines containing both aluminum and iron

- Equivalent sensing distances for both iron and aluminum *1
- Enables common design for lines with both iron and aluminum *1
- The exceptional sensing range *2, which means fewer false detections and thereby fewer unexpected stoppages.
- OMRON's unique fluororesin coating technologies enable long-lasting spatter resistance *4, which lasts 60 times *3 longer than previous models.
- Durable full metal body to reduce unexpected stoppages
- 2-output (NO+NC) models and models with IO-Link are also available.
- The laser printing on the sensor head let you know the sensing distance at glance. *5
- Equipped with a function, which effectively cancels pulse noise of current magnetic field. *1
- UL certification (UL60947-5-2) and CSA certification (CSA C22.2 UL60947-5-2-14)

*1. PREMIUM Models only.
*2. Based on June 2019 OMRON investigation.
*3. Comparison with E2EF-Q products. Based on June 2019 OMRON investigation.
*4. Models with spatter-resistant coating only.
*5. Models without spatter-resistant coating only.



For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

Be sure to read *Safety Precautions* on page 37.

E2EW Series Model Number Legend

DC 3-wire

E2EW - (1) X (2) (3) (4) (5) (6) - (7) (8)

No.	Type	Code	Meaning
(1)	Case	Blank	Without spatter-resistant coating
		Q	With spatter-resistant coating
(2)	Sensing distance	Number	Sensing distance (Unit: mm)
(3)	Output configuration	B	PNP open collector
		C	NPN open collector
(4)	Operation mode	1	Normally open (NO)
		2	Normally closed (NC)
		3	Normally open, Normally closed (NO+NC)
(5)	IO-Link baud rate	Blank	Non IO-Link compliant
		D	COM2 (38.4kbps)
		T	COM3 (230.4kbps)
(6)	Size	12	M12
		18	M18
		30	M30
(7)	Connection method	Blank	Pre-wired Models
		M1TJ	M12 Pre-wired Smartclick Connector Models
(8)	Cable length	Number M	Cable length

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.

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E2EW Series

Ordering Information

PREMIUM Model

E2EW Series (Quadruple distance model)

DC 3-wire [Refer to *Dimensions* on page 40.]

Shielded *1

Size (Sensing distance)	Connection method	Operation mode	Model	
			PNP	NPN
M18 (12 mm)	Pre-wired (2 m) *2	NO	**E2EW-X12B1T18 2M**	**E2EW-X12C118 2M**
		NC	**E2EW-X12B218 2M**	**E2EW-X12C218 2M**
		NO+NC	**E2EW-X12B3T18 2M**	---
	M12 Pre-wired Smartclick Connector (0.3 m)	NO	**E2EW-X12B1T18-M1TJ 0.3M**	**E2EW-X12C118-M1TJ 0.3M**
		NC	**E2EW-X12B218-M1TJ 0.3M**	**E2EW-X12C218-M1TJ 0.3M**
		NO+NC	**E2EW-X12B3T18-M1TJ 0.3M**	---
M30 (22 mm)	Pre-wired (2 m) *2	NO	**E2EW-X22B1T30 2M**	**E2EW-X22C130 2M**
		NC	**E2EW-X22B230 2M**	**E2EW-X22C230 2M**
		NO+NC	**E2EW-X22B3T30 2M**	---
	M12 Pre-wired Smartclick Connector (0.3 m)	NO	**E2EW-X22B1T30-M1TJ 0.3M**	**E2EW-X22C130-M1TJ 0.3M**
		NC	**E2EW-X22B230-M1TJ 0.3M**	**E2EW-X22C230-M1TJ 0.3M**
		NO+NC	**E2EW-X22B3T30-M1TJ 0.3M**	---

*1. When embedding the Proximity Sensor in metal, refer to *Influence of Surrounding Metal* on page 38.
*2. Models with 5-m cable length are also available with "5M" suffix. (Example: E2EW-X12B1T18 5M)

Note: 1. Models in [ ] are equipped with IO-Link (COM3). For IO-Link (COM2), select a model number with the format of "E2EW-X□□□D□" (Example: E2EW-X12B1D18 2M).
Operation mode NO can be changed to NC via IO-Link communications.

2. IO-Link is not supported for NC-type PNP outputs or all types of NPN outputs.

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PREMIUM Model

E2EW Series (Triple distance model)

DC 3-wire [Refer to *Dimensions* on page 40.]

Shielded *1

Size (Sensing distance)	Connection method	Operation mode	Model	
			PNP	NPN
M18 (10 mm)	Pre-wired (2 m) *2	NO	**E2EW-X10B1T18 2M**	**E2EW-X10C118 2M**
		NC	**E2EW-X10B218 2M**	**E2EW-X10C218 2M**
		NO+NC	**E2EW-X10B3T18 2M**	---
	M12 Pre-wired Smartclick Connector (0.3 m)	NO	**E2EW-X10B1T18-M1TJ 0.3M**	**E2EW-X10C118-M1TJ 0.3M**
		NC	**E2EW-X10B218-M1TJ 0.3M**	**E2EW-X10C218-M1TJ 0.3M**
		NO+NC	**E2EW-X10B3T18-M1TJ 0.3M**	---
M30 (20 mm)	Pre-wired (2 m) *2	NO	**E2EW-X20B1T30 2M**	**E2EW-X20C130 2M**
		NC	**E2EW-X20B230 2M**	**E2EW-X20C230 2M**
		NO+NC	**E2EW-X20B3T30 2M**	---
	M12 Pre-wired Smartclick Connector (0.3 m)	NO	**E2EW-X20B1T30-M1TJ 0.3M**	**E2EW-X20C130-M1TJ 0.3M**
		NC	**E2EW-X20B230-M1TJ 0.3M**	**E2EW-X20C230-M1TJ 0.3M**
		NO+NC	**E2EW-X20B3T30-M1TJ 0.3M**	---

*1. When embedding the Proximity Sensor in metal, refer to *Influence of Surrounding Metal* on page 38.
*2. Models with 5-m cable length are also available with "5M" suffix. (Example: E2EW-X10B1T18 5M)

Note: 1. Models in ▭ are equipped with IO-Link (COM3). For IO-Link (COM2), select a model number with the format of "E2EW-X□□□D□" (Example: E2EW-X10B1D18 2M).
Operation mode NO can be changed to NC via IO-Link communications.

2. IO-Link is not supported for NC-type PNP outputs or all types of NPN outputs.

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PREMIUM Model

E2EW-Q Series (Spatter-resistant Quadruple distance model)

DC 3-wire [Refer to *Dimensions* on page 40.]

Shielded *1

Size (Sensing distance)	Connection method	Operation mode	Model	
			PNP	NPN
M18 (12 mm)	Pre-wired (2 m) *2	NO	**E2EW-QX12B1T18 2M**	**E2EW-QX12C118 2M**
		NC	**E2EW-QX12B218 2M**	**E2EW-QX12C218 2M**
		NO+NC	**E2EW-QX12B3T18 2M**	---
	M12 Pre-wired Smartclick Connector (0.3 m)	NO	**E2EW-QX12B1T18-M1TJ 0.3M**	**E2EW-QX12C118-M1TJ 0.3M**
		NC	**E2EW-QX12B218-M1TJ 0.3M**	**E2EW-QX12C218-M1TJ 0.3M**
		NO+NC	**E2EW-QX12B3T18-M1TJ 0.3M**	---
M30 (22 mm)	Pre-wired (2 m) *2	NO	**E2EW-QX22B1T30 2M**	**E2EW-QX22C130 2M**
		NC	**E2EW-QX22B230 2M**	**E2EW-QX22C230 2M**
		NO+NC	**E2EW-QX22B3T30 2M**	---
	M12 Pre-wired Smartclick Connector (0.3 m)	NO	**E2EW-QX22B1T30-M1TJ 0.3M**	**E2EW-QX22C130-M1TJ 0.3M**
		NC	**E2EW-QX22B230-M1TJ 0.3M**	**E2EW-QX22C230-M1TJ 0.3M**
		NO+NC	**E2EW-QX22B3T30-M1TJ 0.3M**	---

*1. When embedding the Proximity Sensor in metal, refer to *Influence of Surrounding Metal* on page 38.
*2. Models with 5-m cable length are also available with "5M" suffix. (Example: E2EW-QX12B1T18 5M)

Note: 1. Models in ▭ are equipped with IO-Link (COM3). For IO-Link (COM2), select a model number with the format of "E2EW-QX□□□D□" (Example: E2EW-QX12B1D18 2M).
Operation mode NO can be changed to NC via IO-Link communications.
2. IO-Link is not supported for NC-type PNP outputs or all types of NPN outputs.

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PREMIUM Model

E2EW-Q Series (Spatter-resistant Triple distance model)

DC 3-wire [Refer to *Dimensions* on page 40.]

Shielded *1

Size (Sensing distance)	Connection method	Operation mode	Model	
			PNP	NPN
M18 (10 mm)	Pre-wired (2 m) *2	NO	**E2EW-QX10B1T18 2M**	**E2EW-QX10C118 2M**
		NC	**E2EW-QX10B218 2M**	**E2EW-QX10C218 2M**
		NO+NC	**E2EW-QX10B3T18 2M**	---
	M12 Pre-wired Smartclick Connector (0.3 m)	NO	**E2EW-QX10B1T18-M1TJ 0.3M**	**E2EW-QX10C118-M1TJ 0.3M**
		NC	**E2EW-QX10B218-M1TJ 0.3M**	**E2EW-QX10C218-M1TJ 0.3M**
		NO+NC	**E2EW-QX10B3T18-M1TJ 0.3M**	---
M30 (20 mm)	Pre-wired (2 m) *2	NO	**E2EW-QX20B1T30 2M**	**E2EW-QX20C130 2M**
		NC	**E2EW-QX20B230 2M**	**E2EW-QX20C230 2M**
		NO+NC	**E2EW-QX20B3T30 2M**	---
	M12 Pre-wired Smartclick Connector (0.3 m)	NO	**E2EW-QX20B1T30-M1TJ 0.3M**	**E2EW-QX20C130-M1TJ 0.3M**
		NC	**E2EW-QX20B230-M1TJ 0.3M**	**E2EW-QX20C230-M1TJ 0.3M**
		NO+NC	**E2EW-QX20B3T30-M1TJ 0.3M**	---

*1. When embedding the Proximity Sensor in metal, refer to *Influence of Surrounding Metal* on page 38.
*2. Models with 5-m cable length are also available with "5M" suffix. (Example: E2EW-QX10B1T18 5M)

Note: 1. Models in [ ] are equipped with IO-Link (COM3). For IO-Link (COM2), select a model number with the format of "E2EW-QX□□□D□" (Example: E2EW-QX10B1D18 2M).
Operation mode NO can be changed to NC via IO-Link communications.

2. IO-Link is not supported for NC-type PNP outputs or all types of NPN outputs.

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BASIC Model

E2EW Series (Single distance model)

DC 3-wire [Refer to *Dimensions* on page 40.]

Shielded

Size (Sensing distance)	Connection method	Operation mode	Model	
			PNP	NPN
M12 (2 mm)	Pre-wired (2 m) *	NO	E2EW-X2B112 2M	E2EW-X2C112 2M
		NC	E2EW-X2B212 2M	E2EW-X2C212 2M
		NO+NC	E2EW-X2B312 2M	E2EW-X2C312 2M
	M12 Pre-wired Smartclick Connector (0.3 m)	NO	E2EW-X2B112-M1TJ 0.3M	E2EW-X2C112-M1TJ 0.3M
		NC	E2EW-X2B212-M1TJ 0.3M	E2EW-X2C212-M1TJ 0.3M
		NO+NC	E2EW-X2B312-M1TJ 0.3M	E2EW-X2C312-M1TJ 0.3M
M18 (5 mm)	Pre-wired (2 m) *	NO	E2EW-X5B118 2M	E2EW-X5C118 2M
		NC	E2EW-X5B218 2M	E2EW-X5C218 2M
		NO+NC	E2EW-X5B318 2M	E2EW-X5C318 2M
	M12 Pre-wired Smartclick Connector (0.3 m)	NO	E2EW-X5B118-M1TJ 0.3M	E2EW-X5C118-M1TJ 0.3M
		NC	E2EW-X5B218-M1TJ 0.3M	E2EW-X5C218-M1TJ 0.3M
		NO+NC	E2EW-X5B318-M1TJ 0.3M	E2EW-X5C318-M1TJ 0.3M
M30 (10 mm)	Pre-wired (2 m) *	NO	E2EW-X10B130 2M	E2EW-X10C130 2M
		NC	E2EW-X10B230 2M	E2EW-X10C230 2M
		NO+NC	E2EW-X10B330 2M	E2EW-X10C330 2M
	M12 Pre-wired Smartclick Connector (0.3 m)	NO	E2EW-X10B130-M1TJ 0.3M	E2EW-X10C130-M1TJ 0.3M
		NC	E2EW-X10B230-M1TJ 0.3M	E2EW-X10C230-M1TJ 0.3M
		NO+NC	E2EW-X10B330-M1TJ 0.3M	E2EW-X10C330-M1TJ 0.3M

* Models with 5-m cable length are also available with "5M" suffix. (Example: E2EW-X2B112 5M)

Note: IO-Link is not supported for all types of BASIC Model.

