

N E W

OMRON

Proximity Sensors

DC 2-Wire Models

E2E NEXT Series

7mm (M12)

More than double the sensing
distance of previous models

The World's
Longest-distance*
Detection

Reduces Malfunctions
and Collisions

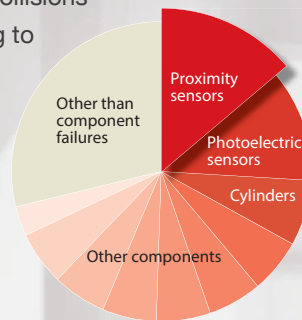
* Based on September 2017 OMRON investigation.

Unexpected Production Facility Stoppages: 70 % Are Caused by Component Failures.

Proximity sensors account for the most.

Many proximity sensors are used for production facilities due to its environment resistance. The short sensing distance, however, causes collisions with sensing objects, leading to a major cause of facility stoppages.

■ Causes of unexpected
production facility stoppages



(Based on September 2017 OMRON investigation.)

With New Proximity Sensors,

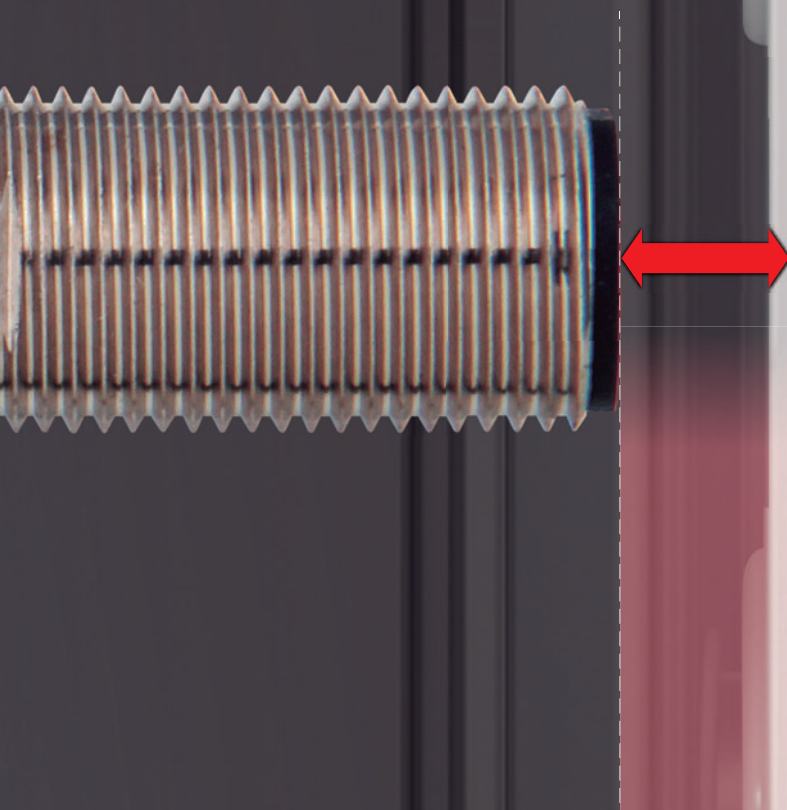
The world's longest*
sensing distance

NEW

7 mm

for M12

* Based on September 2017 OMRON investigation.



Even when the distance from a sensing object changes due to equipment deterioration and vibration,

**a Proximity Sensor
does not hit equipment
and facilities work stably!**

Contributes to **Better Facility "Operation Rates"**.



Also Contributes to **Facility's Greater "Design Flexibility"**.



Stable operation

Quick recovery

Less failures

Long-distance Detection Prevents Unexpected Facility Stoppages

New Proximity Sensors reduce unexpected facility stoppages due to false detection, failures, and damage caused by previous proximity sensors.

7 mm

E2E NEXT

■ Magnetic flux strength

E2E NEXT

Previous models

(Illustration)

3 mm

Previous models

* for M12



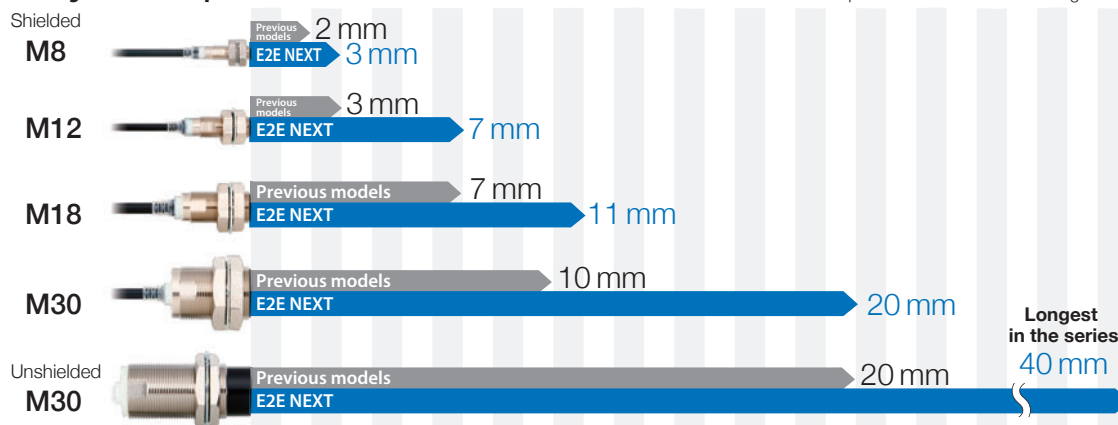
Check the video for the long-distance detection!

<http://www.fa.omron.co.jp/psne>

Nearly double the sensing distance of previous models

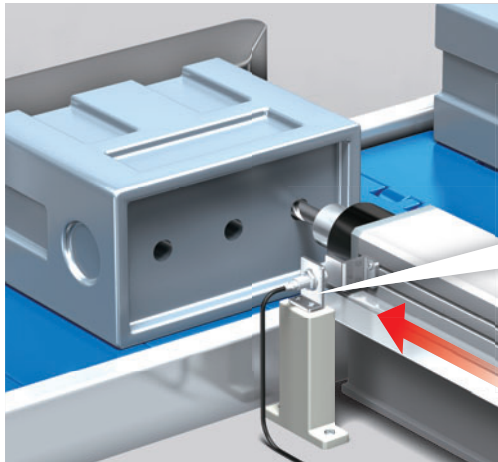
The world's longest sensing distance*

Sensing distance comparison



* Based on September 2017 OMRON investigation.

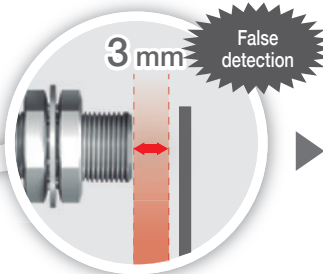
Less False Detection Even When a Stationary Gets Away From the Sensor Due to Equipment Vibration.



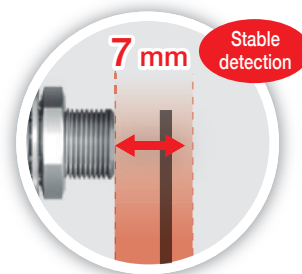
Presence detection of spindles

Previously

The equipment vibration widens the distance between a stationary and a sensor to cause false detection and facility stoppages.



Previous models



E2E NEXT * for M12

E2E NEXT

Long-distance detection enhances the degree of the detection margin.
Stable detection even when a stationary gets away.

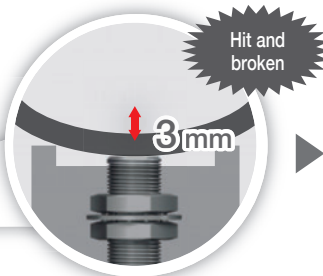
When Workpiece Sitting Position Varies, Collisions Are Unlikely to Happen.



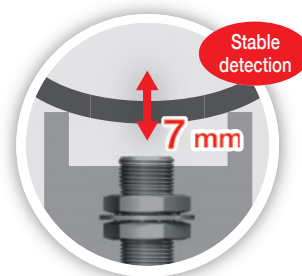
Sitting position confirmation of metal plates to weld

Previously

Workpiece slides and gets closer to the Sensor to cause failures and damage due to collisions, and facility stoppages.



Previous models



E2E NEXT * for M12

E2E NEXT

Long-distance detection keeps enough space from the workpiece.
Less collision risks.

Long-distance and Stable Detection Technology "Thermal Distance Control" and Industry's First Analog Digital Hybrid IC "PROX2"

Proximity sensors with longer sensing distance require increased sensitivity. However, with the increased sensitivity, temperature changes will have bigger influence in sensing distance. E2E NEXT Proximity Sensors use "Thermal Distance Control": long-distance and stable detection technology, newly developed by OMRON. "Thermal Distance Control" with "PROX2" write temperature correction values externally when shipped and minimize the sensing distance changes due to temperature changes, which could not be done by the conventional analog IC. It is industry's first for 2-wire proximity sensors to use analog digital hybrid IC "PROX2".

When compared with M12 at the ambient temperature of 50 °C.

Previously

Error when the sensing distance is extended to 7 mm.



E2E NEXT

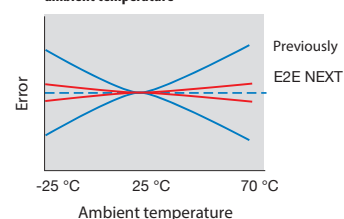
Error when the sensing distance is 7 mm.



Patent Pending

"Thermal Distance Control" technology suppresses the error.

Sensing distance fluctuation due to ambient temperature



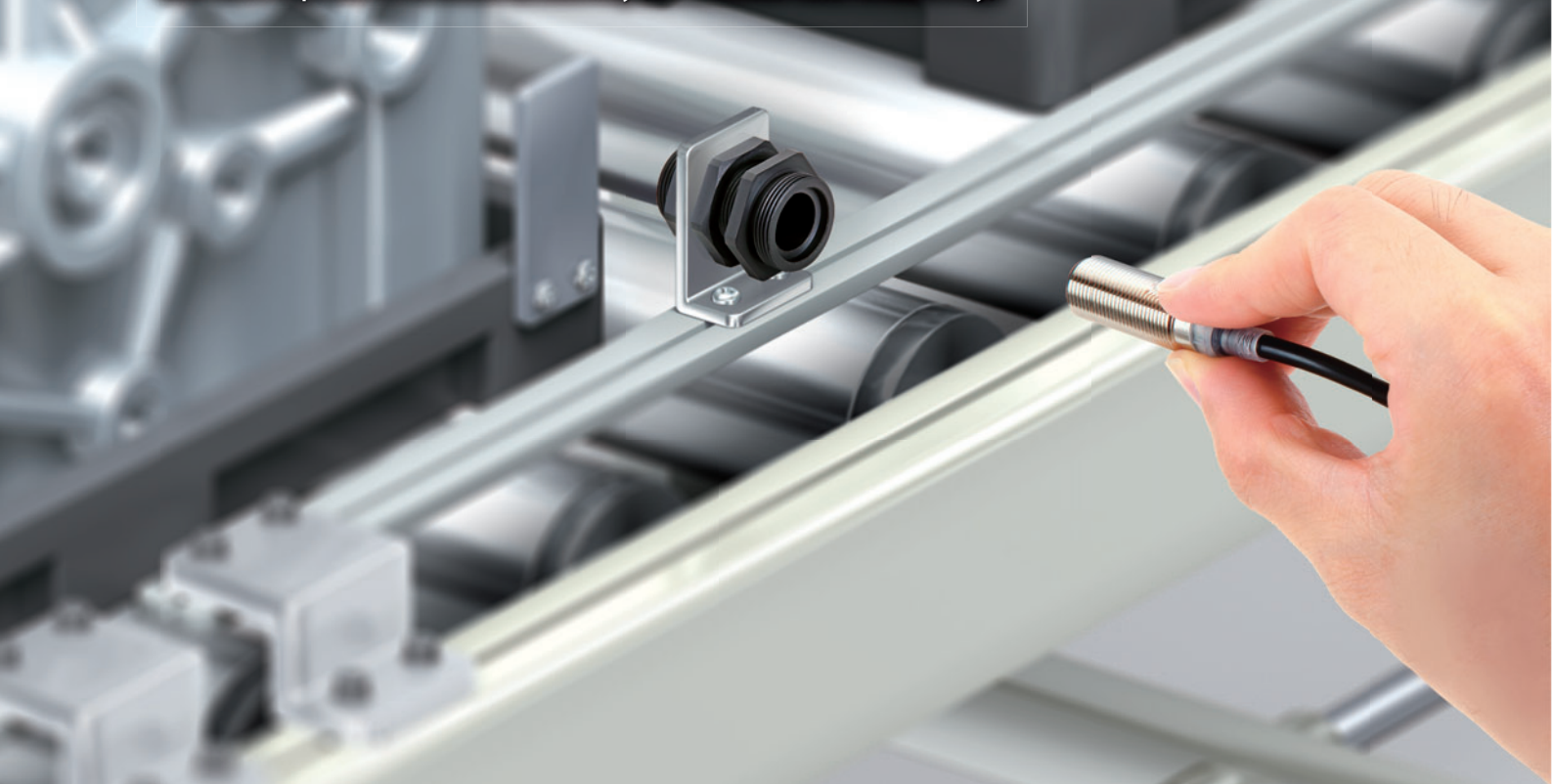
Stable operation

Quick recovery

Less failures

Enhanced Usability Enables Facilities that Can Recover in a Short Time Without Skill Requirements

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



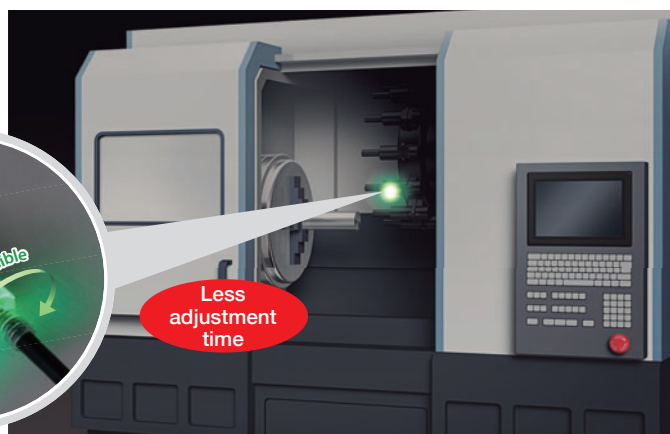
Indicator can be installed without regard to the orientation.

Previously

Indicators are invisible depending on the rotation stop position when installing. When it is installed at the back of the facility, confirming accurate detection is difficult.

