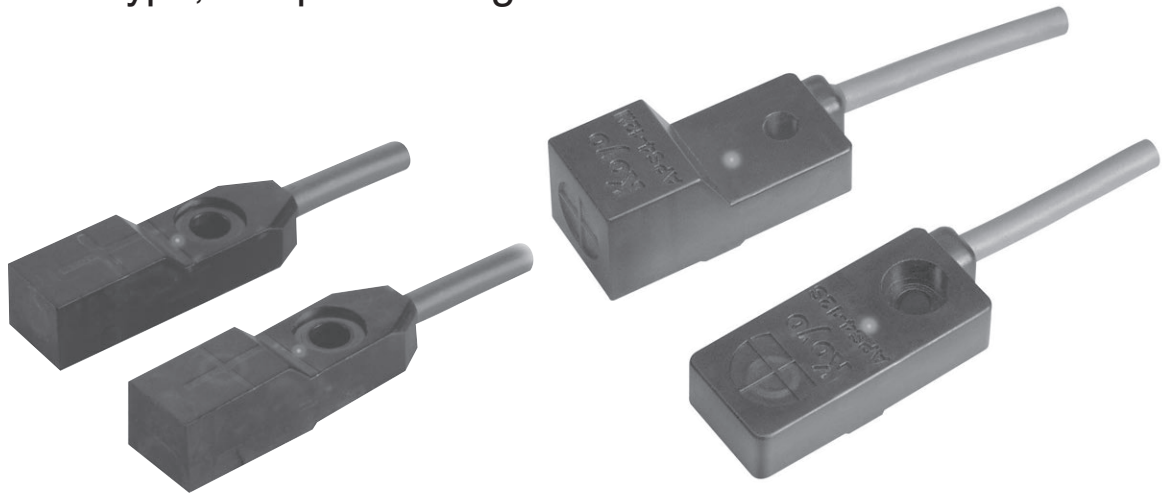


# Rectangular Type APS-S/M Series

Small design offered in two types: front face sensing and upper sensing. Different-frequency type that allows close-contact installation.

Acquiring UL approval, compliant with CE mark.

Resin molded type, and protection grade of IP67.



## Types

### DC 2-wire type

Shape	Operating distance (mm)	Output type	Model number	Remarks
Non-embedded type	4	N.O.	<b>APS4-12M-Z</b>	Front face sensing Different-frequency classification type available ("L" added in the end of model number) Provided with a mounting fixture
	4	N.O.	<b>APS4-12S-Z</b>	Upper face sensing Different-frequency classification type available ("L" added in the end of model number) Provided with a mounting fixture

\* Different-frequency classification types (L) are non-stock product.

### DC 3-wire type

Shape	Operating distance (mm)	Output type	Model number	Remarks
Non-embedded type	2.5	NPN N.O.	<b>APS2.5-8M-E</b>	Front face sensing
		NPN N.O.	<b>APS4-12M-E</b>	Front face sensing Different-frequency classification type available ("L" added in the end of model number) (Excluding E1 type) Provided with a mounting fixture
	NPN N.O.	<b>APS4-12M-E1</b>		
	4	NPN N.O.	<b>APS4-12M-E2</b>	Upper face sensing
		PNP N.O.	<b>APS4-12M-E2</b>	
	2.5	4	NPN N.O.	<b>APS2.5-8S-E</b>
NPN N.O.			<b>APS4-12S-E</b>	
NPN N.O.			<b>APS4-12S-E1</b>	
4	4	NPN N.O.	<b>APS4-12S-E1</b>	Upper face sensing Different-frequency classification type available ("L" added in the end of model number) (Excluding E1 type) Provided with a mounting fixture
		PNP N.O.	<b>APS4-12S-E2</b>	

\* For **APS2.5-8M-E** and **APS2.5-8S-E**, UL recognition is being applied (as of May 2004).

