Proximity Sensors with Built-in Amplifier - Square

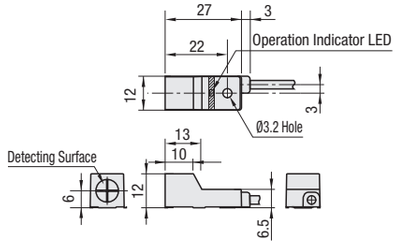
2-Wire / 3-Wire, Non Shield

Do not use this product as a detection device for human body protection.
(For human body protection, use products compliant with the local laws and regulations such as OSHA, ANSI and IEC.)

■General-purpose Square Proximity Sensors at reasonable prices and short lead times.

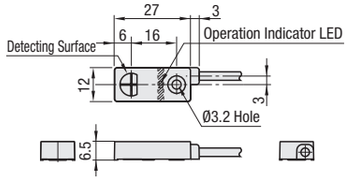
■Front Surface Detection (Detection Distance 4mm)

EX4-F12 (2-Wire)
EMX4-F12 (3-Wire)
EMX4-F12C (3-Wire)



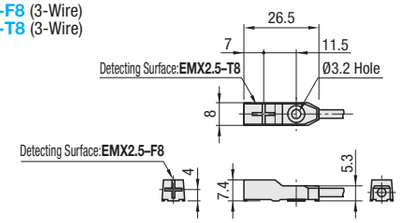
■Upper Surface Detection (Detection Distance 4mm)

EX4-T12 (2-Wire)
EMX4-T12 (3-Wire)
EMX4-T12C (3-Wire)



■Front / Upper Surface Detection (Detection Distance 2.5mm)

EMX2.5-F8 (3-Wire)
EMX2.5-T8 (3-Wire)



M Material: Polycarbonate (Case)
A Accessory: Mounting Brackets (Detection Distance 4mm only)

■2-Wire

Part Number	Detecting Surface	Detection Distance	Output	Unit Price 1 ~ 4 pc(s).	Unit Price 5 ~ 10 pcs.	Volume Discount Rate
EX4-F12	Front Surface	4mm	N.O.			
EX4-T12	Upper Surface					

■3-Wire

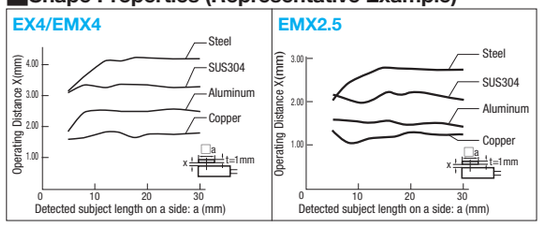
Part Number	Detecting Surface	Detection Distance	Output	Unit Price 1 ~ 4 pc(s).	Unit Price 5 ~ 10 pcs.	Volume Discount Rate
EMX2.5-F8	Front Surface	2.5mm	N.O.			
EMX2.5-T8	Upper Surface					
EMX4-F12	Front Surface	4mm	N.O.			
EMX4-T12	Upper Surface					
EMX4-F12C	Front Surface	4mm	N.C.			
EMX4-T12C	Upper Surface					

Ordering Example — Part Number: EX4-F12

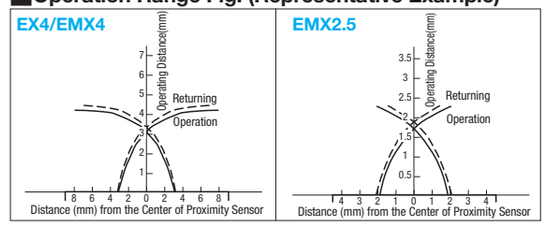
■Specifications

Type	DC, 2-Wire		DC, 3-Wire					
	Front Surface Detection	Upper Surface Detection	Front Surface Detection	Upper Surface Detection	Front Surface Detection	Upper Surface Detection	Front Surface Detection	Upper Surface Detection
	N.O. (Normally Open)		N.O. (Normally Open)		N.O. (Normally Open)		N.C. (Normally Closed)	
Part Number	EX4-F12	EX4-T12	EMX2.5-F8	EMX2.5-T8	EMX4-F12	EMX4-T12	EMX4-F12C	EMX4-T12C
Rated Operating Voltage	12/24VDC (10 ~ 30VDC), Allowable Ripple 3%p-p or less		12/24VDC (10 ~ 30VDC), Allowable Ripple 3%p-p or less		12/24VDC (10 ~ 30VDC), Allowable Ripple 3%p-p or less			
Standard Detected Subject (mm)	Ferrous 20x20x1t		Ferrous 15x15x1t		Ferrous 20x20x1t			
Effective Operation Distance	4mm±10%		2.5mm±15%		4mm±10%			
Guaranteed Operation Distance	0~2.8mm		0~1.7mm		0~2.8mm			
Reactive Material	Ferrous / Nonferrous Metals (Operation distance vary depending on the material)		Ferrous / Nonferrous Metals (Operation distance vary depending on the material)		Ferrous / Nonferrous Metals (Operation distance vary depending on the material)			
Hysteresis	Approx. 20% or less		Approx. 20% or less		Approx. 20% or less			
Operation Cycle Frequency	Up to 200Hz		Up to 500Hz		Up to 200Hz			
Rated Operating Current	5~50mA		Up to 50mA		Up to 50mA			
Voltage Drop	3V or less		1V or less		1V or less			
Off-state Current	1.0mA or less		0.1mA or less		0.1mA or less			
Indicator Light	Operation Indicator		Operation Indicator		Operation Indicator			
Service Ambient Temperature	-10~+50°C		-10~+50°C		-10~+50°C			
Temperature Property	Within ±20% (Operation Distance at +23°C)		Within ±20% (Operation Distance at +23°C)		Within ±20% (Operation Distance at +23°C)			
Withstand Voltage	AC500V 50/60Hz (1 min.)		AC500V 50/60Hz (1 min.)		AC500V 50/60Hz (1 min.)			
Dielectric Strength	50MΩ or more (DC500V)		50MΩ or more (DC500V)		50MΩ or more (DC500V)			
Vibration Resistance	Full Wave Amplitude: 1.5mm 10 ~ 55Hz (in Respective X, Y, Z Direction 2h)		Full Wave Amplitude: 1.5mm 10 ~ 55Hz (in Respective X, Y, Z Direction 2h)		Full Wave Amplitude: 1.5mm 10 ~ 55Hz (in Respective X, Y, Z Direction 2h)			
Shock Resistance	294m/s² Within 11ms (in Respective X, Y, Z Direction each 10 times)		294m/s² Within 11ms (in Respective X, Y, Z Direction each 10 times)		294m/s² Within 11ms (in Respective X, Y, Z Direction each 10 times)			
IP	IP67		IP67		IP67			
Case Material	Polycarbonate		Polycarbonate		Polycarbonate			
Lead Wire	Oil Resistant Cable 1.0m O.D. (Ø3) 0.18mm², 2 Conductors		Oil Resistant Cable 1.0m O.D. (Ø3) 0.18mm², 3 Conductors		Oil Resistant Cable 1.0m O.D. (Ø3) 0.18mm², 3 Conductors			
Tightening Torque	0.4Nm or less		0.4Nm or less		0.4Nm or less			
Mass	Approx. 20g		Approx. 19g		Approx. 20g			