E2E NEXT

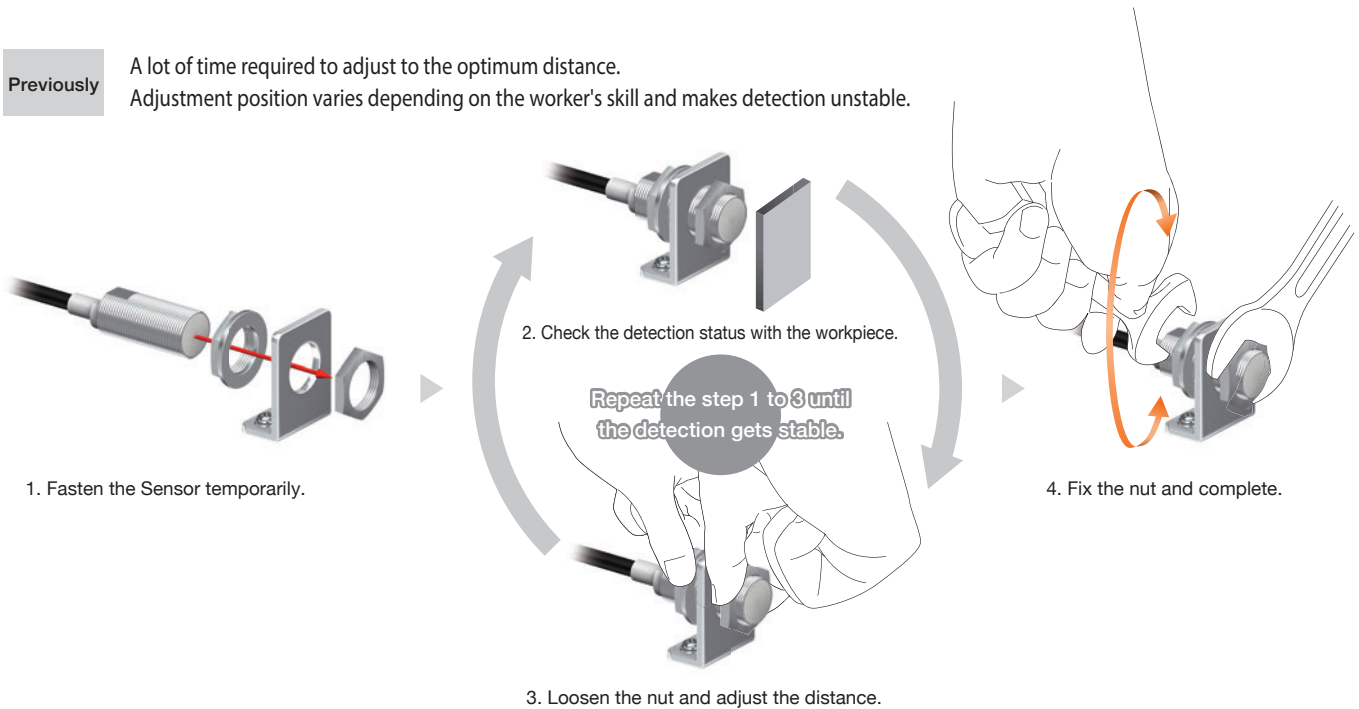
With high-brightness LED, the indicator is visible anywhere from 360° and **it is easy to confirm the detection status.**



Only 10 Seconds* to Replace a Proximity Sensor with "e-jig".

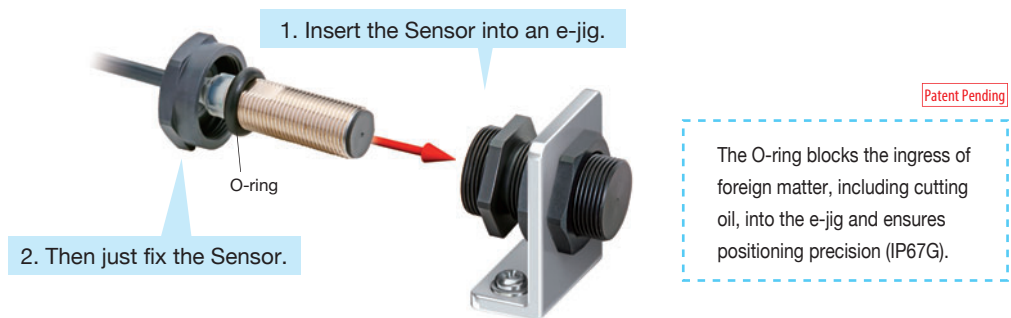
Previously

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

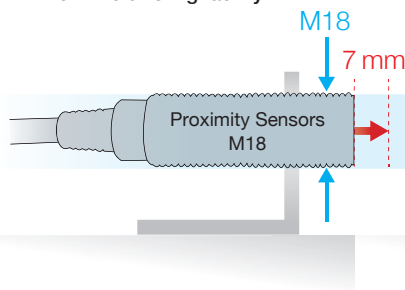
Reducing the replacement time significantly down to **approx. 10 sec.***
Eliminating the need for adjustment allows for installation in the same position by any worker.



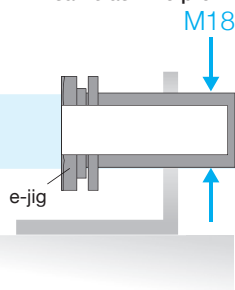
Easily upgrade existing facilities to the one that needs "only 10 seconds* to replace" a proximity sensor

The sensing distance of E2E-NEXT is nearly double the conventional one. The sensing distance of the M12 models is 7 mm, which is same as conventional M18 models. When you use an e-jig together, you can easily upgrade existing facilities to the ones that need only 10 seconds* to replace a proximity sensor.

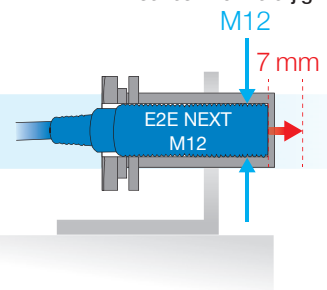
1. Dismount the M18 proximity sensor from the existing facility.



2. Mount an e-jig whose size is same as M18 proximity sensor.



3. Insert an M12 model of E2E NEXT series into the e-jig.



* Time required to adjust the diistance when installing a Sensor. Based on OMRON investigation.

Stable operation

Quick recovery

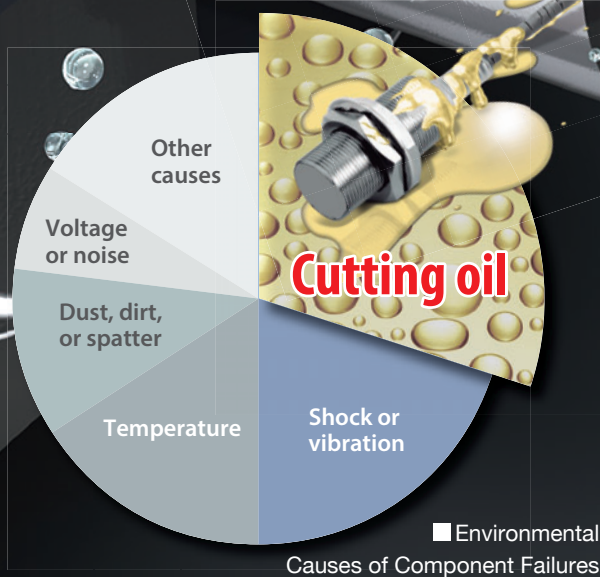
Less failures

Components with Oil Resistance of 2 Years^{*1} Further Reduce Unexpected Facility Stoppages

The Sensor reduces further unexpected failures in environments requiring oil resistance in addition to damage caused by collisions.

Unexpected component failures:

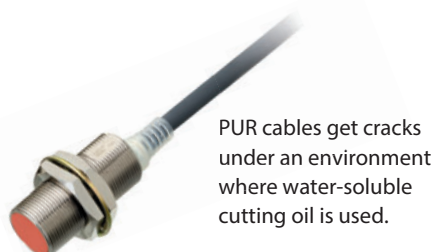
Approx. 30 % are caused by cutting oil.



(Based on June 2016 OMRON investigation.)

Cables with enhanced oil resistance enabled 2-year oil resistance^{*1}.

Previously Cable deterioration due to cutting oil



PUR cables get cracks under an environment where water-soluble cutting oil is used.

E2E NEXT

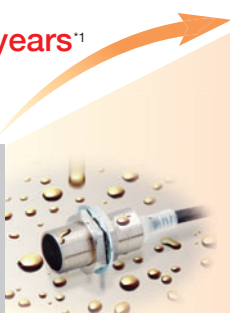
Verification of 2-Year Oil Resistance^{*1} Based on IP67G^{*2} and OMRON's Oil-resistant Component Evaluation Standards.



OMRON's E2E NEXT series Proximity Sensors use PVC cables with enhanced oil resistance, and have been evaluated according to IP67G^{*2} of JIS C 0920 as well as according to the strict evaluation standard for OMRON's oil-resistant components.

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



(Illustration)

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



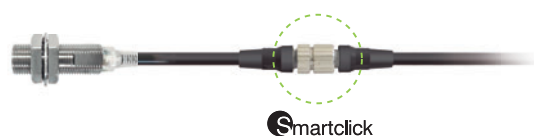
(Illustration)

Eight representative types of oil which had oil resistance testing

Test oil type	Oil	JIS classification	Kinetic viscosity (mm ² /s, 40 °C)	pH ^{*3}
Water-soluble cutting oil	Yushiroken EC50T-3 (YUSHIRO CHEMICAL INDUSTRY CO., LTD.)	A1	—	10.2
	Yushiroken FGE366 (YUSHIRO CHEMICAL INDUSTRY CO., LTD.)	A1	—	9.3
	Yushiroken FX90 (YUSHIRO CHEMICAL INDUSTRY CO., LTD.)	A1	—	9.6
	Yushiroken FGM427 (YUSHIRO CHEMICAL INDUSTRY CO., LTD.)	A2	—	10.2
	Yushiroken FGS700 (YUSHIRO CHEMICAL INDUSTRY CO., LTD.)	A2	—	9.9
	Yushiroken FGC950PR (YUSHIRO CHEMICAL INDUSTRY CO., LTD.)	A3	—	10.1
Water-insoluble cutting oil	Yushiron Cut Abas BZ224K (YUSHIRO CHEMICAL INDUSTRY CO., LTD.)	N3	10	—
	Yushiron Cut Abas KZ440 (YUSHIRO CHEMICAL INDUSTRY CO., LTD.)	N4	19	—

M12 Pre-wired Smartclick Connector models also 2-Year^{*1} Oil Resistance verified

- Uses unique OMRON technology PVC cable with increased oil resistance.
Oil-resistance performance values of 2 years^{*1}
- With smartclick structure,
No matter who do the connection, the result is the same.
To block the ingress of cutting oil.



Smartclick

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

Oil Resistance:
4 years



Cat. No. Y215

*1. · Applicable oil types: specified in JIS K 2241:2000

2-year oil resistance indicates the median value of the product design and the oil-resistance performance criterion result (=Typical value).
Products to be shipped will have around 2 years of oil resistance, but will vary depending on the product.

· The Pre-wired Connector Model verifies 2 years of oil resistance when mating with Round Oil-resistant Connectors XS5 NEXT series.

*2. The IP67G is the degree of protection which is defined according to the JIS (Japanese Industrial Standards).

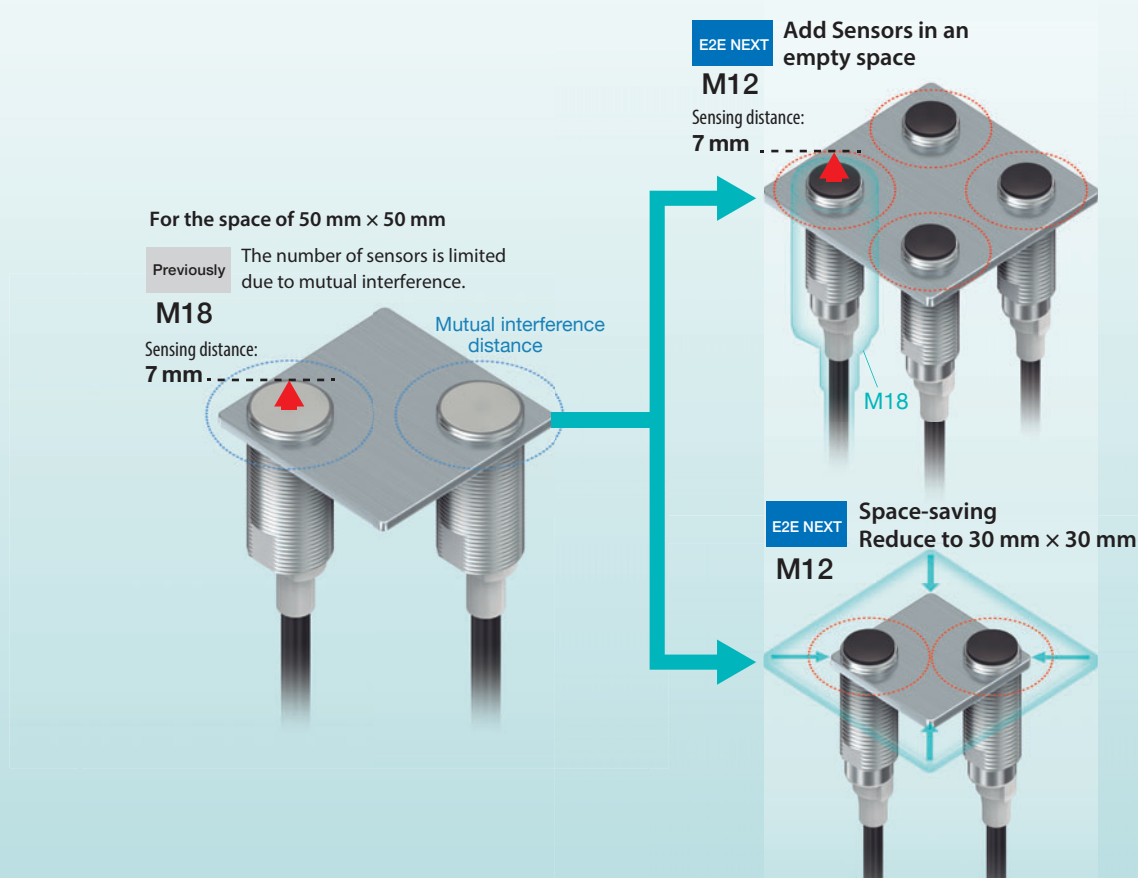
The IP67 indicates the same level of protection as defined by the IEC, and the G indicates that a device has resistance to oil.

*3. pH values recommended by the cutting oil manufacturer are listed.

Greater Flexibility

Downsized Sensor Enhances Flexibility in Facility Design

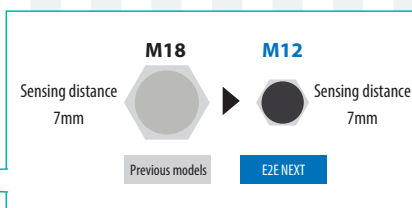
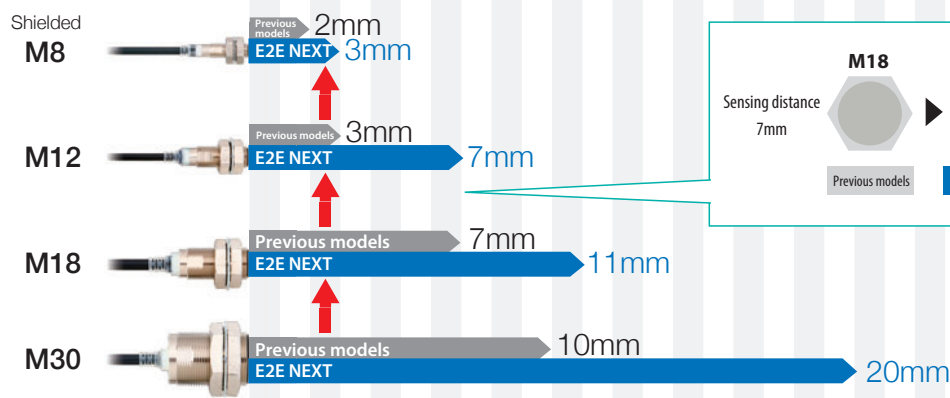
Longer sensing distance enables one size smaller sensor with the same sensing distance, so we can add more sensors to an empty space and save space for the installation.



"Double distance" downsizes the sensors

The world's longest sensing distance*

Sensing distance comparison

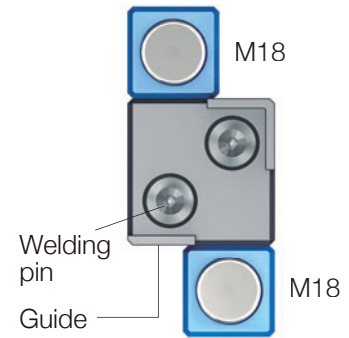


Easy to install in a welding jig



Previously

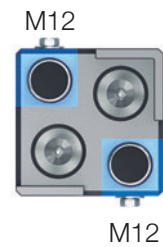
Due to the guide surrounding the welding pin, it is difficult to install a sensor near the pin to check the sitting position.