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BASIC Model

E2EW-Q Series (Spatter-resistant Single distance model)

DC 3-wire [Refer to *Dimensions* on page 40.]

Shielded

Size (Sensing distance)	Connection method	Operation mode	Model	
			PNP	NPN
M12 (2 mm)	Pre-wired (2 m) *	NO	E2EW-QX2B112 2M	E2EW-QX2C112 2M
		NC	E2EW-QX2B212 2M	E2EW-QX2C212 2M
		NO+NC	E2EW-QX2B312 2M	E2EW-QX2C312 2M
	M12 Pre-wired Smartclick Connector (0.3 m)	NO	E2EW-QX2B112-M1TJ 0.3M	E2EW-QX2C112-M1TJ 0.3M
		NC	E2EW-QX2B212-M1TJ 0.3M	E2EW-QX2C212-M1TJ 0.3M
		NO+NC	E2EW-QX2B312-M1TJ 0.3M	E2EW-QX2C312-M1TJ 0.3M
M18 (5 mm)	Pre-wired (2 m) *	NO	E2EW-QX5B118 2M	E2EW-QX5C118 2M
		NC	E2EW-QX5B218 2M	E2EW-QX5C218 2M
		NO+NC	E2EW-QX5B318 2M	E2EW-QX5C318 2M
	M12 Pre-wired Smartclick Connector (0.3 m)	NO	E2EW-QX5B118-M1TJ 0.3M	E2EW-QX5C118-M1TJ 0.3M
		NC	E2EW-QX5B218-M1TJ 0.3M	E2EW-QX5C218-M1TJ 0.3M
		NO+NC	E2EW-QX5B318-M1TJ 0.3M	E2EW-QX5C318-M1TJ 0.3M
M30 (10 mm)	Pre-wired (2 m) *	NO	E2EW-QX10B130 2M	E2EW-QX10C130 2M
		NC	E2EW-QX10B230 2M	E2EW-QX10C230 2M
		NO+NC	E2EW-QX10B330 2M	E2EW-QX10C330 2M
	M12 Pre-wired Smartclick Connector (0.3 m)	NO	E2EW-QX10B130-M1TJ 0.3M	E2EW-QX10C130-M1TJ 0.3M
		NC	E2EW-QX10B230-M1TJ 0.3M	E2EW-QX10C230-M1TJ 0.3M
		NO+NC	E2EW-QX10B330-M1TJ 0.3M	E2EW-QX10C330-M1TJ 0.3M

* Models with 5-m cable length are also available with "5M" suffix. (Example: E2EW-QX2B112 5M)

Note: IO-Link is not supported for all types of BASIC Model.

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Accessories (Sold Separately)

Sensor I/O Connectors

(Models for Pre-wired Connectors) A Sensor I/O Connector is not provided with the Sensor. It must be ordered separately as required.

Round Water-resistant Connectors XS5 series

Appearance	Cable Specification	Type	Cable diameter (mm)	Cable Connection Direction	Cable length (m)	Sensor I/O Connector model number	Applicable Proximity Sensor model number
M12 Smartclick Connector Straight type 	PVC robot cable	Sockets on One Cable End	6 dia.	Straight	1	**XS5F-D421-C80-F**	E2EW-X□□□-M1TJ E2EW-QX□□□-M1TJ
					2	**XS5F-D421-D80-F**	
					3	**XS5F-D421-E80-F**	
					5	**XS5F-D421-G80-F**	
					10	**XS5F-D421-J80-F**	
				Right-angle	1	**XS5F-D422-C80-F**	
					2	**XS5F-D422-D80-F**	
					3	**XS5F-D422-E80-F**	
					5	**XS5F-D422-G80-F**	
					10	**XS5F-D422-J80-F**	
Right-angle type 		Socket and Plug on Cable Ends	6 dia.	Straight (Socket)/ Straight (Plug)	1	**XS5W-D421-C81-F**	
					2	**XS5W-D421-D81-F**	
					3	**XS5W-D421-E81-F**	
					5	**XS5W-D421-G81-F**	
					10	**XS5W-D421-J81-F**	
				Right-angle (Socket)/ Right-angle (Plug)	2	**XS5W-D422-D81-F**	
					5	**XS5W-D422-G81-F**	
				Straight (Socket)/ Right-angle (Plug)	2	**XS5W-D423-D81-F**	
					5	**XS5W-D423-G81-F**	
				Right-angle (Socket)/ Straight (Plug)	2	**XS5W-D424-D81-F**	
					5	**XS5W-D424-G81-F**	

Note: For details of the connector, refer to *XS5 Series* on page 42.

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Ratings and Specifications

PREMIUM Model

E2EW Series (Quadruple/Triple distance model)
E2EW-Q Series (Spatter-resistant Quadruple/Triple distance model)

DC 3-wire
Shielded

Item	Type	Quadruple distance model		Triple distance model	
	Size	M18	M30	M18	M30
	Model	E2EW-(Q)X12□18	E2EW-(Q)X22□30	E2EW-(Q)X10□18	E2EW-(Q)X20□30
Sensing distance		12 mm ±10%	22 mm ±10%	10 mm ±10%	20 mm ±10%
Setting distance		0 to 8.4 mm	0 to 15.4 mm	0 to 7.0 mm	0 to 14 mm
Differential travel		15% max. of sensing distance			
Detectable object		Ferrous metals and non-ferrous metals (The sensing distance depends on the material of the sensing object. Refer to *Engineering Data* on page 25.)			
Standard sensing object		Iron, 36 × 36 × 1 mm	Iron, 66 × 66 × 1 mm	Iron, 30 × 30 × 1 mm	Iron, 60 × 60 × 1 mm
Response frequency *1 *2		2 Hz			
Power supply voltage		10 to 30 VDC (including 10% ripple (p-p)), Class 2			
Current consumption		720 mW max. (Current consumption: 30 mA max. at power supply voltage of 24 V)			
Output configuration		B□ Models: PNP open collector, C□ Models: NPN open collector			
Operation mode		1-output models (B1, C1): NO (Normally open), 1-output models (B2, C2): NC (Normally closed), 2-output models (B3): NO+NC (Normally open, Normally closed)			
Control output	Load current	1-output models (B1,B2,C1,C2): 10 to 30 VDC, Class 2, 200 mA max. 2-output models (B3): 10 to 30 VDC, Class 2, 100 mA max.			
	Residual voltage	1-output models (B1,B2,C1,C2): 2 V max. (Load current: 200 mA, Cable length: 2 m) 2-output models (B3): 2 V max. (Load current: 100 mA, Cable length: 2 m)			
Indicator		In the Standard I/O mode (SIO mode): Operation indicator (orange, lit) and communication indicator (green, not lit) In the IO-Link communication mode (COM mode): Operation indicator (orange, lit) and communication indicator (green, blinking at 1 s intervals)			
Protection circuits		Power supply reverse polarity protection, Surge suppressor, Output short-circuit protection, Output reverse polarity protection			
Ambient temperature range		Operating: 0 to 85 °C, Storage: -15 to 85 °C (with no icing or condensation) *4			
Ambient humidity range		Operating/Storage: 35% to 95% (with no condensation)			
Temperature influence		±20% max. of sensing distance at 23 °C in the temperature range of 0 to 85 °C			
Voltage influence		±1.5% max. of sensing distance at rated voltage in the rated voltage ±15% range			
Insulation resistance		50 MΩ min. (at 500 VDC) between current-carrying parts and case			
Dielectric strength		1,000 VAC, 50/60 Hz for 1 minute 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)		1,000 m/s^2 10 times each in X, Y, and Z directions			
Degree of protection		IEC 60529: IP67			
Connection method		Pre-wired Models (Standard cable length: 2 m), Pre-wired Connector Models (Standard cable length: 0.3 m)			
Weight (packed state)	Pre-wired	Approx. 165 g	Approx. 225 g	Approx. 165 g	Approx. 225 g
	M12 Pre-wired Smartclick Connector	Approx. 100 g	Approx. 160 g	Approx. 100 g	Approx. 160 g
Materials	Case	E2EW-X□: Stainless steel (SUS303), E2EW-QX□: Fluororesin coating (Base material: (SUS303))			
	Sensing surface	E2EW-X□: Stainless steel (SUS303), E2EW-QX□: Fluororesin coating (Base material: (SUS303))			
	Sensing surface (Thickness)	0.4 mm	0.5 mm	0.4 mm	0.5 mm
	Clamping nuts	E2EW-X□: Stainless steel (SUS303), E2EW-QX□: Fluororesin coating (Base material: (SUS303))			
	Toothed washers	Zinc-plated iron			
	Cable	Vinyl chloride (PVC)			
Main IO-Link functions *3		Operation mode switching between NO and NC, self diagnosis enabling, excessive proximity judgment distance selecting, timer function of the control output and timer time selecting, instability output (IO-Link mode) ON delay timer time selecting function, monitor output, operating hours read-out, readout of the sensor internal temperature, and initial reset			
IO-Link Communication specifications *3	IO-Link specification	Ver.1.1			
	Baud rate	E2EW(-Q) X□B□T□: COM3 (230.4 kbps), E2EW(-Q) X□B□D□: COM2 (38.4 kbps)			
	Data length	PD size: 2 bytes, OD size: 1 byte (M-sequence type: TYPE_2_2)			
	Minimum cycle time	COM2: 2.3 ms, COM3: 1.0 ms			
Accessories		Instruction manual, Clamping nuts, Toothed washer			

*1. The response frequency is an average value.
*2. Factory setting: (timer function: ONOFF delay, timer time: 200 ms)
*3. IO-Link is not supported for NC-type PNP outputs or all types of NPN outputs.
*4. UL temperature rating is between 0 °C to 60 °C.

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BASIC Model

E2EW Series (Single distance model)
E2EW-Q Series (Spatter-resistant Single distance model)

DC 3-wire
Shielded

Item	Model	Type	Single distance model		
		Size	M12	M18	M30
		Model	E2EW-(Q)X2□12	E2EW-(Q)X5□18	E2EW-(Q)X10□30
Sensing distance			2 mm ±10%	5 mm ±10%	10 mm ±10%
Setting distance			0 to 1.4 mm	0 to 3.5 mm	0 to 7 mm
Differential travel			10% max. of sensing distance		
Detectable object			Ferrous metals and non-ferrous metals (The sensing distance depends on the material of the sensing object. Refer to *Engineering Data* on page 25.)		
Standard sensing object			Iron, 12 × 12 × 1 mm	Iron, 18 × 18 × 1 mm	Iron, 30 × 30 × 1 mm
Response frequency *1			100 Hz	80 Hz	40 Hz
Power supply voltage			10 to 30 VDC (including 10% ripple (p-p)), Class 2		
Current consumption			1-output models (B1, B2, C1, C2): 16 mA max. 2-output models (B3, C3): 20 mA max.		
Output configuration			B□ Models: PNP open collector, C□ Models: NPN open collector		
Operation mode			1-output models (B1, C1): NO (Normally open), 1-output models (B2, C2): NC (Normally closed), 2-output models (B3, C3): NO+NC (Normally open, Normally closed)		
Control output	Load current		1-output models (B1, B2, C1, C2): 10 to 30 VDC, Class 2, 200 mA max. 2-output models (B3, C3): 10 to 30 VDC, Class 2, 100 mA max.		
	Residual voltage		1-output models (B1, B2, C1, C2): 2 V max. (Load current: 200 mA, Cable length: 2 m) 2-output models (B3, C3): 2 V max. (Load current: 100 mA, Cable length: 2 m)		
Indicator			Operation indicator (orange, lit) and communication indicator (green, not lit)		
Protection circuits			Power supply reverse polarity protection, Surge suppressor, Output short-circuit protection, Output reverse polarity protection		
Ambient temperature range			Operating: 0 to 85 °C, Storage: -15 to 85 °C (with no icing or condensation) *2		
Ambient humidity range			Operating/Storage: 35% to 95% (with no condensation)		
Temperature influence			±20% max. of sensing distance at 23 °C in the temperature range of 0 to 85 °C		
Voltage influence			±1.5% max. of sensing distance at rated voltage in the rated voltage ±15% range		
Insulation resistance			50 MΩ min. (at 500 VDC) between current-carrying parts and case		
Dielectric strength			1,000 VAC, 50/60 Hz for 1 minute 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)			1,000 m/s^2 10 times each in X, Y, and Z directions		
Degree of protection			IEC 60529: IP67		
Connection method			Pre-wired Models (Standard cable length: 2 m), Pre-wired Connector Models (Standard cable length: 0.3 m)		
Weight (packed state)	Pre-wired		Approx. 140 g	Approx. 160 g	Approx. 225 g
	M12 Pre-wired Smartclick Connector		Approx. 70 g	Approx. 95 g	Approx. 160 g
Materials	Case		E2EW-X□: Stainless steel (SUS303), E2EW-QX□: Fluororesin coating (Base material: (SUS303))		
	Sensing surface		E2EW-X□: Stainless steel (SUS303), E2EW-QX□: Fluororesin coating (Base material: (SUS303))		
	Sensing surface (Thickness)		0.8 mm	0.8 mm	0.8 mm
	Clamping nuts		E2EW-X□: Stainless steel (SUS303), E2EW-QX□: Fluororesin coating (Base material: (SUS303))		
	Toothed washers		Zinc-plated iron		
	Cable		Vinyl chloride (PVC)		
Accessories			Instruction manual, Clamping nuts, Toothed washer		

*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. UL temperature rating is between 0 °C to 60 °C.

