

OMRON

形 E2E(Q)-X□D□

近接センサ

取扱説明書

このたびは、本製品をお買い上げいただきまして、まことにありがとうございます。

ご使用に際しては、次の内容をお守りください。

・電気的知識を有する専門家が取り付けください。

・この取扱説明書をよくお読みになり、十分にご理解のうえ、正しくご使用ください。

・この取扱説明書はいつでも参照できるように大切に保管してください。

QTY. 1

オムロン株式会社

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3135301-1G

安全上のご注意

警告表示の意味

正しい取扱いをしなければ、この危険のために、軽傷・中程度の傷害を負ったり、万が一の場合には重症や死亡にいたる恐れがあります。

警告表示



破裂の恐れがあります。AC電源では絶対に使用しないでください。

安全を確保する目的で直接的または間接的に人体を検出する用途に本製品は使用できません。

安全上の要点

以下に示すような項目は、安全を確保する上で必要な項目ですので必ず守ってください。

- (1)引火性、爆発性ガスの環境では使用しないで下さい。(2)製品の分解、修理、改造をしないで下さい。(3)電源電圧について...

使用上の注意

- (1)下記の設置場所では使用しないで下さい。(2)高周波電界を発生するよう超音波洗浄装置、高周波発生装置、トランスミッター、携帯電話やインバータなどの近くでは誤動作することがあります。(3)高圧電線、動力線と近接スイッチの配線が同一配管あるいはダクトで行われると誘導を受け、誤動作あるいは破壊の原因となる場合があります。

■周囲金属の影響

近接センサをナットで取り付けの際には、本体付属のナットを使用し、下表に示した値以上でご使用ください。

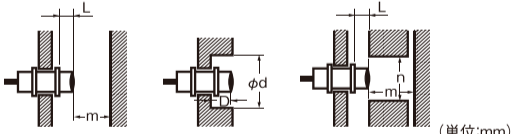


Table with 2 columns: 形式 (シールドタイプ) and 項目 (L, d, D, m, n) for various sensor models.

Table with 2 columns: 形式 (非シールドタイプ) and 項目 (L, d, D, m, n) for various sensor models.

形式ごとに付属しているナットは異なります。形状の詳細は外形寸法をご参照ください。

近接スイッチを金属に埋め込む場合などは下表に示した値以上でご使用ください。

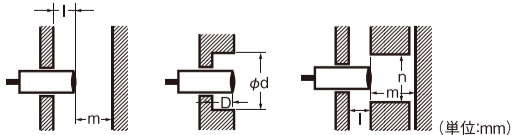


Table with 2 columns: 形式 (シールドタイプ) and 項目 (L, d, D, m, n) for various sensor models.

Table with 2 columns: 形式 (非シールドタイプ) and 項目 (l, d, D, m, n) for various sensor models.

■相互干渉

2個以上の近接スイッチを対向または並列に配置される場合は、下表に示した値以上でご使用下さい。

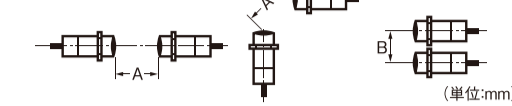
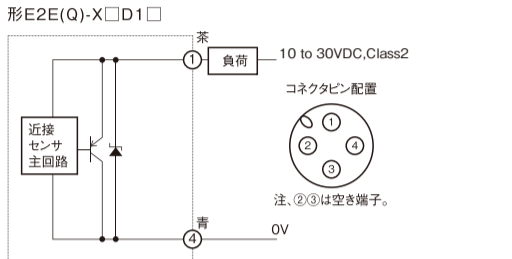
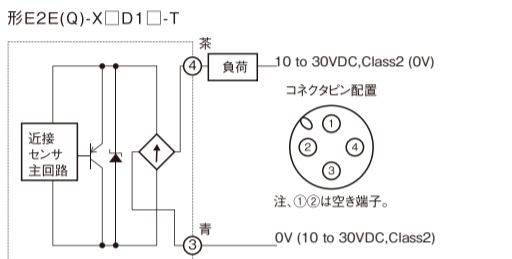


Table with 4 columns: 形式 (シールドタイプ), A, B, 形式 (非シールドタイプ), A, B for various sensor models.