E2E NEXT

Proximity sensor **can be installed in a small space around the welding pin.**

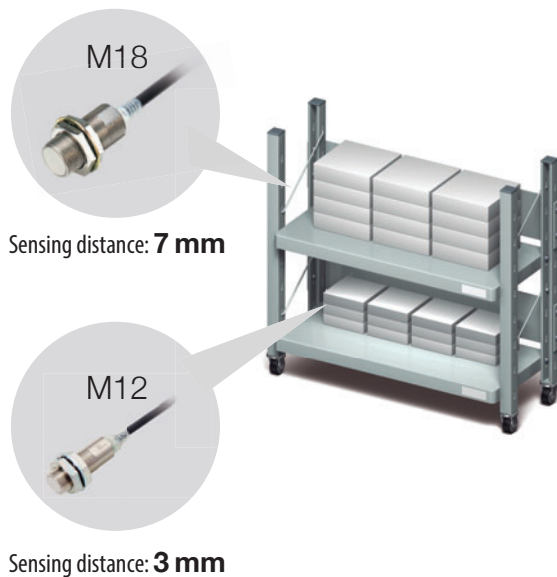
With the shorter mutual interference distance, you can install a proximity sensor near the welding pin.



Integrating the number of model types to unify models kept in stock.

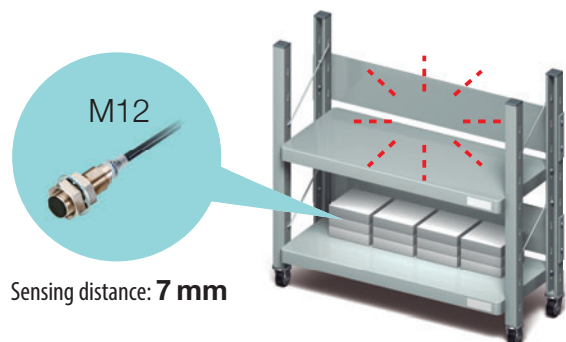
Previously

Two types of M12 and M18 models are kept in stock.



E2E NEXT

M12 models can cover the conventional M18 models and **unify the stock into one model type.**



Long-distance Detection Prevents Unexpected Facility Stoppages

- The world's longest sensing distance*¹
Nearly double the sensing distance of previous
- 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.
- UL certification (UL508) and CSA certification (CSA C22.2 No.14-13)



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

*1. Based on July 2017 OMRON investigation.

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

*3. Refer to page 16 and 18 for details. However, E2EQ series is excluded.



Be sure to read *Safety Precautions* on page 23.

E2E/E2EQ NEXT Series Model Number Legend

E2E (1) - X (2) (3) (4) (5) (6) (7) - (8) - (9) (10) - (11) (12)

No.	Classification	Code	Meaning
(1)	Case	Blank	Without spatter-resistant coating
		Q	With spatter-resistant coating
(2)	Sensing distance	Number	Long-distance type, Spatter-resistant Long-distance type 3: 3 mm, 6: 6 mm, 7: 7 mm, 10: 10 mm, 11: 11 mm, 20: 20 mm, 40: 40 mm, Standard-distance type 1R5: 1.5 mm, 2R5: 2.5 mm, 5: 5 mm
(3)	Shielding	Blank	Shielded Models
		M	Unshielded Models
(4)	Output specifications	D	DC 2-wire
(5)	Operation mode	1	Normally open (NO)
		2	Normally closed (NC)
(6)	Body size	Blank	Standard
		L	Long Body
(7)	Size (Omitted for the Standard-distance type.)	8	M8
		12	M12
		18	M18
		30	M30
(8)	Connecting method	Blank	Pre-wired Models
		M1TGJ	M12 Pre-wired Smartclick Connector Models
(9)	Polarity	Blank	Polarity
		T	No polarity
(10)	Cable specifications	Blank	Standard PVC cable
		R	Robot (bending-resistant) PVC cable
(11)	New model	Blank	Other than Standard-distance type (Pre-wired Models)
		N	Standard-distance type (Applicable only to Pre-wired Models)
(12)	Cable length	Number M	Number M Cable length (Unit: m) (Applicable to Pre-wired Models and Pre-wired Connector Models)

Note: 1. 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.



2. Size description of the number 7 is not included in the Standard-distance type.

Ordering Information

Sensors

E2E NEXT Series (Long-distance type)

DC 2-wire [Refer to *Dimensions* on page 25.]

Appearance	Sensing distance	Connection method	Cable specifications	Polarity	Model	
					Operation mode: NO	Operation mode: NC
Shielded *1 	M8 3 mm	Pre-wired Models (2 m) *2 *3 *4	Vinyl chloride (PVC) (oil-resistant reinforced)	Yes	E2E-X3D18 2M	E2E-X3D28 2M
		M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2E-X3D18-T 2M	E2E-X3D28-T 2M
	M12 7 mm	Pre-wired Models (2 m) *2 *3 *4		Yes	E2E-X3D18-M1TGJ 0.3M	E2E-X3D28-M1TGJ 0.3M
		M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2E-X3D18-M1TGJ-T 0.3M	E2E-X3D28-M1TGJ-T 0.3M
	M18 11 mm	Pre-wired Models (2 m) *2 *3 *4		Yes	E2E-X7D112 2M	E2E-X7D212 2M
		M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2E-X7D112-T 2M	E2E-X7D212-T 2M
	M30 20 mm	Pre-wired Models (2 m) *2 *3 *4		Yes	E2E-X7D112-M1TGJ 0.3M	E2E-X7D212-M1TGJ 0.3M
		M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2E-X7D112-M1TGJ-T 0.3M	E2E-X7D212-M1TGJ-T 0.3M
	M18 11 mm	Pre-wired Models (2 m) *2 *3 *4		Yes	E2E-X11D118 2M	E2E-X11D218 2M
		M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2E-X11D118-T 2M	E2E-X11D218-T 2M
	M30 20 mm	Pre-wired Models (2 m) *2 *3 *4		Yes	E2E-X11D118-M1TGJ 0.3M	E2E-X11D218-M1TGJ 0.3M
		M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2E-X11D118-M1TGJ-T 0.3M	E2E-X11D218-M1TGJ-T 0.3M
Unshielded 	M8 6 mm	Pre-wired Models (2 m) *2 *3 *4	Vinyl chloride (PVC) (oil-resistant reinforced)	Yes	E2E-X20D130 2M	E2E-X20D230 2M
		M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2E-X20D130-T 2M	E2E-X20D230-T 2M
	M12 10 mm	Pre-wired Models (2 m) *2 *3 *4		Yes	E2E-X20D130-M1TGJ 0.3M	E2E-X20D230-M1TGJ 0.3M
		M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2E-X20D130-M1TGJ-T 0.3M	E2E-X20D230-M1TGJ-T 0.3M
	M18 20 mm	Pre-wired Models (2 m) *2 *3 *4		Yes	E2E-X6MD18 2M	E2E-X6MD28 2M
		M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2E-X6MD18-T 2M	E2E-X6MD28-T 2M
	M30 40 mm	Pre-wired Models (2 m) *2 *3 *4		Yes	E2E-X6MD18-M1TGJ 0.3M	E2E-X6MD28-M1TGJ 0.3M
		M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2E-X6MD18-M1TGJ-T 0.3M	E2E-X6MD28-M1TGJ-T 0.3M
	M12 10 mm	Pre-wired Models (2 m) *2 *3 *4		Yes	E2E-X10MD112 2M	E2E-X10MD212 2M
		M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2E-X10MD112-T 2M	E2E-X10MD212-T 2M
	M18 20 mm	Pre-wired Models (2 m) *2 *3 *4		Yes	E2E-X10MD112-M1TGJ 0.3M	E2E-X10MD212-M1TGJ 0.3M
		M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2E-X10MD112-M1TGJ-T 0.3M	E2E-X10MD212-M1TGJ-T 0.3M
	M30 40 mm	Pre-wired Models (2 m) *2 *3 *4		Yes	E2E-X20MD1L18 2M	E2E-X20MD2L18 2M
		M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2E-X20MD1L18-T 2M	E2E-X20MD2L18-T 2M
	M30 40 mm	Pre-wired Models (2 m) *2 *3 *4		Yes	E2E-X20MD1L18-M1TGJ 0.3M	E2E-X20MD2L18-M1TGJ 0.3M
		M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2E-X20MD1L18-M1TGJ-T 0.3M	E2E-X20MD2L18-M1TGJ-T 0.3M
	M30 40 mm	Pre-wired Models (2 m) *2 *3 *4		Yes	E2E-X40MD1L30 2M	E2E-X40MD2L30 2M
		M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2E-X40MD1L30-T 2M	E2E-X40MD2L30-T 2M
	M30 40 mm	Pre-wired Models (2 m) *2 *3 *4		Yes	E2E-X40MD1L30-M1TGJ 0.3M	E2E-X40MD2L30-M1TGJ 0.3M
		M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2E-X40MD1L30-M1TGJ-T 0.3M	E2E-X40MD2L30-M1TGJ-T 0.3M

*1. When embedding the Proximity Sensor in metal, refer to *Influence of Surrounding Metal* on page 24.

*2. Models with 5-m cable length are also available with "5M" suffix. (Example: E2E-X3D18 5M)

*3. Models with robot (bending-resistant) cable are also available with "-R" in the model number. (Example: E2E-X3D18-R 2M)








*4. Models with 5-m robot (bending-resistant) cable are also available with "-R" and the "5M" suffix in the model number. (Example: E2E-X3D18-R 5M)

E2E/E2EQ NEXT Series

Sensors

E2EQ NEXT Series (Spatter-resistant Long-distance type)

DC 2-wire [Refer to *Dimensions* on page 27.]








Appearance		Sensing distance		Connection method	Cable specifications	Polarity	Model	
							Operation mode: NO	Operation mode: NC
Shielded *1 	M8		3 mm	Pre-wired Models (2 m) *2	Vinyl chloride (PVC) (oil-resistant reinforced)	Yes	E2EQ-X3D18 2M	E2EQ-X3D28 2M
				M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2EQ-X3D18-T 2M	E2EQ-X3D28-T 2M
	M12		7 mm	Pre-wired Models (2 m) *2		Yes	E2EQ-X3D18-M1TGJ 0.3M	E2EQ-X3D28-M1TGJ 0.3M
				M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2EQ-X3D18-M1TGJ-T 0.3M	E2EQ-X3D28-M1TGJ-T 0.3M
	M18		11 mm	Pre-wired Models (2 m) *2		Yes	E2EQ-X7D112 2M	E2EQ-X7D212 2M
				M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2EQ-X7D112-T 2M	E2EQ-X7D212-T 2M
	M30		20 mm	Pre-wired Models (2 m) *2		Yes	E2EQ-X7D112-M1TGJ 0.3M	E2EQ-X7D212-M1TGJ 0.3M
				M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2EQ-X7D112-M1TGJ-T 0.3M	E2EQ-X7D212-M1TGJ-T 0.3M
	M18		11 mm	Pre-wired Models (2 m) *2		Yes	E2EQ-X11D118 2M	E2EQ-X11D218 2M
				M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2EQ-X11D118-T 2M	E2EQ-X11D218-T 2M
	M30		20 mm	Pre-wired Models (2 m) *2		Yes	E2EQ-X11D118-M1TGJ 0.3M	E2EQ-X11D218-M1TGJ 0.3M
				M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2EQ-X11D118-M1TGJ-T 0.3M	E2EQ-X11D218-M1TGJ-T 0.3M

*1. When embedding the Proximity Sensor in metal, refer to *Influence of Surrounding Metal* on page 24.

*2. Models with 5-m cable length are also available with "5M" suffix. (Example: E2EQ-X3D18 5M)

E2E NEXT Series (Standard-distance type)

DC 2-wire [Refer to *Dimensions* on page 28.]

Appearance		Sensing distance		Connection method	Cable specifications	Polarity	Model	
							Operation mode: NO	Operation mode: NC
Shielded 	M8		1.5 mm	Pre-wired Models (2 m) *1 *2 *3	Vinyl chloride (PVC) (oil-resistant reinforced)	Yes	E2E-X1R5D1-N 2M	E2E-X1R5D2-N 2M
				M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2E-X1R5D1-T-N 2M	E2E-X1R5D2-T-N 2M
	M12		2.5 mm	Pre-wired Models (2 m) *1 *2 *3		Yes	E2E-X1R5D1-M1TGJ 0.3M	E2E-X1R5D2-M1TGJ 0.3M
				M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2E-X1R5D1-M1TGJ-T 0.3M	E2E-X1R5D2-M1TGJ-T 0.3M
	M18		5 mm	Pre-wired Models (2 m) *1 *2 *3		Yes	E2E-X2R5D1-N 2M	E2E-X2R5D2-N 2M
				M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2E-X2R5D1-T-N 2M	E2E-X2R5D2-T-N 2M
	M18		5 mm	Pre-wired Models (2 m) *1 *2 *3		Yes	E2E-X2R5D1-M1TGJ 0.3M	E2E-X2R5D2-M1TGJ 0.3M
				M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2E-X2R5D1-M1TGJ-T 0.3M	E2E-X2R5D2-M1TGJ-T 0.3M
	M18		5 mm	Pre-wired Models (2 m) *1 *2 *3		Yes	E2E-X5D1-N 2M	E2E-X5D2-N 2M
				M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2E-X5D1-T-N 2M	E2E-X5D2-T-N 2M
	M18		5 mm	Pre-wired Models (2 m) *1 *2 *3		Yes	E2E-X5D1-M1TGJ 0.3M	E2E-X5D2-M1TGJ 0.3M
				M12 Pre-wired Smartclick Connector Models (0.3 m)		No	E2E-X5D1-M1TGJ-T 0.3M	E2E-X5D2-M1TGJ-T 0.3M

*1. Models with 5-m cable length are also available with "5M" suffix. (Example: E2E-X1R5D1-N 5M)

*2. Models with robot (bending-resistant) cable are also available with "-R" in the model number. (Example: E2E-X1R5D1-R-N 2M)


*3. Models with 5-m robot (bending-resistant) cable are also available with "-R" and the "5M" suffix in the model number. (Example: E2E-X1R5D1-R-N 5M)

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 Oil-resistant Connectors XS5 NEXT series

Appearance	Cable Specification	Type	Cable diameter (mm)	Cable length (m)	Sensor I/O Connector model number	Applicable Proximity Sensor model number
M12 Straight, Smartclick Connector Models 	Fire-retardant, Oil-resistant reinforced PVC Cable	Sockets on One Cable End	6 dia.	1	XS5F-D421-C80-X	E2E-X□D□-M1TGJ(-T) E2EQ-X□D□-M1TGJ(-T)
				2	XS5F-D421-D80-X	
				3	XS5F-D421-E80-X	
				5	XS5F-D421-G80-X	
				10	XS5F-D421-J80-X	
		Socket and Plug on Cable Ends	6 dia.	1	XS5W-D421-C81-X	
				2	XS5W-D421-D81-X	
				3	XS5W-D421-E81-X	
				5	XS5W-D421-G81-X	
				10	XS5W-D421-J81-X	

Note: For details of the connector, refer to *XS5 NEXT series* on page 30.

Round Water-resistant Connectors XS5 series

Appearance	Cable Specification	Type	Cable diameter (mm)	Cable length (m)	Sensor I/O Connector model number	Applicable Proximity Sensor model number
M12 Straight, Smartclick Connector Models 	Fire-retardant, Robot cable	Sockets on One Cable End	6 dia.	1	XS5F-D421-C80-F	E2E-X□D□-M1TGJ(-T) E2EQ-X□D□-M1TGJ(-T)
				2	XS5F-D421-D80-F	
				3	XS5F-D421-E80-F	
				5	XS5F-D421-G80-F	
				10	XS5F-D421-J80-F	
		Socket and Plug on Cable Ends	6 dia.	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	

Note: For details of the connector, refer to *XS5 series* on page 36.

Sensor I/O Connectors Oil resistance performance of mating combination


Model E2E NEXT Series	Applicable connector Model	
	XS5 NEXT series	XS5
E2E-X□D□-M1TGJ(-T)	2 years of oil resistance*	Water-resistant

* Applicable cutting oil type: specified in JIS K 2241:2000

2 years of oil resistance indicates the median value of the product design and the oil-resistance performance criterion result (=Typical value). Products to be shipped will have around 2 years of oil resistance, but will vary depending on the product.

e-jig (Mounting Sleeves) [Refer to Dimensions on page 29.]

A Mounting Bracket is not provided with the Sensor. It must be ordered separately as required.