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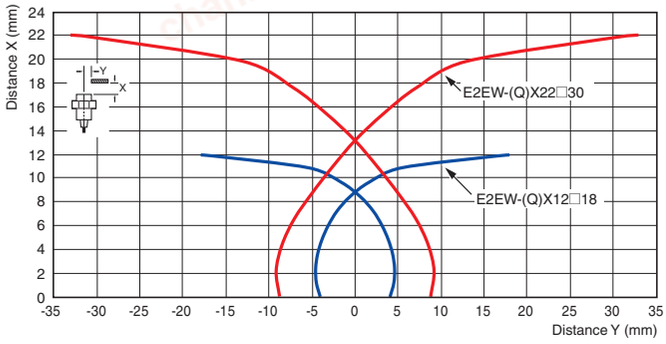
Engineering Data (Reference Value)

Sensing Area

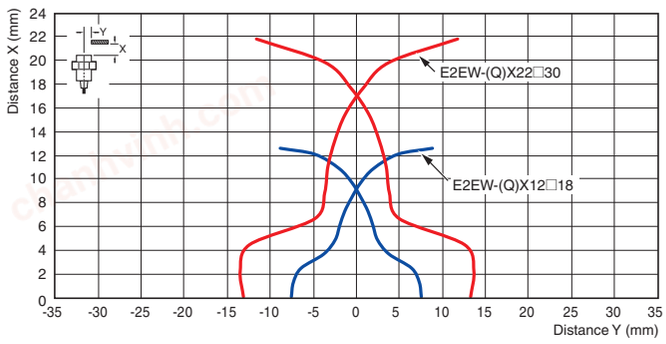
PREMIUM Model

Quadruple distance model/ Spatter-resistant Quadruple distance model Shielded

Sensing object: iron

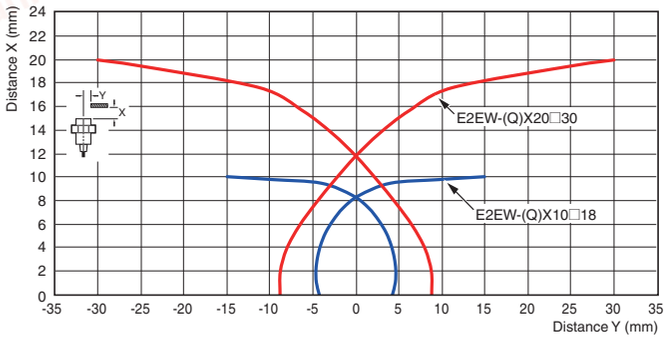


Sensing object: Aluminum

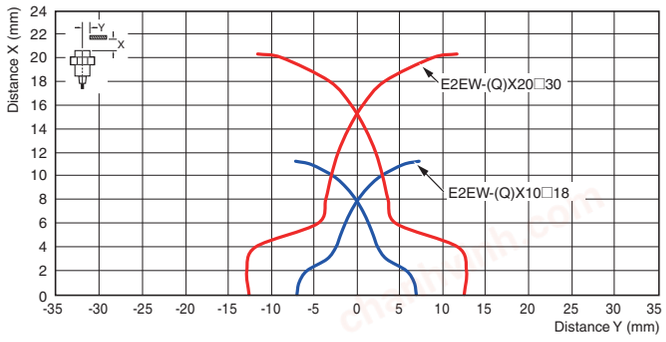


Triple distance model/ Spatter-resistant Triple distance model Shielded

Sensing object: iron



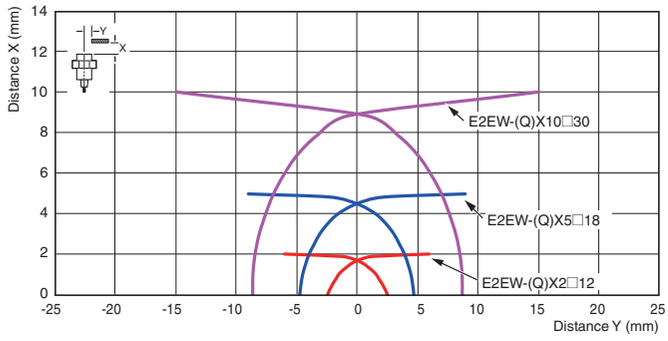
Sensing object: Aluminum



BASIC Model

Single distance model/ Spatter-resistant Single distance model Shielded

Sensing object: iron



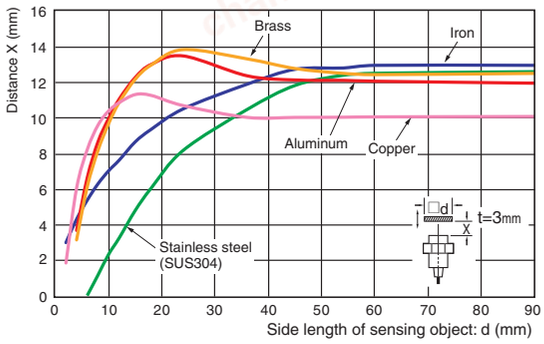
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Influence of Sensing Object Size and Material

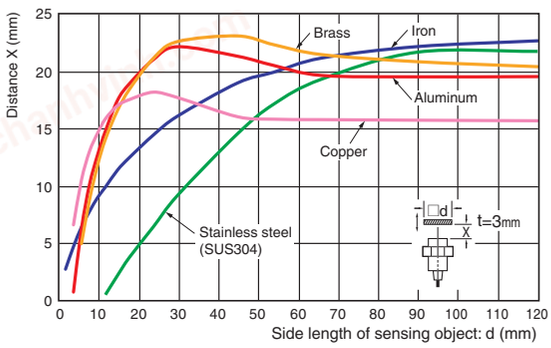
PREMIUM Model

Quadruple distance model/ Spatter-resistant Quadruple distance model Shielded

Size: M18 E2EW-(Q)X12□18

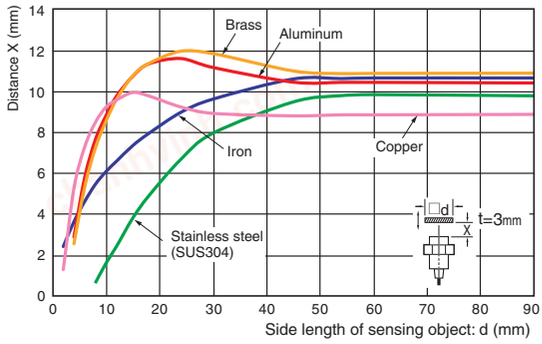


Size: M30 E2EW-(Q)X22□30

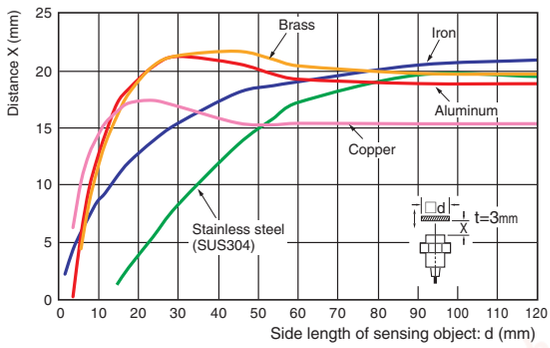


Triple distance model/ Spatter-resistant Triple distance model Shielded

Size: M18 E2EW-(Q)X10□18



Size: M30 E2EW-(Q)X20□30

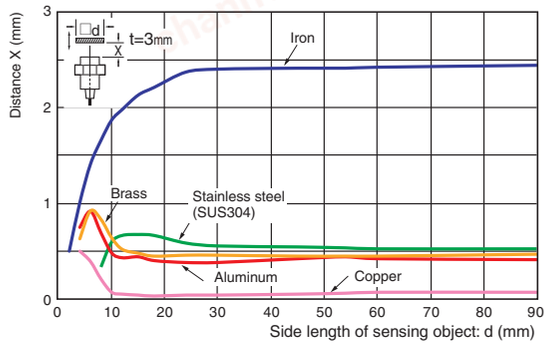


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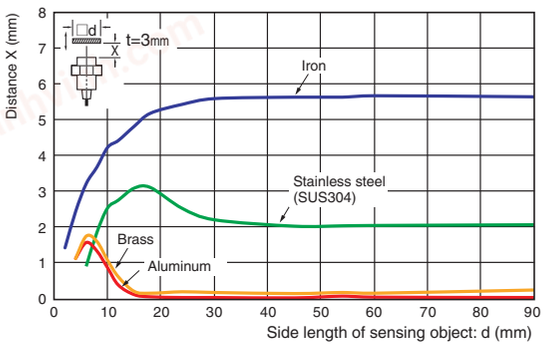
BASIC Model

Single distance model/ Spatter-resistant Single distance model Shielded

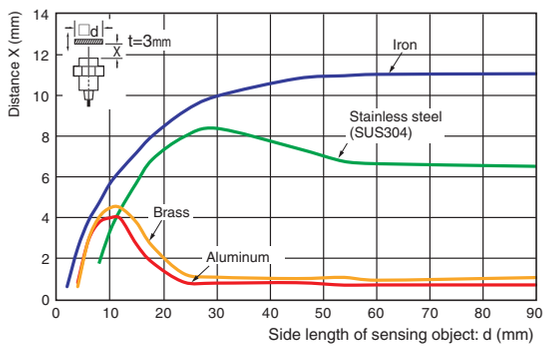
Size: M12 E2EW-(Q)X2□12



Size: M18 E2EW-(Q)X5□18



Size: M30 E2EW-(Q)X10□30



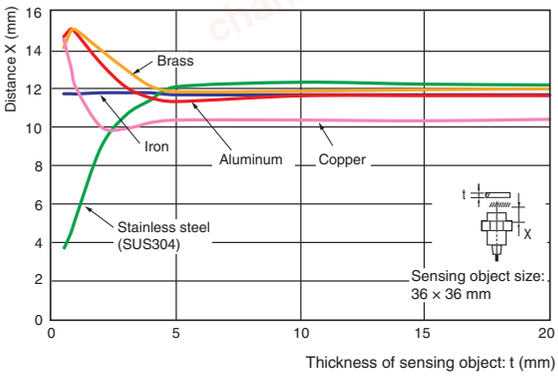
E2EW Series

Influence of Sensing Object Thickness and Material

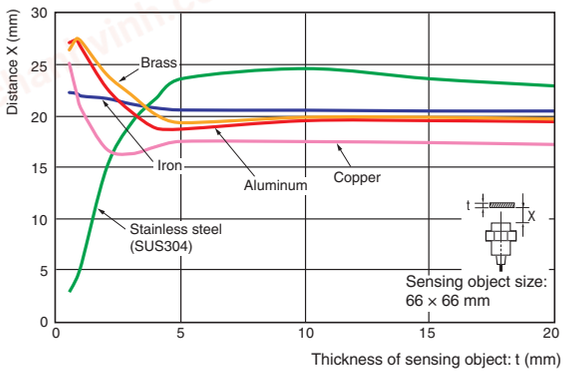
PREMIUM Model

Quadruple distance model/ Spatter-resistant Quadruple distance model Shielded

Size: M18 E2EW-(Q)X12□18

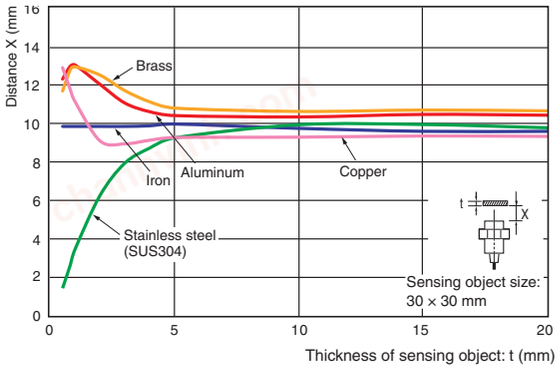


Size: M30 E2EW-(Q)X22□30

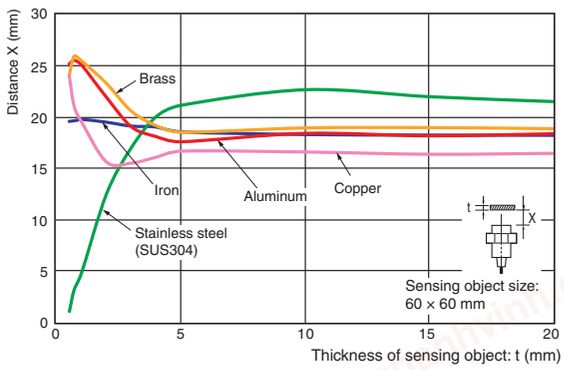


Triple distance model/ Spatter-resistant Triple distance model Shielded

Size: M18 E2EW-(Q)X10□18



Size: M30 E2EW-(Q)X20□30

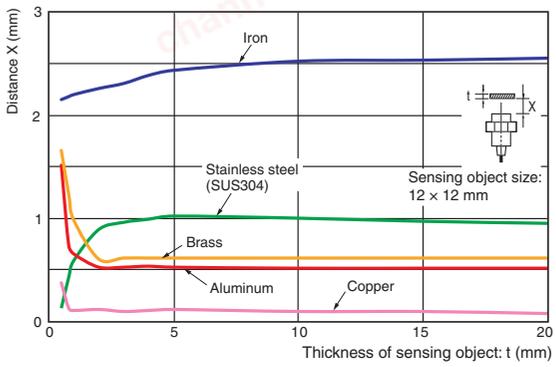


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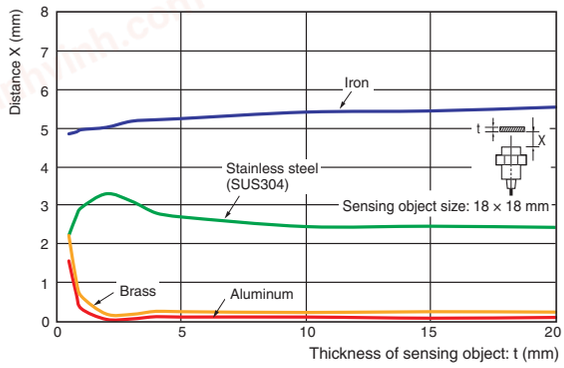
BASIC Model