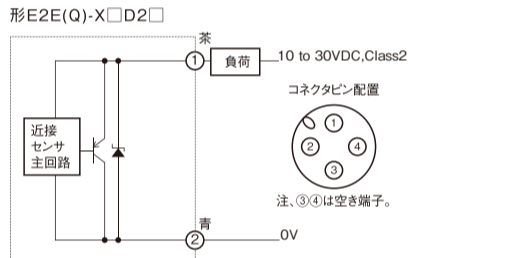
■出力回路図



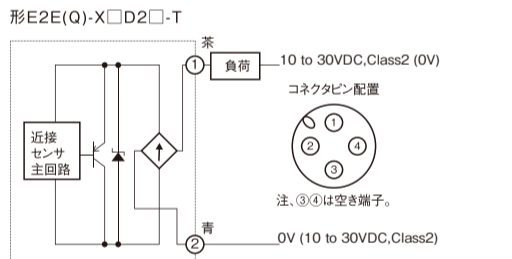
注. 負荷は+側、0V側どちらにも接続可能です。



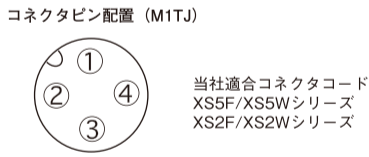
- 注1. 負荷は+側、0V側どちらにも接続可能です。注2. 無極性ですので、茶/青あるいは③/④の極性を考慮する必要がありません。



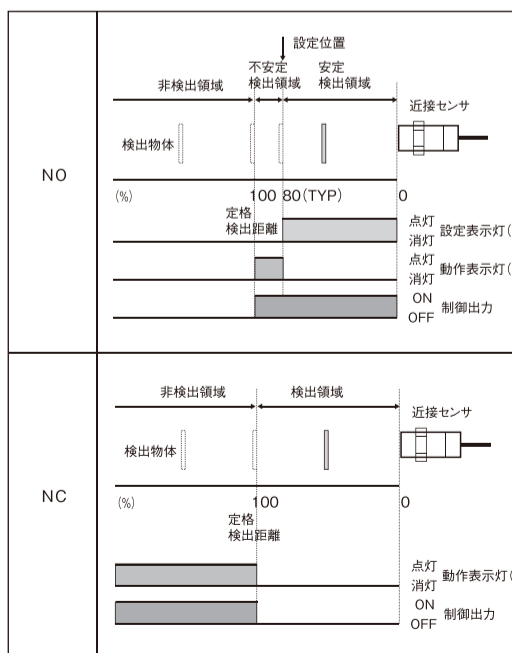
注. 負荷は+側、0V側どちらにも接続可能です。



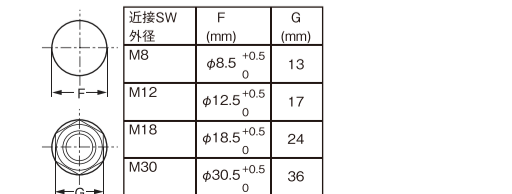
- 注1. 負荷は+側、-側どちらにも接続可能です。注2. 無極性ですので、茶/青あるいは①/②の極性を考慮する必要がありません。