Appearance	Model	Applicable Sensors	Quantity
	Y92E-J8S12	E2E NEXT M8 Shielded Sensors	1
	Y92E-J12S18	E2E NEXT M12 Shielded Sensors	1
	Y92E-J18S30	E2E NEXT M18 Shielded Sensors	1

Note: Mounting Brackets are not Spatter-resistant Models.

E2E/E2EQ NEXT Series

Ratings and Specifications

E2E NEXT Series (Long-distance type)

DC 2-wire

Size		M8		M12		M18		M30	
		Shielded	Unshielded	Shielded	Unshielded	Shielded	Unshielded	Shielded	Unshielded
Item	Model	E2E-X3D□	E2E-X6MD□	E2E-X7D□	E2E-X10MD□	E2E-X11D□	E2E-X20MD□	E2E-X20D□	E2E-X40MD□
Sensing distance		3 mm ±10%	6 mm ±10%	7 mm ±10%	10 mm ±10%	11 mm ±10%	20 mm ±10%	20 mm ±10%	40 mm ±10%
Setting distance *1		0 to 2.4 mm	0 to 4.8 mm	0 to 5.6 mm	0 to 8 mm	0 to 8.8 mm	0 to 16 mm	0 to 16 mm	0 to 32 mm
Differential travel		15% max. of sensing distance							
Detectable object		Ferrous metal (The sensing distance decreases with non-ferrous metal. Refer to <i>Engineering Data</i> on page 19.)							
Standard sensing object		Iron, 9 × 9 × 1 mm	Iron, 18 × 18 × 1 mm	Iron, 21 × 21 × 1 mm	Iron, 30 × 30 × 1 mm	Iron, 33 × 33 × 1 mm	Iron, 60 × 60 × 1 mm	Iron, 60 × 60 × 1 mm	Iron, 120 × 120 × 1 mm
Response frequency *2		350 Hz	250 Hz	350 Hz	200 Hz	250 Hz	200 Hz	200 Hz	50 Hz
Power supply voltage		10 to 30 VDC, (including 10% ripple (p-p))							
Leakage current		0.8 mA max.							
Control output	Load current	3 to 100 mA							
	Residual voltage	Polarity: 3 V max. (Load current: 100 mA, Cable length: 2 m) No polarity: 5 V max. (Load current: 100 mA, Cable length: 2 m)							
Indicator		D1 Models: Operation indicator (orange), Setting indicator (green) D2 Models: Operation indicator (orange)							
Operation mode		D1 Models: NO Refer to the timing charts under <i>I/O Circuit Diagrams</i> on page 22 for details. D2 Models: NC							
Protection circuits		Surge suppressor, Load short-circuit protection							
Ambient temperature range		Operating: -25 to 70°C, Storage: -40 to 85°C (with no icing or condensation)							
Ambient humidity range		Operating and Storage: 35% to 95% (with no condensation)							
Temperature influence		±10% max. of sensing distance at 23°C in the temperature range of -25 to 70°C				±20% max. of sensing distance at 23°C in the temperature range of -25 to 70°C	±10% max. of sensing distance at 23°C in the temperature range of -25 to 70°C	±20% max. of sensing distance at 23°C in the temperature range of -25 to 70°C	
Voltage influence		±1% 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)		500 m/s ² 10 times each in X, Y, and Z directions		1,000 m/s ² 10 times each in X, Y, and Z directions					
Degree of protection		Pre-wired Models/Pre-wired Connector Models: IP67 (IEC 60529), IP67G *3 (JIS C 0920 Annex 1) Passed OMRON's Oil-resistant Component Evaluation Standards *4 (Cutting oil type: specified in JIS K 2241:2000, Temperature: 35 °C max.) and IEC 60529 (old standard: DIN 40050 PART9) IP69K							
Connecting method		Pre-wired Models (Standard cable length: 2 m) and Pre-wired Connector Models (Standard cable length: 0.3 m)							
Weight (packed state)	Pre-wired Models	Approx. 60 g		Approx. 70 g		Approx. 130 g	Approx. 150 g	Approx. 180 g	Approx. 210 g
	Pre-wired Connector Models	Approx. 30 g		Approx. 40 g		Approx. 70 g	Approx. 90 g	Approx. 110 g	Approx. 140 g
Materials	Case	Nickel-plated brass	Stainless steel (SUS303)	Nickel-plated brass					
	Sensing surface	Polybutylene terephthalate (PBT)							
	Clamping nuts	Nickel-plated brass							
	Toothed washer	Zinc-plated iron							
	Cable	Vinyl chloride (PVC)							
Accessories		Instruction manual, Clamping nuts, Toothed washer							

*1. Use the Sensor within the range in which the setting indicator (green LED) is ON (except D2 Models).

*2. 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.

*3. The IP67G is the degree of protection which is defined according to the JIS (Japanese Industrial Standards). The IP67 indicates the same level of protection as defined by the IEC, and the G indicates that a device has resistance to oil.

*4. The Oil-resistant Component Evaluation Standards are OMRON's own durability evaluation standards. 2-year oil resistance indicates the median value of the product design and the oil-resistance performance criterion result (=Typical value). The Pre-wired Connector Model verifies 2 years of oil resistance when mating with Round Oil-resistant Connectors XS5 NEXT series correctly. The degree of protection is not satisfied with the part where cable wires are uncovered for the Pre-wired Models.

E2EQ NEXT Series (Spatter-resistant Long-distance type)

DC 2-wire

Item	Size Shielded Model	M8	M12	M18	M30
		Shielded			
		E2EQ-X3D□	E2EQ-X7D□	E2EQ-X11D□	E2EQ-X20D□
Sensing distance		3 mm ±10%	7 mm ±10%	11 mm ±10%	20 mm ±10%
Setting distance *1		0 to 2.4 mm	0 to 5.6 mm	0 to 8.8 mm	0 to 16 mm
Differential travel		15% max. of sensing distance			
Detectable object		Ferrous metal (The sensing distance decreases with non-ferrous metal. Refer to <i>Engineering Data</i> on page 19.)			
Standard sensing object		Iron, 9 × 9 × 1 mm	Iron, 21 × 21 × 1 mm	Iron, 33 × 33 × 1 mm	Iron, 60 × 60 × 1 mm
Response frequency *2		250 Hz	250 Hz	250 Hz	200 Hz
Power supply voltage		10 to 30 VDC, (including 10% ripple (p-p))			
Leakage current		0.8 mA max.			
Control output	Load current	3 to 100 mA			
	Residual voltage	Polarity: 3 V max. (Load current: 100 mA, Cable length: 2 m) No polarity: 5 V max. (Load current: 100 mA, Cable length: 2 m)			
Indicator		D1 Models: Operation indicator (orange), Setting indicator (green) D2 Models: Operation indicator (orange)			
Operation mode		D1 Models: NO Refer to the timing charts under <i>I/O Circuit Diagrams</i> on page 22 for details. D2 Models: NC			
Protection circuits		Surge suppressor, Load short-circuit protection			
Ambient temperature range		Operating: -25 to 70°C, Storage: -40 to 85°C (with no icing or condensation)			
Ambient humidity range		Operating and Storage: 35% to 95% (with no condensation)			
Temperature influence		±10% max. of sensing distance at 23°C in the temperature range of -25 to 70°C		±20% max. of sensing distance at 23°C in the temperature range of -25 to 70°C	
Voltage influence		±1% 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)		500 m/s ² 10 times each in X, Y, and Z directions	1,000 m/s ² 10 times each in X, Y, and Z directions		
Degree of protection		Pre-wired Models/Pre-wired Connector Models: IP67 (IEC 60529) and IP67G *3 (JIS C 0920 Annex 1)			
Connecting method		Pre-wired Models (Standard cable length: 2 m) and Pre-wired Connector Models (Standard cable length: 0.3 m)			
Weight (packed state)	Pre-wired Models	Approx. 60 g	Approx. 70 g	Approx. 150 g	Approx. 210 g
	Pre-wired Connector Models	Approx. 30 g	Approx. 40 g	Approx. 90 g	Approx. 140 g
Materials	Case	Fluororesin coating (Base material: brass)			
	Sensing surface	Fluororesin			
	Clamping nuts	Fluororesin coating (Base material: brass)			
	Toothed washer	Zinc-plated iron			
	Cable	Vinyl chloride (PVC)			
Accessories		Instruction manual, Clamping nuts, Toothed washer			

*1. Use the Sensor within the range in which the setting indicator (green LED) is ON (except D2 Models).

*2. 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.

*3. The IP67G is the degree of protection which is defined according to the JIS (Japanese Industrial Standards).

The IP67 indicates the same level of protection as defined by the IEC, and the G indicates that a device has resistance to oil.

E2E/E2EQ NEXT Series

E2E NEXT Series (Standard-distance type)

DC 2-wire

Size Shielded		M8	M12	M18
		Shielded		
Item	Model	E2E-X1R5D□	E2E-X2R5D□	E2E-X5D□
Sensing distance		1.5 mm ±10%	2.5 mm ±10%	5 mm ±10%
Setting distance *1		0 to 1.2 mm	0 to 2 mm	0 to 4 mm
Differential travel		10% max. of sensing distance		
Detectable object		Ferrous metal (The sensing distance decreases with non-ferrous metal. Refer to <i>Engineering Data</i> on page 19.)		
Standard sensing object		Iron, 10 × 10 × 1 mm	Iron, 12 × 12 × 1 mm	Iron, 18 × 18 × 1 mm
Response frequency *2		250 Hz	250 Hz	250 Hz
Power supply voltage		10 to 30 VDC, (including 10% ripple (p-p))		
Leakage current		0.8 mA max.		
Control output	Load current	3 to 100 mA		
	Residual voltage	Polarity: 3 V max. (Load current: 100 mA, Cable length: 2 m) No polarity: 5 V max. (Load current: 100 mA, Cable length: 2 m)		
Indicator		D1 Models: Operation indicator (orange), Setting indicator (green) D2 Models: Operation indicator (orange)		
Operation mode		D1 Models: NO Refer to the timing charts under <i>I/O Circuit Diagrams</i> on page 22 for details. D2 Models: NC		
Protection circuits		Surge suppressor, Load short-circuit protection		
Ambient temperature range		Operating: -25 to 70°C, Storage: -40 to 85°C (with no icing or condensation)		
Ambient humidity range		Operating and Storage: 35% to 95% (with no condensation)		
Temperature influence		±10% max. of sensing distance at 23°C in the temperature range of -25 to 70°C		
Voltage influence		±1% 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)		500 m/s ² 10 times each in X, Y, and Z directions	1,000 m/s ² 10 times each in X, Y, and Z directions	
Degree of protection		Pre-wired Models/Pre-wired Connector Models: IP67 (IEC 60529), IP67G *3 (JIS C 0920 Annex 1) Passed OMRON's Oil-resistant Component Evaluation Standards *4 (Cutting oil type: specified in JIS K 2241:2000, Temperature: 35°C max.) and IEC 60529 (old standard: DIN 40050 PART9) IP69K		
Connecting method		Pre-wired Models (Standard cable length: 2 m) and Pre-wired Connector Models (Standard cable length: 0.3 m)		
Weight (packed state)	Pre-wired Models	Approx. 60 g	Approx. 70 g	Approx. 130 g
	Pre-wired Connector Models	Approx. 30 g	Approx. 40 g	Approx. 70 g
Materials	Case	Stainless steel (SUS303)	Nickel-plated brass	
	Sensing surface	Polybutylene terephthalate (PBT)		
	Clamping nuts	Nickel-plated brass		
	Toothed washer	Zinc-plated iron		
	Cable	Vinyl chloride (PVC)		
Accessories		Instruction manual, Clamping nuts, Toothed washer		

*1. Use the Sensor within the range in which the setting indicator (green LED) is ON (except D2 Models).

*2. The response frequency is an average value. Measurement conditions are as follows: standard sensing object, a distance of twice the standard.

*3. The IP67G is the degree of protection which is defined according to the JIS (Japanese Industrial Standards).

The IP67 indicates the same level of protection as defined by the IEC, and the G indicates that a device has resistance to oil.

*4. The Oil-resistant Component Evaluation Standards are OMRON's own durability evaluation standards.

2-year oil resistance indicates the median value of the product design and the oil-resistance performance criterion result (=Typical value).

The Pre-wired Connector Model verifies 2 years of oil resistance when mating with Round Oil-resistant Connectors XS5 NEXT series correctly.

The degree of protection is not satisfied with the part where cable wires are uncovered for the Pre-wired Models.

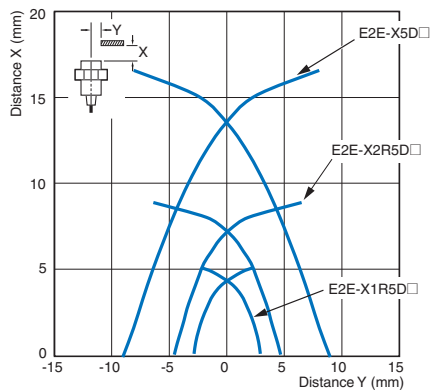
Engineering Data (Reference Value)

Sensing Area

Long-distance type, Spatter-resistant Long-distance type

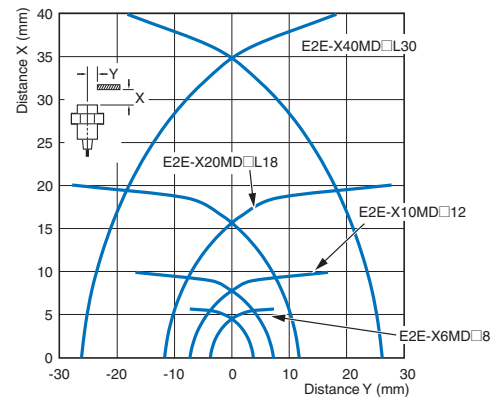
Shielded Models

E2E-X□D□/E2EQ-X□D□



Unshielded Models

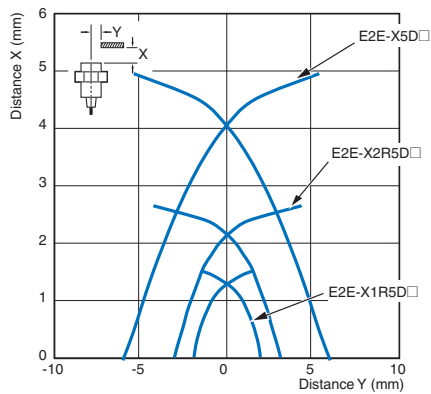
E2E-X□MD□



Standard-distance type

Shielded Models

E2E-X1R5D□/-X2R5D□/-X5D□

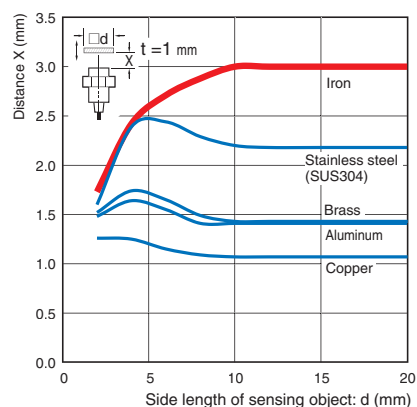


E2E/E2EQ NEXT Series

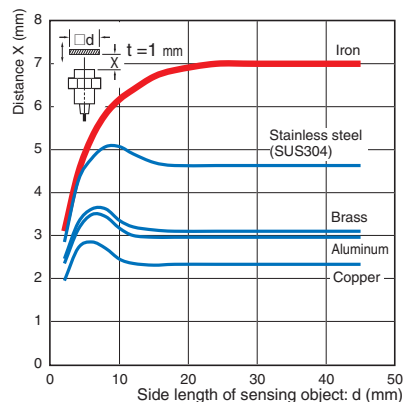
Influence of Sensing Object Size and Materials