AC 2-wire, Non-embedded Type

Effective operating distance	4 mm ±10%	
Dimensions (mm)		
Remarks	Different-frequency classification model available / operation indicator LED / provided with mounting fixture	
	Upper face sensing	Upper face sensing
Output type	NO	Model number
		Price
		<b>APS4-12S-Z</b>
		¥980 (Minimum ordering qty: 5 units)
		<b>APS4-12M-Z</b>
		¥980 (Minimum ordering qty: 5 units)
Rated operating voltage	DC+12/+24 V (+10 to +30V) Permissible ripple rate: 3%p-p or less	
Standard target object (mm)	Iron 20 × 20 × 1t	
Rated operating distance	0 to 2.8 mm	
Responding material	Iron/nonferrous metal (operating distance varies with material)	
Differential travel	20% or less	
Switching frequency	200 Hz max	
Rated operating current	5 to 50 mA	
Voltage drop	3 V or less	
Leakage current	1.0 mA or less	
Indicator lamp	Operation indication	
Operating temperature	-10 to +50°C	
Temperature characteristics	Within ± 20% (of operating distance at +23°C)	
Withstand voltage	500 VAC, 50/60 Hz (1 minute)	
Insulation resistance	50 MΩ or higher (500 VDC)	
Vibration resistance	Double amplitude: 1.5 mm, 10 to 55 Hz (2 hours in each of X, Y and Z directions)	
Impact resistance	294 m/s <sup>2</sup> , within 11 ms (10 cycles in each of X, Y and Z directions)	
Protection grade	IP67	
Casing material	Polycarbonate	
Lead wire	Oil-resistant vinyl chloride cable 1.0 m Outer diameter (ø3), 0.18 mm <sup>2</sup> 2-wire	
Tightening torque	0.4 Nm or less	
Weight	Approx. 20 g	

\*The frequency classification models have "L" at the end of its model number (non-stock product).