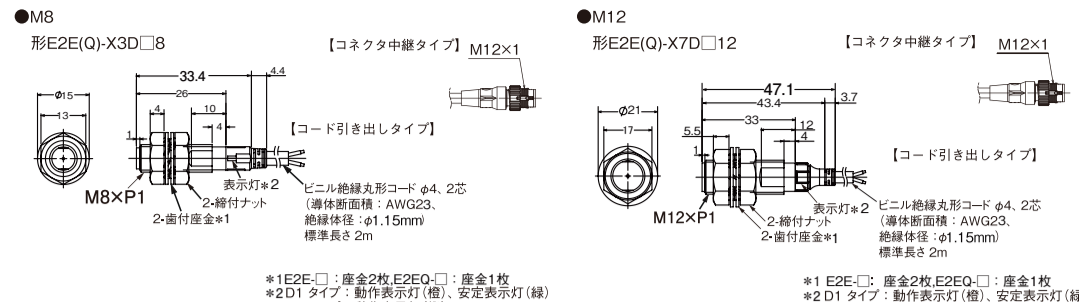
■タイムチャート



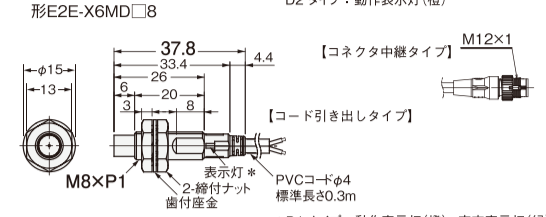
■取り付け穴加工寸法とナット対角寸法



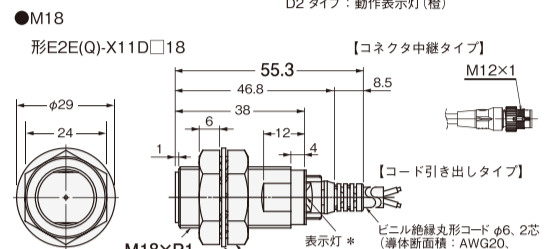
■外形寸法図



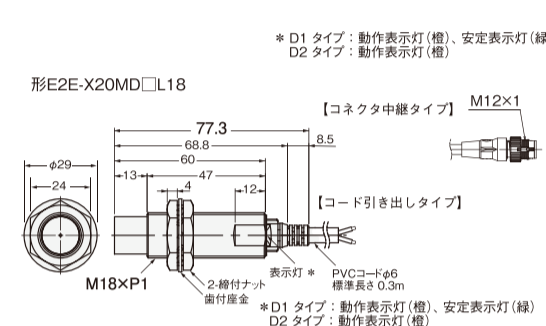
\*1 E2E□: 産金2枚 E2EQ□: 産金1枚 \*2 D1 タイプ: 動作表示灯(橙)、安定表示灯(緑) D2 タイプ: 動作表示灯(橙)



\*1 E2E□: 産金2枚 E2EQ□: 産金1枚 \*2 D1 タイプ: 動作表示灯(橙)、安定表示灯(緑) D2 タイプ: 動作表示灯(橙)

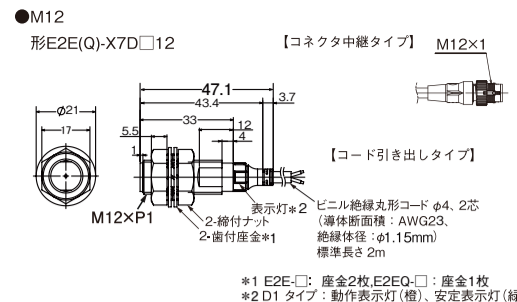
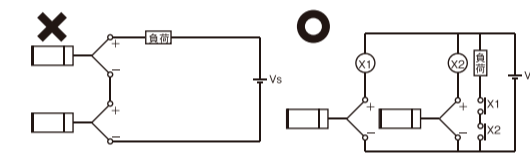


\*1 E2E□: 産金2枚 E2EQ□: 産金1枚 \*2 D1 タイプ: 動作表示灯(橙)、安定表示灯(緑) D2 タイプ: 動作表示灯(橙)

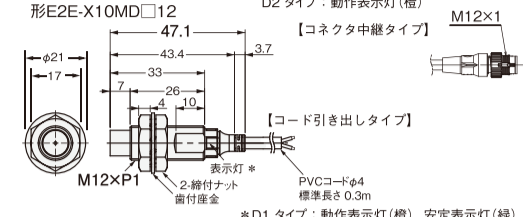


■近接センサのAND配線

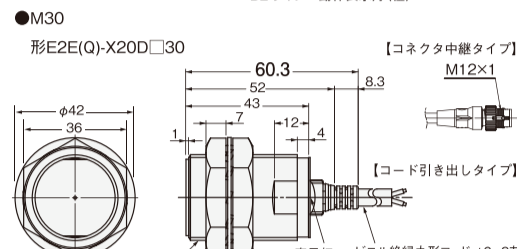
2個以上のセンサを直列に接続してAND回路で使用することはできません。図のようにリレーを介してご使用願います。