Single distance model/ Spatter-resistant Single distance model Shielded

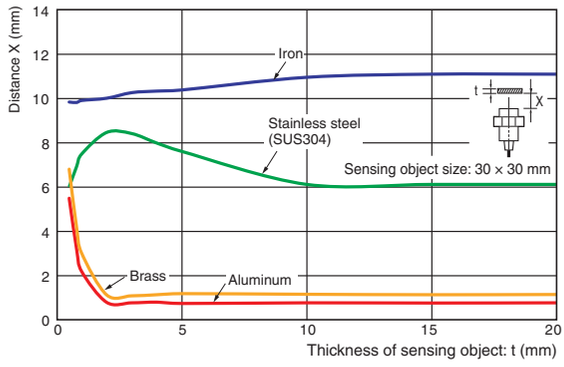
Size: M12 E2EW-(Q)X2□12



Size: M18 E2EW-(Q)X5□18



Size: M30 E2EW-(Q)X10□30



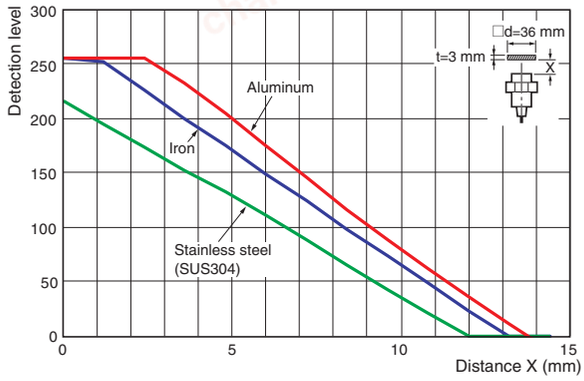
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Monitor Output vs. Sensing Distance

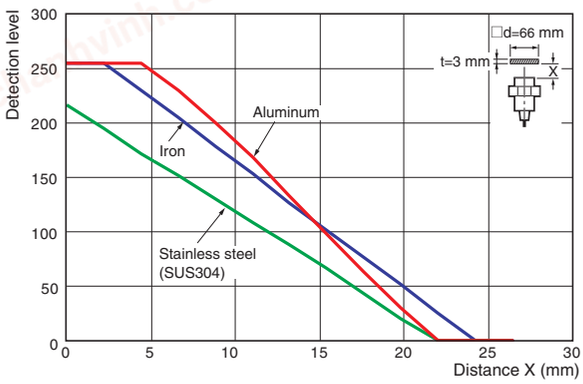
PREMIUM Model

Quadruple distance model/ Spatter-resistant Quadruple distance model Shielded

Size: M18 E2EW-(Q)X12□18

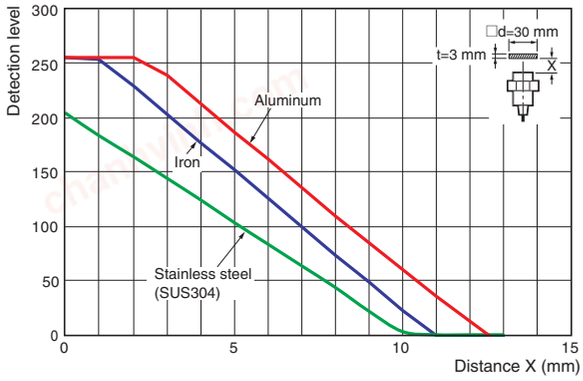


Size: M30 E2EW-(Q)X22□30

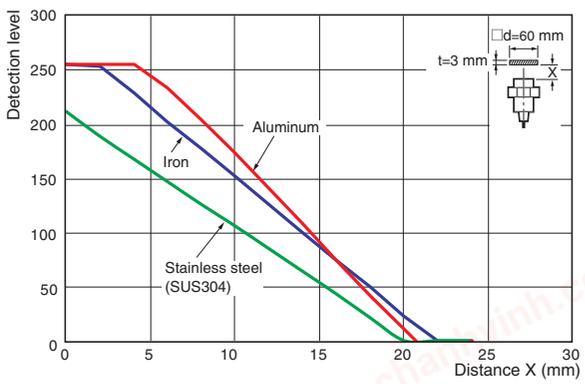


Triple distance model/ Spatter-resistant Triple distance model Shielded

Size: M18 E2EW-(Q)X10□18



Size: M30 E2EW-(Q)X20□30

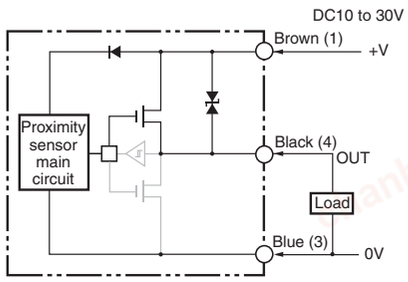
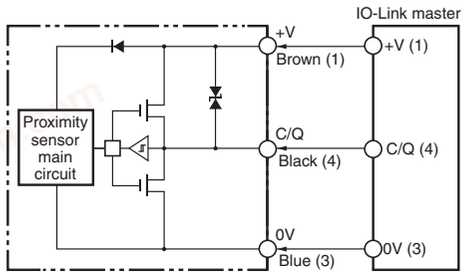
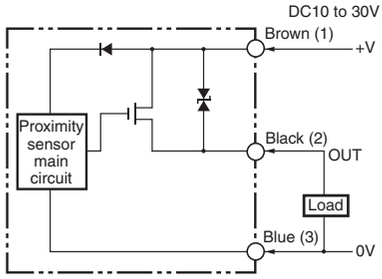
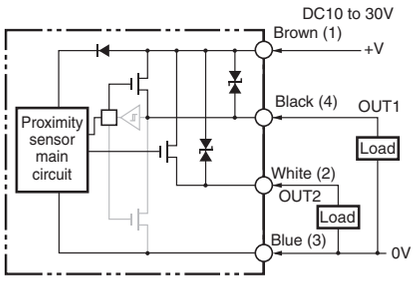
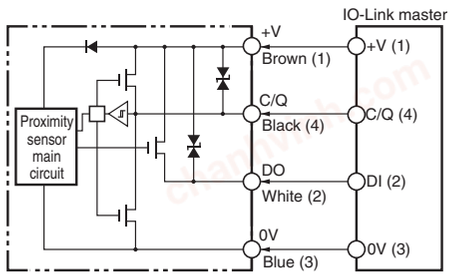


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I/O Circuit Diagrams/Timing charts

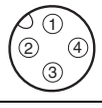
DC 3-wire

PNP output PREMIUM Model

Operation mode	Model	Output circuit	
		Standard I/O mode (SIO mode) When using as a general	IO-Link Communication mode (COM mode) When using the Sensor connected to IO-Link Master Unit
NO	E2EW-(Q)X□B1		
NC	E2EW-(Q)X□B2		---
NO+NC	E2EW-(Q)X□B3		

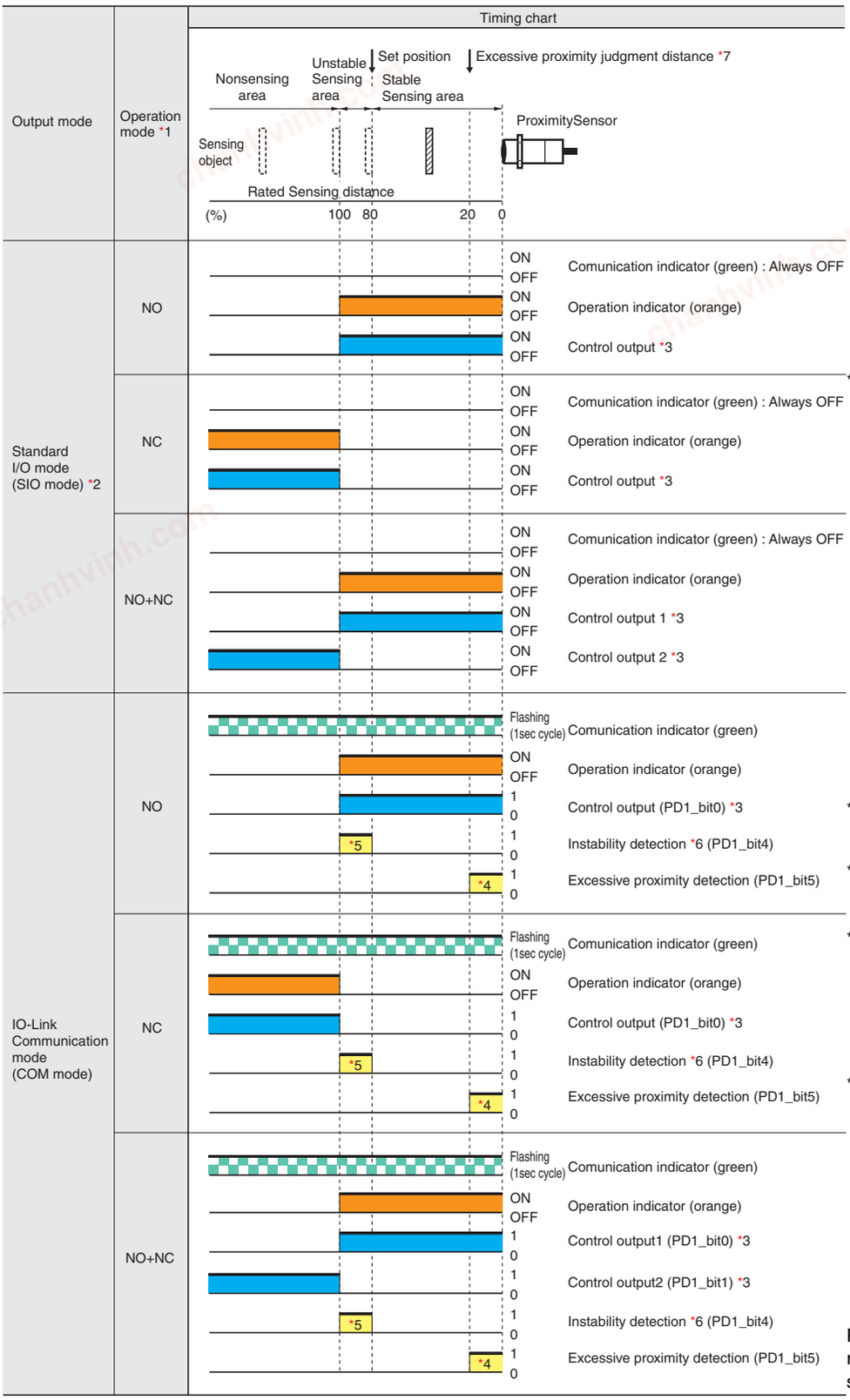
In the IO-Link mode, the cord between the IO-Link master and sensor must have a length of 20 m or less.

Connector Pin Arrangement

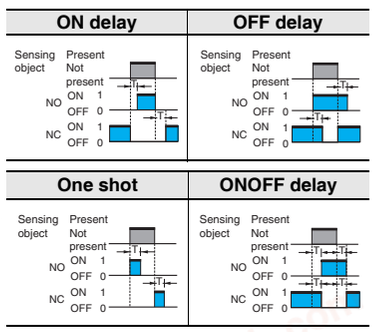
M12 Smartclick Connector


E2EW Series

PNP output



*3. The timer function of the control output can be set up by the IO-Link communications. (It is able to select ON delay, OFF delay, one-shot, or ONOFF delay function and select a timer time of 1 to 16,383ms (T).)



*4. The excessive proximity diagnosis function can be selected by the IO-Link communications.

*5. The instability detection diagnosis can be selected by the IO-Link communications.