APS-GMC  
APS-GMD  
APS-GM  
APS-GK  
APS-30/31  
APS-CK  
APS-S/M  
APS-F/U  
APS-10~15  
APS-CU  
CS

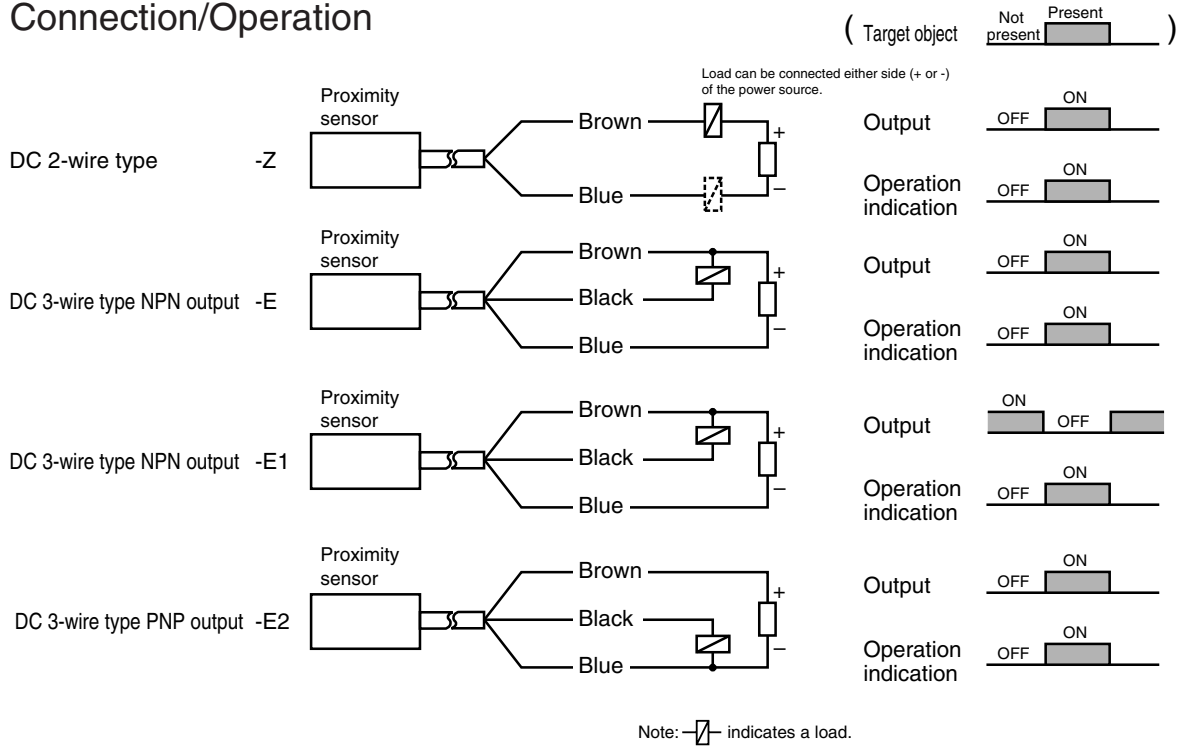
# Rectangular Type APS-S/M Series

## DC 3-wire, Non-embedded Type

Effective operating distance	2.5 mm ±15%		4 mm ±10%		
Dimensions (mm)					
Remarks	Operation indicator LED / mounting fixture sold separately ( <b>APS-KNG8</b> )		Different-frequency classification model available (excl. E1 type) / provided with mounting fixture		
	Upper face sensing	Front face sensing	Upper face sensing	Front face sensing	
Output type	NPN NO	Model number <b>APS2.5-8S-E</b> Price ¥940 (Minimum ordering qty: 10)	Model number <b>APS2.5-8M-E</b> Price ¥940 (Minimum ordering qty: 10)	Model number <b>APS4-12S-E</b> Price ¥880 (Minimum ordering qty: 5)	Model number <b>APS4-12M-E</b> Price ¥880 (Minimum ordering qty: 5)
	NPN NC	Model number <b>APS4-12S-E1</b> Price ¥880 (Minimum ordering qty: 5)	Model number <b>APS4-12M-E1</b> Price ¥880 (Minimum ordering qty: 5)	Model number <b>APS4-12S-E2</b> Price ¥880 (Minimum ordering qty: 5)	Model number <b>APS4-12M-E2</b> Price ¥880 (Minimum ordering qty: 5)
Rated operating voltage	DC+12/+24 V (+10 to +30 V) Permissible ripple rate: 3%p-p or less				
No-load current	20 mA or less		10 mA or less		
Standard detection object (mm)	Iron 15 × 15 × 1t		Iron 20 × 20 × 1t		
Rated operating distance	0 to 1.7 mm		0 to 2.8 mm		
Responding material	Iron/nonferrous metal (operating distance varies with material)				
Differential travel	20% or less				
Switching frequency	500 Hz max		200 Hz max		
Rated operating current	50 mA max				
Voltage drop	1.0 V or less				
Leakage current	0.1 mA or less				
Indicator lamp	Operation indication				
Operating temperature	-10 to +50°C				
Temperature characteristics	Within ± 20% (of operating distance at +23°C)				
Withstand voltage	500 VAC, 50/60 Hz (1 minute)				
Insulation resistance	50 MΩ or higher (500 VDC)				
Vibration resistance	Double amplitude: 1.5 mm, 10 to 55 Hz (2 hours in each of X, Y and Z directions)				
Impact resistance	294 m/s <sup>2</sup> , within 11 ms (10 cycles in each of X, Y and Z directions)				
Protection grade	IP67				
Casing material	Polycarbonate				
Lead wire	Oil-resistant cable 1.0 m Outer diameter (ø3), 0.18 mm <sup>2</sup> 3-wire				
Tightening torque	0.4 Nm or less				
Weight	Approx. 19 g		Approx. 20 g		

\*The frequency classification models have "L" at the end of its model number (non-stock product).

## Connection/Operation



## Installation and Influence of Surrounding Metals

Installation	(in mm)						
	Placed in parallel with a metallic infinite plane	Placed in parallel with a metallic plane as far as the detection plane	Placed in the hole of a window-shaped metallic body	A metallic body is placed in front of the sensor	Two sensors are placed in parallel with each other	Placed to face each other (Front-sensing type)	Placed to face each other (Top-sensing type)
Model number							
APS2.5-8S-...	3.7	3.7	14	8	18	-	20
APS2.5-8M-...	10	7	14	8	18	20	-
APS4-12S-...	3.25	3.25	30	10	32	-	20
APS4-12M-...	20	15	30	10	32	20	-

- \* Position of the target object for a top-sensing model
- If a metallic object is present near the proximity sensor, the operating distance changes and the operation becomes unstable. Secure a sufficient distance from the sensor as long as possible.
- The "D" (mm) is the minimum distance from the proximity sensor's detection plane to the metallic object. Secure a sufficient distance longer than the indicated.
- If the "B" dimension of APS2.5-8M is 3.7 mm (close contact), the detection plane edge of the proximity sensor needs to be at least 3 mm away from the metal.