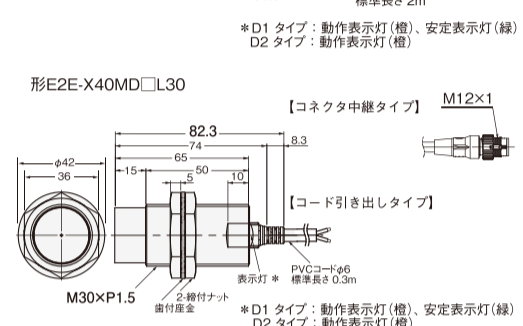
\*1 E2E□: 産金2枚 E2EQ□: 産金1枚 \*2 D1 タイプ: 動作表示灯(橙)、安定表示灯(緑) D2 タイプ: 動作表示灯(橙)



\*1 E2E□: 産金2枚 E2EQ□: 産金1枚 \*2 D1 タイプ: 動作表示灯(橙)、安定表示灯(緑) D2 タイプ: 動作表示灯(橙)

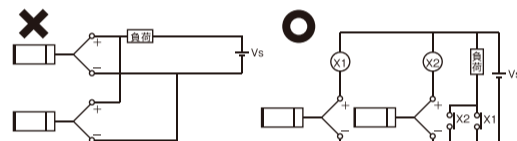


\*1 E2E□: 産金2枚 E2EQ□: 産金1枚 \*2 D1 タイプ: 動作表示灯(橙)、安定表示灯(緑) D2 タイプ: 動作表示灯(橙)



■近接センサのOR配線

2個以上のセンサを並列に接続してOR回路で使用することは原則としてできません。センサが同時に動作せず、負荷を保持させる必要のない場合に限り並列接続で使用できます。



■定格/性能

Large table listing specifications for various sensor models including外形, 形式, 検出距離, 電源電圧, etc.

注. 標高: 2000m以下、汚染度: 3、外郭: Type1 とする。

■締めつけ許容強度

ナットは過大な力で締めつけしないで下さい。締めつけ時は必ず歯付き座金を使用し、下表の締めつけ強度以下とってください。

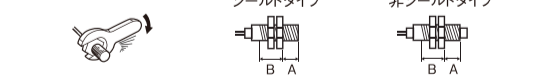


Table showing torque specifications (強度) for different sensor models and nut types.

Table showing torque specifications for different sensor models and nut types.

ご承諾事項

当社商品は、一般工業製品向けの汎用品として設計製造されています。従って、次に掲げる用途での使用を意図しておりません。

- (a) 高い安全性が必要とされる用途 (例: 原子力制御設備、燃焼設備、航空・宇宙設備、鉄道設備、昇降設備、娯楽設備、医用機器、安全装置、その他生命・身体に危険及びうる用途)

(b) 高い信頼性が必要な用途 (例: ガス・水道・電気等の供給システム、24時間連続運転システム、決済システムほか権利・財産を取扱う用途など)

(c) 厳しい条件または環境での用途 (例: 屋外に設置する設備、化学的汚染を被る設備、電磁的妨害を被る設備、振動・衝撃を受ける設備など)

(d) カタログ等に記載のない条件や環境での用途

オムロン株式会社

2014年7月



Model **E2E(Q)-X□D□**

Proximity Sensor

**INSTRUCTION SHEET**

Thank you for selecting OMRON product. This sheet primarily describes precautions required in installing and operating the product. Before operating the product, read the sheet thoroughly to acquire sufficient knowledge of the product. For your convenience, keep the sheet at your disposal.

TRACEABILITY INFORMATION:  
 Importer in EU:  
 OMRON Europe B.V.  
 Wegalaan 67-69,  
 NL-2132 JD Hoofddorp  
 The Netherlands  
 Manufacturer:  
 OMRON Corporation,  
 Shiokoji Horikawa, Shimogyo-ku,  
 Kyoto. 600-8530 JAPAN

The following notice applies only to products that carry the CE mark:  
 Notice:  
 In a residential environment, this product may cause radio interference,  
 in which case the user may be required to take adequate measures.



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**Precaution on Safety**

**● Meanings of Signal Words**

**WARNING** 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.

**● Alert statements**



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

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

**PRECAUTIONS FOR SAFE USE**

The following precautions must be observed to ensure safe operation.