*6. The judgment time for the instability detection diagnosis can be selected by the IO-Link communications. (For the ON delay timer function, the setting can be selected from 0 (invalid), 10, 50, 100, 300, 500, or 1000 ms.)

*7. The judgment distance of the excessive proximity diagnosis function can be selected by the IO-Link communications. (The distance can be selected as a combination of the material of the object detected, such as iron, aluminum, or SUS and the judgment distance of approximately 10, 20, or 30%. However, it is not allowed to select a combination of aluminum and 10%.)

Please contact your OMRON sales representative regarding the IO-Link setup file (IODD file).

Please contact your OMRON sales representative regarding assignment of data.

*1. For models with IO-Link, the operation mode can be changed by the IO-Link communications.

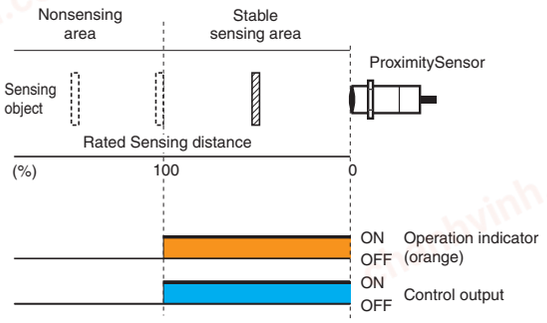
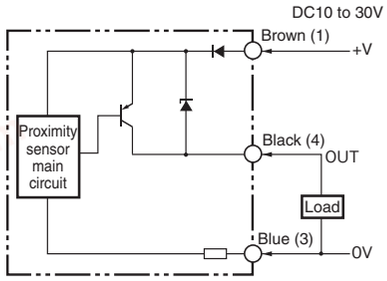
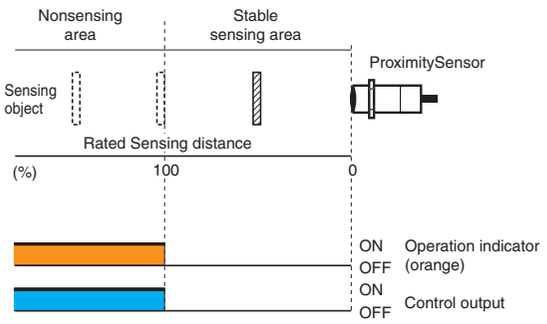
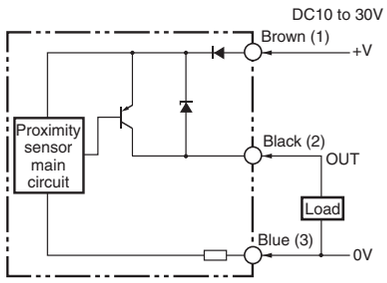
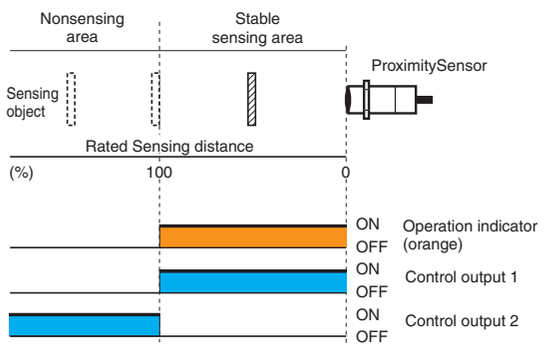
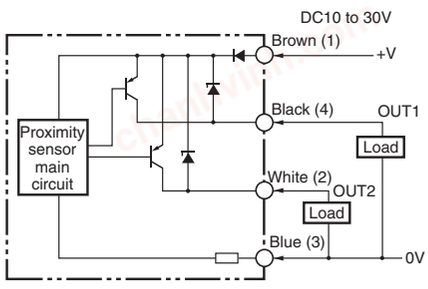
*2. If using a model with IO-Link as a general sensor or using a model without IO-Link, it operates in the standard I/O mode (SIO mode).

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DC 3-wire

PNP output

BASIC Model

Operation mode	Model	Timing chart	Output circuit
NO	E2EW-(Q)X□B1		
NC	E2EW-(Q)X□B2		
NO+NC	E2EW-(Q)X□B3		

Connector Pin Arrangement

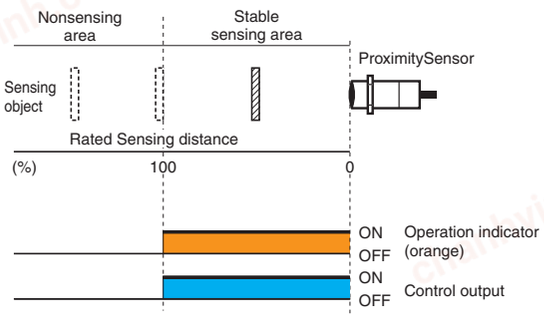
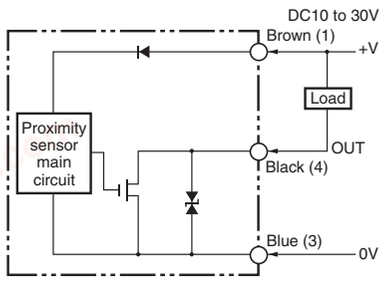
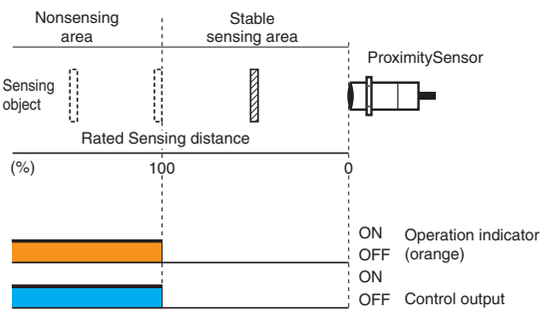
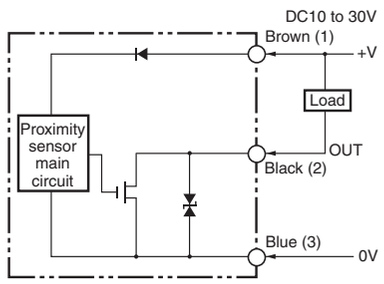
M12 Smartclick Connector



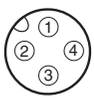
E2EW Series

DC 3-wire

NPN OUTPUT PREMIUM Model

Operation mode	Model	Timing chart	Output circuit
NO	E2EW-(Q)X□C1		
NC	E2EW-(Q)X□C2		

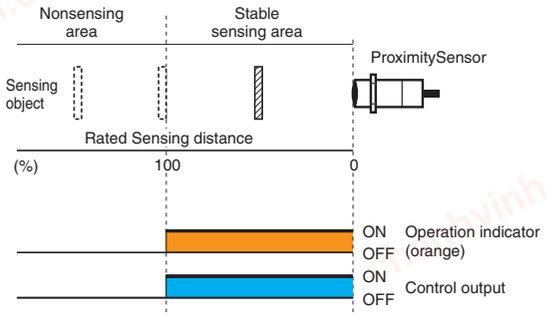
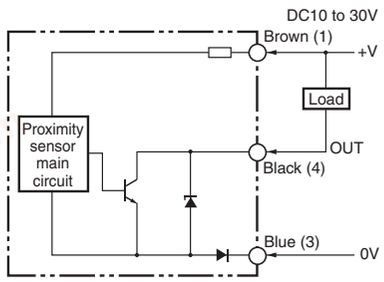
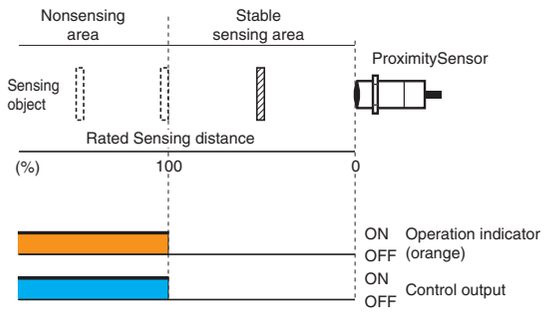
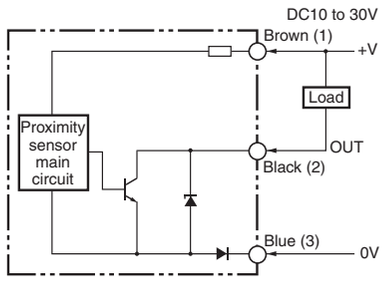
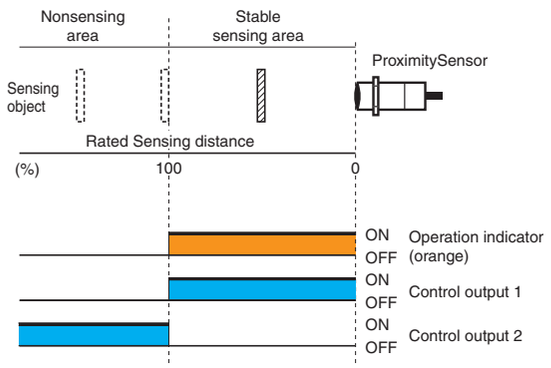
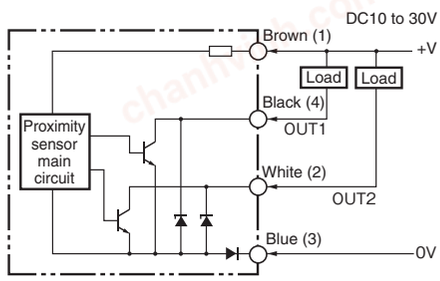
Connector Pin Arrangement

M12 Smartclick Connector


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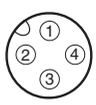
DC 3-wire

NPN OUTPUT BASIC Model

Operation mode	Model	Timing chart	Output circuit
NO	E2EW-(Q)X□C1		
NC	E2EW-(Q)X□C2		
NO+NC	E2EW-(Q)X□C3		

Connector Pin Arrangement

M12 Smartclick Connector

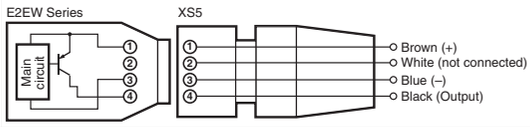
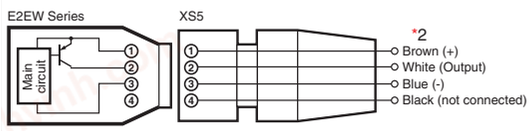
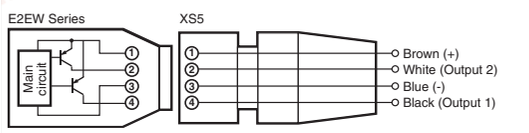
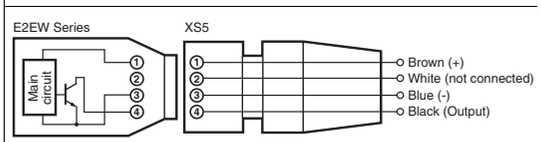
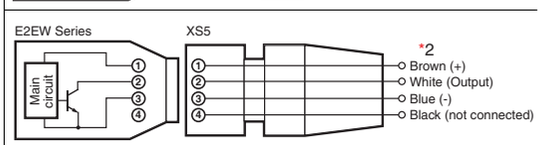
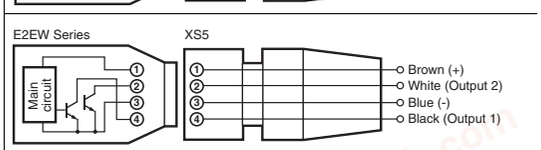


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E2EW Series

Connections for Sensor I/O Connectors

DC 3-Wire

Proximity Sensor				Sensor I/O Connectors	
Types	Output	Operation mode	Model	Model	Connections *1
DC 3-Wire (M12 Smartclick Connector)	PNP	NO	E2EW-(Q)X□B1□- M1TJ	XS5F-D421-□80-X□ XS5F-D42□-□80-F XS5W-D421-□81-X□ XS5W-D42□-□81-F **Note:** For details of the connector, refer to *XS5 Series* on page 42.	
		NC	E2EW-(Q)X□B2□-M1TJ		
		NO+NC	E2EW-(Q)X□B3□-M1TJ		
	NPN	NO	E2EW-(Q)X□C1□-M1TJ		
		NC	E2EW-(Q)X□C2□-M1TJ		
		NO+NC	E2EW-(Q)X□C3□-M1TJ		

*1. If the XS5W Series Connector which has a socket and plug on the cable ends is connected to the Sensor, this part will be a plug.
*2. Different from Proximity Sensor wire colors.

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Safety Precautions

Be sure to read the precautions for all models in the website at: http://www.ia.omron.com/.

Warning Indications

⚠WARNING	**Warning level** Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally there may be significant property damage.
Precautions for Safe Use	Supplementary comments on what to do or avoid doing, to use the product safely.
Precautions for Correct Use	Supplementary comments on what to do or avoid doing, to prevent failure to operate, malfunction or undesirable effect on product performance.

Meaning of Product Safety Symbols

	**General prohibition** Indicates the instructions of unspecified prohibited action.
	**Caution, explosion** Indicates the possibility of explosion under specific conditions.

⚠ WARNING

This product is not designed or rated for ensuring safety of persons either directly or indirectly.
Do not use it for such purposes.