Long-distance type, Spatter-resistant Long-distance type
Shielded Models

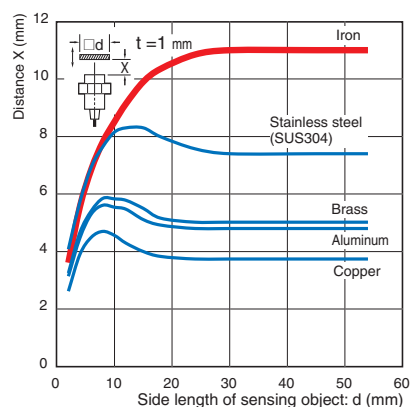
E2E-X3D□8/E2EQ-X3D□8



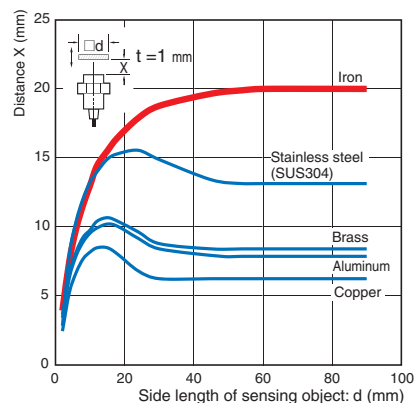
E2E-X7D□12/E2EQ-X7D□12



E2E-X11D□18/E2EQ-X11D□18

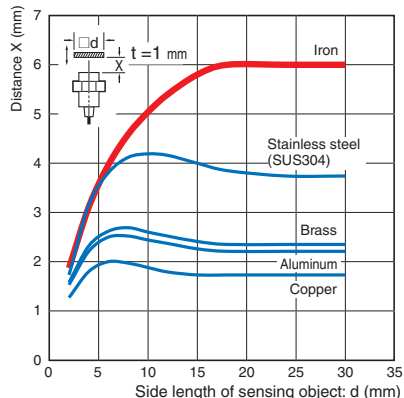


E2E-X20D□30/E2EQ-X20D□30

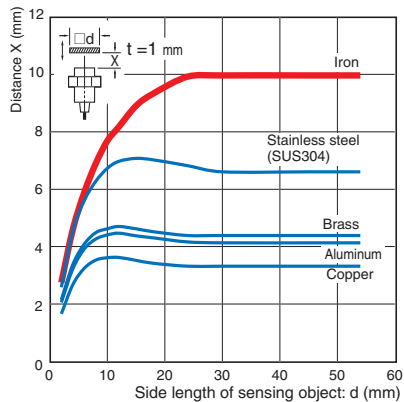


Unshielded Models

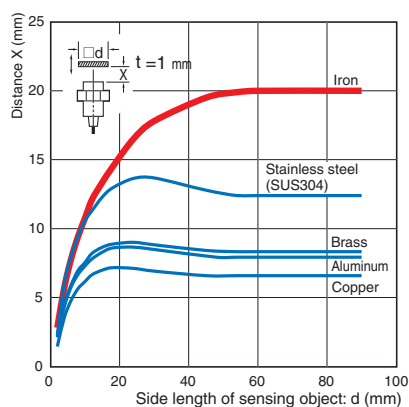
E2E-X6MD□8



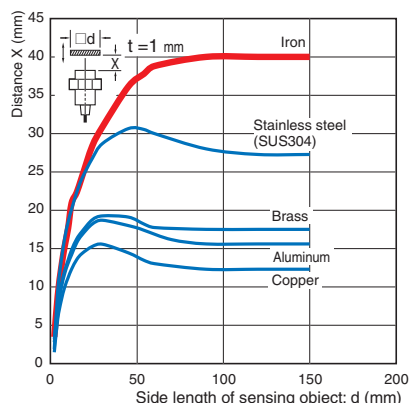
E2E-X10MD□12



E2E-X20MD□L18

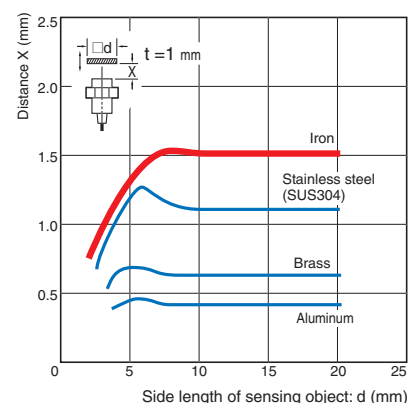


E2E-X40MD□L30

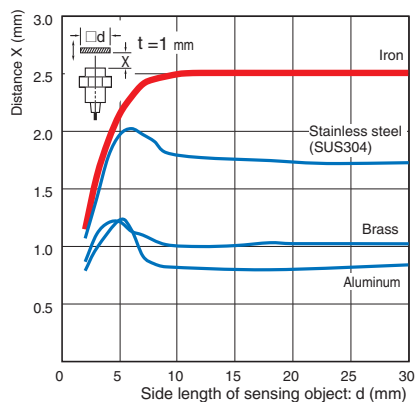


Standard-distance type
Shielded Models

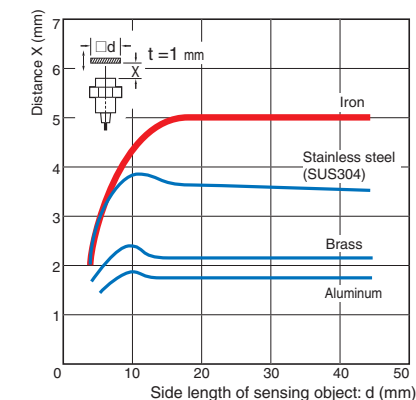
E2E-X1R5D□



E2E-X2R5D□

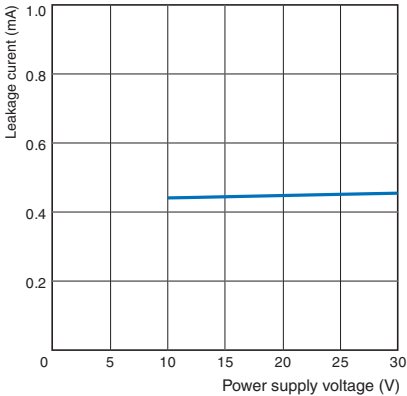


E2E-X5D□



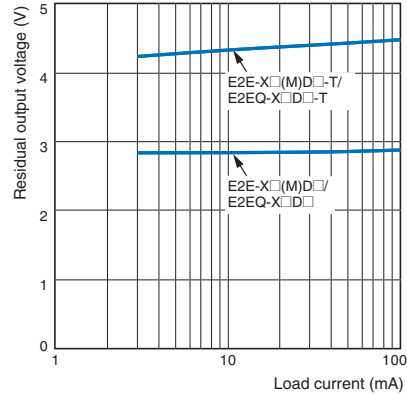
Leakage Current

Long-distance type / Spatter-resistant Long-distance type / Standard-distance type
E2E-X□(M)D□(-T)/E2EQ-X□D□(-T)



Residual Output Voltage

Long-distance type / Spatter-resistant Long-distance type / Standard-distance type
E2E-X□(M)D□(-T)/E2EQ-X□D□(-T)



E2E/E2EQ NEXT Series

I/O Circuit Diagrams

DC 2-Wire Models

Operation mode	Model	Timing Chart	Output circuit
NO	E2E-X□D1□ E2EQ-X□D1□		<p>Note: The load can be connected to either the +V or 0 V side.</p> <p>Connector Pin Arrangement: Pins 1, 2, 3, 4. Note: Pins 2 and 3 are not used.</p>
	E2E-X□D1□-T E2EQ-X□D1□-T		<p>Note1. The load can be connected to either the +V or 0 V side. 2. The E2E□-X□D1□(-M1TGJ)-T has no polarity. There is no need to be concerned about the polarity of brown and blue wires, or pins 3 and 4.</p> <p>Connector Pin Arrangement: Pins 1, 2, 3, 4. Note: Pins 1 and 2 are not used.</p>
NC	E2E-X□D2□ E2EQ-X□D2□		<p>Note: The load can be connected to either the +V or 0 V side.</p> <p>Connector Pin Arrangement: Pins 1, 2, 3, 4. Note: Pins 3 and 4 are not used.</p>
	E2E-X□D2□-T E2EQ-X□D2□-T		<p>Note1. The load can be connected to either the +V or 0 V side. 2. The E2E□-X□D2□(-M1TGJ)-T has no polarity. There is no need to be concerned about the polarity of brown and blue wires, or pins 1 and 2.</p> <p>Connector Pin Arrangement: Pins 1, 2, 3, 4. Note: Pins 3 and 4 are not used.</p>

Connections to Sensor I/O Connectors

Proximity Sensor				Sensor I/O Connector model number	Connections
Type	Polarity	Operation mode	Model		
DC 2-wire (Smartclick Connector)	Yes	NO	E2E-X□D1□-M1TGJ E2EQ-X□D1□-M1TGJ	XS5F-D421-□80-X or XS5F-D421-□80-F The box □ is replaced by the cable length. C: 1-m cable D: 2-m cable E: 3-m cable G: 5-m cable J: 10-m cable	<p>○ Brown (+) ○ White (not connected) ○ Blue (not connected) ○ Black (-)</p>
	No	NC	E2E-X□D2□-M1TGJ E2EQ-X□D2□-M1TGJ		<p>○ Brown (+) ○ White (-) ○ Blue (not connected) ○ Black (not connected)</p>
	Yes	NO	E2E-X□D1□-M1TGJ-T E2EQ-X□D1□-M1TGJ-T		<p>○ Brown (not connected) ○ White (not connected) ○ Blue (+) (-) ○ Black (-) (+)</p>
	No	NC	E2E-X□D2□-M1TGJ-T E2EQ-X□D2□-M1TGJ-T		<p>○ Brown (+)(-) ○ White (-)(+) ○ Blue (not connected) ○ Black (not connected)</p>


Note: Different from Proximity Sensor wire colors.

* If the XS5W-D421-□81-X or XS5W-D421-□81-F Connector which has a socket and plug on the cable ends is connected to the Sensor, this part will be a plug.



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.	
	
Risk of explosion. Do not connect sensor to AC power supply.	
	

Precautions for Safe Use

The following precautions must be observed to ensure safe operation.

1. Do not use the product in an environment where flammable or explosive gas is present.
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 damage or burnout.
4. Be sure that the power supply polarity and other wiring is correct. Incorrect wiring may cause explosion or burnout.
5. If the power supply is connected directly without a load, the internal elements may explode or burn. Be sure to insert a load when connecting the power supply.
6. Dispose of this product as industrial waste.

Precautions for Correct Use

Do not use this product under ambient conditions that exceed the ratings.

● Operating Environment

1. Do not install the product in the following locations. Doing so may result in product failure or malfunction.
 - (1) Outdoor locations directly subject to sunlight, rain, snow, water droplets, or oil.
 - (2) Locations subject to atmospheres with chemical vapors, in particular 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. The following conditions shall be observed if you use the product under an environment using cutting oil that may affect product's life and/or performance.
 - Usage under the cutting oil condition designated by the specification
 - Usage under the cutting oil dilution ratio recommended by its manufacturer
 - Usage in oil or water is prohibited

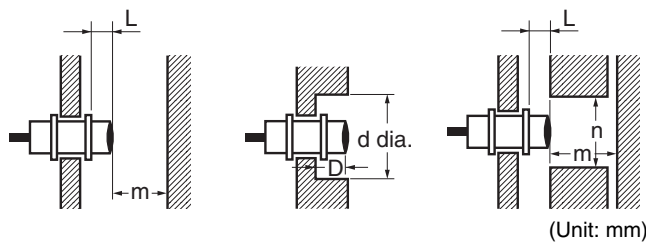
Impact on the product life may differ depending on the oil you use. Before using the cutting oil, make sure that it should not cause deterioration or degradation of sealing components.

E2E/E2EQ NEXT Series

● Design

Influence of Surrounding Metal

When mounting the Proximity Sensor using a nut, only use the provided nut. And ensure that the minimum distances given in the following table are maintained.

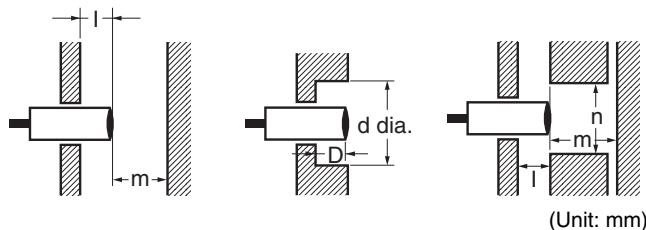


(Unit: mm)

Type	Item	M8	M12	M18	M30
Long-distance type E2E-X□D□(-T) Spatter-resistant Long-distance type E2EQ-X□D□(-T) *1	L	0	0	0	0
	d	20	20	50	70
	D	2	4	4	8
	m	9	18	33	60
	n	18	20	54	90
Long-distance type E2E-X□MD□(-T) *2	L	10	16	31	50
	d	30	50	80	130
	D	13	20	35	55
	m	18	30	60	120
	n	30	50	80	130
Standard-distance type E2E-X□R5D□(-T) E2E-X5D□(-T) *2	L	0	0	0	---
	d	8	12	18	---
	D	0	0	0	---
	m	4.5	8	20	---
	n	12	18	27	---

Note: Nuts that are supplied along with each Sensor (*1, *2) are different. Refer to *Dimensions* for details on shapes.

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

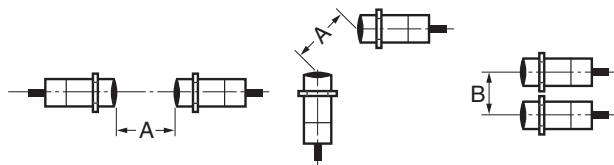


(Unit: mm)

Type	Item	M8	M12	M18	M30
Long-distance type E2E-X□D□(-T) Spatter-resistant Long-distance type E2EQ-X□D□(-T)	l	2	4	4	8
	d	20	20	50	70
	D	2	4	4	8
	m	9	18	33	60
	n	18	20	54	90
Long-distance type E2E-X□MD□(-T)	l	13	20	35	55
	d	30	50	80	130
	D	13	20	35	55
	m	18	30	60	120
	n	30	50	80	130
Standard-distance type E2E-X□R5D□(-T) E2E-X5D□(-T)	l	0	0	0	---
	d	8	12	18	---
	D	0	0	0	---
	m	4.5	8	20	---
	n	12	18	27	---

● Mutual Interference

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



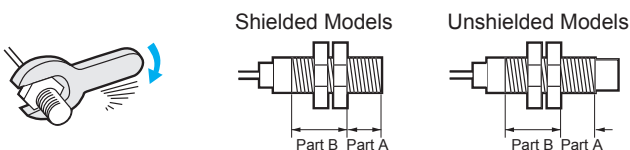
(Unit: mm)

Type	Item	M8	M12	M18	M30
Long-distance type E2E-X□D□(-T) Spatter-resistant Long-distance type E2EQ-X□D□(-T)	A	25	40	70	140
	B	20	30	45	70
Long-distance type E2E-X□MD□(-T)	A	80	120	200	380
	B	60	100	120	280
Standard-distance type E2E-X□R5D□(-T) E2E-X5D□(-T)	A	20	30	50	---
	B	15	20	35	---

● Mounting

Tightening Force

Do not tighten the nut with excessive force.
A washer must be used with the nut.



Note: 1. The allowable tightening strength depends on the distance from the edge of the head, as shown in the following table. (A is the distance from the edge of the head. B includes the nut on the head side. If the edge of the nut is in part A, the tightening torque for part A applies instead.)