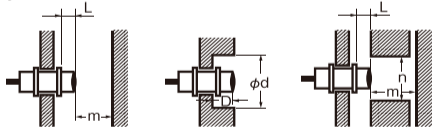
- Do not use the product in an environment where flammable or explosive gas is present.
- Do not attempt to disassemble, repair, or modify the product.
- Power Supply Voltage** Do not use a voltage that exceeds the rated operating voltage range. Applying a voltage that is higher than the operating voltage range may result in damage or burnout.
- Incorrect Wiring** Be sure that the power supply polarity and other wiring is correct. Incorrect wiring may cause explosion or burnout.
- Connection without a Load** 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.
- Dispose of this product as industrial waste.

**PRECAUTIONS FOR CORRECT USE**

- Do not use in following ambience.
  - Direct sunlight, rain, snow, and waterdrop.
  - Chemicals, especially solvents and acids.
  - Corrosive gas, erosive gas.
- Please note that this sensor might malfunction when using it near the ultrasonic cleansing apparatus that generates the high frequency electric field, the high frequency generation device, the transmitter, the cellular phone, and the inverter, etc. Please refer to Sensor General Catalogue for typical measures.
- Plumbing into the same pipe or duct with high-voltage line or power line may cause a malfunction, or destruction because of induction.
- Do not use thinner may dissolve the surface of products.

**● Effects of Surrounding Metal**

When mounting the Proximity Sensor using a nut, only use the provided nut. And ensure that the minimum distances given in table 1 are maintained.

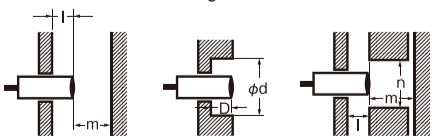


**Table 1** (Unit: mm)

Model (Shielded type)	Item				
	L	d	D	m	n
E2E(Q)-X3D□8	0	20	2	9	18
E2E(Q)-X7D□12	0	20	4	18	20
E2E(Q)-X11D□18	0	50	4	33	54
E2E(Q)-X20D□30	0	70	8	60	90
Model (Non shielded type)	Item				
	L	d	D	m	n
E2E-X6MD□8	10	30	13	18	30
E2E-X10MD□12	16	50	20	30	50
E2E-X20MD□L18	31	90	35	60	80
E2E-X40MD□L30	50	170	55	120	140

The attached nuts are different depending on the models. For details on nut shapes, refer to the outer dimensions.

When mounting the proximity switch in a metal panel, maintain the clearances given in table 2.



**Table 2** (Unit: mm)

Model (Shielded type)	Item				
	L	d	D	m	n
E2E(Q)-X3D□8	2	20	2	9	18
E2E(Q)-X7D□12	4	20	4	18	20
E2E(Q)-X11D□18	4	50	4	33	54
E2E(Q)-X20D□30	8	70	8	60	90

Model (Non shielded type)	Item				
	L	d	D	m	n
E2E-X6MD□8	13	30	13	18	30
E2E-X10MD□12	20	50	20	30	50
E2E-X20MD□L18	35	90	35	60	80
E2E-X40MD□L30	55	170	55	120	140

**■ Mutual Interference**

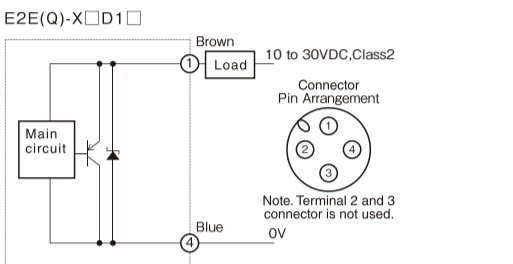
When installing two or more proximity switches close together, ensure the minimum separation distances given in table 3.