Otherwise, explosion may result.
Never use the product with an AC power supply.



Precautions for Safe Use

The following precautions must be observed to ensure safe operation.

1. Do not use the product in environments subject to flammable or explosive gases.
2. Do not attempt to disassemble, repair, or modify the product.
3. Do not use a voltage that exceeds the rated operating voltage range.
   Applying a voltage that is higher than the operating voltage range may result in explosion or fire.
4. Be sure that the power supply polarity and other wiring is correct. Incorrect wiring may cause explosion or fire.
5. If the power supply is connected directly without a load, the internal elements may explode or burn.
6. Dispose of the product according to applicable regulations (laws).

Precautions for Correct Use

Do not use the product in any atmosphere or environment that exceeds the ratings.

Operating Environment

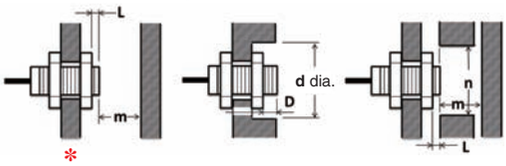
1. Do not install the Sensor in the following locations.
   (1) Outdoor locations directly subject to sunlight, rain, snow, waterdroplets, or oil.
   (2) Locations subject to atmospheres with chemical vapors, inparticular solvents and acids.
   (3) Locations subject to corrosive gases.
2. The Sensor may malfunction if used near ultrasonic cleaning equipment, high-frequency equipment, transceivers, cellular phones, inverters, or other devices that generate a high-frequency electric field. Please refer to the Precautions for Correct Use on the OMRON website (www.ia.omron.com) for typical measures.
3. Laying the Proximity Sensor wiring in the same conduit or duct as high-voltage wires or power lines may result in incorrect operation and damage due to induction. Wire the Sensor using a separate conduit or independent conduit.
4. Never use thinner or other solvents. Otherwise, the Sensor surface may be dissolved.
5. When turning on the power by influence of temperature environment, an outputmis-pulse sometimes occurs. After the sensor has passed for 300 msec after turning on, please use in the stable state.
6. The sensor is adjusted with a high degree of accuracy, so do not use in the environment with sudden temperature change.
7. Operation check is performed using an OMRON's IO-Link master. If using an IO-Link master from another company, perform the operation check in advance.
8. When connecting non IO-Link compliant models to the IO-Link master, use the SIO mode.
9. In the IO-Link mode, the cord between the IO-Link master and sensor must have a length of 20 m or less.

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Design

Influence of Surrounding Metal

When mounting the Proximity Sensor, ensure that the minimum distances given in the following table are maintained.
If you use a nut, only use the provided nut. And ensure that the minimum distances between the sensing surface and nut is bigger than the "L" given in the following table.
Other non-ferrous metals affect sensor's performance in the same way as aluminum. Perform the operation check in advance.



(Unit: mm)

Mounting panel material: Iron

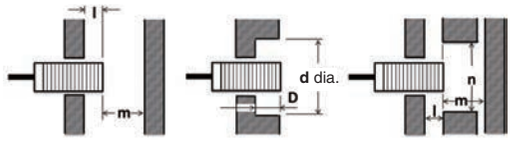
Models	Model	L	d	D	m	n
Quadruple distance model	E2EW-(Q)X12□18	6	54	6	36	54
	E2EW-(Q)X22□30	8	90	8	66	90
Triple distance model	E2EW-(Q)X10□18	2	54	2	30	54
	E2EW-(Q)X20□30	0	30	0	60	90
Single distance model	E2EW-(Q)X2□12	0	12	0	8	40
	E2EW-(Q)X5□18	0	18	0	20	60
	E2EW-(Q)X10□30	0	30	0	40	100

Mounting panel material: Aluminum

Models	Model	L	d	D	m	n
Quadruple distance model	E2EW-(Q)X12□18	12	80	12	36	80
	E2EW-(Q)X22□30	16	120	16	66	120
Triple distance model	E2EW-(Q)X10□18	12	80	12	30	80
	E2EW-(Q)X20□30	16	120	16	60	120
Single distance model	E2EW-(Q)X2□12	12	70	12	8	70
	E2EW-(Q)X5□18	12	80	12	20	80
	E2EW-(Q)X10□30	16	120	16	40	120

* If you use the model E2EW-(Q)X22□30, or E2EW-(Q)X20□30, the panel thickness (t) is 3 mm or less.

When the Proximity Sensor is mounted in metal, ensure that the minimum distances given in the following table are maintained.



(Unit: mm)

Embedded material: Iron

Models	Model	l	d	D	m	n
Quadruple distance model	E2EW-(Q)X12□18	6	54	6	36	54
	E2EW-(Q)X22□30	8	90	8	66	90
Triple distance model	E2EW-(Q)X10□18	0	18	0	30	54
	E2EW-(Q)X20□30	0	30	0	60	90
Single distance model	E2EW-(Q)X2□12	0	12	0	8	40
	E2EW-(Q)X5□18	0	18	0	20	60
	E2EW-(Q)X10□30	0	30	0	40	100

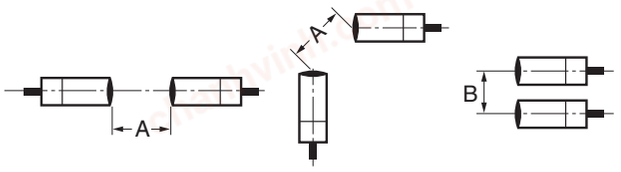
Embedded material: Aluminum

Models	Model	l	d	D	m	n
Quadruple distance model	E2EW-(Q)X12□18	12	80	12	36	80
	E2EW-(Q)X22□30	16	120	16	66	120
Triple distance model	E2EW-(Q)X10□18	12	80	12	30	80
	E2EW-(Q)X20□30	16	120	16	60	120
Single distance model	E2EW-(Q)X2□12	12	70	12	8	70
	E2EW-(Q)X5□18	12	80	12	20	80
	E2EW-(Q)X10□30	16	120	16	40	120

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Mutual Interference

When installing two or more Proximity Sensors face-to-face or sideby-side, ensure that the minimum distances given in the following table are maintained.



(Unit: mm)

Models	Model	Item	
		A	B
Quadruple distance model	E2EW-(Q)X12□18	80	60
	E2EW-(Q)X22□30	135	110
Triple distance model	E2EW-(Q)X10□18	80	60
	E2EW-(Q)X20□30	135	110
Single distance model	E2EW-(Q)X2□12	40	35
	E2EW-(Q)X5□18	65	60
	E2EW-(Q)X10□30	110	100

Chips from Cutting Aluminum

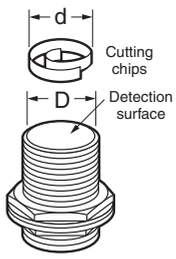
Normally, chips from cutting aluminum will not cause a detection signal to be output even if it adheres to or accumulates on the detection surface. In the following cases, however, a detection signal may be output.

Remove the cutting chips in these cases.

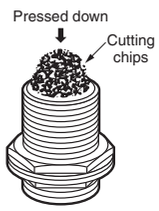
1. If d ≥ 2/3D at the center of the detection surface where d is the cutting chip size and D is the detection surface size

(Unit: mm)

Model	Dimension	D
E2EW-(Q)X□12		10
E2EW-(Q)X□18		16
E2EW-(Q)X□30		28



2.If the cutting chips are pressed down



Mounting

Tightening Force

Do not tighten the nut with excessive force.

A washer must be used with the nut.

The tightening force must be the same or less than the figures in the following table.



Quadruple distance model, Triple distance model, Single distance model

Size	Torque	
	E2EW-X□	E2EW-QX□
M12	30 N·m	15 N·m
M18	70 N·m	35 N·m
M30	180 N·m	60 N·m

Note: When mounting the Proximity Sensor, only use the provided nut. Do not use set screws. The Sensor may malfunction.

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E2EW Series

Dimensions

(Unit: mm)
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

Sensors

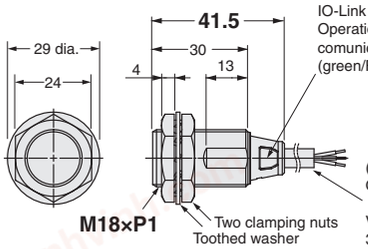
PREMIUM Model

E2EW/E2EW-Q Series (Quadruple distance/Triple distance/Spatter-resistant Quadruple distance, Spatter-resistant Triple distance model)

Pre-wired Model



E2EW-X12□□□18/E2EW-QX12□□□18
E2EW-X10□□□18/E2EW-QX10□□□18

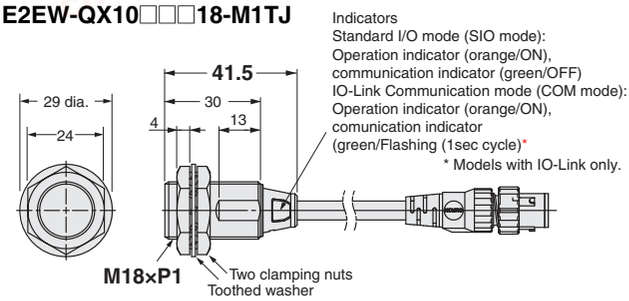




Pre-wired Connector Model



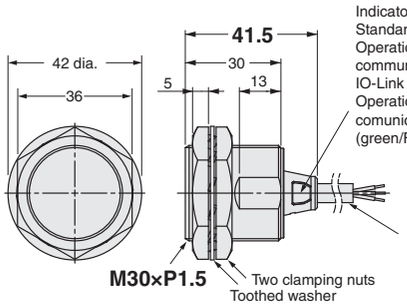
E2EW-X12□□□18-M1TJ
E2EW-X10□□□18-M1TJ
E2EW-QX12□□□18-M1TJ
E2EW-QX10□□□18-M1TJ

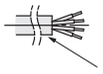


(Operation mode): Output configuration (B1, C1): NO
(B2, C2): NC
Vinyl-insulated round cable with 3 conductors size: 6-dia.
(Conductor cross section: 0.3 mm² (AWG24),
Insulator diameter: 1.05 mm), Standard length: 2 m

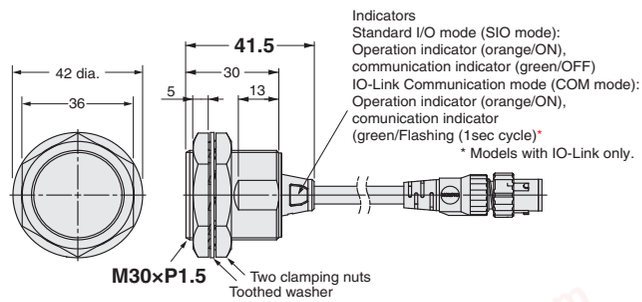
(Operation mode): Output configuration (B3): NO+NC
Vinyl-insulated round cable with 4 conductors size: 6-dia.
(Conductor cross section: 0.3 mm² (AWG24),
Insulator diameter: 1.05 mm), Standard length: 2 m

E2EW-X22□□□30/E2EW-QX22□□□30
E2EW-X20□□□30/E2EW-QX20□□□30





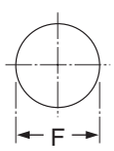
E2EW-X22□□□30-M1TJ
E2EW-X20□□□30-M1TJ
E2EW-QX22□□□30-M1TJ
E2EW-QX20□□□30-M1TJ



(Operation mode): Output configuration (B1, C1): NO
(B2, C2): NC
Vinyl-insulated round cable with 3 conductors size: 6-dia.
(Conductor cross section: 0.3 mm² (AWG24),
Insulator diameter: 1.05 mm), Standard length: 0.3 m

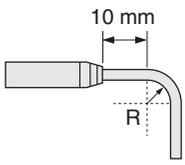
(Operation mode): Output configuration (B3): NO+NC
Vinyl-insulated round cable with 4 conductors size: 6-dia.
(Conductor cross section: 0.3 mm² (AWG24),
Insulator diameter: 1.05 mm), Standard length: 0.3 m

Mounting Hole Dimensions



Dimensions	F (mm)
M18	18.5 dia. $^{+0.5}_{0}$
M30	30.5 dia. $^{+0.5}_{0}$

Angle R of the Bending Wire



Dimensions	R (mm)
M18	18
M30	

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BASIC Model E2EW/E2EW-Q Series (Single distance model/Spatter-resistant Single distance model)

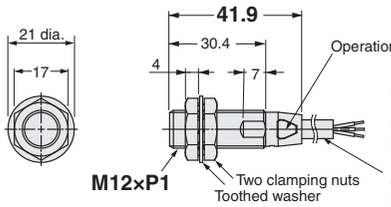
Pre-wired Model



Pre-wired Connector Model



E2EW-X2□□12
E2EW-QX2□□12

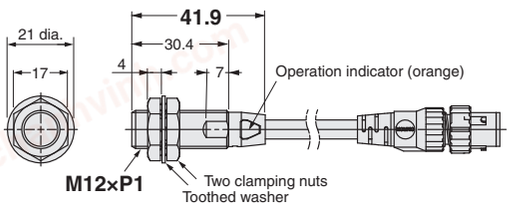


(Operation mode):
Output configuration (B1, C1): NO
(B2, C2): NC
Vinyl-insulated round cable with
3 conductors size: 6-dia.
(Conductor cross section:
0.3 mm² (AWG24),
Insulator diameter: 1.05 mm),
Standard length: 2 m