2. The following strengths assume washers are being used.

Long-distance type

Model		Part A		Part B
		Dimension (mm)	Torque	Torque
M8	Shielded	9	4 N·m	10 N·m
	Unshielded	3		
M12	Shielded	16	6 N·m	15 N·m
	Unshielded	9		
M18	Shielded	16	15 N·m	60 N·m
	Unshielded	3		
M30	Shielded	23	40 N·m	80 N·m
	Unshielded	8		

Spatter-resistant Long-distance type

Model		Part A		Part B
		Dimension (mm)	Torque	Torque
M8		9	4 N·m	10 N·m
M12		16	6 N·m	15 N·m
M18		16	15 N·m	30 N·m
M30		23	40 N·m	80 N·m

Standard-distance type

Model		Part A		Part B
		Dimension (mm)	Torque	Torque
M8		9	9 N·m	12 N·m
M12		---	30 N·m	
M18		---	70 N·m	

Dimensions

Sensors

E2E NEXT Series (Long-distance type)

Pre-wired Models Shielded

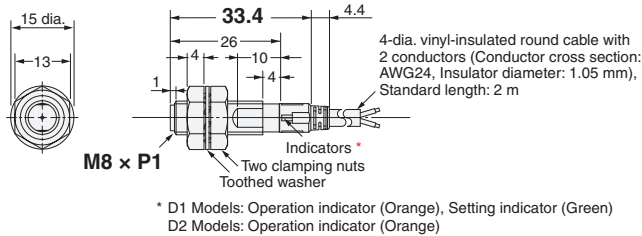


DC 2-wire

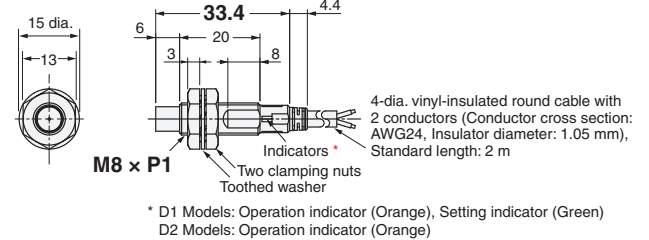
Pre-wired Models Unshielded



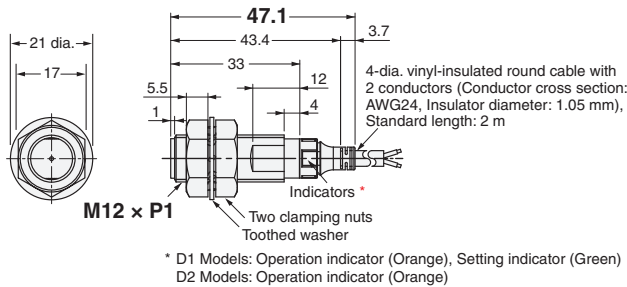
E2E-X3D□8



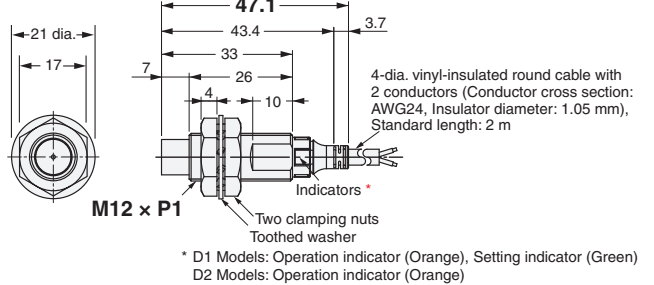
E2E-X6MD□8



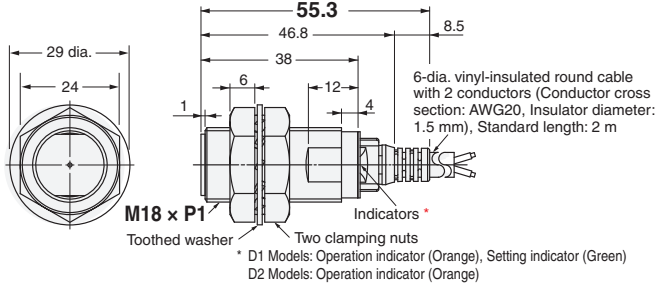
E2E-X7D□12



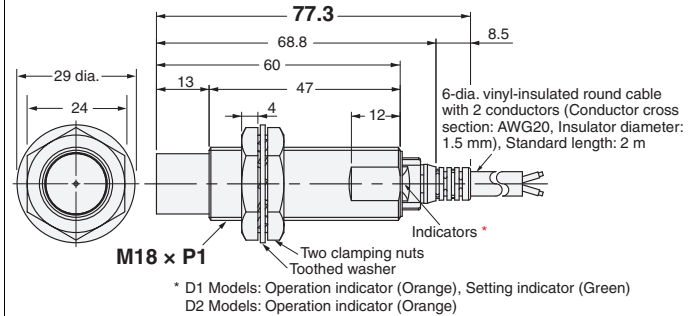
E2E-X10MD□12



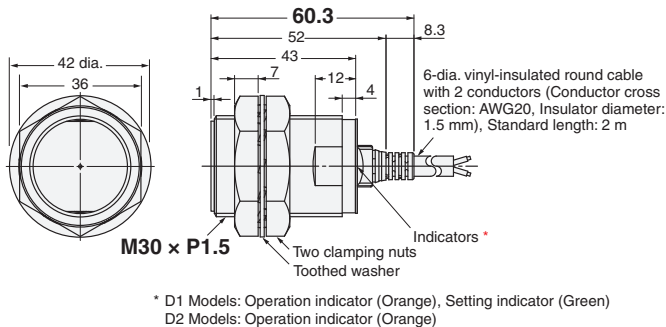
E2E-X11D□18



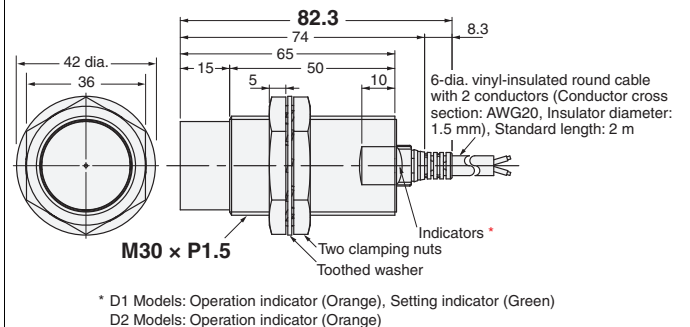
E2E-X20MD□L18



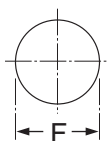
E2E-X20D□30



E2E-X40MD□L30

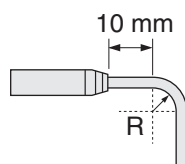


Mounting Hole Dimensions



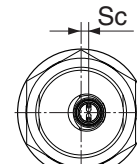
Dimensions	F (mm)
M8	8.5 dia. $+0.5$ ₀
M12	12.5 dia. $+0.5$ ₀
M18	18.5 dia. $+0.5$ ₀
M30	30.5 dia. $+0.5$ ₀

Angle R of the Bending Wire



Dimensions	R (mm)
M8	12
M12	12
M18	18
M30	18

Wire pullout position



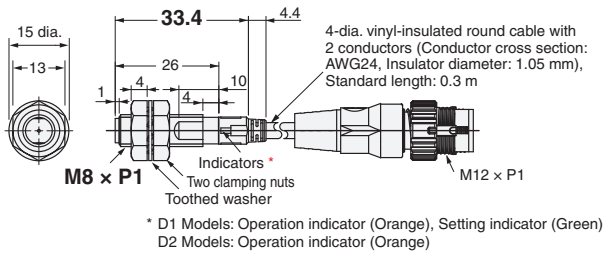
Dimensions	Sc (mm)
M8	- (0)
M12	- (0)
M18	- (0)
M30	2.5

E2E/E2EQ NEXT Series

Pre-wired Connector Models
Shielded



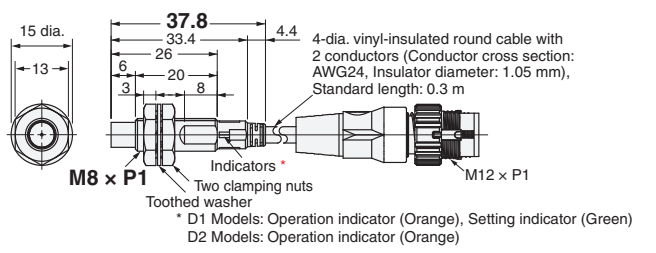
E2E-X3D□8-M1TGJ



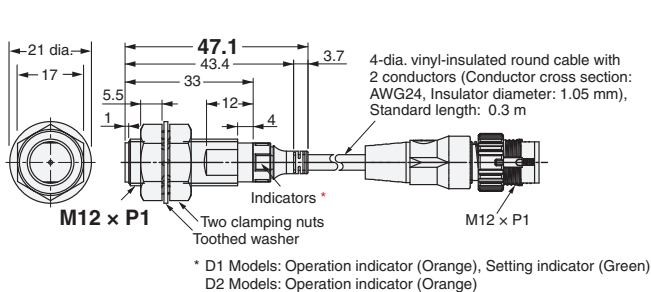
Pre-wired Connector Models
Unshielded



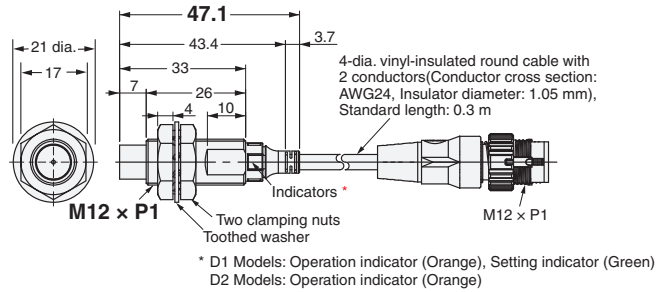
E2E-X6MD□8-M1TGJ



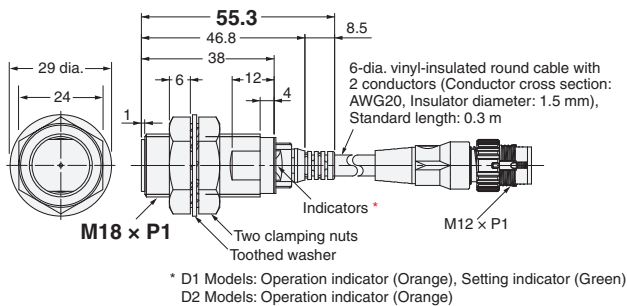
E2E-X7D□12-M1TGJ



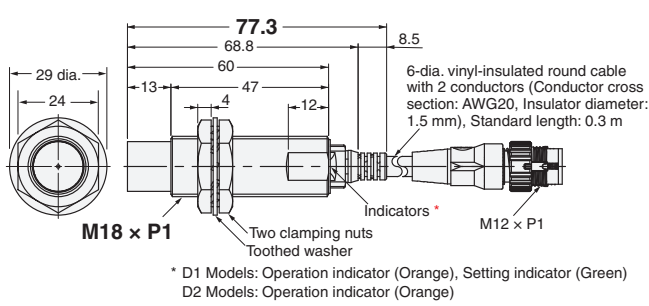
E2E-X10MD□12-M1TGJ



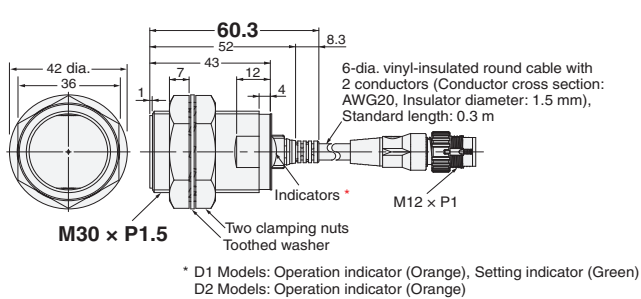
E2E-X11D□18-M1TGJ



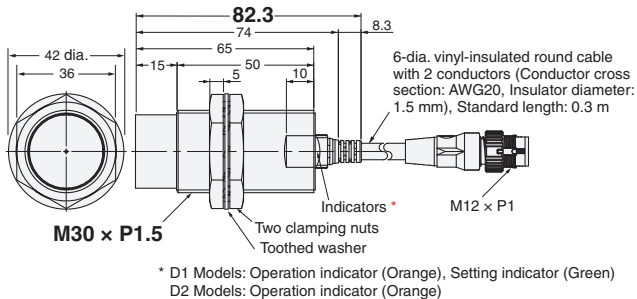
E2E-X20MD□L18-M1TGJ



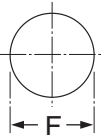
E2E-X20D□30-M1TGJ



E2E-X40MD□L30-M1TGJ

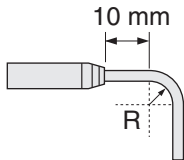


Mounting Hole Dimensions



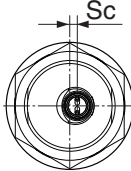
Dimensions	F (mm)
M8	8.5 dia. $+0.5_0$
M12	12.5 dia. $+0.5_0$
M18	18.5 dia. $+0.5_0$
M30	30.5 dia. $+0.5_0$

Angle R of the Bending Wire



Dimensions	R (mm)
M8	12
M12	
M18	
M30	18

Wire pullout position



Dimensions	Sc (mm)
M8	- (0)
M12	
M18	
M30	2.5

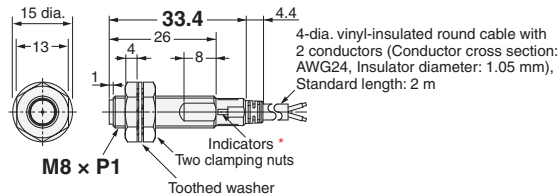
Sensors

E2EQ NEXT Series (Spatter-resistant Long-distance type)

DC 2-wire

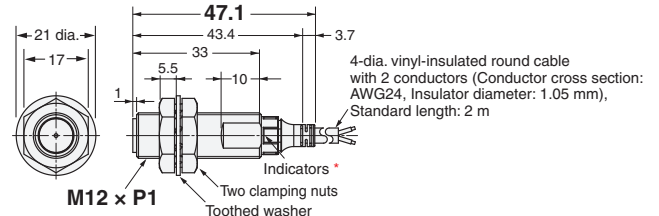
Pre-wired Models
Shielded

E2EQ-X3D□8



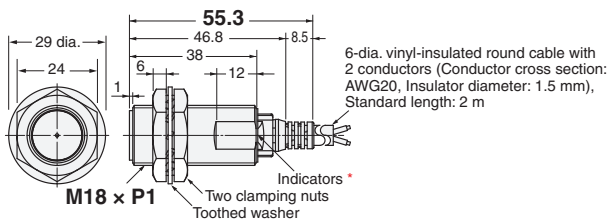
* D1 Models: Operation indicator (Orange), Setting indicator (Green)
D2 Models: Operation indicator (Orange)

E2EQ-X7D□12



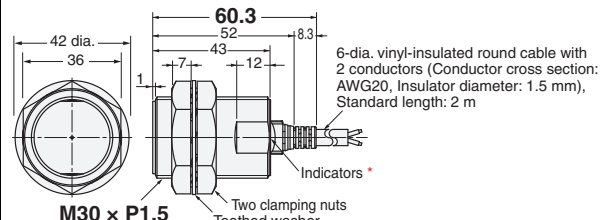
* D1 Models: Operation indicator (Orange), Setting indicator (Green)
D2 Models: Operation indicator (Orange)

E2EQ-X11D□18



* D1 Models: Operation indicator (Orange), Setting indicator (Green)
D2 Models: Operation indicator (Orange)

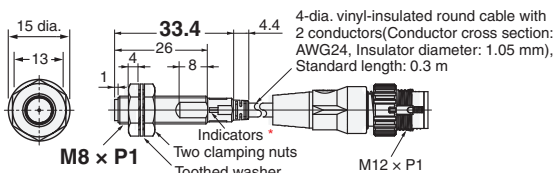
E2EQ-X20D□30



* D1 Models: Operation indicator (Orange), Setting indicator (Green)
D2 Models: Operation indicator (Orange)

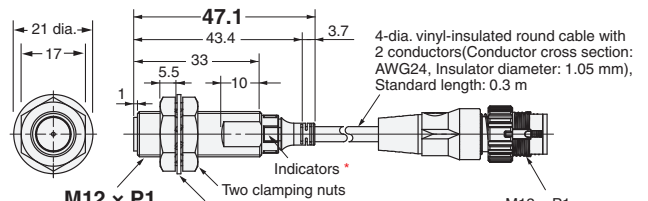
Pre-wired Connector Models
Shielded

E2EQ-X3D□8-M1TGJ



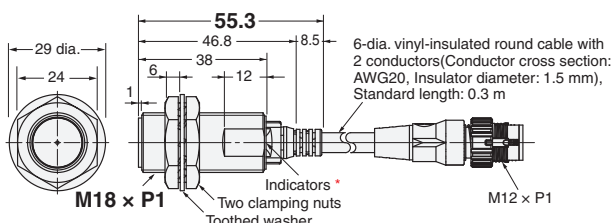
* D1 Models: Operation indicator (Orange), Setting indicator (Green)
D2 Models: Operation indicator (Orange)