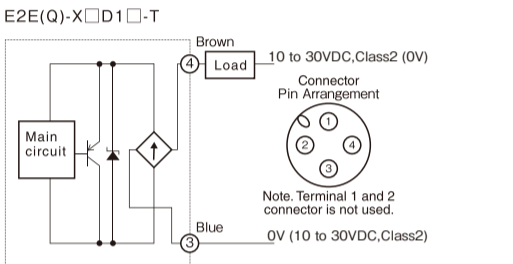
**Table 3**

Model (Shielded type)	A		Model (Non shielded type)	A		B	
	A	B		A	B		
E2E(Q)-X3D□8	25	20	E2E-X6MD□8	80	60		
E2E(Q)-X7D□12	40	30	E2E-X10MD□12	120	100		
E2E(Q)-X11D□18	70	45	E2E-X20MD□L18	200	110		
E2E(Q)-X20D□30	140	70	E2E-X40MD□L30	380	280		

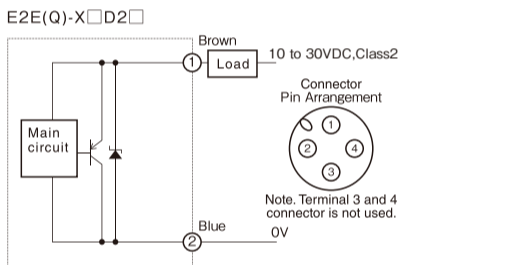
**■ Output Circuit Diagrams And Connection**



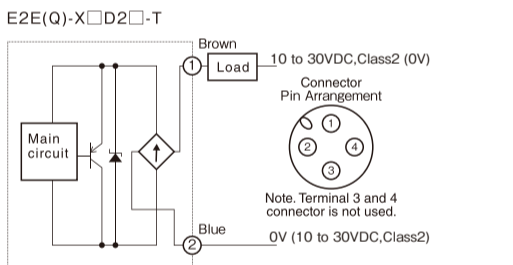
Note. The load can be connected to either the +V or 0V side.



Note1. The load can be connected to either the +V or 0V side.  
 Note2. There is no polarity. Therefore the brown and blue or ③ and ④ lines have no polarity.



Note. The load can be connected to either the +V or 0V side.



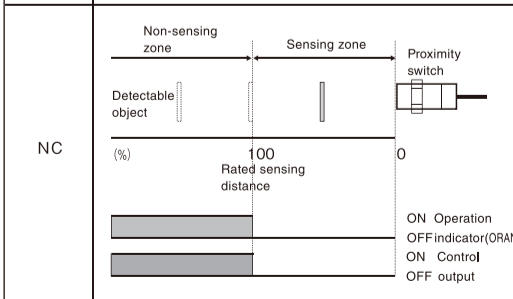
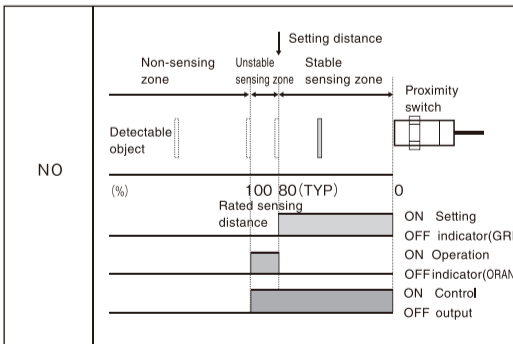
Note1. The load can be connected to either the +V or 0V side.  
 Note2. There is no polarity. Therefore the brown and blue or ① and ② lines have no polarity.