## Precautions on handling the product

- Before using the product
  - If no target object is present when the sensor is turned on, a detection signal may be output for approx. 25 ms. If a target object is present near the sensor, a detection signal may be output for approx. 100 ms.
- Precautions on installation
  - When using screws to mount the product, be sure not to give stress to the sensor.
    - \* Tightening the screw with a force exceeding the specification value of 0.4 Nm for the tightening torque may break the sensor.
- UL approval
  - When using the sensor as a UL approved product, use a Class-2 power source.
  - A UL approved product is required to be approved in recognition and use a Class-2 power source.

APS-GMC  
 APS-GMD  
 APS-GM  
 APS-GK  
 APS-30/31  
 APS-CK  
 APS-S/M  
 APS-F/U  
 APS-10~15  
 APS-CU  
 CS

## Mutual Interference and Classification of Frequencies

When using two or more proximity sensors in close contact with each other, secure an interval between the proximity sensors (center to center) at least 10 times the operating distance. If the interval is inadequate, mutual interference may occur.



In applications where it is impossible to secure adequate intervals, use models classified by frequency. Normally, frequency classification is indicated by an alphabet immediately after the operating distance of the model number.

- Those models classified by frequency have the following marking on the cable so that they can easily be distinguished from other models.  
For low frequencies (L) : red spiral mark

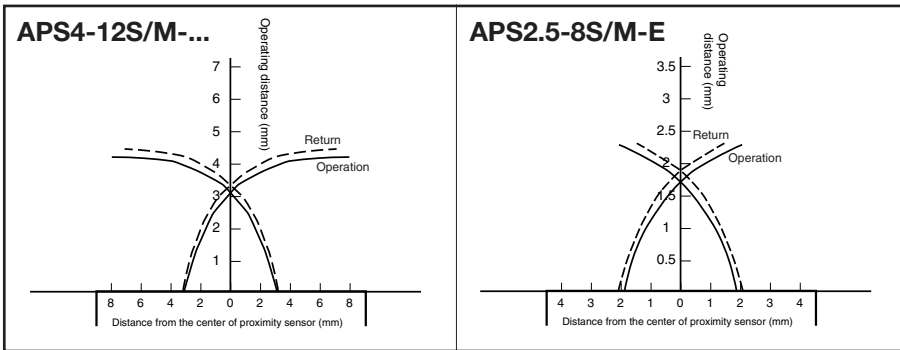
Example:

**APS4-12S-E(M)** ..... Model with a standard frequency  
-E2 (normally, "M" is omitted)

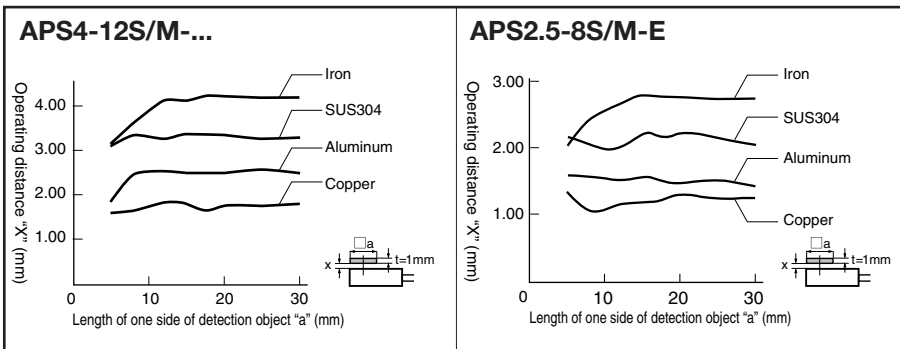
**APS4-12S-EL** ..... Model with a lower frequency than the standard frequency

Combinations of models classified by frequency (can be installed in close contact with each other)	
<p><b>APS4-12□-□(M)L</b> (Excluding -E1 type)</p>	<p>Can be installed with casings in close contact with each other</p> <p>L </p> <p>(M) </p> <p>* To install three or more sensors in close contact, preliminary study is required.</p>