(Operation mode):
Output configuration (B3, C3): NO+NC
Vinyl-insulated round cable with
4 conductors size: 6-dia.
(Conductor cross section:
0.3 mm² (AWG24),
Insulator diameter: 1.05 mm),
Standard length: 2 m

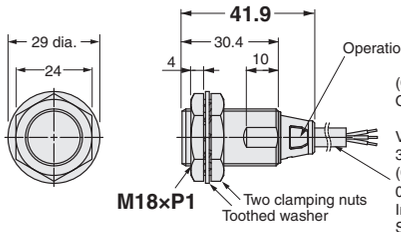
E2EW-X2□□12-M1TJ
E2EW-QX2□□12-M1TJ



(Operation mode): Output configuration (B1, C1): NO
(B2, C2): NC
Vinyl-insulated round cable with 3 conductors size: 6-dia.
(Conductor cross section: 0.3 mm² (AWG24),
Insulator diameter: 1.05 mm), Standard length: 0.3 m

(Operation mode): Output configuration (B3, C3): NO+NC
Vinyl-insulated round cable with 4 conductors size: 6-dia.
(Conductor cross section: 0.3 mm² (AWG24),
Insulator diameter: 1.05 mm), Standard length: 0.3 m

E2EW-X5□□18
E2EW-QX5□□18

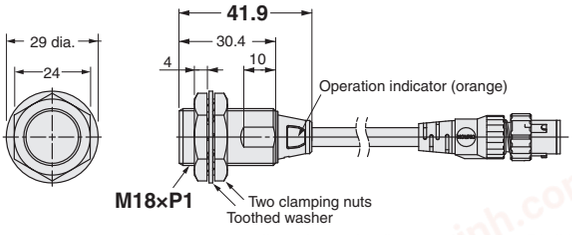


(Operation mode):
Output configuration (B1, C1): NO
(B2, C2): NC
Vinyl-insulated round cable with
3 conductors size: 6-dia.
(Conductor cross section:
0.3 mm² (AWG24),
Insulator diameter: 1.05 mm),
Standard length: 2 m



((Operation mode):
Output configuration (B3, C3): NO+NC
Vinyl-insulated round cable with
4 conductors size: 6-dia.
(Conductor cross section:
0.3 mm² (AWG24),
Insulator diameter: 1.05 mm),
Standard length: 2 m

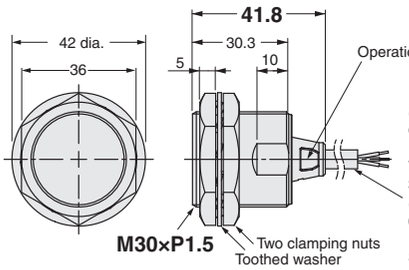
E2EW-X5□□18-M1TJ
E2EW-QX5□□18-M1TJ



(Operation mode): Output configuration (B1, C1): NO
(B2, C2): NC
Vinyl-insulated round cable with 3 conductors size: 6-dia.
(Conductor cross section: 0.3 mm² (AWG24),
Insulator diameter: 1.05 mm), Standard length: 0.3 m

(Operation mode): Output configuration (B3, C3): NO+NC
Vinyl-insulated round cable with 4 conductors size: 6-dia.
(Conductor cross section: 0.3 mm² (AWG24),
Insulator diameter: 1.05 mm), Standard length: 0.3 m

E2EW-X10□□30
E2EW-QX10□□30

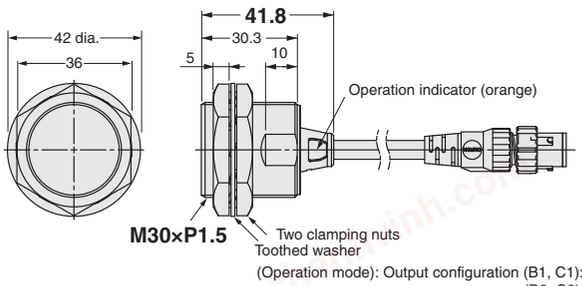


(Operation mode):
Output configuration (B1, C1): NO
(B2, C2): NC
Vinyl-insulated round cable with
3 conductors size: 6-dia.
(Conductor cross section:
0.3 mm² (AWG24),
Insulator diameter: 1.05 mm),
Standard length: 2 m



(Operation mode):
Output configuration (B3, C3): NO+NC
Vinyl-insulated round cable with
4 conductors size: 6-dia.
(Conductor cross section:
0.3 mm² (AWG24),
Insulator diameter: 1.05 mm),
Standard length: 2 m

E2EW-X10□□30-M1TJ
E2EW-QX10□□30-M1TJ



(Operation mode): Output configuration (B1, C1): NO
(B2, C2): NC
Vinyl-insulated round cable with 3 conductors size: 6-dia.
(Conductor cross section: 0.3 mm² (AWG24),
Insulator diameter: 1.05 mm), Standard length: 0.3 m

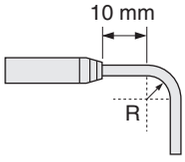
(Operation mode): Output configuration (B3, C3): NO+NC
Vinyl-insulated round cable with 4 conductors size: 6-dia.
(Conductor cross section: 0.3 mm² (AWG24),
Insulator diameter: 1.05 mm), Standard length: 0.3 m

Mounting Hole Dimensions



Dimensions	F (mm)
M12	12.5 dia. $^{+0.5}_{0}$
M18	18.5 dia. $^{+0.5}_{0}$
M30	30.5 dia. $^{+0.5}_{0}$

Angle R of the Bending Wire



Dimensions	R (mm)
M12	18
M18	
M30	

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Round Water-resistant Connectors (M12 Smartclick)

XS5

Round Water-resistive Smartclick Connectors for E2E NEXT Series proximity sensors that Reduce Installation Work

- A newly developed lock mechanism that is compatible with round M12 connectors.
- Simply insert the Connectors, then turn them approximately 1/8 of a turn to lock.
- A positive click indicates locking.
- IP67 degree of protection.
- UL approved products.



Smartclick

For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

⚠ Be sure to read *Safety Precautions* on page 48.

Model Number Structure

Model Number Legend

Use this legend when determining the product specifications from the model number. When ordering, use a model number from the table in **Ordering Information**.

XS5□-D 4 2 □ - □ 8 □ - F
1 2 3 4 5 6 7 8 9

1. **Type**
   W: Connectors connected to cable, socket and plug on cable ends
   F: Connectors connected to cable, socket on one cable end
2. **Mating Section Form**
   D: A-coding (for DC sensor)
3. **Connector Poles**
   4: 4 poles
4. **Contact Plating**
   2: Gold plating
5. **Cable Connection Direction**
   XS5W
   1: Straight (Socket)/Straight (Plug)
   2: Right-angle (Socket)/Right-angle (Plug)
   3: Straight (Socket)/Right-angle (Plug)
   4: Right-angle (Socket)/Straight (Plug)

   XS5F
   1: Straight
   2: Right-angle
6. **Cable Length**
   C: 1 m
   D: 2 m
   E: 3 m
   G: 5 m
   J: 10 m
7. **Connections** (Numbers inside circles are terminal numbers)
   8: ①Brown, ②White, ③Blue, ④ Black
8. **Connectors on One End/Both Ends**
   0: Sockets on One Cable End
   1: Socket and Plug on Cable Ends
9. **Cable Specifications**
   F: Robot cable

Smartclick is registered trademark of OMRON Corporation.

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Ordering Information

Connectors

Type	Cable outer diameter (mm)	Cable Connection Direction	Cable length (m)	Model	UL
Socket and Plug on Cable Ends XS5W	6 dia.	Straight (Socket)/Straight (Plug)	1	**XS5W-D421-C81-F**	UL2238 certified (File no. E207683)
			2	**XS5W-D421-D81-F**	
			3	**XS5W-D421-E81-F**	
			5	**XS5W-D421-G81-F**	
			10	**XS5W-D421-J81-F**	
		Right-angle (Socket)/Right-angle (Plug)	2	**XS5W-D422-D81-F**	
			5	**XS5W-D422-G81-F**	
		Straight (Socket)/Right-angle (Plug)	2	**XS5W-D423-D81-F**	
			5	**XS5W-D423-G81-F**	
		Right-angle (Socket)/Straight (Plug)	2	**XS5W-D424-D81-F**	
			5	**XS5W-D424-G81-F**	
Sockets on One Cable End XS5F	6 dia.	Straight type	1	**XS5F-D421-C80-F**	
			2	**XS5F-D421-D80-F**	
			3	**XS5F-D421-E80-F**	
			5	**XS5F-D421-G80-F**	
			10	**XS5F-D421-J80-F**	
		Right-angle type	1	**XS5F-D422-C80-F**	
			2	**XS5F-D422-D80-F**	
			3	**XS5F-D422-E80-F**	
			5	**XS5F-D422-G80-F**	
			10	**XS5F-D422-J80-F**	

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Accessories (Sold Separately)

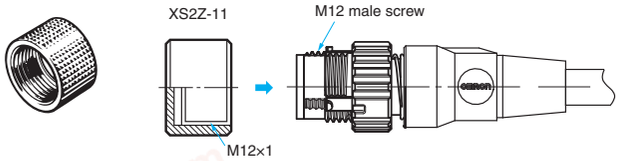
Connector Covers

Water-resistive Covers

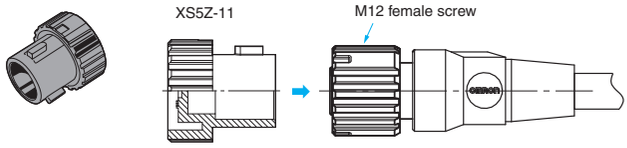
Model	Material	Suitable connector		Remarks
		Model	Mounting portion	
XS2Z-11	Brass/ Nickel plated	XS5W	M12 male screw	This provides IP67 levels of protection. When mounting the Water-resistive Cover to a Connector, be sure to apply a torque range between 0.39 and 0.49 N·m to tighten the Water-resistive Cover.
XS5Z-11	PBT	XS5F/XS5W	M12 female screw	This provides IP67 levels of protection. This uses the Smart click mechanism. There's no need to keep track of locking torque.

Water-resistive Covers

XS2Z-11



XS5Z-11

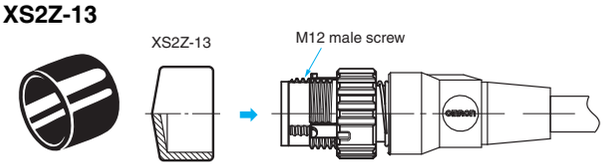


Dust Covers

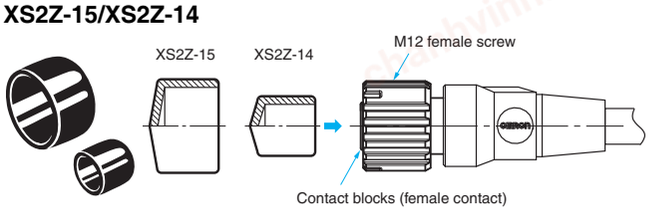
Model	Material	Suitable connector		Remarks
		Model	Mounting portion	
XS2Z-13	Rubber/Black	XS5W	M12 male screw	The Dust Cover is for dust prevention and does not ensure IP67 degree of protection. When mounting the Dust Cover to a connector, be sure to press the Dust Cover onto the Connector until the Connector is fully inserted into the Dust Cover.
XS2Z-14		XS5F/XS5W	Contact blocks (female contact)	
XS2Z-15			M12 female screw	

Dust Covers

XS2Z-13



XS2Z-15/XS2Z-14



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Ratings and Specifications

Rated current	4 A
Rated voltage	250 VDC
Contact resistance (connector)	40 mΩ max. (at 20 mV max., 100 mA max.)
Insulation resistance	1,000 MΩ min. (at 500 VDC) *1
Dielectric strength (connector)	1,500 VAC for 1 minute (leakage current: 1 mA max.)
Degree of protection	IP67 (IEC 60529)
Insertion tolerance	50 times
Lock strength	Tensile: 100 N/15 s, Torsion: 1 N·m/15 s
Cable holding strength	Tensile: 100 N/15 s, Torsion: 1 N·m/15
Lock operating force	0.1 to 0.25 N·m
Ambient operating temperature range	-25 to 70°C *2
Ambient humidity range	20 to 85%RH

✻1. State at shipping.
✻2. Use the robot cable within a temperature range of 0 to 70°C to avoid the wire breakage when moving.