**Connector pin arrangement**



OMRON adaptive connector cord:  
 XSSF/XSSW series, XS2F/XS2W series

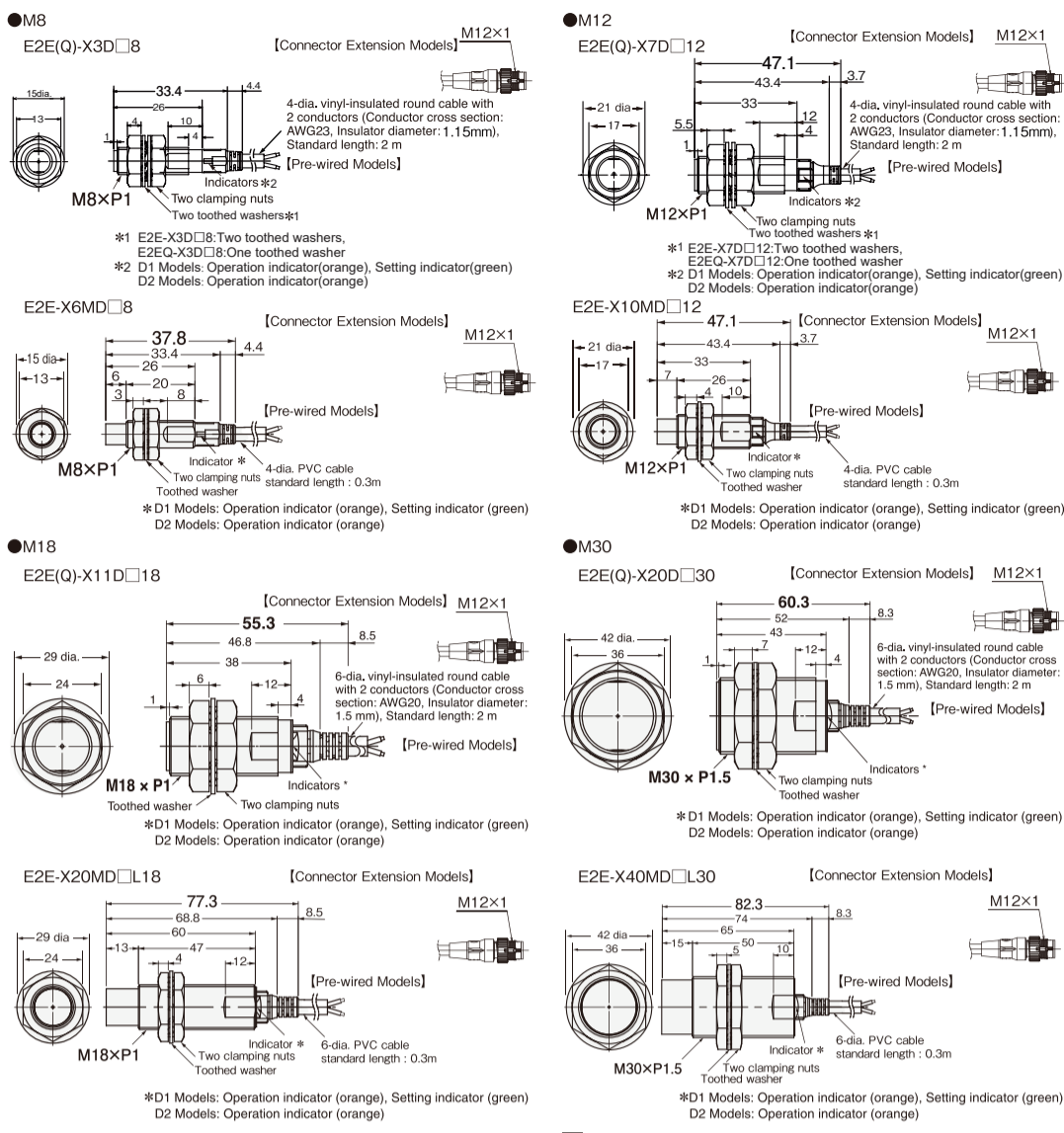
**■ Timing Chart**



**■ Mounting Hole and Nut Dimensions**

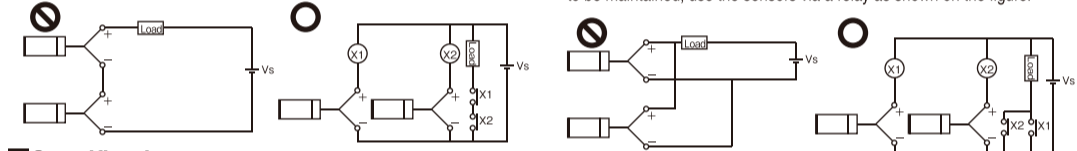
	Diameter of Proximity Switch	F (mm)	G (mm)
M8	$\phi 8.5^{+0.5}_0$	13	
M12	$\phi 12.5^{+0.5}_0$	17	
M18	$\phi 18.5^{+0.5}_0$	24	
M30	$\phi 30.5^{+0.5}_0$	36	

**■ Dimension**



**■ AND Connection of Proximity Sensors**

Two or more sensors cannot be connected in series on the AND circuit. Use them via a relay as shown on the figure.