## Detection Area Diagrams (Representative Examples)

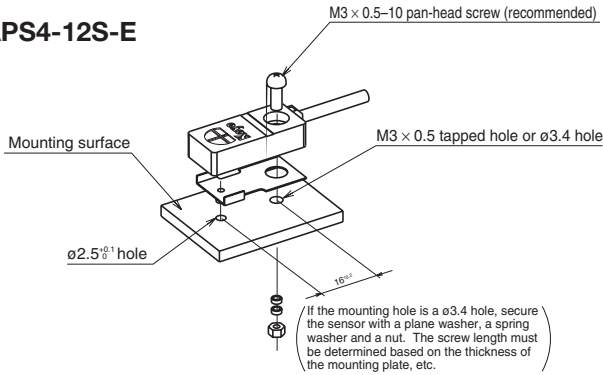


## Shape Characteristics (Representative Examples)

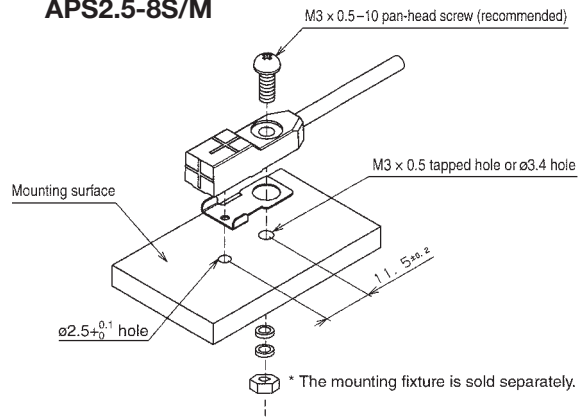


Installation

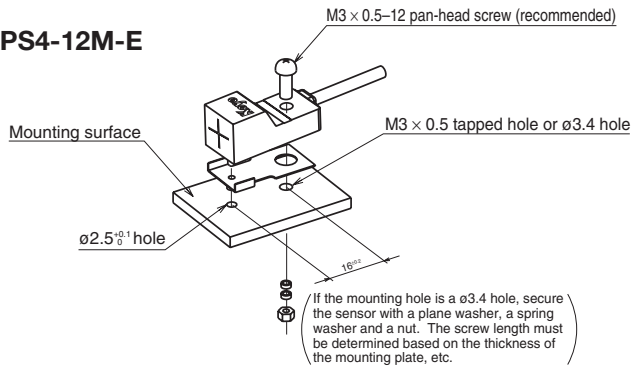
APS4-12S-E



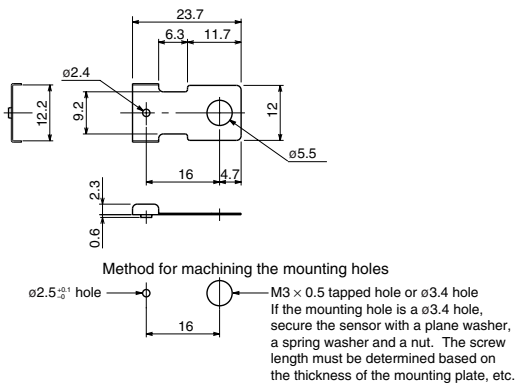
APS2.5-8S/M



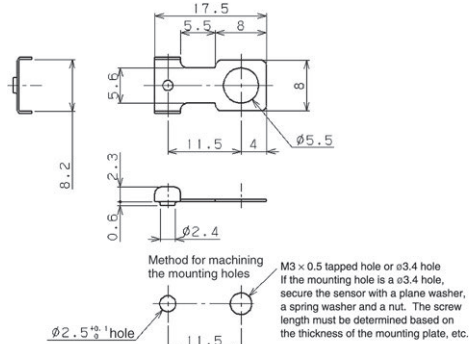
APS4-12M-E



Mounting fixture for APS4-12S/M



Mounting fixture for APS2.5-8S/M (※ sold separately)



Model number **APS-KNG8**  
 Price **¥120**  
 ※ Minimum ordering qty: 10 pcs

APS-GMC
APS-GMD
APS-GM
APS-GK
APS-30/31
APS-CK
APS-S/M
APS-F/U
APS-10~15
APS-CU
CS