E2EQ-X7D□12-M1TGJ



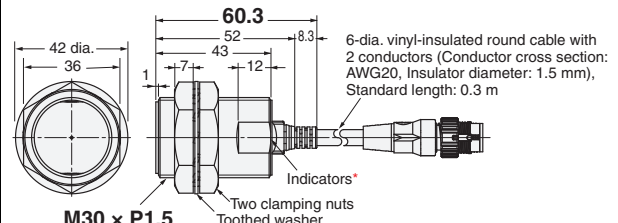
* D1 Models: Operation indicator (Orange), Setting indicator (Green)
D2 Models: Operation indicator (Orange)

E2EQ-X11D□18-M1TGJ



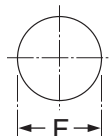
* D1 Models: Operation indicator (Orange), Setting indicator (Green)
D2 Models: Operation indicator (Orange)

E2EQ-X20D□30-M1TGJ



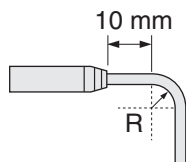
* D1 Models: Operation indicator (Orange), Setting indicator (Green)
D2 Models: Operation indicator (Orange)

Mounting Hole Dimensions



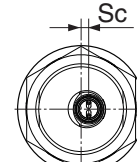
Dimensions	F (mm)
M8	8.5 dia. $+0.5$ ₀
M12	12.5 dia. $+0.5$ ₀
M18	18.5 dia. $+0.5$ ₀
M30	30.5 dia. $+0.5$ ₀

Angle R of the Bending Wire



Dimensions	R (mm)
M8	12
M12	12
M18	18
M30	18

Wire pullout position



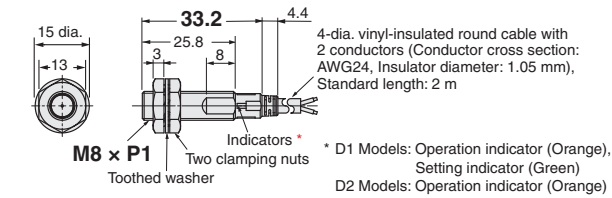
Dimensions	Sc (mm)
M8	- (0)
M12	- (0)
M18	2.5
M30	2.5

E2E/E2EQ NEXT Series

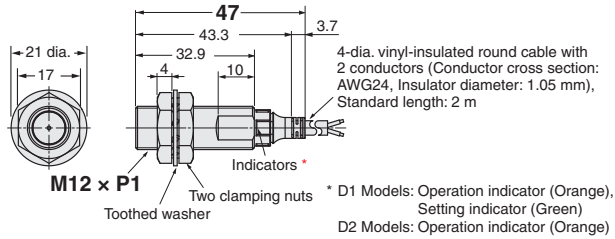
Sensors
E2E NEXT Series (Standard-distance type)
DC 2-wire
Pre-wired Models
Shielded



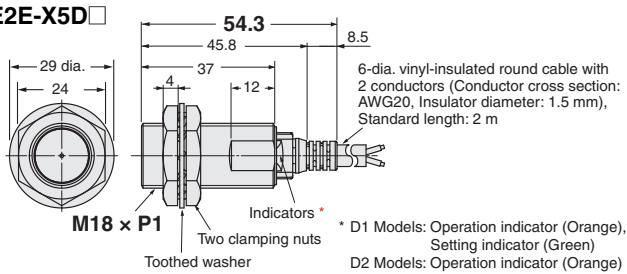
E2E-X1R5D



E2E-X2R5D



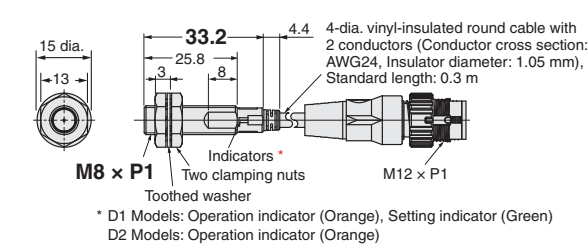
E2E-X5D



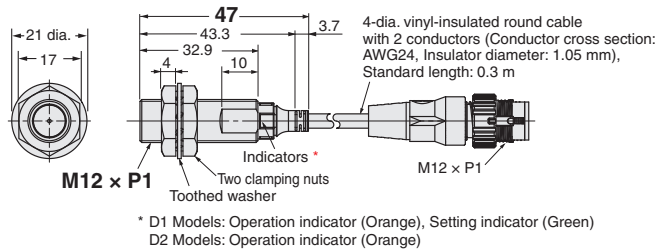
Pre-wired Connector Models
Shielded



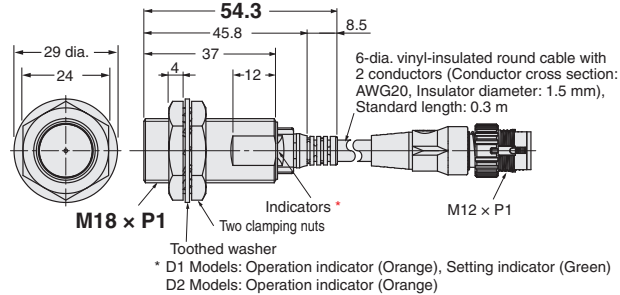
E2E-X1R5D-M1TGJ



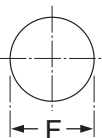
E2E-X2R5D-M1TGJ



E2E-X5D-M1TGJ

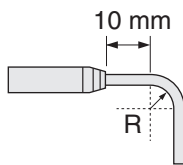


Mounting Hole Dimensions



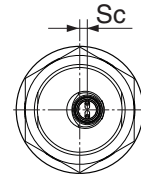
Dimensions	F (mm)
M8	8.5 dia. $+0.5_0$
M12	12.5 dia. $+0.5_0$
M18	18.5 dia. $+0.5_0$
M30	30.5 dia. $+0.5_0$

Angle R of the Bending Wire



Dimensions	R (mm)
M8	12
M12	12
M18	18
M30	18

Wire pullout position

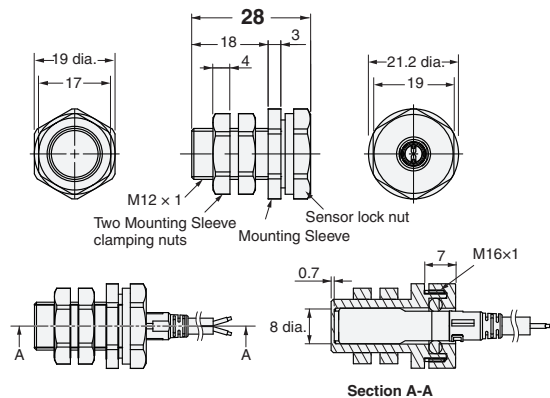


Dimensions	Sc (mm)
M8	- (0)
M12	- (0)
M18	2.5
M30	2.5

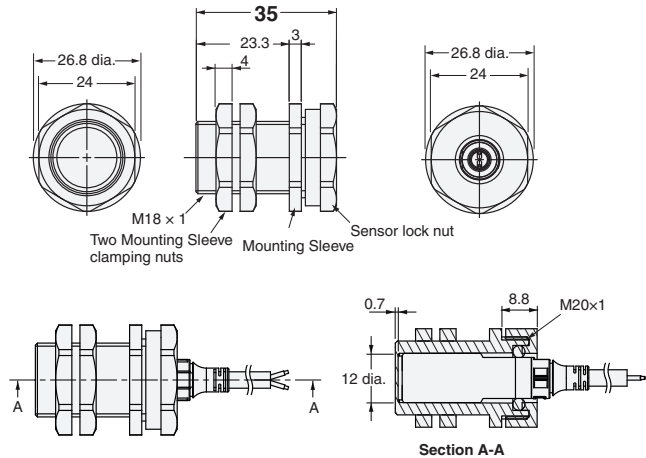
Accessories (Sold Separately)

e-jig (Mounting Sleeves)

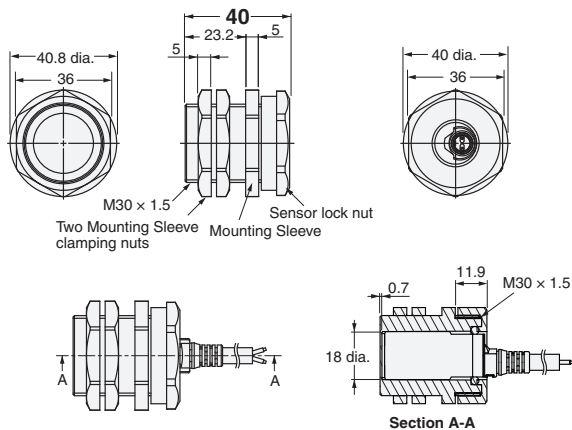
Y92E-J8S12



Y92E-J12S18



Y92E-J18S30



Material

Mounting Sleeve	Polyetheretherketone (PEEK) / Polybutylene terephthalate (PBT)
Mounting Sleeve clamping nut	Polybutylene terephthalate (PBT)
Sensor lock nut	Polybutylene terephthalate (PBT)
Sensor lock O-ring	Material combining HNBR and fluororubber

Tightening Force

Model	Torque	
	Mounting Sleeve clamping nut	Sensor lock nut
Y92E-J8S12	0.6 N·m	0.6 N·m
Y92E-J12S18	1.2 N·m	1.2 N·m
Y92E-J18S30	5 N·m	3.5 N·m

XS5 NEXT Series

Round Oil-resistive Smartclick Connectors for E2E NEXT Series, that are Resistant to Oil, and that Reduce Installation Work

- Uses unique OMRON technology and the same PVC cable with increased oil resistance as the E2E NEXT Series. Oil-resistance performance values of 2 years* when used in combination with E2E NEXT Series proximity sensors.
- 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, IP69K degree of protection.
- UL approved products.

* Covered types of oil: Cutting oil specified in JIS K 2241:2000

The oil-resistance performance value (2 years) indicates the median value (=Typ) at product design, and in evaluation testing results of oil-resistance performance. Shipped products will show some variance around this 2 year value in actual usage.



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 34.

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** **-** **X**

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: 0.4-μm gold plating

5. Cable Connection Direction

XS5W 1: Straight/straight

XS5F 1: Straight

6. Cable Length

C: 1 m

D: 2 m

E: 3 m

G: 5 m

J: 10 m

7. Connections

8: ①Brown, ②White, ③Blue, ④ Black

(Numbers inside circles are terminal numbers)

8. Connectors on One End/Both Ends

0: One cable end

1: Both cable ends

9. Cable Specifications

X: Fire-retardant, Oil-resistant PVC cable



Smartclick is registered trademark of OMRON Corporation.

Ordering Information

Connectors

Type	Cable outer diameter (mm)	Cable length (m)	Model	Minimum order	UL
Socket single end connector	6 dia.	1	XS5F-D421-C80-X	10	UL2238 certified (File no. E207683)
		2	XS5F-D421-D80-X	5	
		3	XS5F-D421-E80-X		
		5	XS5F-D421-G80-X		
		10	XS5F-D421-J80-X	1	
Both ends	6 dia.	1	XS5W-D421-C81-X	10	
		2	XS5W-D421-D81-X	5	
		3	XS5W-D421-E81-X		
		5	XS5W-D421-G81-X		
		10	XS5W-D421-J81-X	1	

Accessories (Sold Separately)

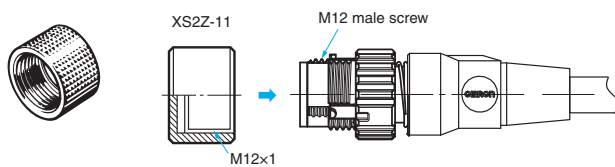
Connector Covers

Water-resistive Covers

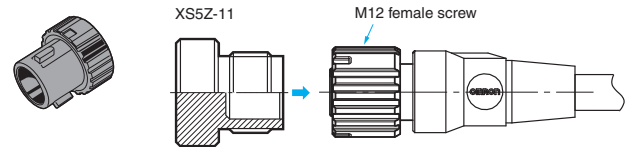
Model	Minimum order	Material	Suitable connector		Remarks
			Model	Mounting portion	
XS2Z-11	50	Brass/ nickel plated	XS5W	M12 male screw	This provides IP67 levels of protection. When mounting the Water-resistive Cover to a Connector, be sure to apply a torque range between 0.39 and 0.49 N·m to tighten 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



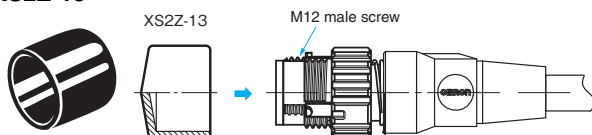
Dust Covers

Model	Minimum order	Material	Suitable connector		Remarks
			Model	Mounting portion	
XS2Z-13	50	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	

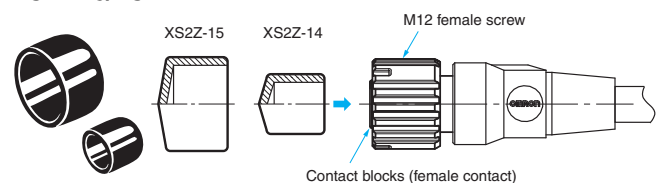
Note: Pricing for water-resistive covers and dust covers is for individually-wrapped items.

Dust Covers

XS2Z-13



XS2Z-15/XS2Z-14



XS5 NEXT Series

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	Meet IP67, IP69K (IEC 60529), and OMRON's Oil-resistant Component Evaluation Standards *2 (Cutting oil type JIS K 2241:2000-specification cutting oil, at 35°C or below)
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 s (for cable diameter of 6 mm) *3
Lock operating force	0.1 to 0.25 N·m
Ambient operating temperature range	-25 to +70°C
Ambient humidity range	20 to 85%RH

*1. State at shipping.

*2. "OMRON's Oil-resistant Component Evaluation Standards" are OMRON's own durability evaluation standards.

Protection performance with oil-resistive connector (XS5F/W-X) correctly mated.

This performance does not apply if an oil-resistive connector (XS5F/W-X) is missing, and cord wiring is exposed.

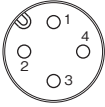

*3. Refer to product specifications for details.

Materials and Finishes

Model		XS5F/W-X
Item		
Contacts	Material	Copper alloy
	Finish	Gold plating
Fixtures		Nickel-plated zinc alloy
Fixtures (Lock) *		SUS
Pin block		PBT resin (UL94V-0)
O-ring		Material combining HNBR and fluororubber
Cover		PBT resin (UL94V-0)
Cable	Fire-retardant, Oil-resistant PVC cable	UL 758 (AWM) 6 mm dia. AWG20 (0.5mm ²) Structure: 0.16 mm/26 wires

* Only plug

Connector Pinout Diagram (from Mating Side)

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

Connection Combinations

Plug		Smartclick Plug Connectors	M12 Plug Connectors
Socket	OMRON model No.	XS5H, XS5G, XS5W (plug side), XS5R (plug side), XS5M *	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 *	○	○

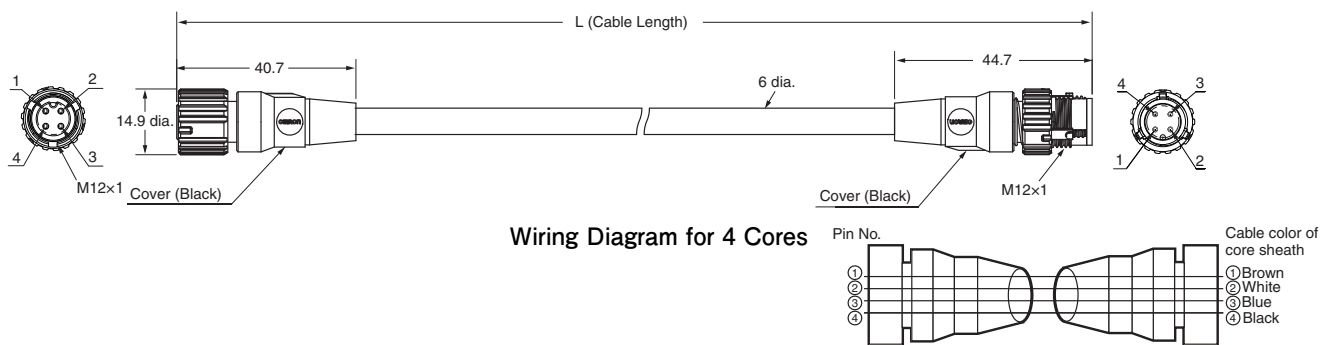
* XS2P/XS5P and XS5M, XS2M cannot mate with each other.