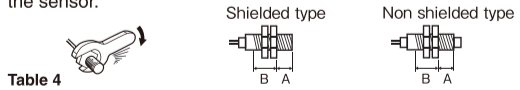
**■ Specifications**

Size	M8	M8	M12	M12	M18	M18	M30	M30	
Model	E2E(Q)-X3D□8	E2E-X6MD□8	E2E(Q)-X7D□12	E2E-X10MD□12	E2E(Q)-X11D□18	E2E-X20MD□L18	E2E(Q)-X20D□30	E2E-X40MD□L30	
Sensing distance	3mm±10%	6mm±10%	7mm±10%	10mm±10%	11mm±10%	20mm±10%	20mm±10%	40mm±10%	
Set distance	0 to 2.4mm	0 to 4.8mm	0 to 5.6mm	0 to 8mm	0 to 8.8mm	0 to 16mm	0 to 16mm	0 to 32mm	
Differential travel	15% max. of sensing distance								
Detectable object	Ferrous metals (The sensing distance decreases with non-ferrous metal.)								
Standard detectable object	Iron 9×9×1mm	Iron 18×18×1mm	Iron 21×21×1mm	Iron 30×30×1mm	Iron 33×33×1mm	Iron 60×60×1mm	Iron 60×60×1mm	Iron 120×120×1mm	
Response frequency	E2E	250Hz	250Hz	200Hz	250Hz	200Hz	200Hz	50Hz	
Power supply voltage	10 to 30VDC (including 10% ripple (p-p), Class2)								
Leakage current	0.8 mA max.								
Load current	3 to 100mA								
Residual voltage	Polar type : 3 V or less. Nonpolar type : 5 V or less. (load current 100 mA or less, cord length 2 m)								
Indicators	D1 type: Operation indicator (Orange LED), Operation set indicator (Green LED) D2 type: Operation indicator (Orange LED)								
Operating temperature	Operating : -25 to +70°C, Storage : -40 to +85°C (no freezing and condensation)								
Operating humidity	Operating : 35 to 95%RH, Storage : 35 to 95%RH (no condensation)								
Insulation resistance	50MΩ min. (at 500VDC) between charge part batch and metal base								
Degree of protection	E2E: IEC60529:IP67, ISO20653 (replacement for DIN40050-9) : IP69K, JIS C 0920 Annex1: IP67G Passed OMRON's Oil-resistant Component Evaluation Standards E2EQ: IEC60529:IP67, JIS C 0920 Annex1: IP67G								
Material	Case: E2E: Nickel-plated brass	E2E: Stainless steel (SUS303)	E2E: Nickel-plated brass					E2EQ: Fluorine resin-coated brass	
Sensing surface	E2E: PBT Color: Black E2EQ: Fluorine resin Color: White								
Cable	PVC								
Clamping nut	E2E: Nickel-plated brass				E2EQ: Fluorine resin-coated brass				
Washer with teeth	Iron with galvanizing								
AWG size	Standard Cable: AWG23 Models: E2E(Q)-X3D□8, E2E(Q)-X7D□12, E2E(Q)-X11D□18, E2E(Q)-X20D□30				AWG20 Models: E2E-X6MD□8, E2E-X10MD□12, E2E-X20MD□L18, E2E-X40MD□L30 Robot Cable Models: AWG25				

Note. Altitude: Up to 2000m, Pollution degree: 3, Enclosure type: type 1

**■ Tightening Force**

Do not tighten the sensor mounting nuts with excessive force. Secure the mounting nuts to the corresponding torque values in table 4. Failure to observe these values may cause damage to the sensor.



**Table 4**

Model (Shielded type)	A		B	
	Size	Torque	Size	Torque
E2E(Q)-X3D□8	9	4N·m	10N·m	
E2E(Q)-X7D□12	16	6N·m	15N·m	
E2E(Q)-X11D□18	16	15N·m	60N·m (30N·m)*	
E2E(Q)-X20D□30	23	40N·m	80N·m	

\*E2E-Q-X11D□18

**Suitability for Use**

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM. See also Product catalog for Warranty and Limitation of Liability.

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