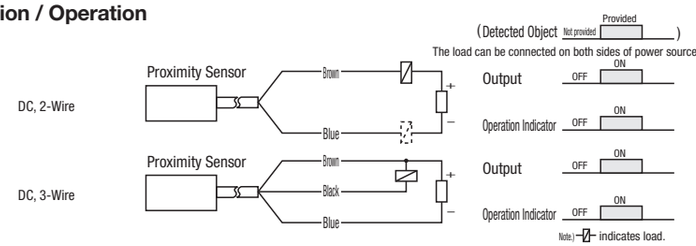
■Shape Properties (Representative Example)



■Operation Range Fig. (Representative Example)



■Connection / Operation



■Reciprocal Interference and Same Frequency Classification

When installing 2 or more Proximity Sensors closely, the distance should be 10 times or more as far as operation distance (from center to center).
Mutual Interference may occur if the interval is inadequate.

(mm)

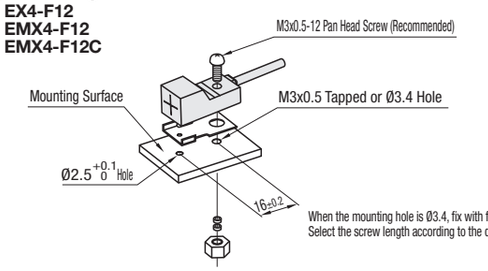
Part Number \ Installation	Infinitely Metal Surface Parallel Placement	Metal Surface Parallel Placement to Detection Surf.	Opening on Metal	Metal on the Other Side	Parallel Placement	Opposed Placement Front Surface Detection Type	Opposed Placement Upper Surface Detection Type
	Detected Subject, A*	Detected Subject, B*	C, Detected Subject	Detected Subject, D	Detected Subject, D1	Detected Subject, D2	Detected Subject, D3
EMX2.5-T8	3.7	3.7	14	8	18	-	20
EMX2.5-F8	10	7	14	8	18	20	-
EX4-T12 EMX4-T12 EMX4-T12C	3.25	3.25	30	10	32	-	20
EX4-F12 EMX4-F12 EMX4-F12C	20	15	30	10	32	20	-

* Detected Subject Position for Upper Surface Detection Type

- Metals around Proximity Sensors change the operation distance and make the operation unstable. Keep surrounding metals away from the sensor.
- D dimension (mm) indicates least distance from the detecting surface of Proximity Sensor to surrounding metals. Keep the distance beyond the value in the table above.
- When B dimension of EMX2.5-F8=3.7mm (Solid Installation), the detecting surface of Proximity Sensor should be located 3mm or more far from surrounding metals.
- If sufficient clearance cannot be allocated, mutual interference can be avoided by using sensors of different frequencies. Request for such a sensor is accepted as part of special order. For details, contact MISUMI.

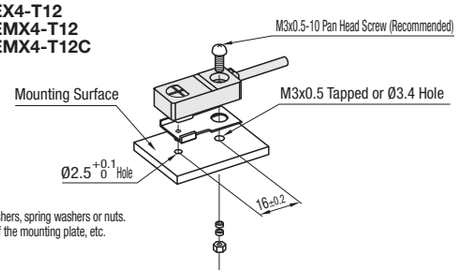
■Mounting (Detection Distance 4mm)

EX4-F12
EMX4-F12
EMX4-F12C



When the mounting hole is Ø3.4, fix with flat washers, spring washers or nuts.
Select the screw length according to the depth of the mounting plate, etc.

EX4-T12
EMX4-T12
EMX4-T12C



■Before Using the Products

- Note that this product may output a detection signal when the power turns on. For about 25ms when there is no object, for about 100ms when there are some objects around.

■Cautions for Mounting

- When tightening by screws, ensure that the sensor is not be subjected to stresses.
  * Sensors may be damaged by tightening with over Tightening Torque 0.4Nm.

■UL Recognition

When using this sensor as a UL recognized component, use the power Class 2. UL recognized components are approved by UL recognition and required to use power Class 2.