Materials and Finishes

Model / Item	XS5W/XS5F
Contacts	Copper alloy/Gold plating
Fixtures	Zinc alloy/Nickel plationg
Pin block	PBT resin
O-ring	Rubber
Cover	PBT resin
Cable	UL13 (CL3), UL758 (AWM), 6 mm dia., AWG20

Connector Pinout Diagram (from Mating Side)

Item	No. of poles	4 poles
A-coding (For DC sensors)	**Male (plug) contacts**	
	Female (socket) contacts	

Connection

Socket	Plug: OMRON model No.	Smartclick Plug Connectors: XS5H, XS5G, XS5W (plug side), XS5R (plug side), XS5M *	M12 Plug Connectors: XS2H, XS2G, XS2W (plug side), XS2R (plug side), XS2M *
Smartclick Socket Connectors	**XS5F, XS5C XS5W (socket side), XS5R (socket side), XS5P ***	⊙	❍
M12 Socket Connectors	**XS2F, XS2C, XS2W (socket side), XS2R (socket side), XS2P ***	❍	❍

✻ XS2P/XS5P and XS5M, XS2M cannot mate with each other.
Note: ⊙: Connected by twisting.
❍: Connected by screwing.

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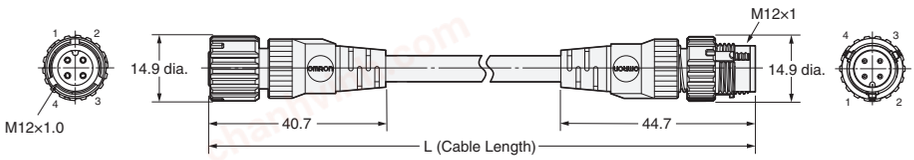
XS5

Dimensions

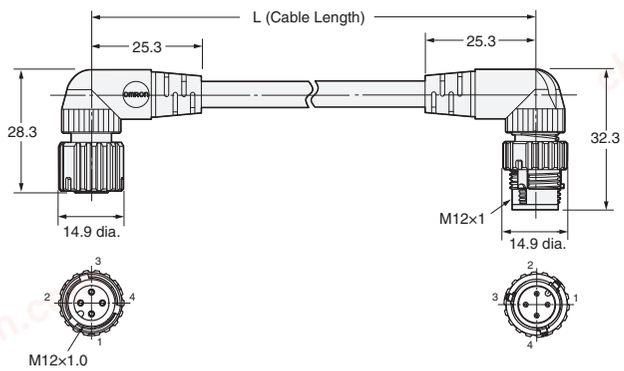
(Unit: mm)

Socket and Plug on Cable Ends XS5W

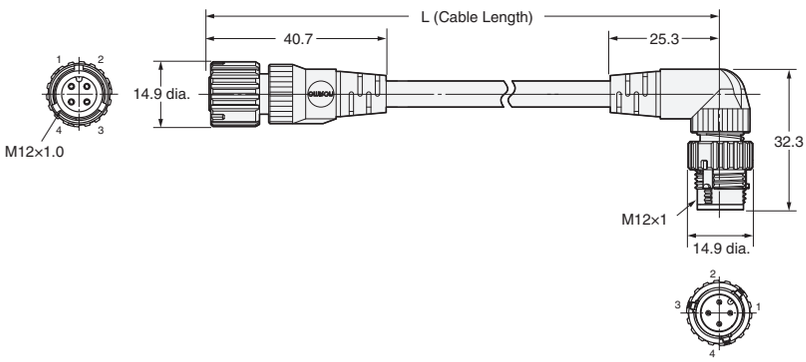
Straight (Socket)/straight (Plug)
XS5W-D421-□81-F



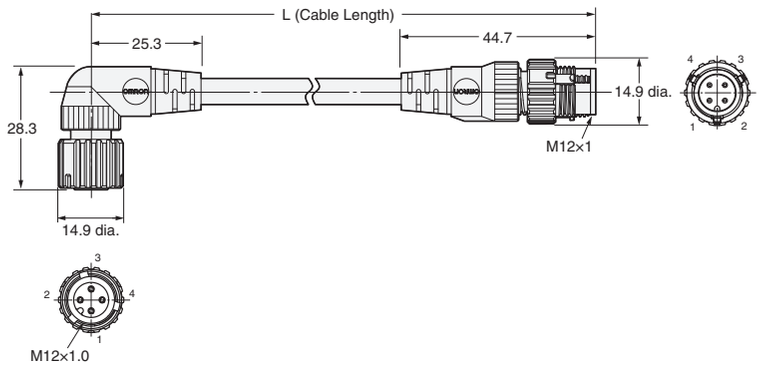
Right-angle (Socket)/right-angle (Plug)
XS5W-D422-□81-F



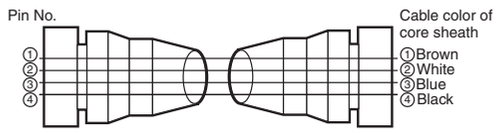
Straight (Socket)/right-angle (Plug)
XS5W-D423-□81-F



Right-angle (Socket)/straight (Plug)
XS5W-D424-□81-F



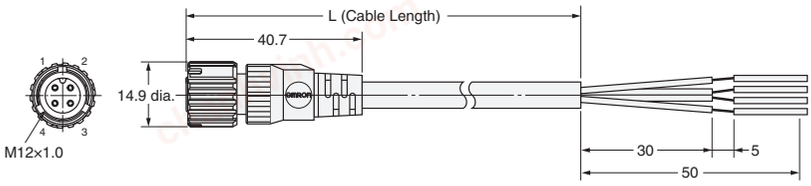
Wiring Diagram for 4 Cores



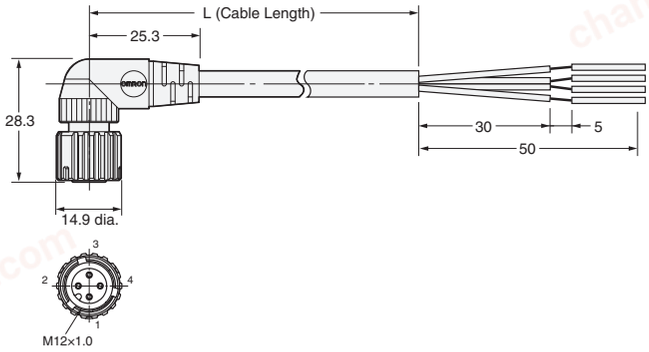
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Sockets on One Cable End XS5F

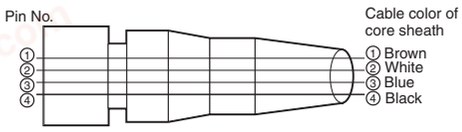
Straight type
XS5F-D421-□80-F



Right-angle type
XS5F-D422-□80-F



Wiring Diagram for 4 Cores



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Safety Precautions

Meaning of Display

Precautions for Safe Use	Supplementary comments on what to do or avoid doing, to use the product safely.
Precautions for Correct Use	Supplementary comments on what to do or avoid doing, to prevent failure to operate, malfunction, or undesirable effects on product performance.

Precautions for Safe Use

Degree of Protection

Do not use the product if its protective capabilities have been compromised, such as through swelling or cracks to housing or seal materials.
Breakages or damage from fire may occur when products in this state continue to be used.

Connector Connection and Disconnection

- When connecting or disconnecting Connectors, be sure to hold the Connectors by hand.
- Do not hold the cable when disconnecting Connectors.
  Check the alignment using the slot in the polarity key.
- Do not wiring the Connector when your hands are wet. Malfunctions or device damage may occur when power is supplied to a device.
- When mating Connectors, be sure to insert the plug all the way to the back of the socket before attempting to lock the Connectors.
  After you lock a Connector, always confirm that it is mated properly.
- Do not use tools of any sort to mate the Connectors. Always use your hands. Pliers or other tools may damage the Connectors.
- When you replace a Connector, make sure that there is no liquid, cutting oil, or other foreign matter on the mating surfaces before you mate the Connector.

Disposal

Dispose of this product as industrial waste.

Precautions for Correct Use

- Do not use the Connectors in an atmosphere or environment that exceeds the specifications.
- Always turn OFF the power supply before wiring. Failure to turn OFF the power supply may lead to electric shock or damage to devices.
- Environments with corrosive gases and high temperature and humidity can cause bad connections and damage through corrosion, leading to degraded performance, therefore do not use these products in such environments.
- Do not pull on the Connectors or cables with excessive force.
- Do not step on or place any objects on the Connectors. Doing so may damage the Connectors.
- Lay the cable where it will not be stepped on to prevent the wires in the cable from being disconnected and to protect the Connectors from being damaged. If the cable must be placed where it will be stepped on, install a protective cover.
- At installation, if not installing sensors or switches, and not mating plug connectors, then use water-resistant covers (XS5Z-11, XS2Z-11) or dust-resistant covers (XS2Z-13/14/15) in order to ensure correct connector mating.

Wiring

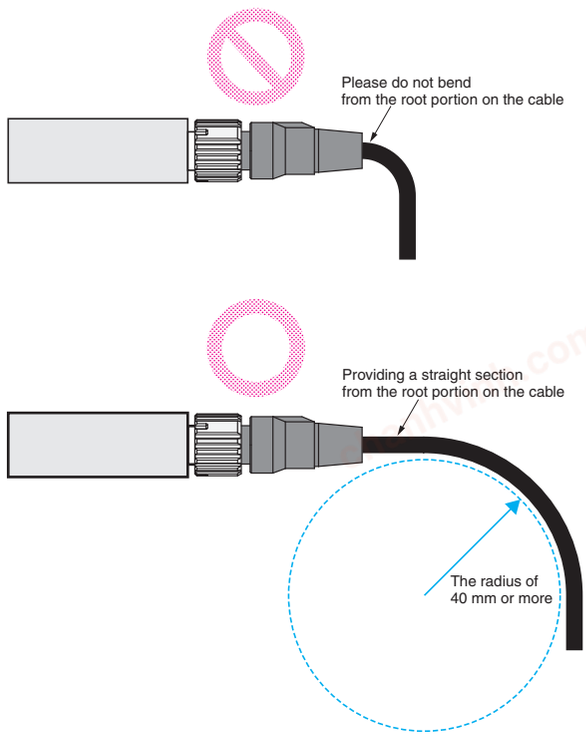
- Do not wire cables in environments in which the cable terminal sections will be subject to fluids such as water or cutting oil.
- When wiring cables, ensure this is carried out in accordance with the wiring diagram.
- Lay the cables so that external force is not applied to the Connectors. Otherwise, the degree of protection (IP67G) may not be achieved.

Degree of Protection (IP67)

- The degree of protection of Connectors (IP67) is not for a fully watertight structure. Do not use the Connectors underwater.
- Do not step on or place any objects on the Connectors. Doing so may damage the Connectors.

Setup

- Do not install the Connectors with a load placed directly on the joint or at the point where the wires connect to the Connector.
  The Connector may be damaged or the wires in the cable may be disconnected.
- If bending cables, ensure that these use a minimum bend radius of 40 mm.



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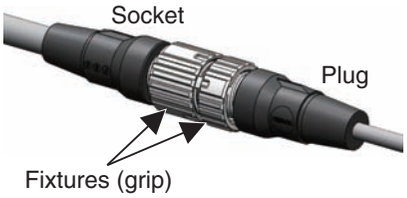
Connecting

1. Connecting the XS5 Plug and Socket

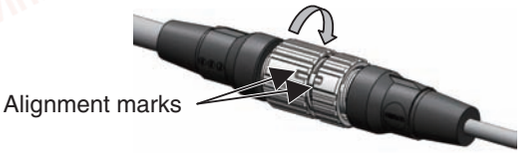
- Align the projection on the plug cover with the polarity key on the socket, then insert the plug all the way in.



- Hold the knurled socket grip, then insert the projection on the plug into the groove of the socket.



- Turn the knurled grips of the socket clockwise approximately 1/8 turn in respect to the plug. A click will indicate that the Connectors are locked. The locking condition can also be confirmed by the alignment marks on the plug and socket.



2. Connecting the XS5 and XS2

- Align the projection on the plug cover with the polarity key on the socket, then insert the plug all the way in.
- In the same way as when connecting two XS2 Connectors, screw the knurled grip in the clockwise direction.
- Use your fingers to tighten the Connectors sufficiently.

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Related products

Proximity Sensors
DC 2-Wire and 3-Wire Models

E2E NEXT Series

- Exceptional sensing range[*1] approximately double the sensing distance of previous models.
- With high-brightness LED, the indicator is visible anywhere from 360°.
- Only 10 seconds[*2] to replace a Proximity Sensor with the "e-jig" (Mounting Sleeve).
- Cables with enhanced oil resistance enabled 2-year oil resistance[*3].

*1. Based on December 2018 OMRON investigation.
*2. Time required to adjust the distance when installing a Sensor. Based on OMRON investigation.
*3. Refer to *Ratings and Specifications* on the catalog for details.
However, E2E Connector Models and E2EQ series are excluded.



Refer to the catalog for details.
Cat. No. D121

Exceptional sensing range Proximity Sensors (E2E NEXT Series/E2EW Series)

More E2E NEXT and E2EW products are scheduled to be released for the complete lineup. (As of December 2019)

	Proximity Sensors E2E NEXT Series		Welding Proximity Sensors E2EW Series	
	DC 3-wire	DC 2-wire	DC 3-wire	DC 2-wire
PREMIUM Models	Available IO-Link	Available	Available IO-Link	—
BASIC Models	Available IO-Link	Scheduled for release	Available	Scheduled for release

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