Note: ⊙: Connected by twisting.
○: Connected by screwing.

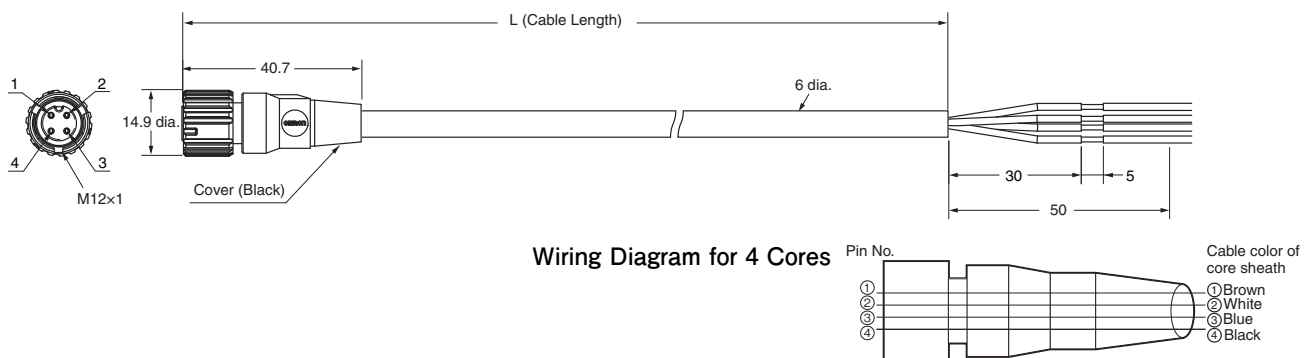
Dimensions

(Unit: mm)

(Both end connector type XS5W-D421-□81-X)



(One end connector type XS5F-D421-□80-X)



XS5 NEXT Series

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.

If products in this state continue to be used, then cutting oil or other contaminants may enter the product, leading to breakages or damage from fire.

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.

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.
- As usage in environments in which cutting oil is used may impact service life and performance, ensure the following requirements are met.
 - Usage with cutting oil requirements as defined in specifications.
 - Usage at a dilution ratio as recommended by cutting oil manufacturers.
 - Usage immersed in oil or water is prohibited.

The cutting oil used may have a different impact on product service life. Ensure that the product is used only after confirming with the customer that there has been no deformation or deterioration of seal material from the cutting oil.

- The mating coupler will impact the oil-resistance performance values (years). Confirm mating of the couplers before use.

Mating Combinations

	XS5FR XS5WR	XS5F-X XS5W-X	Other XS5/ XS2 Series
XS5FR XS5WR	Oil-resistance performance values 4 years	Oil-resistance performance values 2 years	Water-resistance
XS5F-X XS5W-X	Oil-resistance performance values 2 years	Oil-resistance performance values 2 years	Water-resistance
Other XS5/XS2 Series *	Water-resistance	Water-resistance	Water-resistance

* Oil-resistant (polyurethane) cable products (XS5F-P, XS5H-P, XS5W-P) as well as oil-resistant (polyurethane) robot cables (XS5F-PR, XS5W-PR) are excluded. Please consult with OMRON for details of these products.

- 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

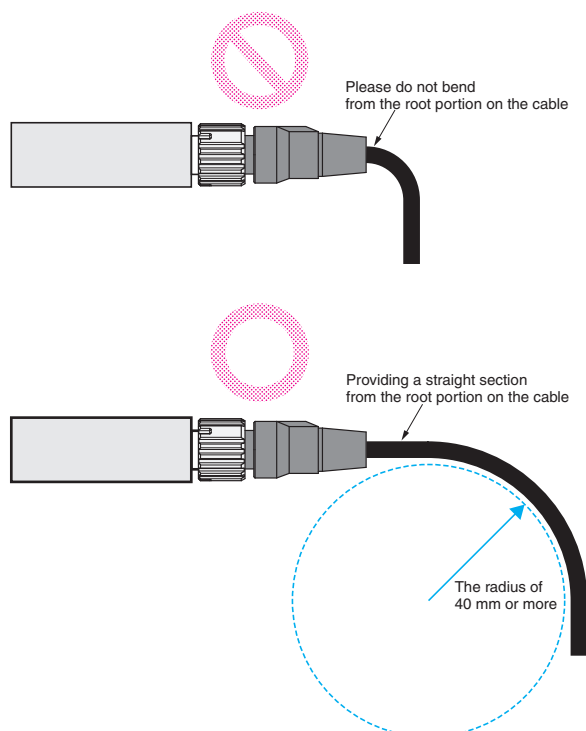
- Do not wire cables in environments in which the cable terminal sections will be subject to fluids such as water or cutting oil.
- When wiring cables, ensure this is carried out in accordance with the wiring diagram.
- Lay the cables so that external force is not applied to the Connectors. Otherwise,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

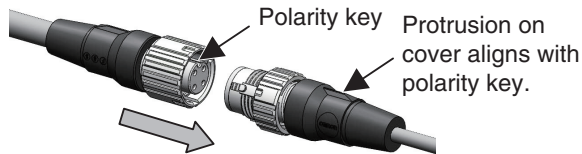
- Do not install the Connectors with a load placed directly on the joint or at the point where the wires connect to the Connector. The Connector may be damaged or the wires in the cable may be disconnected.
- If bending cables, ensure that these use a minimum bend radius of 40 mm.



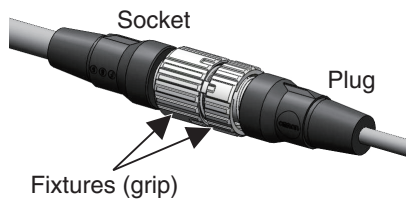
Connecting

1. Connecting the XS5□-X Plug and Socket

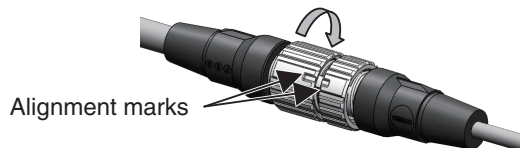
- Align the projection on the plug cover with the polarity key on the socket, then insert the plug all the way in.



- 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□-X 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.
- When mating the products to XS2 or other M12 Connectors, tighten the lock to a torque of 0.39 to 0.49 N·m.


Round Water-resistant Connectors (M12 Smartclick) XS5

Round Water-resistive Smartclick Connectors for E2E NEXT Series 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.



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 40.

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** **1** **-**

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: 0.4-μm gold plating

5. Cable Connection Direction

XS5W 1: Straight/straight
XS5F 1: Straight

6. Cable Length

C: 1 m
D: 2 m
E: 3 m
G: 5 m
J: 10 m

7. Connections

8: ①Brown, ②White, ③Blue, ④ Black
(Numbers inside circles are terminal numbers)

8. Connectors on One End/Both Ends

0: One cable end
1: Both cable ends

9. Cable Specifications

F: Fire-retardant, Robot cable

 Smartclick is registered trademark of OMRON Corporation.

Ordering Information

Connectors

Type	Cable outer diameter (mm)	Cable length (m)	Model	Minimum order	UL
Socket single end connector	6 dia.	1	XS5F-D421-C80-F	10	UL2238 certified (File no. E207683)
		2	XS5F-D421-D80-F	5	
		3	XS5F-D421-E80-F		
		5	XS5F-D421-G80-F		
		10	XS5F-D421-J80-F	1	
Both ends	6 dia.	1	XS5W-D421-C81-F	10	
		2	XS5W-D421-D81-F	5	
		3	XS5W-D421-E81-F		
		5	XS5W-D421-G81-F		
		10	XS5W-D421-J81-F	1	

Accessories (Sold Separately)

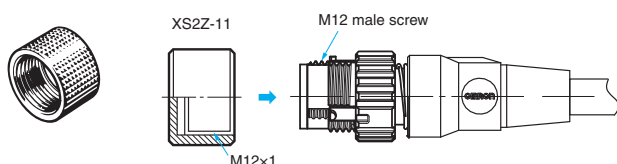
Connector Covers

Water-resistive Covers

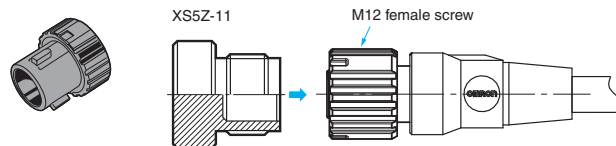
Model	Minimum order	Material	Suitable connector		Remarks
			Model	Mounting portion	
XS2Z-11	50	Brass/ nickel plated	XS5W	M12 male screw	This provides IP67 levels of protection. When mounting the Water-resistive Cover to a Connector, be sure to apply a torque range between 0.39 and 0.49 N·m to tighten 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



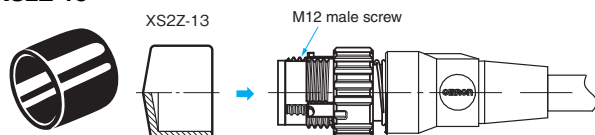
Dust Covers

Model	Minimum order	Material	Suitable connector		Remarks
			Model	Mounting portion	
XS2Z-13	50	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	

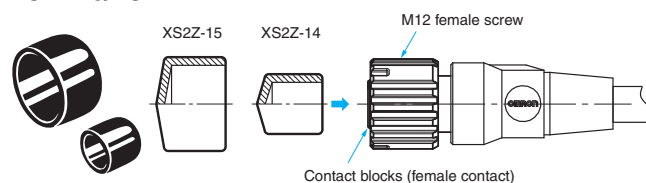
Note: Pricing for water-resistive covers and dust covers is for individually-wrapped items.

Dust Covers

XS2Z-13



XS2Z-15/XS2Z-14



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 s (for cable diameter of 6 mm) *2
Lock operating force	0.1 to 0.25 N·m
Ambient operating temperature range	-25 to +70°C
Ambient humidity range	20 to 85%RH



*1. State at shipping.
*2. Refer to product specifications for details.

Materials and Finishes

Model		XS5F/XS5W
Item	Material	Copper alloy
	Finish	Gold plating
Fixtures		Nickel-plated zinc alloy
Fixtures (Lock) *		SUS
Pin block		PBT resin (UL94V-0)
O-ring		Rubber
Cover		PBT resin (UL94V-0)
Cable	Fire-retardant, Robot cable	UL13 (CL3), UL758 (AWM), 6 mm dia., AWG20 (0.5 mm²)
		Structure: 0.08 mm/110 wires

* Only plug

Connector Pinout Diagram (from Mating Side)

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

Connection Combinations

Plug		Smartclick Plug Connectors	M12 Plug Connectors
Socket	OMRON model No.	XS5H, XS5G, XS5W (plug side), XS5R (plug side), XS5M *	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.

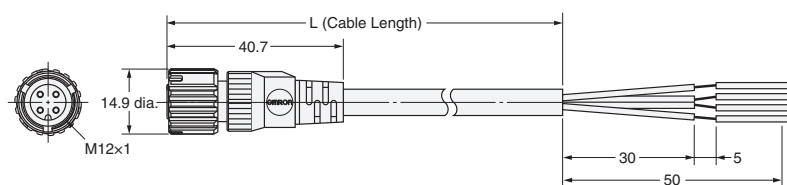
Note: ⊙: Connected by twisting.

○: Connected by screwing.

Dimensions

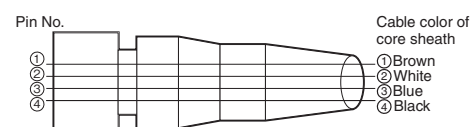
(Unit: mm)

Sockets on One Cable End XS5F Models Straight

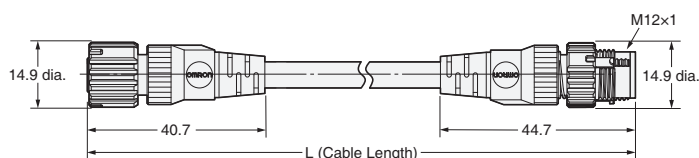


- L=1 m (XS5F-D421-C80F)
 2 m (XS5F-D421-D80F)
 3 m (XS5F-D421-E80F)
 5 m (XS5F-D421-G80F)
 10 m (XS5F-D421-J80F)

Wiring Diagram for 4 Cores

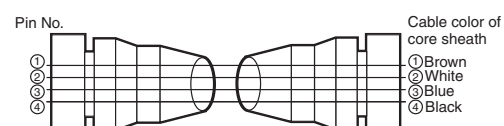


Sockets on One Cable End XS5F Models Straight/straight



- L=1 m (XS5F-D421-C80F)
 2 m (XS5F-D421-D80F)
 3 m (XS5F-D421-E80F)
 5 m (XS5F-D421-G80F)
 10 m (XS5F-D421-J80F)

Wiring Diagram for 4 Cores



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.

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

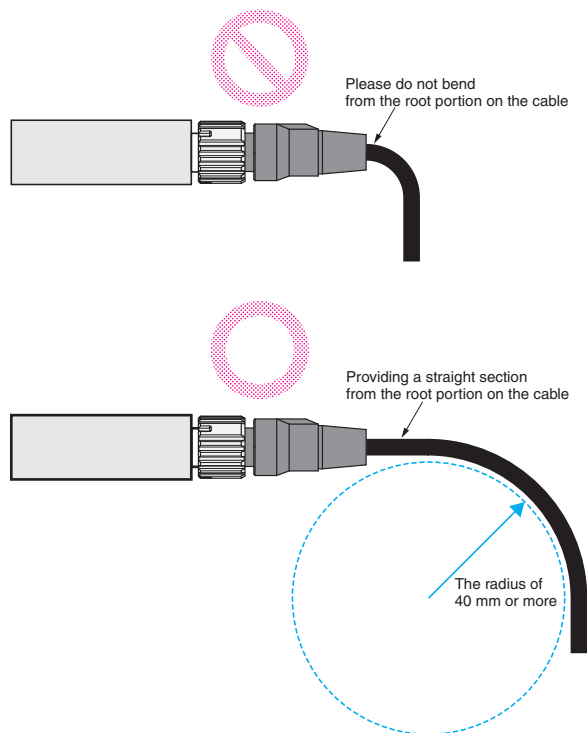
- Do not wire cables in environments in which the cable terminal sections will be subject to fluids such as water or cutting oil.
- When wiring cables, ensure this is carried out in accordance with the wiring diagram.
- Lay the cables so that external force is not applied to the Connectors. Otherwise,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

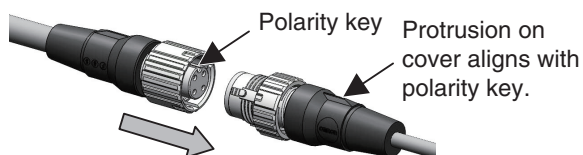
- Do not install the Connectors with a load placed directly on the joint or at the point where the wires connect to the Connector. The Connector may be damaged or the wires in the cable may be disconnected.
- If bending cables, ensure that these use a minimum bend radius of 40 mm.



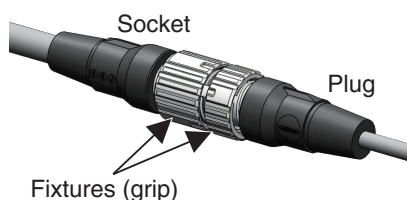
Connecting

1. Connecting the XS5 Plug and Socket

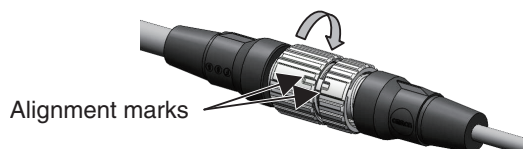
- Align the projection on the plug cover with the polarity key on the socket, then insert the plug all the way in.



- 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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